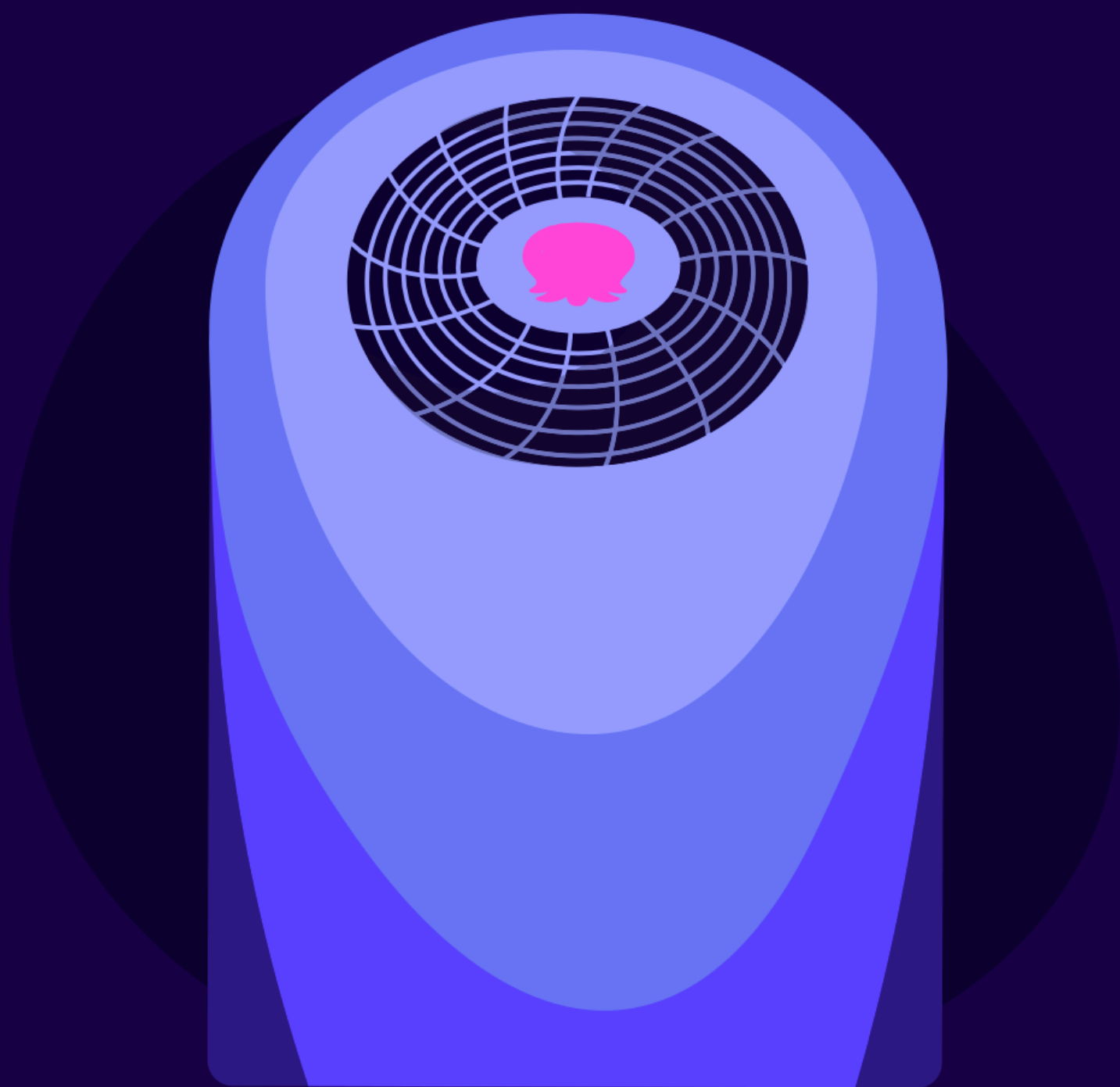


Cosy Series Installation Manual

Version 4.0



Foreword

This manual describes the unpacking, safe handling, installation, fault finding and servicing of the Cosy series of R290 air source heat pumps.

Please make sure that this manual is read, understood, and kept for reference before beginning the installation. As this manual is a work in progress, successive versions may incorporate significant changes to prior procedures, figures, and guidelines. Below is a summary of changes that will help you understand what is new in this version of the manual.

Summary of Changes

Note the following changes from **v3.1** to **v4**

- Section 1 *No Change*
- Section 2 *No Change*
- Section 3.3 New information on system architecture including microbore & underfloor
- Section 3.4 Updated plumbing components information including compatible cylinders
- Section 3.5 Updated plumbing schematics
- Section 3.6 **NEW** Electrical components information including wire types
- Section 3.7 **NEW** Electrical schematics
- Section 4 *No Change*
- Section 5 *No Change*
- Section 6.3 Updated R290 safety clearance zones:
 - Spark Zone renamed to No Spark Zone
 - Gas meter boxes added to Drain Zone diagram & clearances
- Section 7 *No Change*
- Section 8 *No Change*
- Section 9.2 Updated heat pump base dimensions
- Section 9.3 Updated condensate drain requirements
 - Removed U-trap
 - Restricted drains connection to non-foul drains only
- Section 9.4 Updated heat pump mounting procedures to threaded rod/resin
- Section 9.5 **NEW** Electrical connections information
- Section 10.6 Added Circulating Pump wiring diagram for Cosy Hub controller & valves
- Section 11.3 Updated **controls commissioning instructions**
 - **57° C High** setting for weather compensation
 - **36° C Low** setting for weather compensation
 - Default setting for ambient temperatures
- Section 12 *No Change*
- Section 13 *No Change*

Contents

Section	Page
1. Safety Information.....	5
1.1. Before beginning work	
1.2. Safety symbols	
1.3. R290 refrigerant safety information	
1.4. Special qualifications for R290	
1.5. R290 emergency procedures	
1.6. Safe siting	
1.7. Installation restrictions	
1.8. Electrical work	
2. Introduction.....	10
2.1. Cosy series heat pumps	
2.2. Legal Disclaimer	
3. Cosy Heating System information.....	11
3.1. Cosy system design	
3.2. Main components	
3.3. Heating architectures with Cosy 6	
3.4. Plumbing system components	
3.5. Plumbing schematics	
3.6. Electrical system components	
3.7. Electrical schematic	
4. Key Safety Features.....	21
4.1. Overview	
4.2. Failsafe conditions & key components	
5. Cosy 6 Monobloc Unit Subsystems.....	22
5.1. Subsystems overview	
5.2. Refrigerant circuit	
5.3. Water circuit	
5.4. Heat exchanger	
5.5. Evaporator & fan	
5.6. Onboard electronics	
6. Siting and Installation Clearances.....	24
6.1. General information	
6.2. Operational clearances	
6.3. Safety clearances	

7. Product Data Sheet.....	32
8. Transporting & Unpacking.....	33
9. Heat pump unit installation.....	34
9.1. Before installing	
9.2. Heat pump base	
9.3. Condensate drainage	
9.4. Mounting	
9.5. Plumbing connections	
9.6. Electrical connections	
10. Cosy Hub Installation.....	47
10.1. Controls overview	
10.2. Controls architecture and requirements	
10.3. Cosy Hub mounting	
10.4. Cosy Hub wiring	
10.5. Wiring for DHW	
11. Commissioning.....	57
11.1. Pre-commissioning checks	
11.2. Filling the system	
11.3. Commissioning the controls	
11.4. Setting up Cosy Pods	
11.5. Octopus Energy app setup	
12. Post-Installation Handover.....	68
12.1. Final checks	
12.2. Document delivery	
12.3. System explanation	
13. Servicing the product.....	70
13.1. General precautions	
13.2. Electrical safety guidelines	
13.3. General servicing guidelines	
13.4. Checking for hydraulic leaks	
13.5. Noise trouble-shooting	
13.6. Electrical maintenance	
13.7. Repairs involving refrigerant	
14. Decommissioning.....	77
14.1. Uninstalling the unit	
14.2. Decommissioning labeling	

1. Safety Information

1.1 Before beginning any work

- Carefully read all installation instructions before installation.
- Use proper protective equipment and follow all safety and warning instructions.
- Aside from the requirements set out in this document, installers must follow national guidelines, regional regulations, and technical regulations of their jurisdiction.
- Installers should document each installation process and any issues that arise at the time of install in the space allotted on the commissioning documentation.

1.2 Safety symbols used in this manual

This installation manual contains special symbols to draw your attention to information deemed vital to the safeguarding of life, property, or components.:



WARNING - Red triangle enclosing relevant ISO 7010 symbology

Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or even death to people, pets, or wildlife.



CAUTION - Yellow triangle with exclamation point

Advises on how to avoid property damage or an undesirable outcome for the heat pump or associated components.

1.3 R290 refrigerant safety information



WARNING: Danger of fire or explosion due to flammable gasses

- Do not pierce or burn any part of the unit.
- Do not smoke around the unit, either during work or during transportation.
- Do not use any open flame in the vicinity of the unit.
- Make sure there are no sources of ignition in the vicinity of the product.
- Never store the unit in an enclosed space with continuously operating ignition sources (example: open flames, operable gas appliances or electric heaters).
- Unit shall be stored as to prevent mechanical damage that may create a leak.



CAUTION: To ensure there is no leakage when working on the product, a gas detector calibrated for use with R290 should be used and set to $\leq 25\%$ of the lowest flammability limit.

Refrigerant details

Cosy series heat pumps contain the natural refrigerant R290, commonly known as propane. Propane is an excellent refrigerant. It is much safer for the environment, with a global warming potential of only 3 (nearly equal to pure CO₂). Other common refrigerants such as R32 have GWP values more than 200 times higher. R290 also performs better than prior refrigerants, allowing heat pumps to create much higher temperatures.

R290 is a colorless, odorless substance that exists in gas form at room temperature. If the refrigerant leaks and is exposed to a source of ignition, there is a risk of explosion or fire.

R290 is heavier than air and can collect in low-lying areas, including pipes and drains. Unlike other forms of propane such as patio gas, R290 contains no artificial scent to aid in detecting a leak. If a leak occurs, the refrigerant can become a combustible gas when in contact with air and in sufficient concentrations.

For your safety and the safety of others, proper procedures must be followed at all times.

1.4 Special qualifications for refrigerant R290



WARNING: Due to risk of fire and explosion, maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.



CAUTION:

- The unit must only be opened by personnel with knowledge of the properties and risks associated with the refrigerant R290.
- Work on the refrigerant circuit requires special training in addition to standard repair procedures due to the refrigerant being flammable.
- Any person who is involved with working on or accessing a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Servicing shall only be performed as recommended by Octopus Heating, the original equipment manufacturer
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants
- On top of the instructions provided in this manual, all installers should adhere to regulations regarding R290 in their jurisdiction.
- The unit refrigerant circuit is hermetically sealed, and has been appropriately leak tested in line with standard EN-60335.
- Note clearance distances required for R290 - as shown in Figure 6.1

1.5 R290 emergency procedures

FIRST AID MEASURES	
General Information	May cause asphyxiation in high concentrations. Victim may not be aware of asphyxiation. Symptoms may include loss of mobility or consciousness. If asphyxiation is suspected, move the victim to a well-ventilated area, lay down, and seek medical attention immediately.
Skin Contact	Allow to evaporate. Wash off immediately with plenty of soap and water. Remove contaminated clothing. Seek medical attention if irritation or symptoms persist
Eye Contact	Remove contact lenses. Keep eyelids open, rinse with plenty of water for 15 minutes. Seek medical attention if irritation persists.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. Seek medical attention if irritation persists.
Ingestion	Rinse mouth thoroughly with water. Do not induce vomiting. Never give anything by mouth to an unconscious person.
FIRE FIGHTING MEASURES	
Suitable Extinguishing Media	Extinguishing powder, water spray, water mist, or AFFF (foam). Use appropriate media for surrounding fire conditions. Cool fire-exposed containers with water spray.
Unsuitable Extinguishing Media	High-pressure water jet, carbon dioxide.
Fire Hazards	Heating produces hazardous fumes. Gas is heavier than air and may accumulate in low areas.
Protective Equipment	Wear self-contained breathing apparatus and protective clothing.
ACCIDENTAL RELEASE MEASURES	
Personal Precautions	Ensure adequate ventilation, evacuate to a safe area, prevent further spillage. Keep public away, eliminate ignition sources.
Environmental Precautions	Should not be released into the environment. Suppress gasses/vapors/mists with a water spray jet.

1.6 Safe siting of heat pump unit



WARNING: Unit must be secured against tipping during all phases of installation. Failure to secure the unit may result in injury or death.



WARNING: Unit must be installed away from any source of flammable gasses. Accumulation of such gasses around the unit may result in fire or explosion.



CAUTION:

- The unit is intended for closed household (domestic) heating systems only. All other use is considered unsuitable.
- Diagrams for minimum distance for placement of the product in relation to surrounding structures have been provided and should be consulted prior to product placement, ideally during survey of the property.
- If the outdoor unit is installed in areas exposed to steam, oils, or where it may be consistently covered by snow, performance of the unit may be affected, and damage may be caused.
- The unit produces water due to the formation and melting of ice through operation. It therefore requires suitable drainage to prevent damage to the unit or potential injury to users.

1.7 Installation, commissioning, and servicing restrictions



WARNING: Protective gloves should be worn to remove the unit from the packaging and to move, as evaporator fins can cause injury.



WARNING: Do not touch pipework during operation. Pipes can reach up to 75°C depending on the condition of the refrigerant.



WARNING: Components within the enclosed heat pump casing may be hot enough to cause severe burns after the unit has stopped operating.



WARNING: Do not smoke around the unit, either during work or during transportation.



CAUTION:

- The heat pump may only be installed, brought into operation, and maintained by authorized personnel.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge only if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

- Two or more persons are needed to handle the unit, as it weighs over 20 kg.
- Use only original spare parts as outlined by the manufacturer, or explicitly agreed between manufacturer and installer.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

1.8 Electrical work



WARNING: Risk of electrical shock resulting in serious injury or death. Ensure all sources of electrical power are isolated and secured against accidental contact before removing casing or undertaking any work.



WARNING: Electric drive components have capacitors that remain powered for up to 10 minutes even after the main power is isolated from the heat pump.



CAUTION:

- The unit must be powered via dedicated power lines with the correct voltage and circuit breakers being used.
- Installation of a residual current device (RCD) having a rated residual operating current not exceeding 30 milliamperes (mA) is advisable.
- Electrical install must be conducted by a current and qualified electrician to the latest version of IET wiring standards BS 7671.
- Before starting the install, make sure to isolate mains power on all poles, including any components that may be separately supplied. Ensure the heat pump cannot accidentally connect to the power supply. If performing maintenance on an installed unit, leave for minimally one minute before touching the unit again in order to ensure no components still hold any electrical charge.
- Means for disconnection must be incorporated in the fixed wiring in accordance with national and local wiring regulations. If a rotary isolator is installed it must be outside of the clearance zones specific for R290 in section 6.
- The unit must be suitably earthed with its connection verified.
- Do not leave the unit unattended during installation or servicing, especially when the door of the unit is removed.

2. Introduction

2.1 Cosy Series Heat Pumps

The Cosy Series of heat pumps are designed and built by Octopus Energy in the United Kingdom. They represent the first heat pump built from the ground up that keeps the unique design and heating needs of British homes in mind.

Cosy Series heat pumps form the basis of the Cosy Heating System, and are designed and intended to work only with the associated Cosy components to deliver the correct performance for the home. More information on the Cosy Heating System components and their interaction can be found in subsequent sections.

This manual describes the correct installation and operation of the Cosy 6 R290 air source heat pump. The procedures in this manual are sufficient for installation of all Cosy models. Where procedures and methods in this manual conflict with laws or building codes in the nation or locality where the Cosy is to be installed, local requirements shall take precedence.

2.2 Legal Disclaimer

Octopus Energy Group and its subsidiaries accept no responsibility or liability for losses or damages incurred due to use of this heat pump or associated equipment for any purpose other than their intended use.

No liability for losses, damages, or injuries will be accepted by Octopus Energy Group under the following circumstances:

- Installation, commissioning, and/or servicing of the heat pump performed by any persons other than trained and authorized Octopus Energy personnel
- Installation or operation of the heat pump not in accordance with the instructions within this document
- Installation or operation of the heat pump with control components other than those specified in this document
- Failure to comply with safety warnings
- Failure to use properly worn personal protective equipment during handling, installation, commissioning, or servicing

3. Cosy heating system information

3.1 Cosy system design

Please ensure that the full system design and heating/hot water requirements are understood before beginning installation of the heat pump or hot water tank. System design must be undertaken by a trained professional to ensure proper operation in the home.

It is the responsibility of the system designer to ensure that the correct Cosy heat pump is selected for the installation and in concordance with heat loss and sizing calculations.

If there are any questions about any part of the installation of the heat pump after fully reading this installation manual, please contact Octopus technical support or your area manager for further guidance. Likewise, if the instructions in this manual cannot be followed, please stop the installation, and contact Octopus technical support or your area manager.

3.2 Main system components

The Cosy system consists of three main elements distinct from other heat pump systems:

1. Cosy Heat Pump outdoor monobloc unit with a nominal output of 6 kW
2. Cosy Hub indoor heat pump controller unit
3. Cosy Pod indoor temperature and humidity sensors

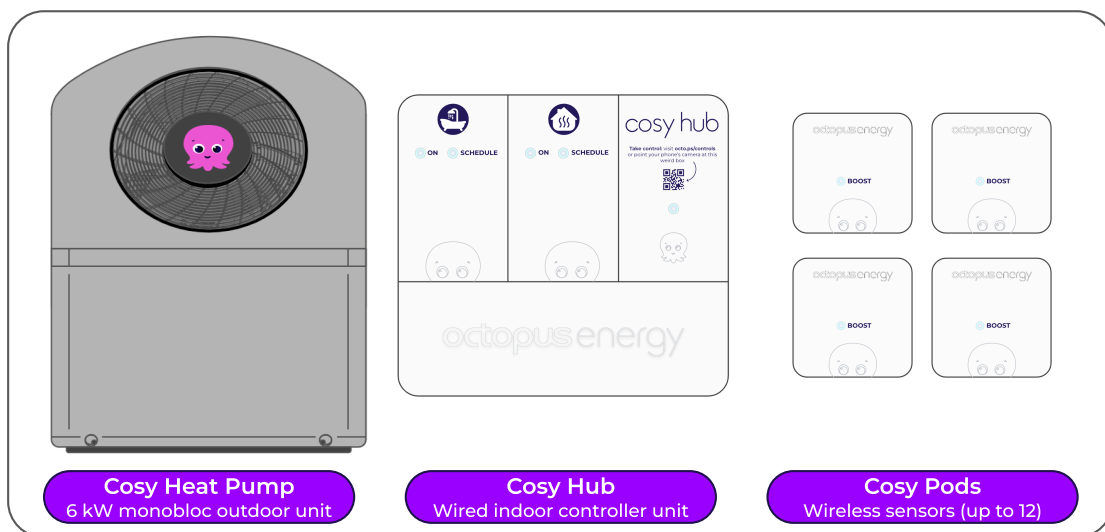


Figure 3.1 - Basic Components

Cosy heat pumps must be installed as part of a Cosy Heating System designed around the customer's specific home. Cosy Heat Pumps should not be swapped onto existing heat pump systems until those components in the home have been evaluated and incorporated into a design specific to the home.



CAUTION: Operation of the heat pump with any control system other than the Cosy Hub, including third-party thermostats, may result in damage to the unit

3.3 Heating architectures with Cosy 6

3.3.1 Heating zones

The Cosy system can support up to four heating zones: three space heating zones and one domestic hot water zone. DHW is always specified as a zone in the Cosy Hub controller.

Single-zone space heating is preferred for the Cosy system in most homes. Multiple zones must be specified and included in the initial system design. If the customer requests a zone architecture that differs from the design, you should contact Octopus technical support or your manager to obtain an updated design.

3.3.2 Microbore & Restrictive Circuits

Cosy heat pumps are compatible with restrictive circuits including microbore. Where microbore is present, a hydraulic split will be necessary for best performance. This allows the compressor to run at a more efficient speed while a circulating pump provides a lower flow rate to the radiators to ensure necessary temperature differential and adequate room heating.

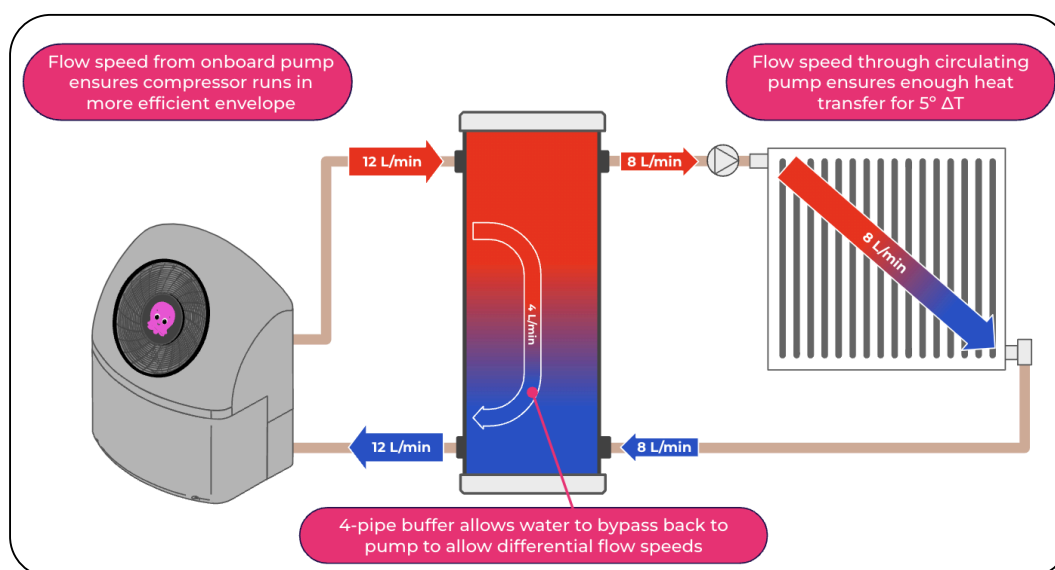


Figure 3.2 - 4-pipe buffer with hydraulic split

Whenever there is microbore or a restrictive circuit, the volumizer should be installed in a 4-pipe configuration. One or more circulating pumps should be installed to avoid adverse flow scenarios. See section 3.4 and Section 9 for additional information.

Restriction may exist in heating systems where microbore is not present. For Cosy systems, a home where the pressure drop across the circuit is less than 9 kPA is considered restrictive.



CAUTION: Installation on restrictive circuits without hydraulic separation (hydrosplit) will result in reduced performance and adverse running conditions.

3.3.3 Underfloor Heating

Cosy heat pumps are compatible with underfloor heating systems. Underfloor circuits should be treated as a separate zone and may also be restrictive circuits. Existing pumps and blending valves should be removed and replaced with zone valves and pipe thermostats per the provided design.

3.4 Plumbing system components

3.4.1 Water Cylinder

Cosy heat pumps require installation of a heat pump-compatible cylinder sized for the home per the provided system design. Standard cylinder models for use with the Cosy are listed in Table 3.A

Cosy 6 Compatible Water Cylinders				
Manufacturer	Model	Capacity	Diameter	Height
Whitewolf	WWA180HPI	180L	545 mm	1314 mm
Joule	TRSMVH-0210SFC	180L	475 mm	1470 mm
Whitewolf	WWA200HPI	200L	545 mm	1444 mm
Joule	TRSMVH-0210SFC	210L	475 mm	1903 mm
Whitewolf	WWA250HPI	250L	580 mm	1480 mm
Whitewolf	WWA300HPI	300L	580 mm	1660 mm

Table 3.A - Compatible water cylinders

3.4.2 Buffer tank (4-pipe setup)

Buffer tanks should be installed per the provided design. Where required, the buffer tank must be installed with a 4-pipe architecture to create hydraulic separation. This will prevent flow rate issues and pump oscillation. Installation of a 4-pipe buffer is the default approach for microbore and other restrictive circuits where the pressure drop is below 9 kPa.

3.4.3 Volumizer

Where a 4-pipe buffer is not specified, a volumizer will be specified in the design on the return flow line and should be installed using the primary or alternate configurations given.

3.4.4 Circulating pump(s)

Fixed-speed circulating pump(s) should be fitted in all restrictive circuit applications to achieve required flow rate, with the associated hydraulic separation as specified above. Pump speed should be set to achieve the specified temperature differential across the flow and return portions of the load circuit (5° C unless otherwise specified). This can be achieved through the use of temperature clamps or other similar methods.

3.4.5 Return Water Filter

All Cosy heat pumps shall be fitted with an external filter with magnetic and sieve protection on the heat pump primary return line.

3.4.5 Pressure Relief Valve

Pressure relief valves are required on all Cosy installations. Pressure relief valves should be installed as close to the wall as possible and terminate straight to the outside using one of the two approved termination methods.

3.4.5.A Pipe Turnback (Preferred)

Default termination method should be a turnback. Plumb PRV 15mm copper pipe as depicted, ensuring outlet is one pipe width (15mm) from the wall. Where the pipe passes through the exterior wall, larger (20mm) pipe should be used to create a sleeve. If another pipe size is used for the PRV outlet, adjust sizes and standoff accordingly. See Figure 3.6

3.4.5.B Pipe cowl or blowback cap (Not Preferred)

Where necessary, a commercially procured pipe cowl or blowback cap may be used in accordance with manufacturer instructions. Avoid when able due to cost. See Figure 3.6

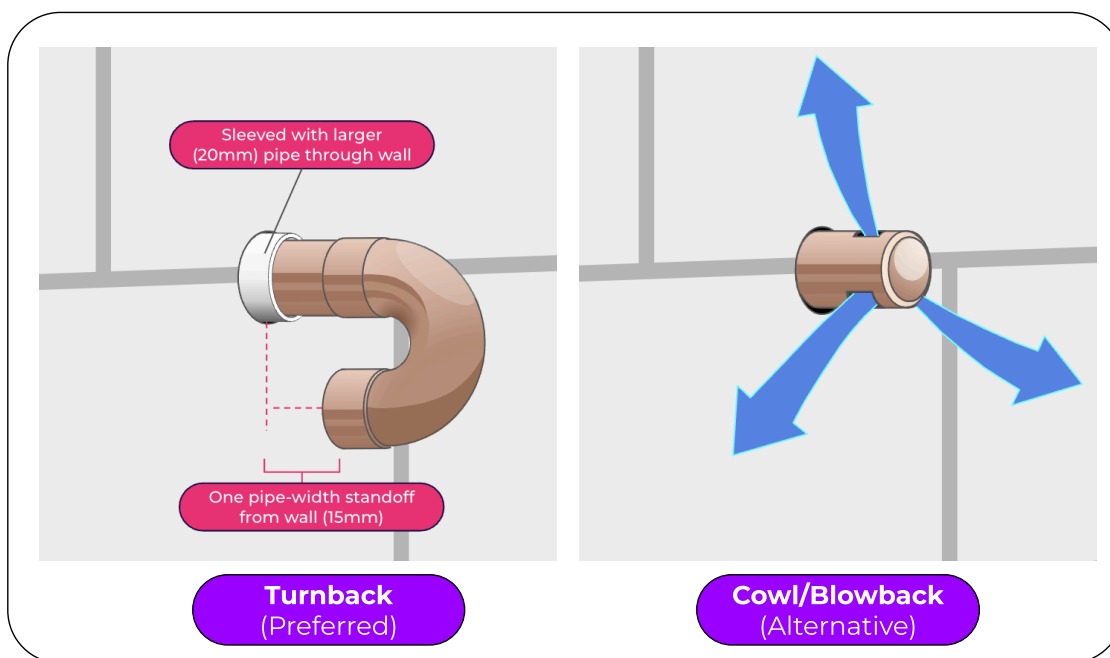


Figure 3.3 - PRV Terminations

3.4.6 Antifreeze valve

As a standard practice, antifreeze valves are not required on Cosy heat pumps and should not be fitted as by default. The Cosy unit has built-in protections against freezing that eliminate the need for an antifreeze in nearly all conditions when powered. Should power to the heat pump be lost, the unit can endure reasonably long periods of temperatures at or below 0° C without risk of damage.

Installers should take into account user requirements when assessing the need to add an anti-freeze valve. Holiday homes or extreme cold environments may necessitate the addition of an anti-freeze valve on a case-by-case basis. No antifreeze valve will be supplied as part of the standard materials. The installer to source a valve in addition to the supplied components.



CAUTION: Cosy heat pump should be kept on the 'frost protect' setting. Use of Glycol is not recommended and may lead to poor running.



CAUTION: If the electricity supply is likely to be turned off or disconnected for significant periods of time the installer may wish to install anti-freeze valves.

3.5 Plumbing schematics

The following system architectures are provided for reference. Each home is unique and a specific design for each home should always be used.

3.5.1 Single zone space heating (including 4-pipe buffer)

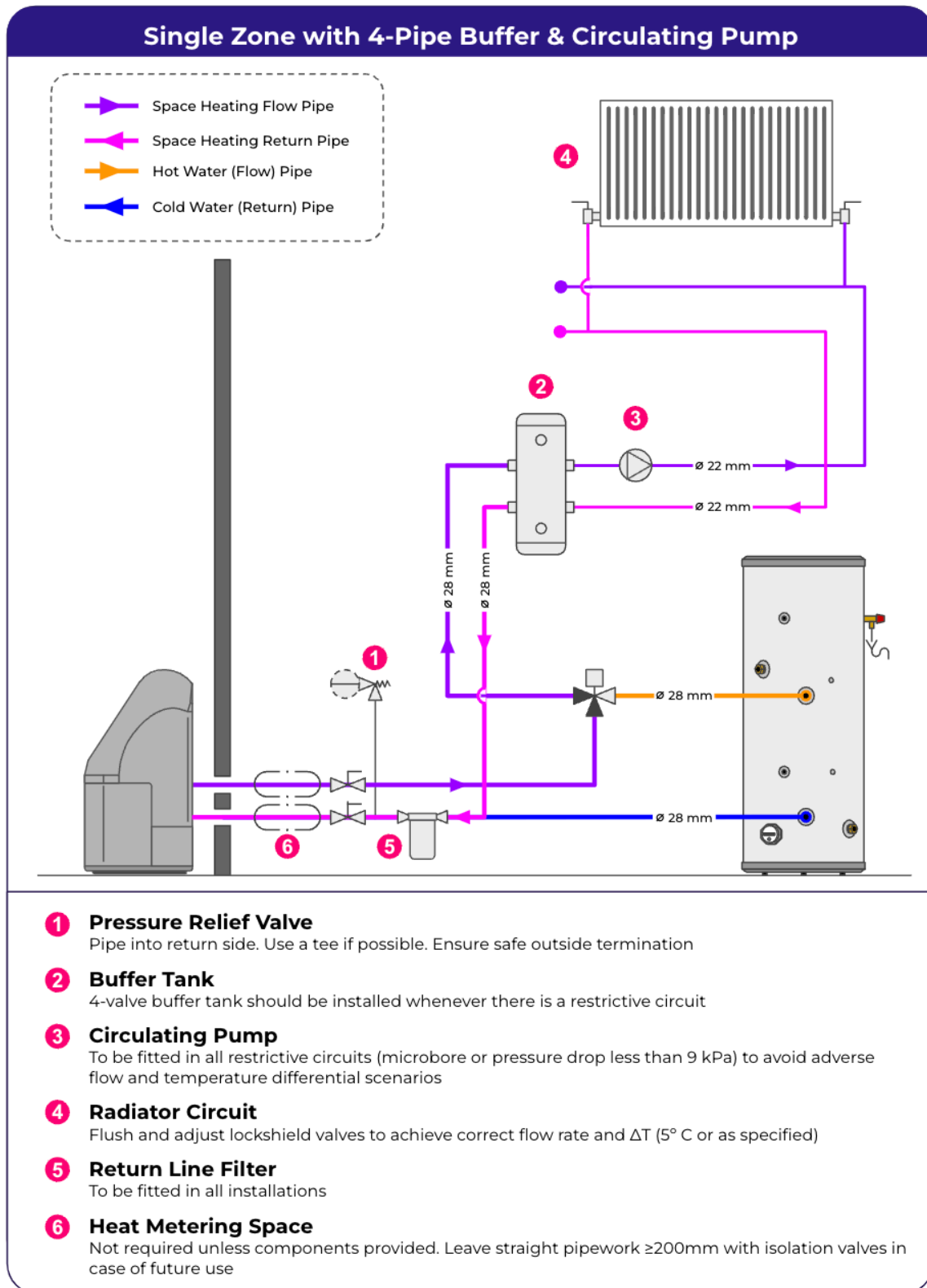


Figure 3.4 - Single zone space heating with 4-pipe buffer tank

3.5.2 Multi-Zone heating - Radiator Circuits

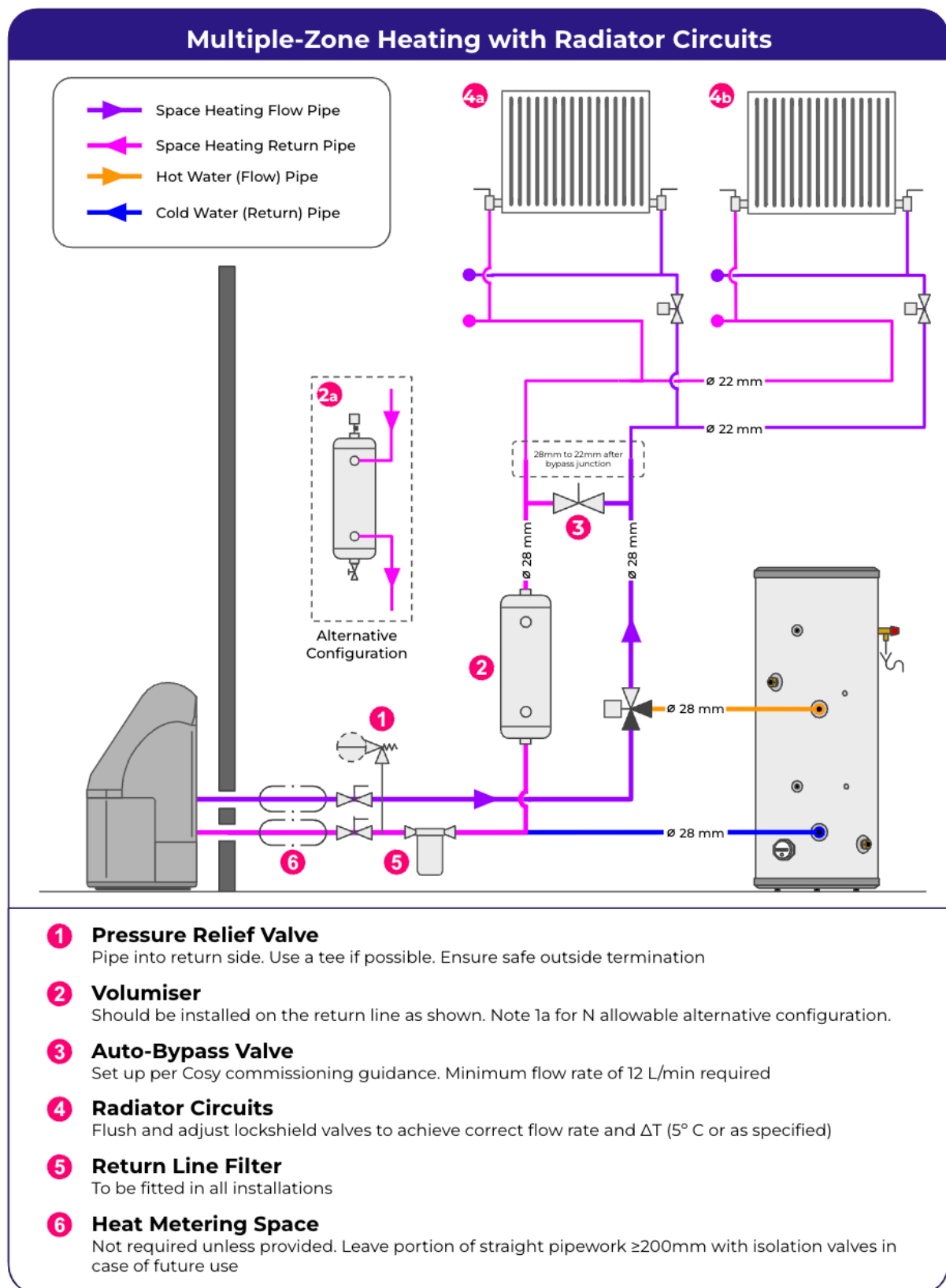


Figure 3.5 - Multi-zone space heating with radiators only

3.5.3 Multi-Zone heating - Radiator and Underfloor Circuits

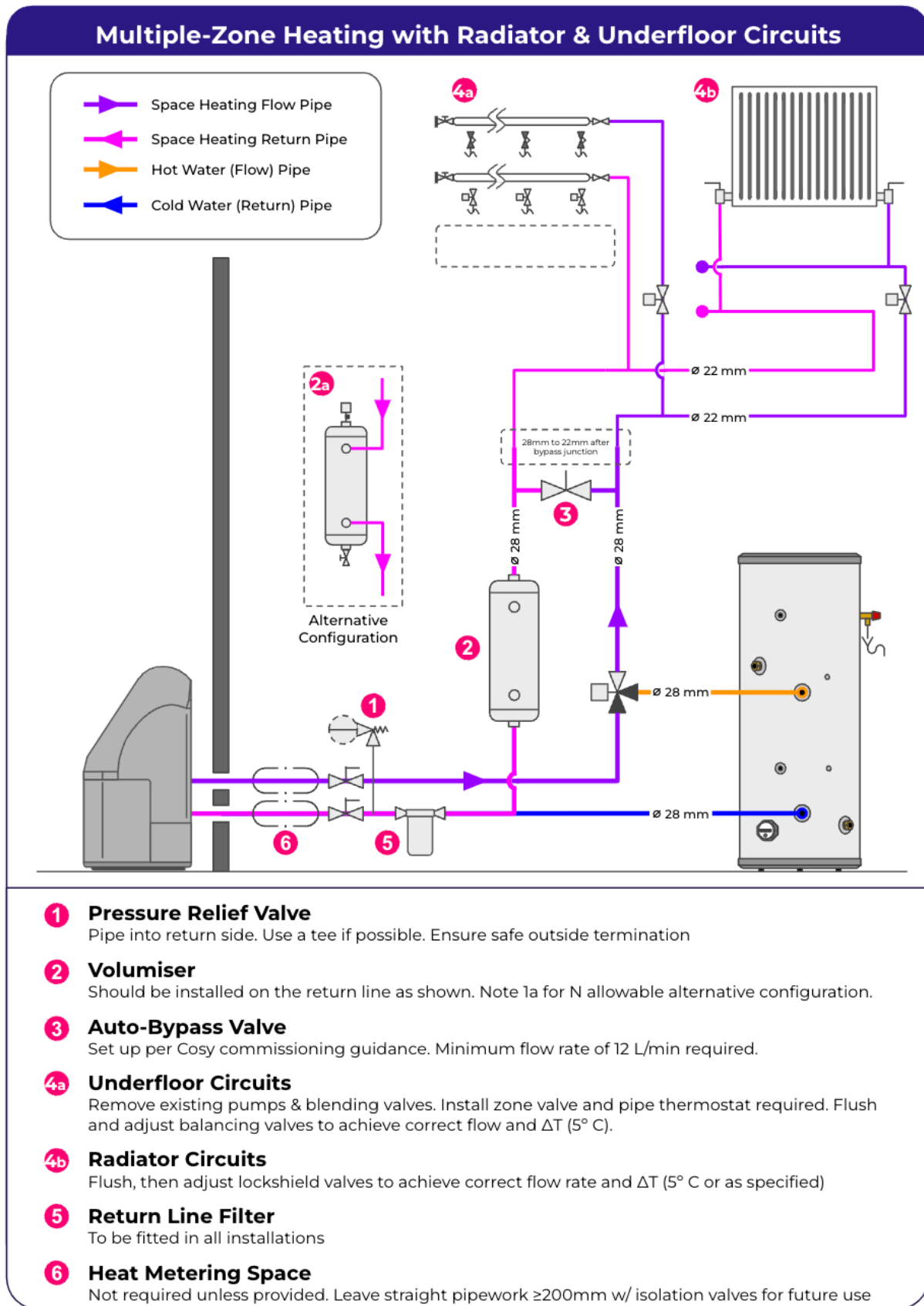


Figure 3.6 - Multi-zone space heating with underfloor heating

3.6 Electrical system components

3.6.1 Distribution Board

Each Cosy system requires a distribution board assembly. The board provides power to the Cosy unit and associated components, protection against overcurrent and current abnormalities, and surge protection.

Distribution boards may be mounted inside or outside the home. For internal use, any distribution box that meets the requirements per regulations pertaining to the installation is acceptable. Where the distribution board is mounted external to the home, an outdoor-use box with ingress rating IP65 or higher is required.

Distribution boards come pre-assembled with the required components, with each component clearly labeled. See *Figure 3.7* below.

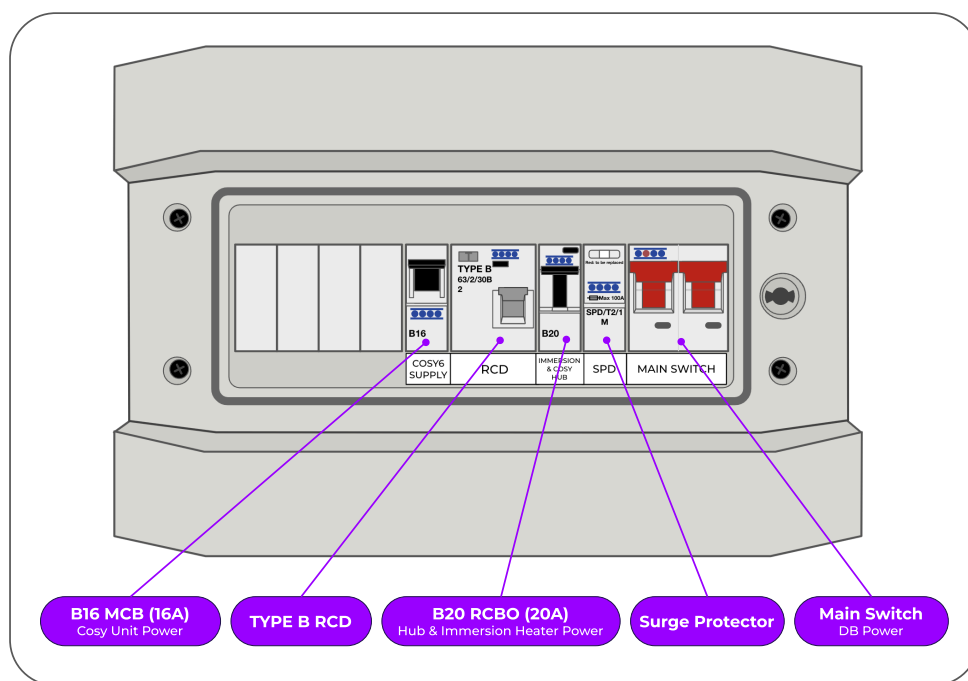


Figure 3.7 - External Distribution board

3.6.1.A Cosy Unit Power

The Cosy 6kW outdoor unit draws up to 16 amps and should be supplied via a B16 RCBO. The unit will be independently isolated and earthed downstream via a rotary isolator mounted external to the home, as detailed in section 3.5.2 and section 9.

3.6.1.B Cosy Hub & Immersion Heater Power

Power to the Cosy Hub controller and Immersion heater requires a 20-amp circuit and should be supplied via a B20 miniature circuit breaker (MCB). Power to these elements requires additional fusing, detailed in section 3.5.3

3.6.1.C Switches and protective devices

All devices will be connected through the main switch and 100A surge protection device (SPD) in the distribution board. Power supply to the Cosy unit requires the additional residual current device (RCD).

3.6.2 Rotary isolator switch

Cosy heat pumps shall be installed with a 32A rotary isolator to ensure the unit can be isolated from the distribution board while remaining grounded at all times. This is a safety requirement for installation and servicing.

3.6.3 Fuses

Two fuse units are required to safely connect the power supply to the immersion heater (13A BS1362) and to the Cosy Hub (5A BS1362).

3.6.4 Wiring

Wiring used to connect the components of the system must meet or exceed the standards for the cables specified in Table 3.B below. If in doubt, consult with Octopus support as to the suitability of a cable.

Cosy 6 Electric Wiring Specifications			
Connection	Cable	UV Stable	Standards
Cosy 6 power supply	4mm 3-core NYY-J / H07	Yes	BS EN/IEC 60332-1-2
Power to 5A fuse units	2mm 3-core NYY-J / T&E	No	BS EN/IEC 60332-1-2
Immersion heater	1.5mm 3-core heat resistant white flex	No	BS EN 50525-2-11
Cosy Hub to zone valves	0.75mm 4-core	No	BS EN 50265-2-11
Cosy Hub to heat pump	2-pair (4-core) screened	Yes	CE2014/30/EU LVD 2014/35/EU
Thermistor	2-core thermistor cable or 0.75mm 2-core flex (for extension)	No	BS EN 50252-2-11

Table 3.A - Compatible water cylinders

3.7 Electrical schematic

The following wiring diagram is provided for reference. Each home is unique and a specific design for each home should always be used.

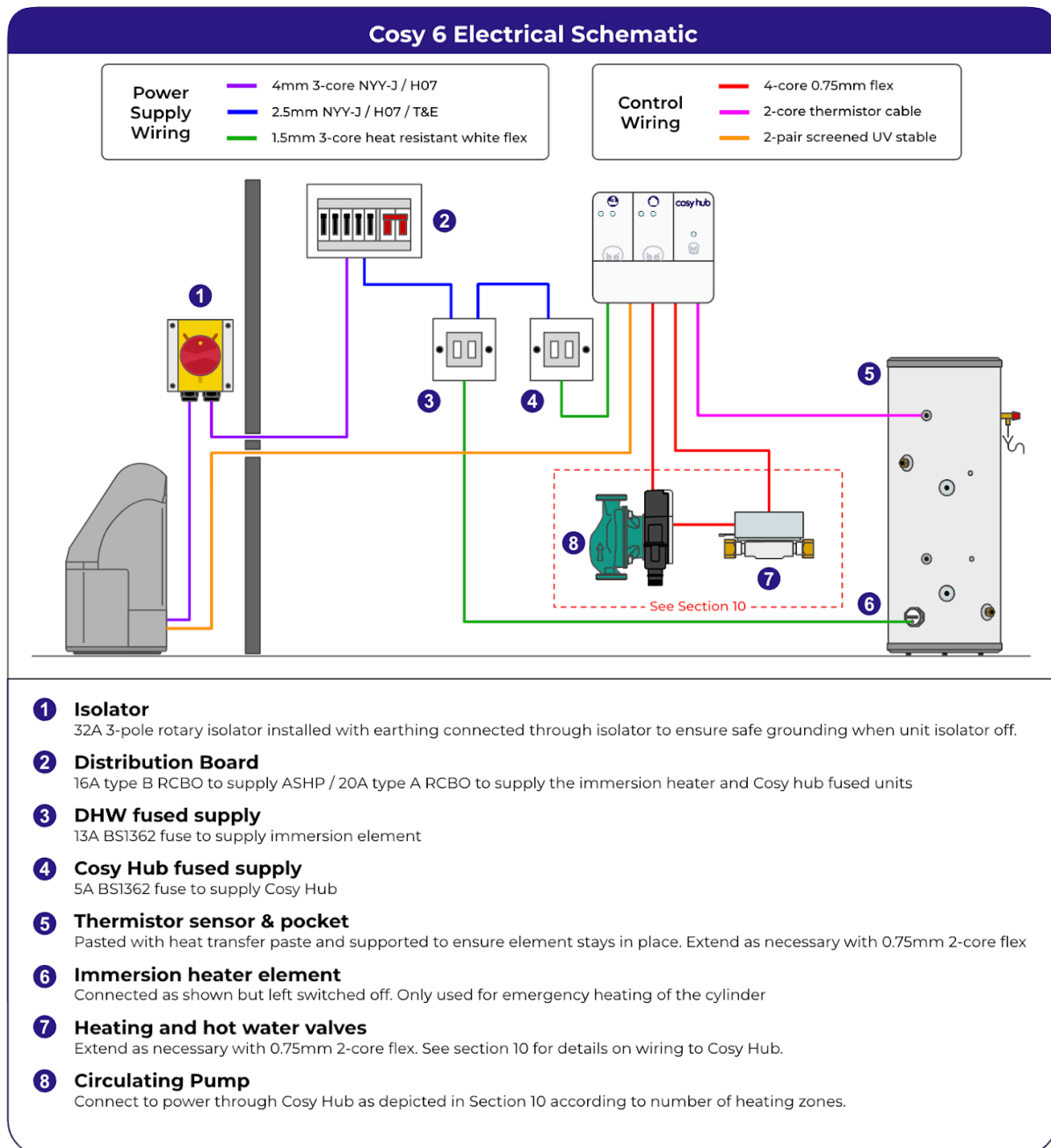


Figure 3.8 - Wiring Diagram

4. Cosy 6 Onboard Safety Features

4.1 Overview

The Cosy 6 has a number of technical design elements to help it safely deliver heating to customer homes under a variety of conditions over its lifetime. However, there may be times when unforeseen circumstances or accidents result in a failure of one or more components.

The heat pump unit contains approximately 0.65 kg of R290 refrigerant, which is flammable in gaseous form (GHS Category 1A). R290 is an extremely efficient working fluid that allows the Cosy to achieve higher flow temperatures while presenting a lower risk to the climate in case of accidental release. Should the unexpected occur, the following list of features ensure the heat pump unit will fault safely when experiencing a system failure or error state.

4.2 Failsafe Conditions

The following components and conditions will trigger a failsafe shutdown of the unit to prevent risk of damage or injury.

4.2.1 High pressure switch

This switch is integral to the refrigeration circuit and cuts power to the compressor when a higher than allowable pressure is reached in the circuit. This will only happen if there is an insufficient or blocked flow to or from the condenser from the home, or high return temperature from the house, or in the unlikely event of a component failure (such as failure in the circulating pump or defrost valve).

4.2.2 Refrigerant temperature sensor

A temperature sensor on the discharge pipe of the compressor ensures that the refrigerant also stays at a safe operational temperature and will trigger a failsafe shutdown if the temperature rises beyond safe limits.

4.2.3 Blocked evaporator sensor

A differential pressure sensor is used to determine if the evaporator becomes blocked for any reason. This may be due to debris blow-by or leaves.

4.2.4 Water flow sensor

A flow sensor checks for sufficient water flow through the heat exchanger and will shut down the unit if flow becomes restricted or blocked from to the heat pump condenser, as this may cause component failure. This is especially relevant during defrost when it can cause freezing in the condenser. Air in the water circuit pipework can cause air locking in the heat exchanger, which may require bleeding.

4.2.5 Fan tachometer

The intelligent fan uses built in sensors to determine blockage and interference and will register a fault/shutdown if the fan becomes obstructed.

4.2.6 Sensor failure

There are several sensors within the heat pump unit. In the unlikely event that one of them fails, the controller can recognise this and bring the heat pump to a safe error state.

5. Cosy 6 monobloc unit subsystems

5.1. Subsystems overview

The Cosy 6 unit is a monobloc heat pump assembly intended for outdoor installation. It comprises a gray plastic weather-resistant casing and five main operational subsystems, along with a variety of additional materials including sound dampening and foam insulation.

The five main operational subsystems of all Cosy monobloc units are:

1. Refrigerant Circuit
2. Water Circuit
3. Heat Exchanger (Condenser)
4. Evaporator & Fan
5. Onboard Electronics

These are described in detail in the following subsections.

5.2 Refrigerant Circuit

The refrigerant circuit is a sealed, high-pressure system containing R290 refrigerant (600-700g) and is the operational heart of the unit. It consists of an inverter-drive compressor, a receiver, valving, fill/bleed ports, pipework and multiple temperature & pressure transducers.

5.3 Water Circuit

The water circuit is a low-pressure system that carries heated water into the home (*Flow*) and brings cooler water back to the heat pump unit (*Return*). The circuit consists of a 10L expansion vessel, a strainer, an air bleed valve, piping, and 1" brass G-type fittings for connection to external pipework.

5.4 Heat Exchanger

The heat exchanger (or condenser) is a sealed micro-plate type unit mounted vertically on the approximate centerline of the Cosy. The heat exchanger is the physical link between the refrigerant circuit and the water circuit, with pipework for both circuits permanently attached to the exchanger body. No access to the internal workings of the heat exchanger is possible.

5.5 Evaporator & Fan

The evaporator is located at the rear of the unit and comprises a network of pipes surrounded by metal fins. The blue coating on the fins serves as corrosion protection (similar to Blygold®) and is sufficient for coastal installations. The fan is front-mounted and uses electrical power to draw air through the evaporator, which is the main source of heat for the refrigerant circuit. The refrigerant circuit is attached to the evaporator at the factory.

5.6 Onboard Electronics

The electronics compartment contains two printed circuit boards and the inverter drive unit for the compressor. The electronics compartment is shrouded by black plastic coverings on both sides, with components mounted to a milled metal "cold plate." The cold plate is connected to the refrigerant circuit, allowing the unit to scavenge heat from the electronics.

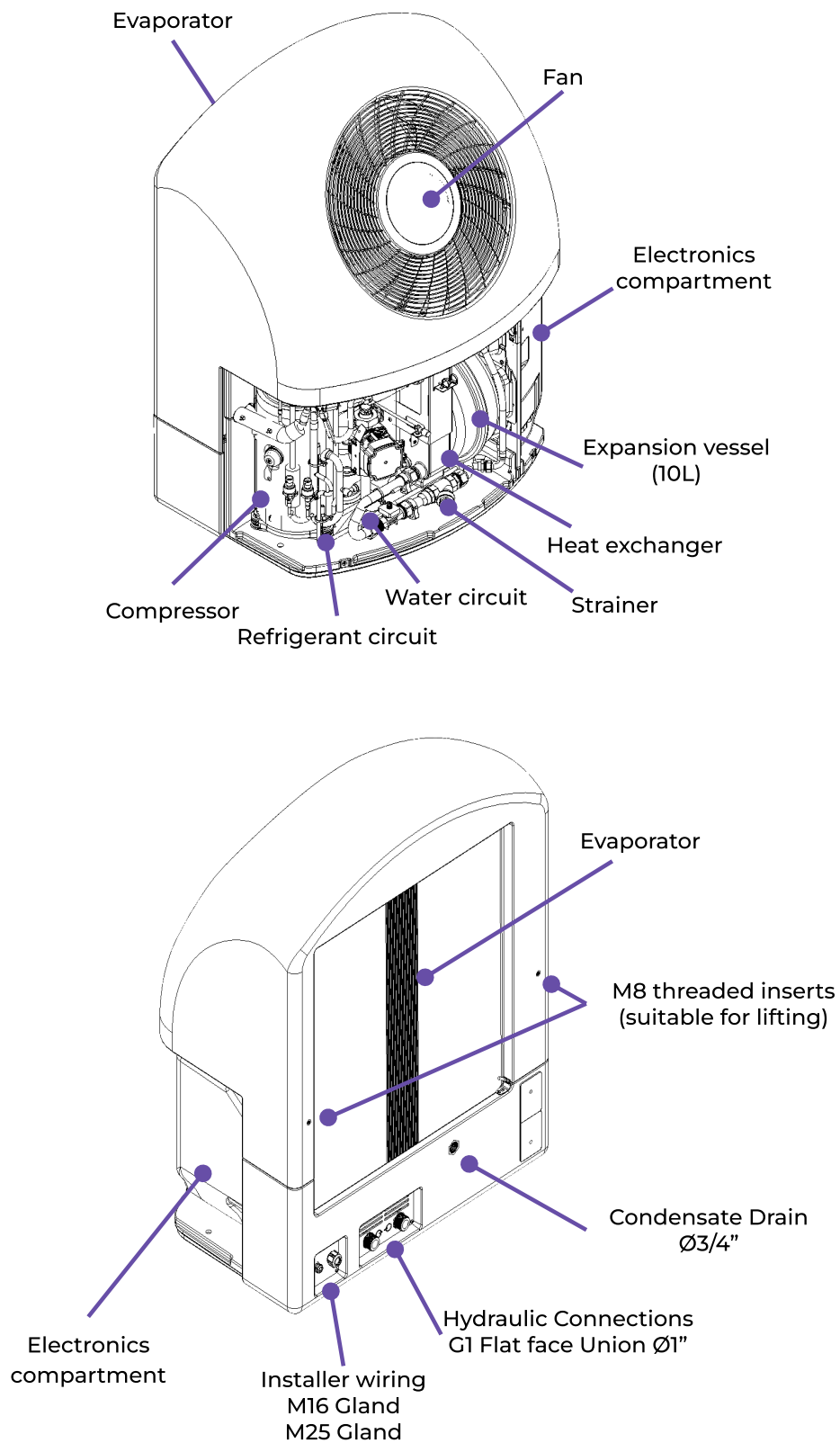


Figure 5.1 - Main subsystems

6. Siting & Installation Clearances

6.1 General Siting and Clearances Information

Siting and clearances for the Cosy 6 are a function of its operation and its R290 propane refrigerant. R290 is a colorless, odorless, highly flammable substance that exists in gas form at room temperature. R290 is heavier than air and can collect in low-lying areas, including pipes and drains. Unlike natural gas and patio gas, R290 has no artificial odor added to aid in detection. R290 can therefore accumulate unnoticed. Proper clearances must be followed when siting the heat pump to ensure minimal risk of a leak resulting in a flammable concentration of R290.

The heat pump should be sited in accordance with the pre-installation survey and should meet the following clearance requirements. These clearances must be maintained for the sake of safety in the rare event of a large and rapid refrigerant leak.

Whenever possible, avoid placing the heat pump in a location where leaves and other debris are likely to build up on top of or behind the unit, blocking the flow of air through the evaporator. Failing to maintain proper rear clearances may encourage the buildup or trapping of leaves, lawn debris, snow, or other materials

6.2 Operational Clearances

Unlike other heat pumps, Cosy unit exhaust fans are canted for greater airflow efficiency and heating performance. The unit draws fresh ambient air in from the rear, through the evaporator, and exhausts spent cold air both forward and upward. This requires the unit to have sufficient offset from rear obstacles to draw fresh air in, and sufficient frontal clearance and headroom for unimpeded flow of exhaust air. Clearances must be observed and maintained during installation to ensure the proper operation of the heat pump and best efficiency for the customer.

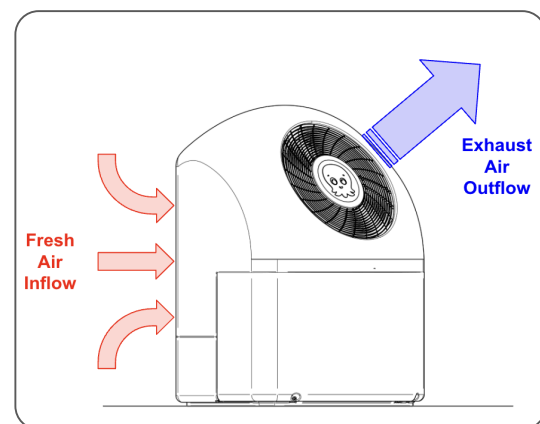


Figure 6.1 - Air Flow

6.2.1 Front & Side Clearances

Required **front clearance from the unit is 500 mm** to ensure space for door removal and servicing. More clearance is preferable, but siting in alleyways and near boundary lines may limit the availability of space in front of the unit. See Figure 6.2.

Side clearance from the unit is 500 mm to any wall >300 mm high to allow airflow into the evaporator, as well as room for handling and access to connections during installation and maintenance. Clearance from the front corners is not explicitly defined, but obstacles should be minimized in these areas for ease of installation & servicing. See Figure 6.2

Note: Figure 6.2 depicts walls on both sides for reference. However, the unit should not be installed as depicted in Figure 6.2. Only one lateral wall is permitted along with a rear wall. If one side of the unit has a wall/fence >300 mm high within 1 meter, the opposite side must have **no walls/fences >250mm tall within 1 meter.**

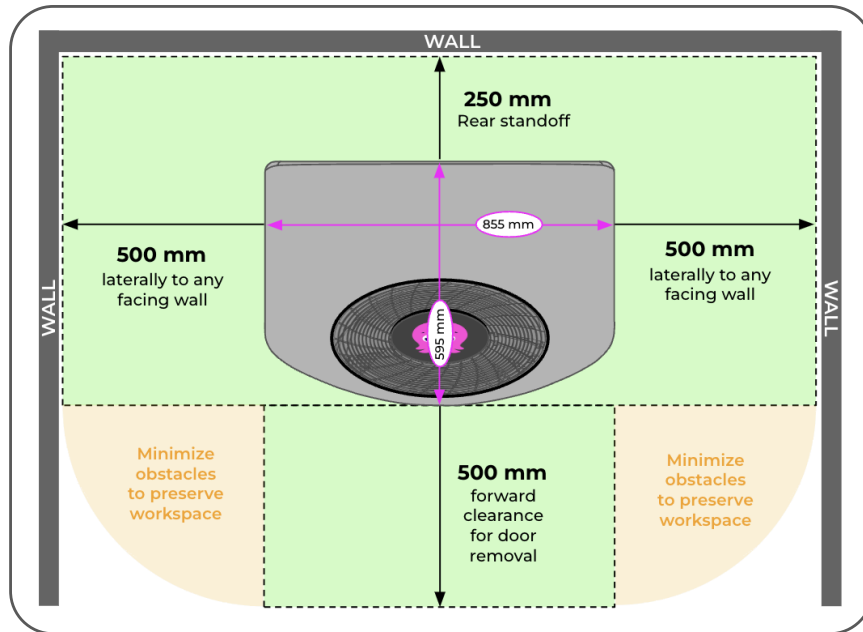


Figure 6.2 - Operational Clearances (Top View)

6.2.2 Rear Standoff Clearance

Standoff from any backing wall >300 mm and overhead clearance are depicted below. Minimum rear standoff is 250 mm. Where possible, increase distance to minimize the likelihood of debris being trapped between a wall and the evaporator. See Figure 6.3

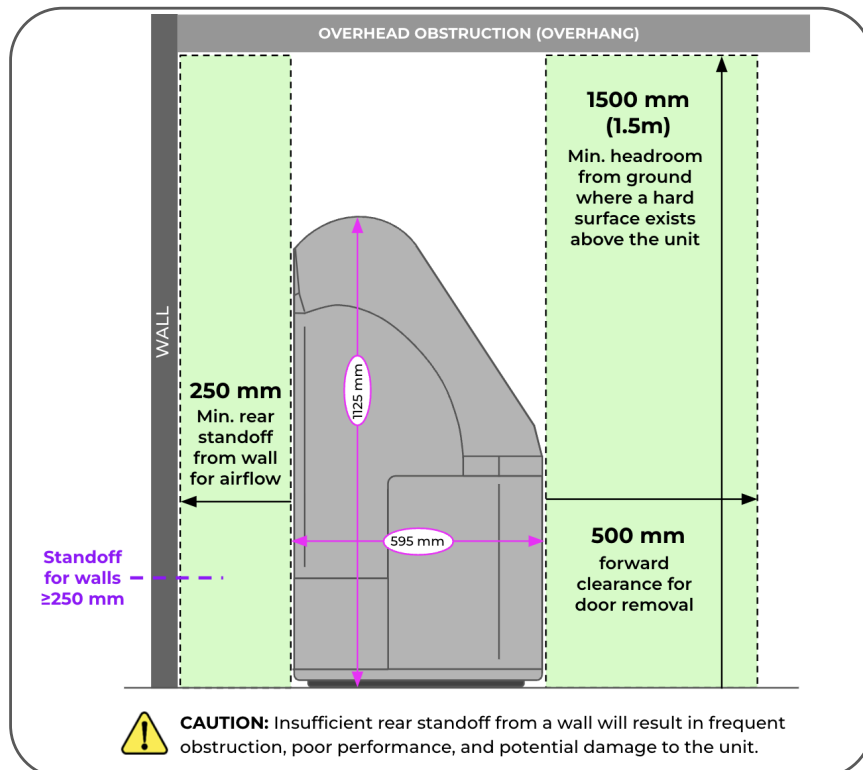


Figure 6.3 - Operational Clearances (Side View)

6.2.3 Overhead Clearances

Minimum height of an overhead surface such as a deck, overhang, or other obstacle that could impede flow of exhaust air is 1500 mm. This limit applies for installations where the heat pump is **not** bounded laterally by a wall within 1 meter. See Figure 6.4

Where there is a wall within 1 meter, minimum headroom from ground to an overhead surface that could impede flow of exhaust air is increased to 2000 mm. The presence of a wall within 1 meter, when combined with an overhead surface, will cause feedback of exhaust air into the evaporator. Increasing overhead clearance by the additional 500 mm reduces the likelihood of exhaust air feedback and preserves efficiency. See Figure 6.4

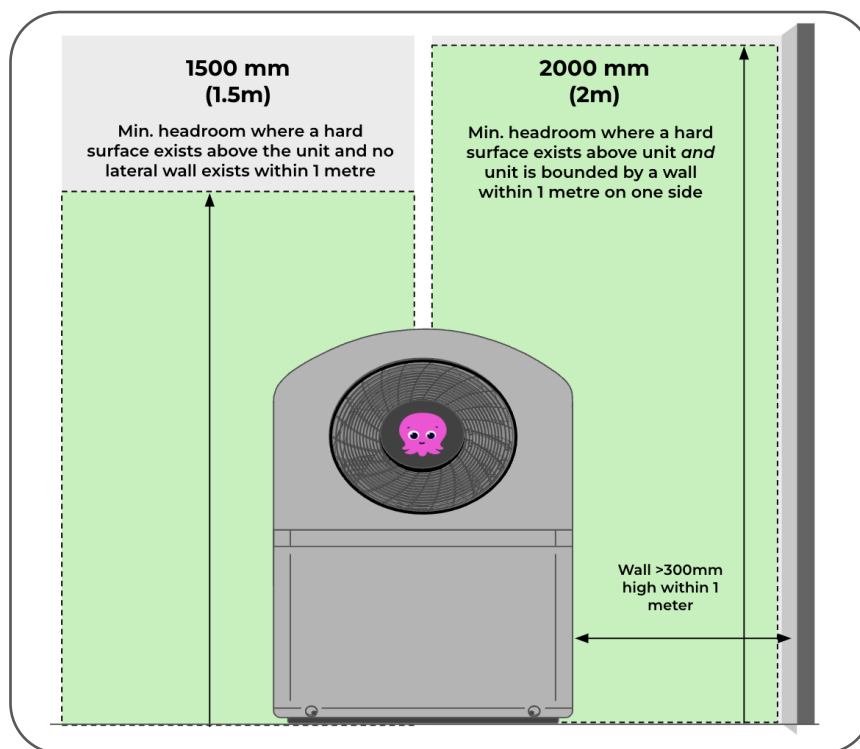


Figure 6.4 - Operational Clearances (Front View)

Operational Clearances Quick Reference		
Aspect	Clearance	Additional Considerations
Front	500 mm	500 mm is the minimum space for removal of the door. Obstacles should be minimized around the front clearway for ease of work.
Sides	500 mm	No wall/fence >300 mm is allowed within 500 mm. Only one side of the unit can be bounded by a wall >300 mm within 1 meter.
Rear	250 mm	Where able, rear spacing should be increased to the maximum reasonable amount to minimize risk of debris behind the unit.
Overhead	1500 mm from base	If the unit is bounded to one side by a wall within 1000 mm (1 m) overhead clearance is 2000 mm (2 m)

Table 6.A - Operational Clearances Quick Reference

6.3 Safety Clearances

Additional clearances must be met for safety due to R290. These clearances are in addition to the operational clearances listed in the preceding section. Safety clearances consist of four (4) distinct but overlapping zones around the unit. These zones are depicted together below. The four zones and their criteria are described individually in detail in the following sections. See *Figure 6.5* and *Table 6.B* below for a summary of clearances and restrictions.

6.3.1 Clearance Zones

1. No Spark Zone - Wall area where all potential ignition sources are prohibited
2. Door & Window Zone - Wall area where doors & openable windows are prohibited
3. Flue & Intake Zone - Wall area where ventilation to indoor spaces is prohibited
4. Drain Zone - Ground area where open drains are prohibited

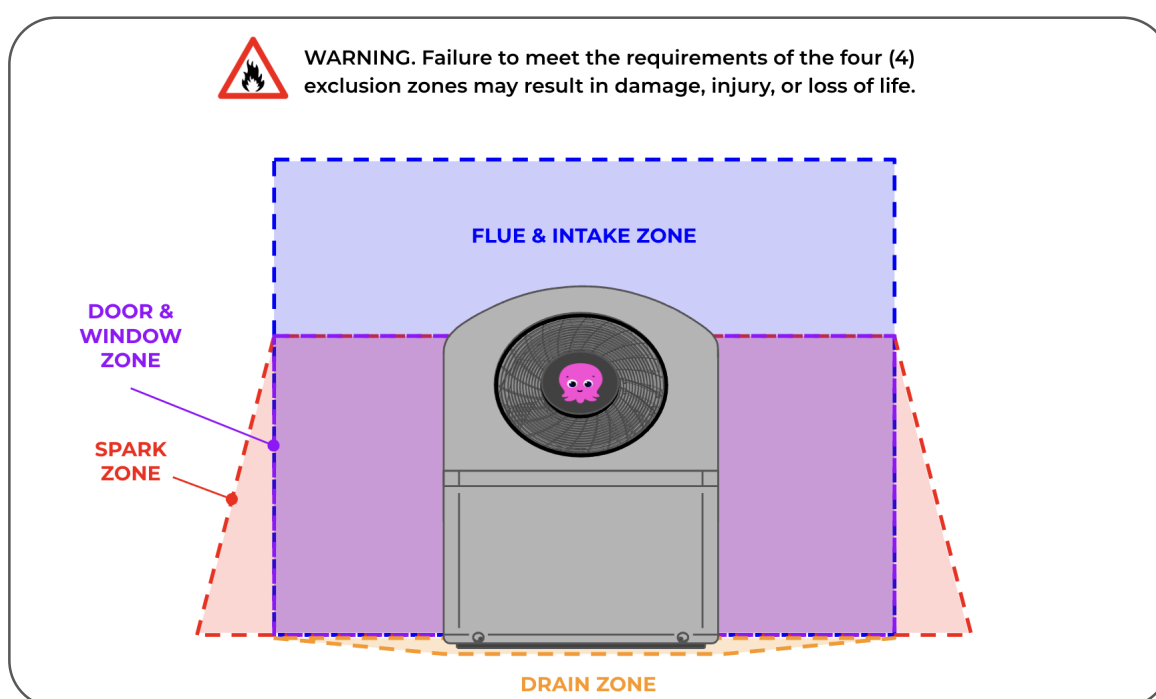


Figure 6.5 - R290 Safety Clearance Zones

Safety Clearances Quick Reference			
Zone	Lateral Clearances	Vertical Clearances	Prohibitions & Restrictions
No Spark Zone	300 mm (top) 500 mm (bottom)	950 mm	<i>Electrical switches, connections, any ignition sources</i>
Doors & Windows	300 mm	950 mm	<i>All doors and openable windows not sealed by design</i>
Flue & Intake	300 mm	150 mm from top of unit (1275 mm min.)	<i>Flues, vents, and air intakes</i>
Drains	300 mm along rear edge inc. rear apron	-	<i>Drains or ground vents where low-lying vapor may collect</i>

Table 6.B - Safety Clearances Quick Reference

6.3.2 No Spark Zone

The No Spark Zone defines an area that must be free of ignition sources, as there can be **some level of combustion risk** in the event of a leak. The zone consists of two trapezoidal areas measuring **500 mm laterally from the heat pump at their bases, 300 mm laterally from the heat pump at their tops, and 950 mm in height**. These are adjoined by an area of equal height behind the heat pump (not depicted in the diagram). See Figure 6.6 below

No electrical switches or other sources of ignition may be located in the No Spark Zone. This applies to switches installed as part of the Cosy system and any pre-existing switches, outlets, or flame/spark sources. See Figure 6.6 below

Note: Air bricks leading to void areas such as under a floor or for cladding ventilation are allowed. However air bricks are **not permitted directly behind the unit**. Fitting a commercial rain shroud to air bricks is best practice but not required.

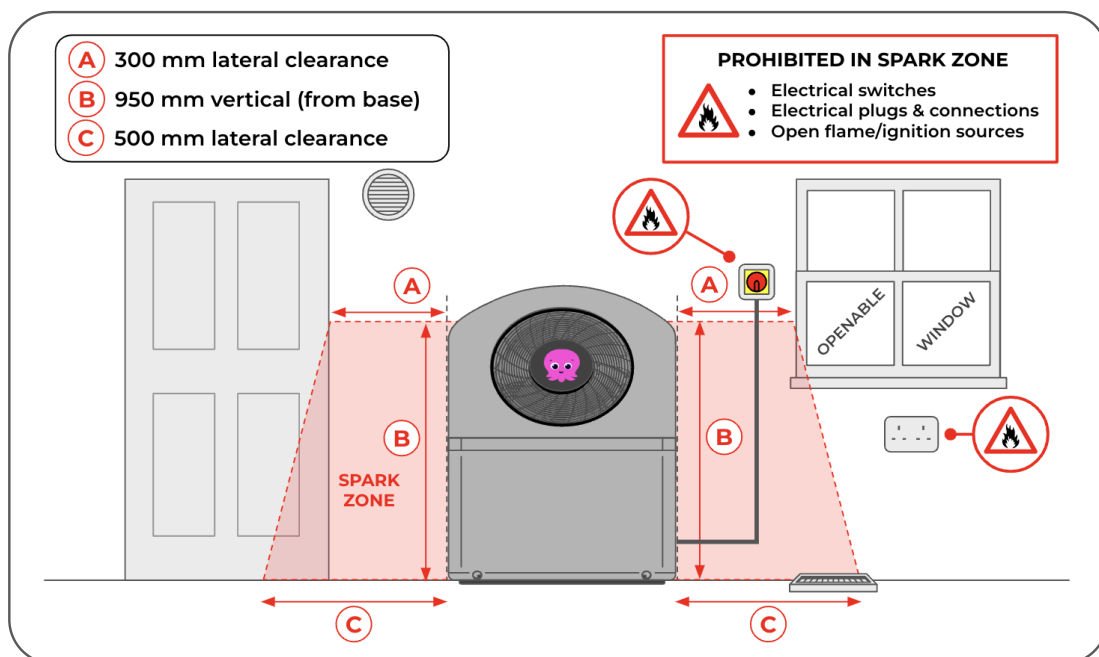


Figure 6.6 - No Spark Zone

6.3.3 Door & Window Zone

6.3.3.A Openable Windows

Openable doors and windows are not permitted in the Door & Window Zone. This is to ensure a leak of R290 does not enter the home through doorways or windows. All doors are assumed to be openable. Windows are assumed to be openable unless they are unable to open by nature of their design. Windows that are reported by a customer to be sealed against opening, but which could be feasibly made to open, are deemed *openable*.

Minimum lateral clearance from heat pump unit to any openable portion of a window **less than 950 mm** from the ground is **300 mm**. If the opening portion of the window is **950 mm or higher from the ground**, no lateral clearance is required. See Figures 6.7 & 6.8

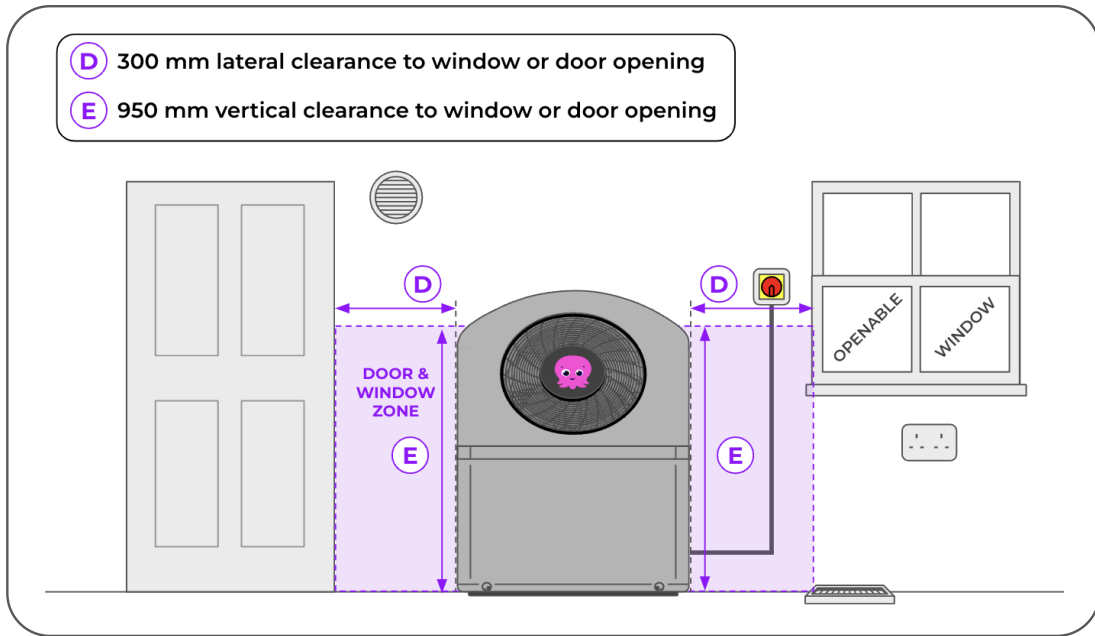


Figure 6.7 - Door & Window Zone

6.3.3.B Non-openable windows & windows above the zone

If the window is permanently sealed and non-openable, the exclusion does not apply. This applies to fully sealed windows that do not open and do not have cracks or gaps around the panes/frames such that a leak of R290 could infiltrate the home. See Figure 6.8

If **all portions of a window are above the 950mm upper limit** of the Spark and Door & Window Zones, no lateral clearance is required. However, it is not advised to place the heat pump directly beneath a window as this will increase the perception of the unit's overall noise level and could affect customer satisfaction. See Figure 6.8

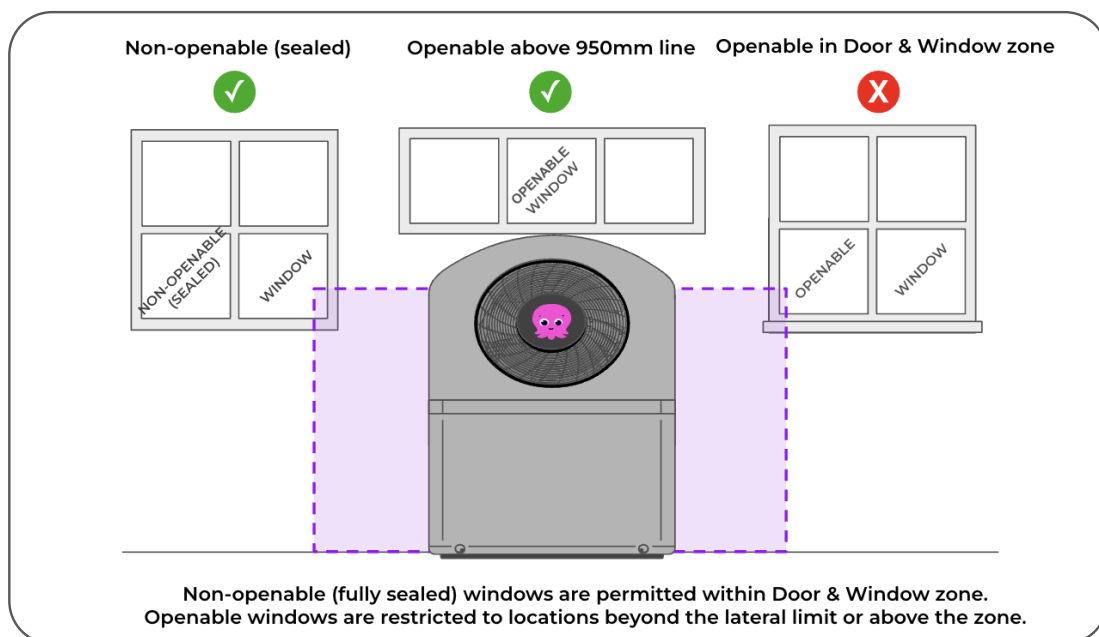


Figure 6.8 - Window Locations Diagram

6.3.4 Flue & Intake Zone

Flues and air intakes are prohibited in the zone extending vertically **1275 mm from the base** and extending **300 mm laterally** from the sides of the unit. This is to ensure that the flue/intake is not affected by the heat pump's operation, and to ensure fumes or exhaust are not drawn into the heat pump where they may affect performance. See Figure 6.9

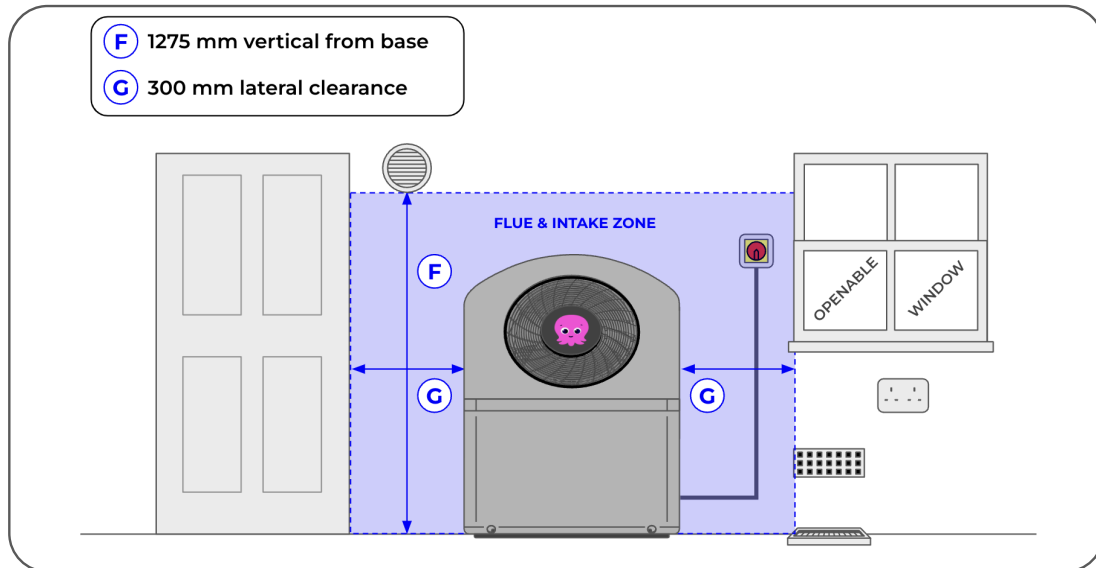


Figure 6.9 - Flue & Intake Zone

6.3.5 Drain Zone

Open (unsealed) drains and ground vents are not permitted within the Drain Zone to mitigate risk of R290 collecting in pipework and creating a flammable environment. The zone extends **laterally 300 mm** from the unit to point X, and includes the **minimum 250 mm rear standoff** (rear apron). The zone extends diagonally from point X to point Y, which is flush with the forwardmost portion of the unit and aligned to the side of the unit. This point must be **at least 845 mm from the wall**. Where no wall exists, the rear apron is defined as 500 mm deep. See Figure 6.10

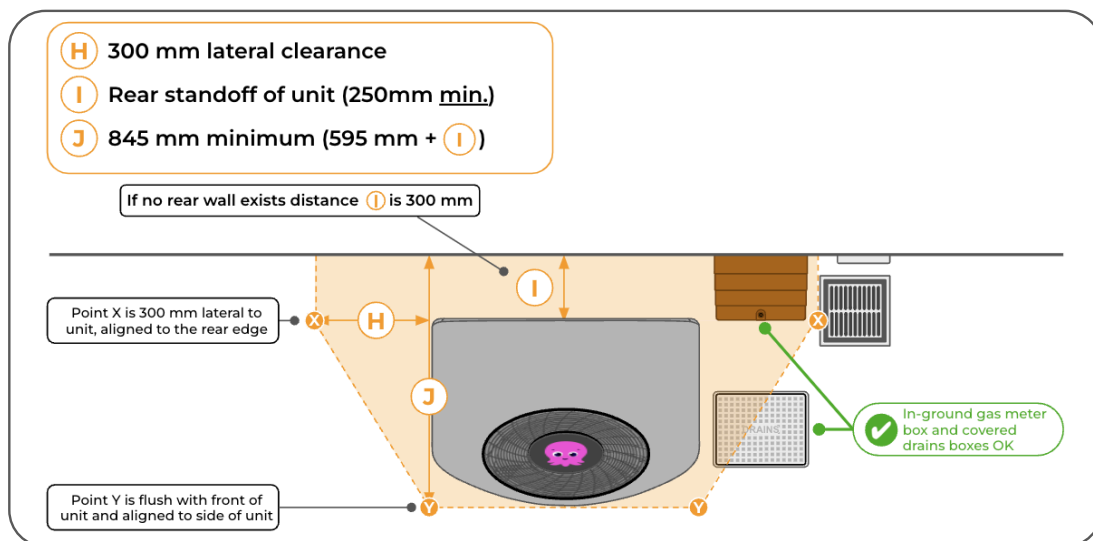


Figure 6.10 - Drain Zone

Cosy Unit Clearances Quick Reference

Area	Lateral Clearances	Vertical Clearances	Prohibitions & Restrictions	Additional Considerations
Front of Unit	500 mm	-	-	Obstacles should be minimized around the front clearway for ease of work.
Sides of Unit	500 mm	-	No wall/fence >300 mm is allowed within 500 mm. Only one side of the unit can be bounded by a wall >300 mm within 1 meter.	Shrubs and similarly dense plant barriers that impede airflow should be considered as walls. Fences that do not impede airflow such as chain-link, chicken-wire, or trellises may be ignored. When in doubt, any barrier you could not watch television through is a wall.
Rear of Unit	250 mm	-	Standoff required for any wall >300 mm	Where able, rear spacing should be increased to the maximum reasonable amount to minimize risk of debris behind the unit.
Overhead	-	1500 mm or 2000 mm from base	If unit is bounded to one side by a wall within 1 m overhead clearance increases to 2000 mm	
No Spark Zone	300 mm (top) 500 mm (bottom)	950 mm	Electrical switches, connections, and any potential ignition sources	Air bricks that lead to void areas (under floors, ventilation spaces) are permitted so long as they are not directly behind the unit.
Doors & Windows Zone	300 mm	950 mm	No doors nor any portion of an openable window (not sealed by design)	Windows above the 950 mm limit and permanently sealed windows are permitted. No doors are permitted (all doors assumed to be openable).
Flue & Intake Zone	300 mm	150 mm from top of unit (1275 mm min.)	No flues, vents, and air intakes allowed within zone	Permanently blocked flues, vents, and intakes are permitted.
Drain Zone	300 mm from rear edge including apron	-	No open drains or ground vents where low-lying vapor may collect	Permanently sealed drains or drains with sufficiently airtight covers such as manhole covers and service boxes are permitted.

Table 6.C - Clearances Quick Reference

7. Product Data Sheet

Parameter	Unit	Value
Nominal capacity	kW	6.00
Coefficient of performance (A7/W35) @5.63kW - EN14511	COP	4.29
Coefficient of performance (A7/W65) @5.23kW - EN14511	COP	2.71
Length	mm	855
Height	mm	1125
Depth	mm	595
Weight	kg	100
Sound power level (Heating, A7W35)	dB	53.4
Sound power level (Heating, A7W55)	dB	56.5
Maximum flow temperature	(°C)	75
Maximum operating pressure	Bar	32
Maximum volume flow	L/m	25
Minimum volume flow	L/m	7
Minimum system volume	L	20
Refrigerant type	-	R290
Refrigerant charge weight	kg	0.65
Electrical supply	-	230V/1ph/50hz
Starting technology	-	Inverter
Compressor type	-	Scroll
Compressor oil type	-	HATCOL 4467
Pipe connections	-	G1" flat face
Rated max current	Amps	16
MCB type	-	B Curve
RCD type		B
Maximum cable length (Modbus)	M	50
IP rating	-	IPX5
Fan maximum input power	W	85
Fan maximum rotor speed	Min ⁻¹	760

8. Transporting & Unpacking

The Cosy 6 will arrive fixed to a pallet, covered with protective materials. In order to unpack the unit safely, follow the steps below.

1. Cut the strap securing packaging to pallet with scissors or another safe implement.



WARNING: Packing strap is under tension. Failure to wear appropriate PPE and exercise care when removing the strap may result in injury.

2. Remove the box, break down flat, and recycle in accordance with local policies.
3. Cut the second securing strap that helps affix the unit to the pallet. Note that the strap is under tension - care is required. Dispose of the foam block appropriately.
4. Unwrap plastic over-packaging from the unit. Do NOT cut the plastic as this could cause damage to the casing. Dispose of over-packaging appropriately.
5. Carefully remove protective cardboard from the evaporator: special care is required here as evaporator fins can be damaged easily.



WARNING: Evaporator fins are sharp. Failure to wear proper hand protection will result in injury



CAUTION: Evaporator fins are fragile. Careless handling or applying excess pressure will damage the fins and reduce performance.

6. Fully check the unit for damage before opening or detaching from the pallet.
7. Remove Door from the unit via the screws located at the bottom. *See Figure 8.1.*
8. Remove bolts from mounting holes and detach the unit from the pallet.

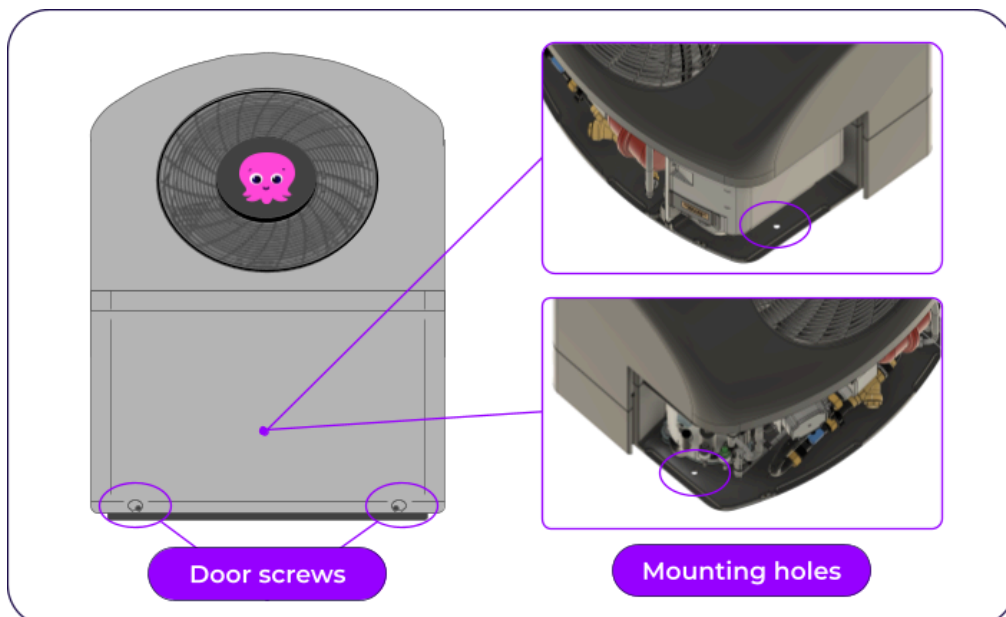


Figure 8.1 - Mounting Holes

9. Heat Pump Unit Installation

9.1 Restrictions and Precautions for Installation

Please pay careful attention to the following points before beginning the installation or any servicing work. Failure to follow these instructions may result in injury to persons or animals, or damage to the unit itself.



The heat pump must not be powered on or run with the front panel, fan guard, or indoor unit front cover removed.



Components within the enclosed casing may be hot enough to cause severe burns even after the unit has stopped operating. Use caution when interacting with components even after the heat pump has stopped running.



Black controller splash guard inside the heat pump does *NOT* need to be opened during install, and should only be opened by a production engineer or specially trained repairer. Opening will expose sensitive electrical components.



When the system is powered, take care to avoid any object entering the fan area. If any object penetrates through the fan guard and comes into physical contact with the fan, it could cause injury or damage to personnel and the unit.



The heat pump should be transported within its packaging and kept upright and secure in transit. The pallet should only be lifted with a pallet trolley or forklift.



The correct PPE, manual handling, and lifting techniques should be employed to avoid risk of injury. Never try to lift or move the heat pump without the correct aid.



Under no circumstance should the sealed refrigerant circuit be tampered with in any way. Care should be taken to avoid any cutting, burning, or grinding near refrigeration pipework.



If a leak in the refrigeration pipework was to occur, it is imperative *NOT* to stop the refrigerant with a hand as R290 can cause severe burns and frostbite.



The heat pump must be installed so that it can be isolated both electrically and hydraulically for servicing..

9.2 Before Installation Checks

Prior to beginning installation, you must assess the technical design and the home together to ensure that reality matches what was planned. Take note of the following checks, and inspect the home & property to ensure you will be able to proceed safely with a quality installation.



CAUTION: Inspect the unit fully for damage before beginning installation (especially the casing, electrical connections and refrigerant pipes). If damage is noted, contact Octopus support for a replacement unit.

9.1.1 Site Suitability

- Heat pump should be located in a free and well ventilated space. If you have concerns about location suitability, contact your area manager or Octopus support.
- Heat pump should be ideally installed where it is at least moderately sheltered from prevailing wind as this ensures the defrost procedure can have maximum effect.
- Installation beside or under bedroom or living room windows should be avoided as noise given off by compressor and fan may cause disturbance. If in doubt, highlight the location to the customer and ensure he/she is aware of the potential noise issue.
- Heat pump should be kept away from heating or cooling sources, including low level flues, extraction fans or air-conditioning units as these may affect performance.
- The heat pump should not be located next to or directly beneath overhead trees or deciduous trees, as leaves may cause blockage and build-up on the evaporator.
- If possible, orient the heat pump in a south or southeast direction so it can capture the most advantage from solar gain.

9.1.2 Site Accessibility

- Ensure there is good access for moving the product into position and that the plumbing and electrics can be routed to the installation site.
- Ensure the door will be accessible during mounting and after installation so it can be removed for install and servicing. *See section 6 for door clearances.*
- Verify there is at least 1.5m clearance is required directly above the heat pump. This is to ensure no obstruction to fan air flow. *See section 6 details.*

9.2 Heat pump base



WARNING: Unit must be secured against tipping during all phases of installation. Failure to secure the unit may result in injury or death.



CAUTION: Heat pump should not be placed on feet or on a sloping surface. Mounting out-of-level will result in damage to the unit and components

9.2.1 Heat Pump Base

Cosy series heat pumps require a flat hard-surface mounting base. Unlike other heat pumps, Cosy models do not come equipped with integrated feet nor with mounting points suitable for third-party feet. All Cosy units should be sited on a prefabricated slab, a poured concrete base poured on site, or a suitable existing flat and level surface such as a patio.

9.2.2.A Prefabricated concrete slab base (Preferred)

- o Prefabricated slabs are the preferred method due to uniformity and ease of installation
- o Minimum base surface dimensions are 900 mm wide x 600 mm deep (front to back). Minimum thickness is 50 mm to ensure safe and adequate purchase of mounting bolts and to minimize risk of cracking. See *Figure 9.1*.
- o Slab base must be level and have a uniform surface finish that allows the heat pump to sit flush without wobbling
- o Slab base must be well-bedded into a gravel sub-base with a soak-away relief area. See the following portion of this section for details.

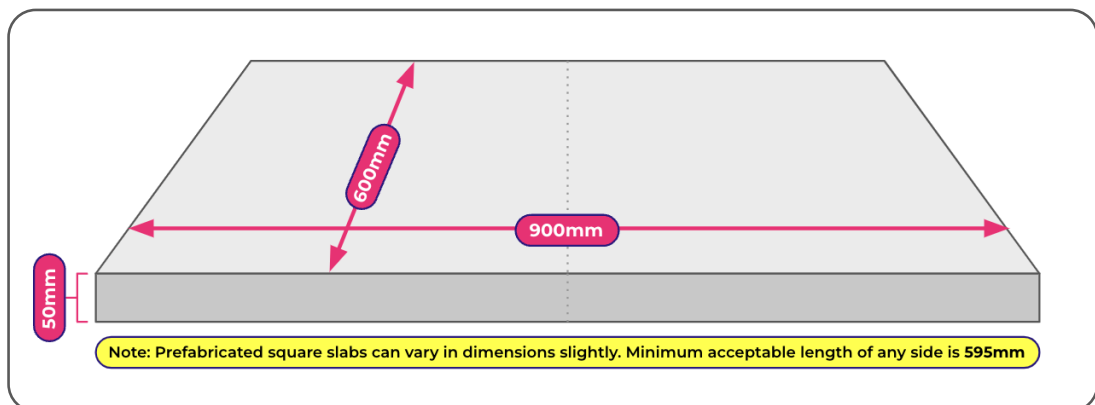


Figure 9.1 - Heat Pump Base

9.2.3.B Customer-supplied poured concrete base (Not Preferred)

- o Minimum base dimensions are 900 mm wide x 600 mm deep (front to back)
- o Minimum thickness recommendation is 100 mm to ensure safe and adequate purchase of mounting bolts and to minimize risk of cracking
- o Base must be level and have a uniform surface finish that allows the heat pump to sit flush without wobbling

9.3 Condensate drainage

When a Cosy heat pump is running in heating mode, ice can accumulate on surfaces of the unit. To prevent ice from growing, the heat pump will regularly go into defrost mode to melt the ice. Water formed from the defrost process will fall to the base of the heat pump where it can escape to ground through the drain holes in the base and through the condensate drain. The unit requires a soakaway or drain to prevent water or ice from forming on the ground.

Soak-away requirement can be accomplished using a gravel relief around the slab area, or by diverting condensation into an existing exterior drain. See *Figures 9.2 & 9.3*

The following criteria must be met to ensure proper drainage:

- Condensate must be piped into a sufficiently large soak-away or drain
- Gravel used for a soak-away must be loose (e.g. pebble gravel, or coarser)
- Condensate tube must be routed away from the unit
- Condensate pipe must terminate above gravel layer
- Condensate tube should be protected from freezing/blockage



CAUTION: If the condensate drain freezes over, the resulting blockage will cause irreparable damage to the heat pump.

9.3.1 Soak-away requirement

The gravel bedding for slab and the associated soakaway should be designed as follows:

1. Minimum depth of 100 mm of pea gravel, chipped stone, or other interlocking aggregate with high drainage rate
2. Front and side gravel relief apron of at least 100 mm from edge of slab
3. Rear relief apron of 100 mm minimum, with additional apron as needed to ensure proper termination of condensate drain piping (300 mm maximum)
4. Consists of pea gravel, chipped stone, or other aggregate with high drainage rate. Sand may be used under gravel but may not reduce gravel depth below 100 mm

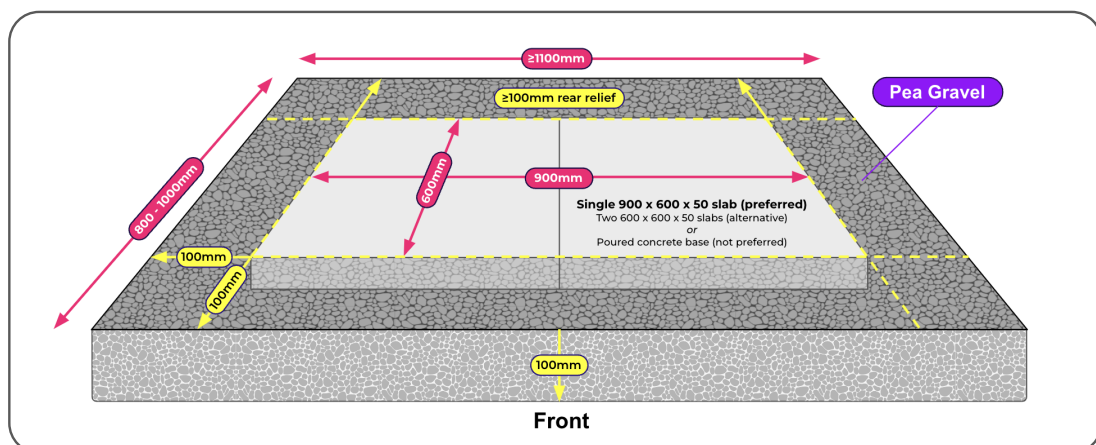


Figure 9.2 - Gravel Soakaway

9.3.2 Condensate Piping Requirements

Cosy units come equipped with a 3/4" brass condensate outlet port. Condensation water must be piped from this port to an area clear of the unit. This will most likely be the gravel soakaway defined in section 9.3.1. However, the installer may opt to connect the port via pipework to an existing drain. Connections should not be made to foul drains. See Figure 9.3

9.3.2.A Condensate piping design for gravel soakaway (Preferred)

1. Use a male-to-male adaptor to establish a connection point for PVC outflow piping to the condensate port.
2. Minimum condensate outflow piping size is 3/4" PVC (larger may be used).
3. Terminate $\geq 25\text{mm}$ above gravel surface to prevent ice formation from blocking outlet.
4. Outflow piping should be lagged for tidiness and to provide extra protection from the elements to minimize the risk of freezing and blockage.

9.3.2.B Condensate piping design for drain or gulley connection (Alternate)

1. Use a male-to-male adaptor to establish a connection point for PVC outflow piping to the condensate port.
2. Minimum condensate piping size is 3/4" PVC (larger may be used).
3. Drain/gulley piping should be 1 1/4" (32 mm) diameter unless otherwise specified.
4. Drain/gulley piping must not include a U-trap due to risk of freezing and blocking drainage from device. **No tundish or air-gap is required** due to air gap within unit.
5. Condensate outflow piping may be lagged for tidiness and to provide extra protection from the elements to minimize the risk of freezing and blockage.

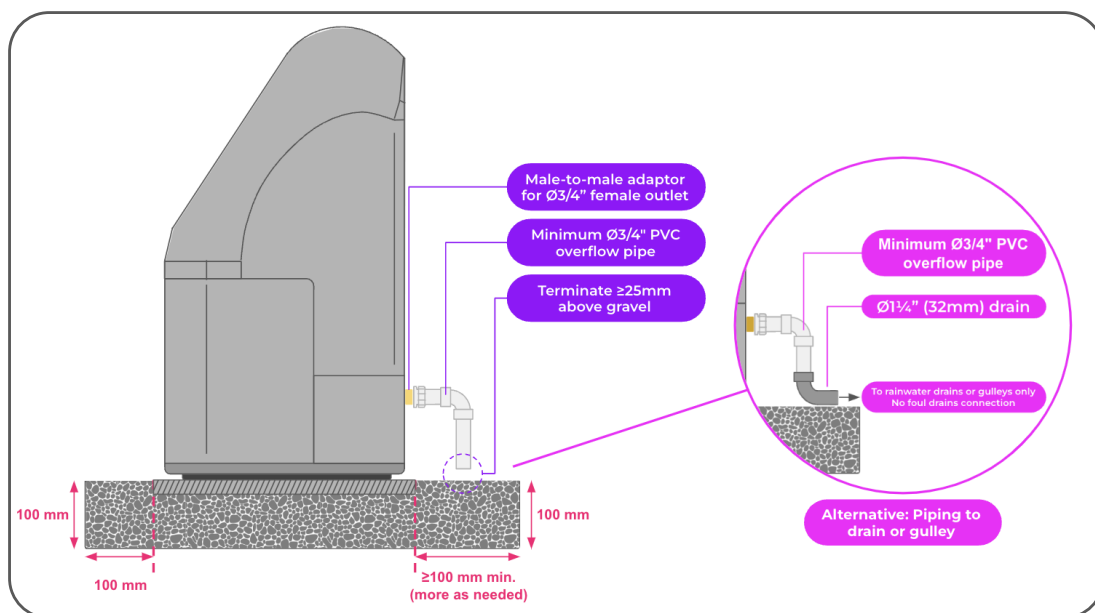


Figure 9.3 - Condensate piping

9.4 Mounting the heat pump

The unit must be positively and securely mounted to the hard base to prevent movement and ensure safety of people and animals.



WARNING: Failure to properly mount the heat pump to the base may result in injury or death to persons or animals due to tipping.

9.4.1 Mounting holes

9.4.1.A Steps for locating holes (Option 1 - Slabs or Poured Base)

1. Place the unit on the base in its final position, making sure to meet all clearance requirements relative to the base.
2. Using a pencil, grease pen, chalk, or other suitable marking tool, mark the location of the mounting holes on the base. *See Figure 9.4 below*
3. Remove the heat pump unit and drill at the marked positions using a masonry drill bit or hole saw, sized as required for the specified bolt (check bolt specifications).

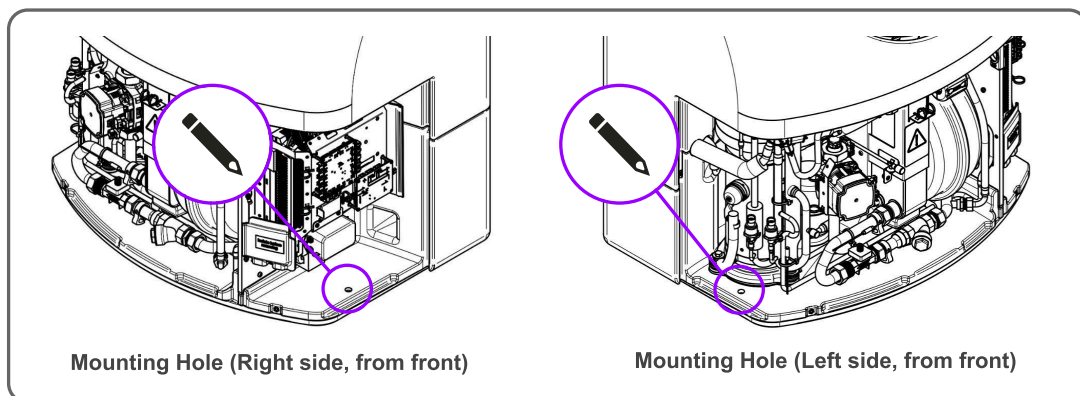


Figure 9.4 - Marking

9.4.1.B Steps for locating holes (Option 2 - Slabs only)

If using the supplied slabs as a base, holes can be located by measuring from known points on the 900 x 600 mm prefabricated slab supplied with the unit. Refer to the below steps and *Figure 9.4* to mark the bolt holes.

1. With the slab bedded in and set in the final position, mark the centreline from front to back (on the shorter aspect of the slab).
2. Measure 363.5 mm along the front edge of the slab from the centreline mark toward the edge,
3. Repeat Step 1 along the rear edge of the slab.
4. Scribe a line between the marks made in Steps 1 & 2.

5. Measure 350 mm along the scribed line from the rear of the slab and mark. Measure 250 mm from the front of the slab and mark (marks should coincide). This is the bolt hole position.
6. Repeat Steps 1-4 for the opposite side. Ensure the two bolt hole positions are 727 mm apart. See *Figure 9.5*

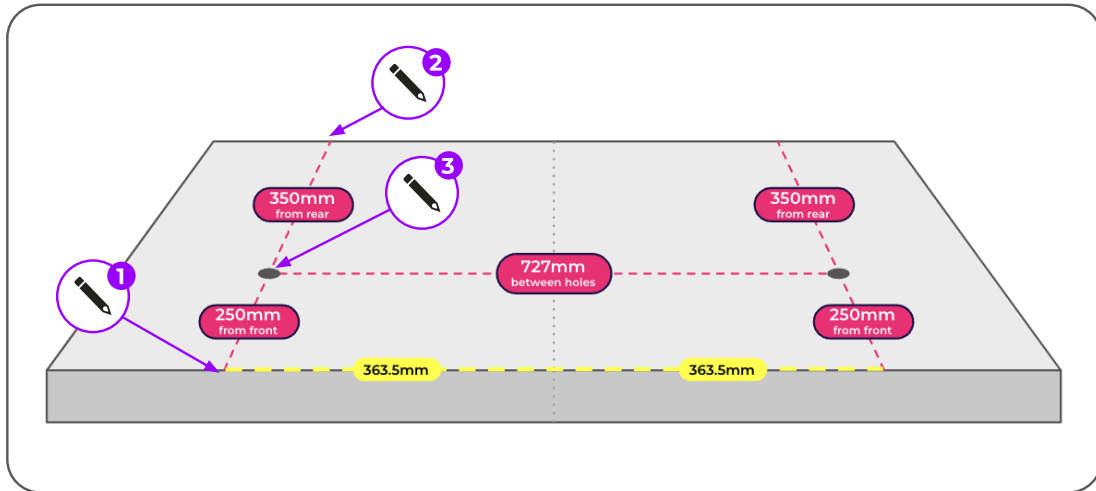


Figure 9.5 - Measurements for bolt holes

7. Drill at the marked bolt hole positions using a masonry drill bit or hole saw, sized as required for the specified bolt (check bolt specifications).

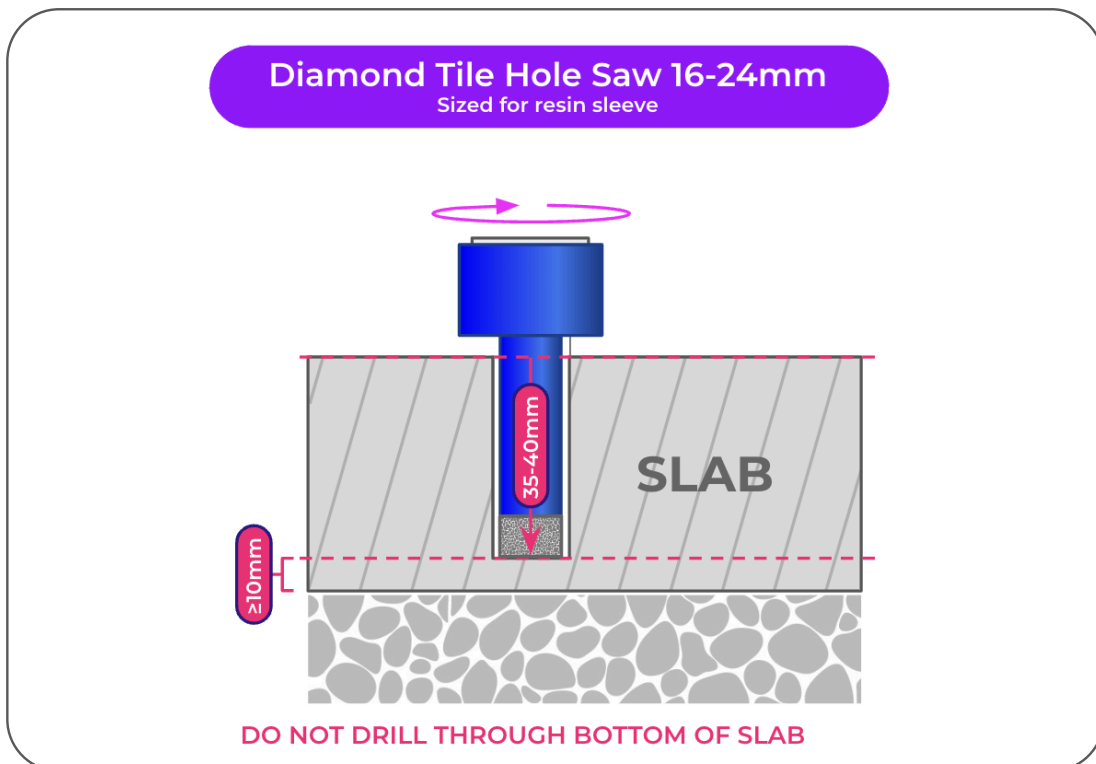


Figure 9.6 - Drilling bolt holes

9.4.2 Securing the heat pump

When securing the unit, there are two options for mounting hardware:

- M10 x 130 mm threaded rod bolts with a chemical fixative (Preferred)
- M10 x 85mm shield anchor bolts with a chemical fixative (Alternative)

Shielded bolts are easier to install and require no additional preparation, but carry the risk of cracking the slab during installation and are more prone to loosening due to vibration. Threaded rod bolts require additional time and preparation to mount, but offer a more durable solution. When possible, threaded rod bolts should be used.

9.4.2.A Steps for mounting threaded rod bolts (Preferred)

1. Ensure bolt holes are sufficient depth but *do not penetrate fully through the slab* and clear of debris and dirt from drilling.
2. Fill each hole with Rawlplug R-Kem II (or equivalent) styrene-free polyester resin fixative according to fixative manufacturer instructions.
3. Place the rod bolts in the holes so that they sit flush with the bottom of the slab. Care should be taken not to force the studs into the underlying gravel. *See Figure 9.6*
4. Wipe away any excess resin from the slab and bolt threads, ensuring roughly 60mm of bolt extends clear of the slab face.
5. Allow resin to cure per manufacturer instructions based on weather conditions.

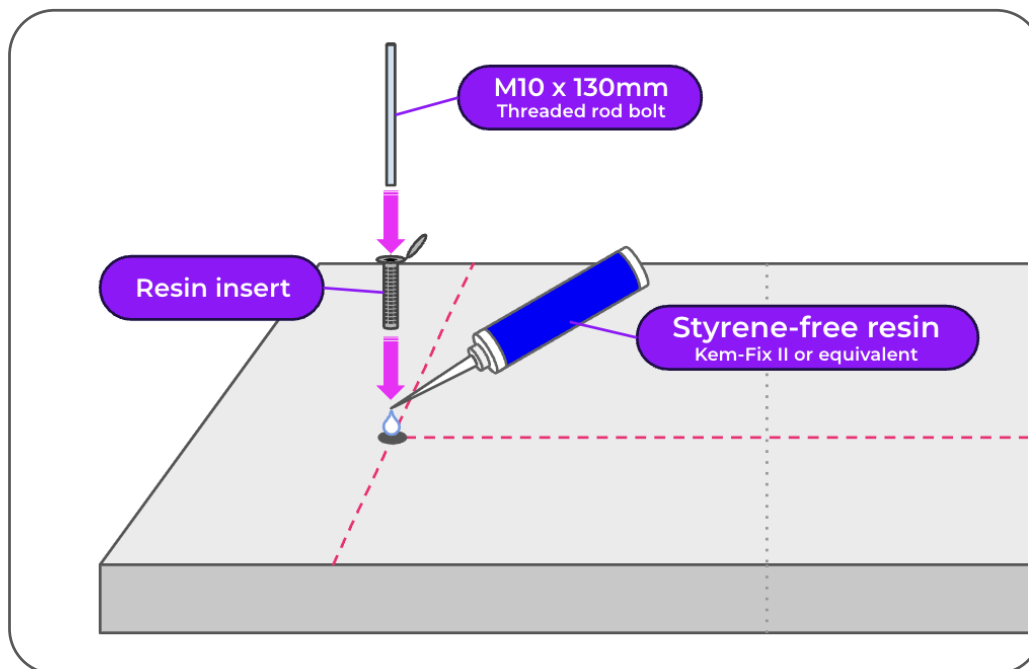


Figure 9.6 - Mounting threaded rod bolts

6. Lift the heat pump into position, taking care to align the mounting holes with the threaded rod bolts and set in place.



Proper PPE and manual handling equipment required for lifting the heat pump due to weight (100 kg)

7. Check for sufficient space and alignment of hydraulic and electrical connections before securing.
8. Secure the heat pump the base using the supplied M10 nuts and hand tighten. Use of thread locker or lock-washers is recommended due to vibration.

9.4.2.B Steps for mounting with shield anchor bolts (Alternative)

1. Ensure bolt holes are sufficient depth (clear through the slab) and clear of debris and dirt from drilling
2. Remove shields from bolts and place in holes, making sure the shields sit at or slightly below the surface of the slabs
3. Lift the heat pump into position, taking care to align the mounting holes with the holes on the slabs. Avoid sliding the heat pump over the slab surface.
4. Place the bolts through the holes and thread into the shields, hand tightening as far as possible. Use of lock-washers is recommended due to vibration.
5. With a 10mm wrench, tighten bolts only until flush with base of heat pump. Do not over-tighten.

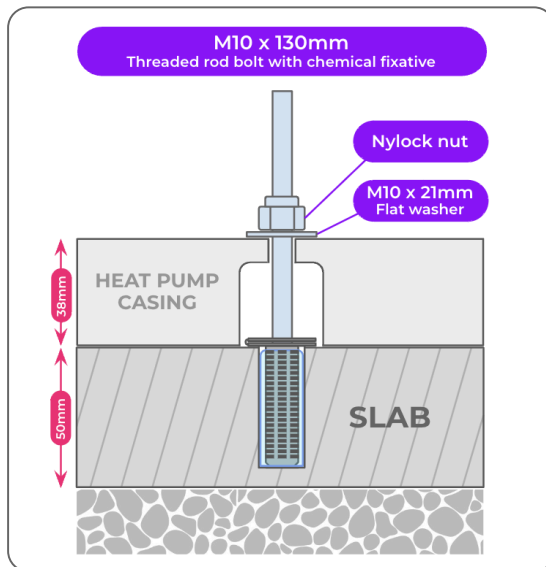


Figure 9.8 - Threaded rod bolt

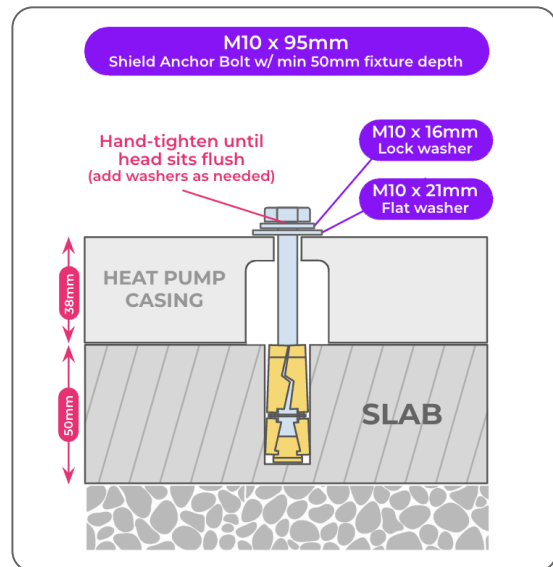


Figure 9.8 - Shield masonry bolt



CAUTION: Overtightening shield bolts will crack or damage the base.

9.5 Plumbing connections to heat pump unit

Once the heat pump has been sited and secured to the base, proceed with plumbing the unit to the home as detailed in the steps below.

9.5.1 Before beginning work

1. Identify the flow (water outlet) and return (water inlet) pipe tails and mark as needed to avoid misidentification during plumbing work. See *Figure 9.8* below.

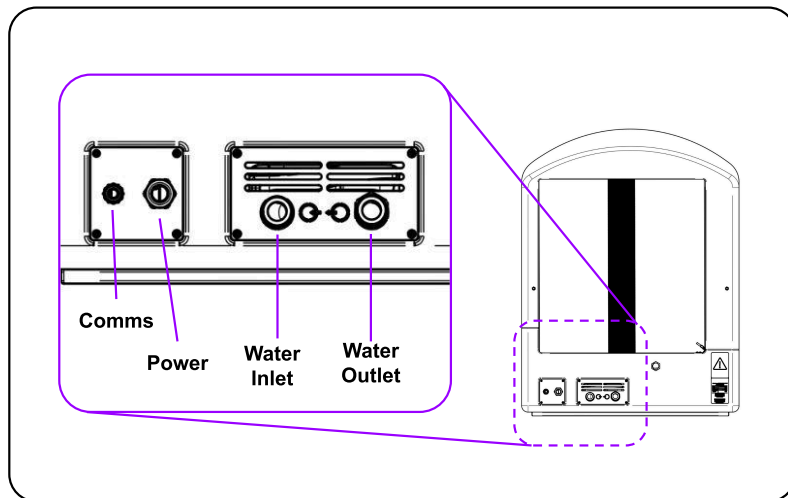


Figure 9.8 - Connection Ports

2. Before beginning any plumbing work, ensure pipe tails are clean and free of debris that may have infiltrated during siting & securing.



CAUTION: Failure to clear debris from the pipe tails will result in premature clogging of filter(s) and a low-flow fault condition

9.5.2 Connecting to pipework

1. Ensure location of pipework and allowable lengths. Longest pipe run should not exceed 15 meters to the first valve.
2. Plumb 28mm copper flow and return pipes from the home as required, ensuring each pipe aligns correctly with its respective port.
3. Connect the flow and return piping to each port using a G1" (28mm) flat-face union mating directly with the 28mm copper pipework.

Note: Braided steel hoses ("flexi-pipe") may be used to isolate the pipework from vibration on very long pipe runs only when necessary. Default connection method should be hard piping.

9.6 Electrical connections to heat pump unit

Electrical install must be conducted by an electrician to the latest edition of standard BS 7671, as well as the relevant national standards in the country of install.

9.6.1 Before beginning work

Inspect all cabling for damage or unserviceable condition before beginning electrical work.



WARNING: Failure to inspect cables and replace damaged cabling before installation may result in injury or death.

9.6.2 Wiring Overview

The following schematic provides general guidance for wiring that may not suit all scenarios. Always refer to a site-specific wiring diagram where one has been provided.

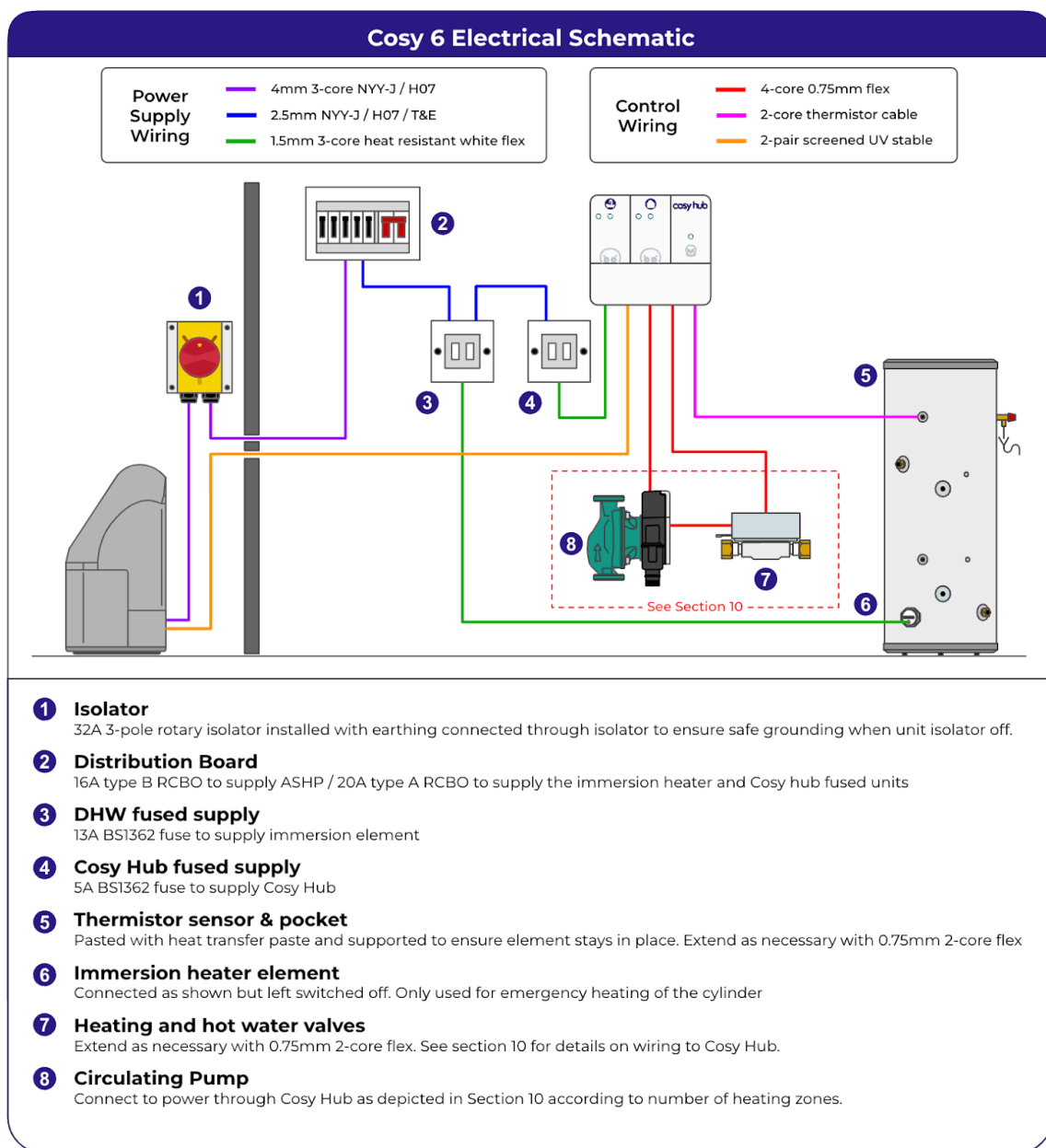


Figure 9.9 - Wiring schematic

9.6.3 Isolator installation

1. Place heat pump isolator switch on the nearest wall, or as close as practical and in accordance with local and national wiring regulations. **Isolator should be placed above the 950mm line.** If impractical to mount above 950mm from base, **place outside the later limits of the No Spark Zone.** See Figure 9.10

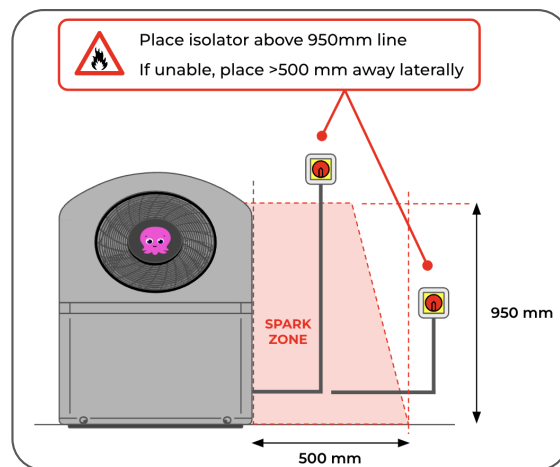


Figure 9.10 - Isolator location

2. Isolator should be wired as follows (see Figure 9.11)
 - a. Terminate L and N wires to terminals for two-pole isolation.
 - b. Earthing wire must connect through rotary isolator to ensure unit is grounded when the isolator is off. Do not connect earthing wire through rotary terminals.
 - c. Terminate earthing wire to earthing terminal or acceptable Wago connection

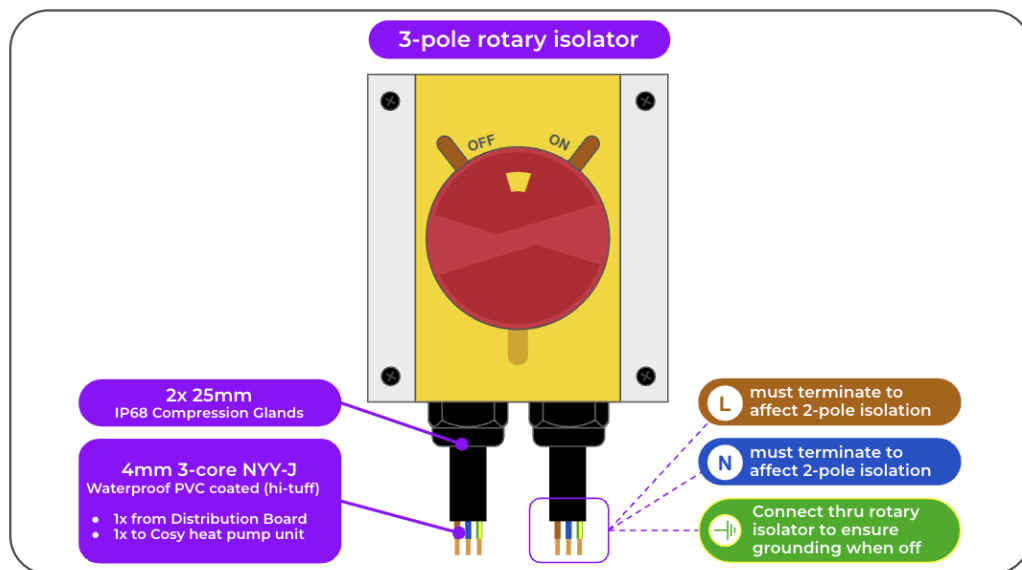


Figure 9.11 - Isolator Wiring

3. Feed power cabling through the M25 cable gland in the installer wiring plate and into the cable channel. See Figure 9.11
4. Feed communications cable through M16 Cable gland in the installer wiring plate and into the cable channel. See Figure 9.11
5. Ensure both cables pass through the cable channel to the front of the unit, making sure to leave ample slack for attaching wiring. See Figure 9.11

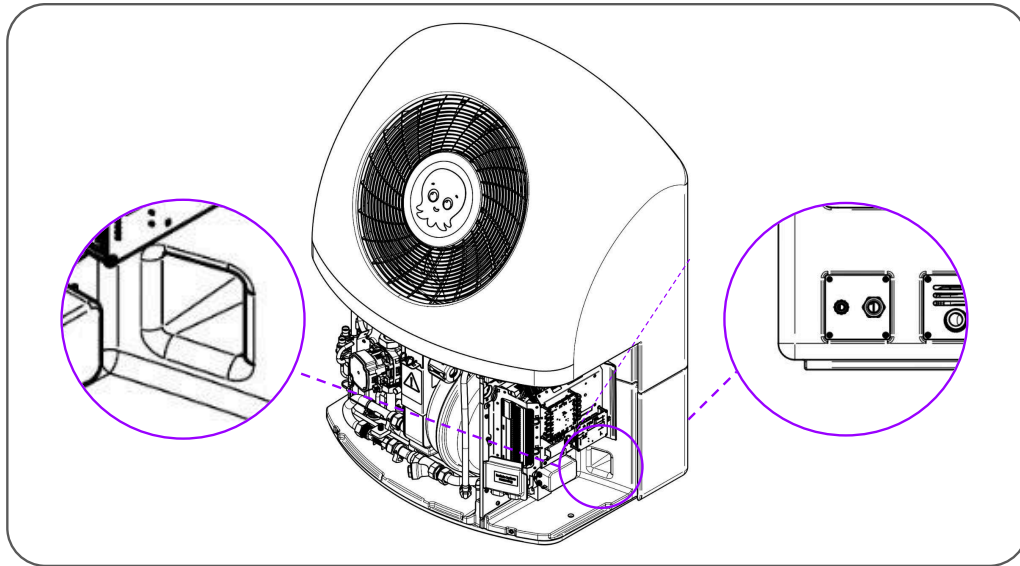


Figure 9.11 - Wiring Plate & Channel

6. Remove terminal cover and connect wires into provided terminal blocks according to *Figure 9.12* below. Connections should be hand-tightened, ensuring sufficient purchase on the wire ends to prevent slipping/loosening due to vibrations.

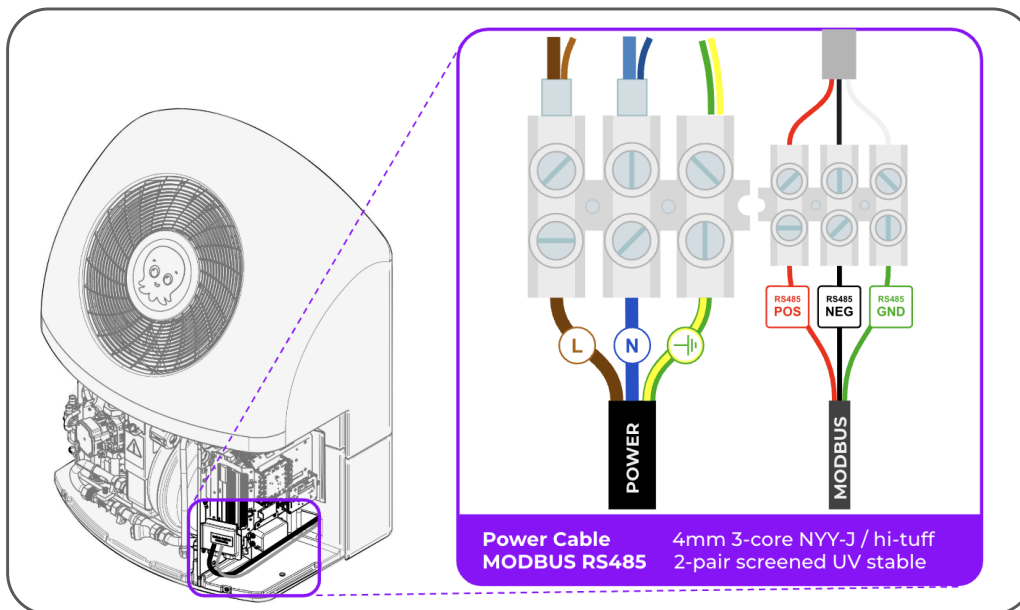


Figure 9.12 - Wiring diagram

7. Secure wiring tails to the supplied mounting block on the terminal board using cable ties, taking care to ensure all wiring is clear of contact with surfaces and conditions that could result in premature or excessive wear.



WARNING: Failure to ensure cabling will not be subject to wear, corrosion, vibration, or other damage may result in injury or death.

10. Cosy Hub installation

10.1 Controls Overview

The Octopus Cosy Hub is the indoor controller for Octopus Cosy heat pumps.

The system communicates to valves and pumps via the four relays integrated inside it, allowing a configuration of a single hot water and up to three space heating zones (note: any of the heating zones can be used and wired as an underfloor zone) The system relies on the home's Wi-Fi to enable remote smart controls via the Octopus Energy app.

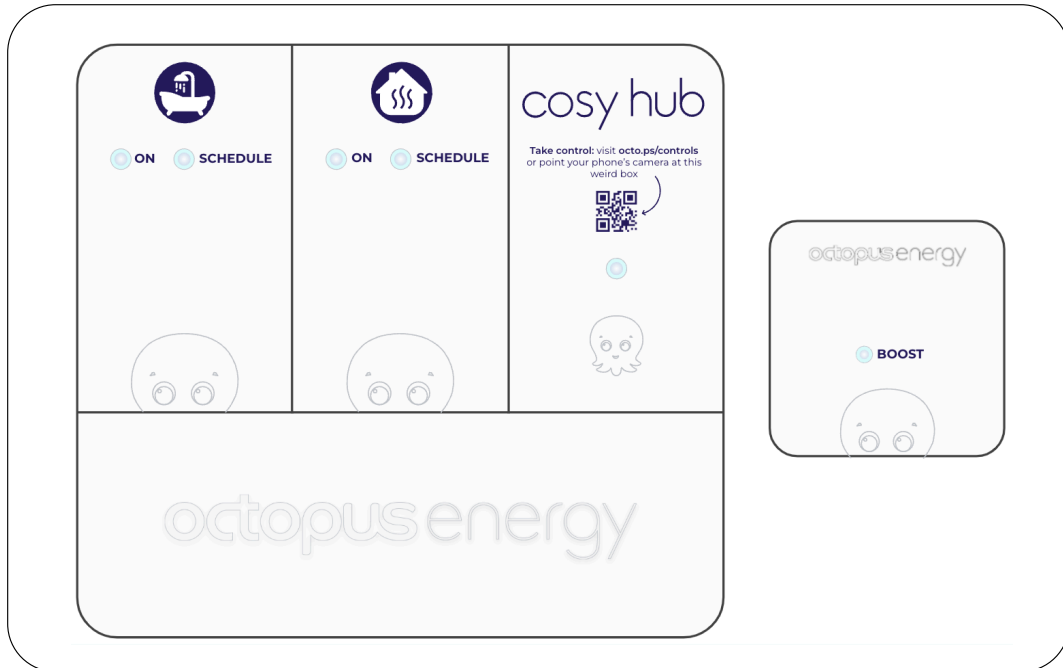


Figure 10.1 - Cosy Hub & Pod

The Cosy Hub controller makes use of various system functions as follows:

- Communicates with and controls the Cosy heat pump via a Modbus interface through a wired communications cable (installed in section 9.3)
- Receives data from Cosy Pods (room temperature and humidity sensors) wirelessly through Zigbee
- Receives domestic hot water (DHW) temperature data from the DHW tank temperature sensor (NTC)
- Communicates to valves and pumps via the 4 relays integrated inside it, allowing a configuration of a single hot water and up to three space heating zones (note: any of the heating zones can be used and wired as an underfloor zone)
- Interfaces with the Octopus Energy App wirelessly through the home Wi-F router to enable remote smart controls

10.2 Controls architecture and requirements

- Each Cosy heat pump needs one (1) controller
- Each controller can support up to four zones (3 space heating plus DHW as a zone)
- Each spacing zone must have at least one pods
- Additional pods can be fitted as secondary boost buttons and for extra room temperature/humidity data up to a maximum of 12 pods.



CAUTION: Cosy Heat pumps require a Cosy Hub controller. Attempting to use a third-party thermostat will cause malfunctioning and damage.

10.3 Cosy Hub mounting

Fit the Cosy Hub in a convenient location (this can be the hot water cylinder cupboard) where the customer can reach it easily and in an area where there is good Wi-Fi reception. Do not install in lofts. Ensure there is at least 30 cm separation from any large metal objects.

Follow the steps below to wire the controller into the heat pump system:

1. Loosen wiring cover screws and pull wiring cover away from the Cosy Hub.
2. Loosen wall plate screws and pull the Cosy Hub away from the wall plate.
3. Affix the wall plate to the wall with the arrow pointing upwards. See *Figure 10.2*

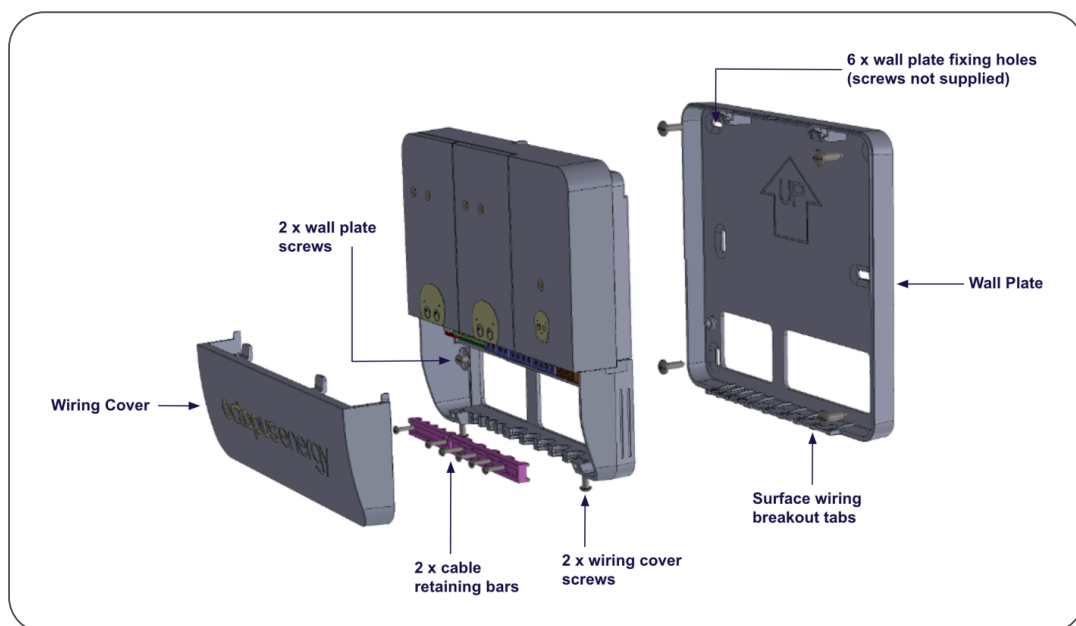


Figure 10.2 - Cosy Hub Mounting



CAUTION: Mounting the Cosy Hub too close to metal objects may result in poor communications with pods or other systems.

10.4 Cosy Hub wiring

Once the Cosy Hub is mounted to a wall, proceed with wiring as detailed below. Wiring can be done either through the surface wiring breakout tabs or through the holes in the wall plate as seen in Figure 10.2 above.

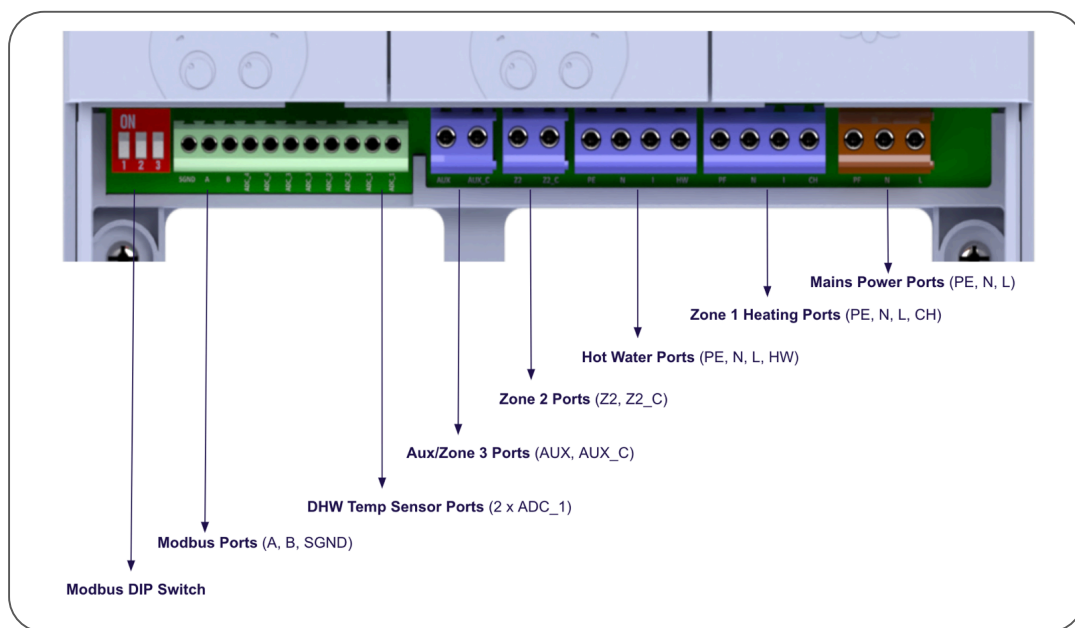


Figure 10.3 - Cosy Ports

10.4.1 Setting Modbus DIP switch

Ensure the Modbus DIP switch is configured as follows. See Figure 10.3

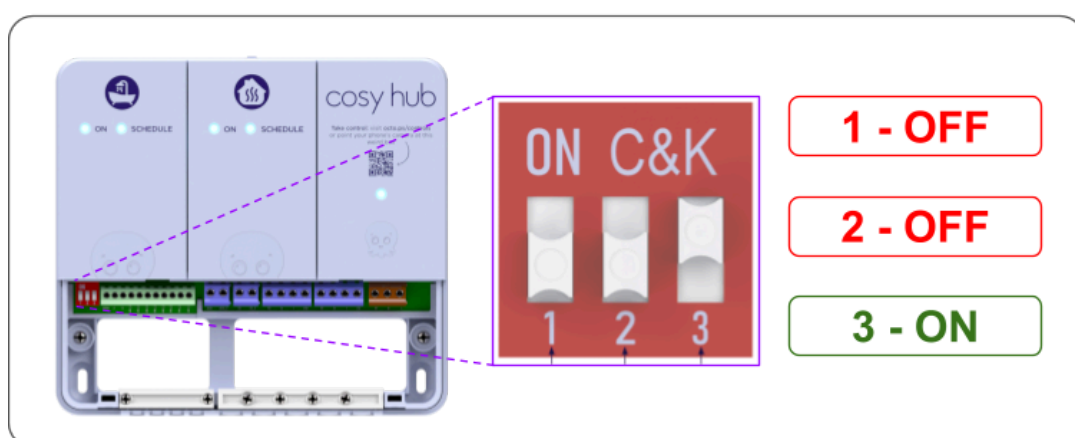


Figure 10.3 - Modbus DIP switch setting

10.4.2 Wiring Modbus ports

Using the supplied Modbus cable, wire the Modbus ports to the Cosy heat pump as follows:

- SGND: Connect one end of the green wire into port SGND and the other end into the correct port on the Cosy Heat pump (SGND is not earth and should not be connected to earth)
- A: Connect one end of the red wire into port A and the other end into the correct port on the Cosy heat pump
- B: Connect one end of the black wire into port B and the other end into the correct port on the Cosy heat pump

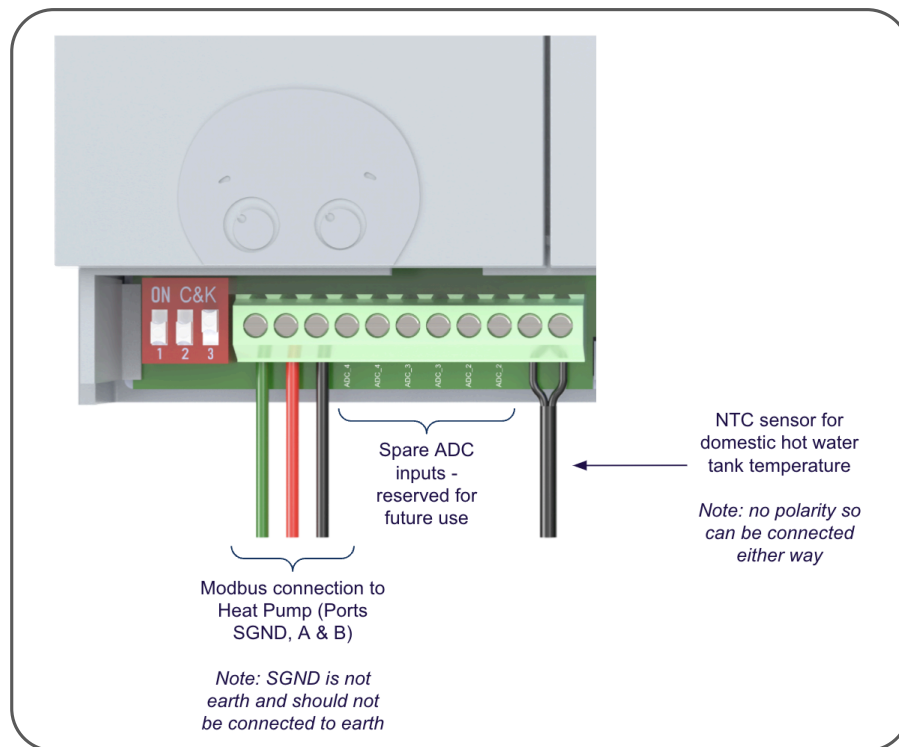


Figure 10.4 - Modbus wiring to Cosy Hub

10.4.3 Wiring DHW temperature sensor ports

- ADC_1: Connect the temperature sensor (NTC type) wires for the hot water tank into ports ADC_1 (no polarity).
- Insert the temperature sensor into tank in accordance with tank OEM instructions and section 3.

10.4.4 Wiring the mains power ports

Connect the mains power into the power port:

- PE: The Cosy Hub is double insulated and does not require earthing (optional)
- L: Connect the brown wire into port L
- N: Connect the blue wire into port N

10.5 Wiring for Heating & DHW zones

This section details the methods and diagrams for connecting the DHW system to the Cosy Hub. Note that several architectures are given. Select the appropriate setup for the installation and refer to that portion of this section.

Ensure the 3-port ESBE valve is plumbed into the central heating when powered from the permanent live wire only. It should then be motored anti-clockwise with a Switched Live input when hot water is needed.

10.5.1 DHW zone / Single heating zone / ESBE & single 2-port valve

Hot Water Ports: Ensure the 3-port ESBE valve is set to the central heating position when permanent live is present and switched live is not active. When the switched live is present the valve should motor anti-clockwise to the DHW position. Connect the 3-port ESBE valve to the Hot Water Ports as follows:

- N: Connect the blue wire from port N of the ESBE valve into port N of the Cosy Hub
- L: Connect the brown wire (this is the permanent live) from port L of the ESBE valve into port L of the Cosy Hub
- HW: Connect the black wire from port Y of the ESBE valve into port HW of the Cosy Hub (this is the switched live)

Note: The ESBE valve is double insulated and should not require earthing.

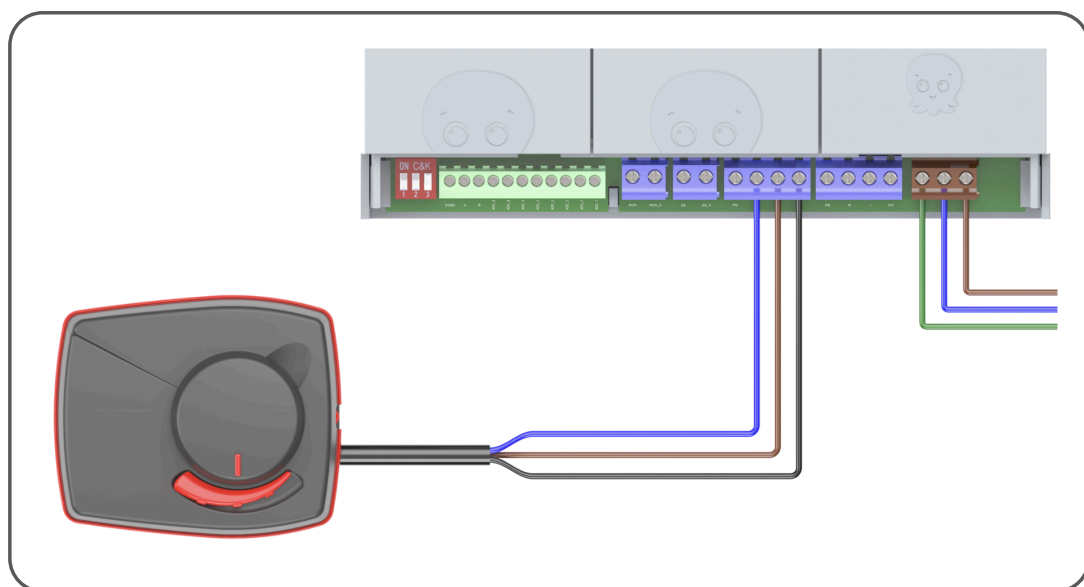


Figure 10.5 - DHW and a single Heat Zone wiring with an ESBE valve

10.5.2 DHW zone / dual heating zones / ESBE valve & two 2-port valves

Hot Water Ports: Follow the instructions in Section 10.4.1 above.

Zone 1 Heating Ports: Connect the first heating zone as follows below.

- PE: Connect the green/yellow wire from port E of the 2-port valve into port PE of the Cosy Hub
- N: Connect the blue wire from port N of the 2-port valve into port N of the Cosy Hub
- CH: Connect the brown wire from port L of the two-port valve into port CH of the Cosy Hub

Zone 2 Heating Ports: Connect the second heating zone as follows below.

- Z2: Connect brown wire from port L of the two-port valve into port Z2 of the Cosy Hub
- Z2_C: Connect a brown link wire to the nearest L port of the Cosy Hub
- N: Connect blue wire from port N of the two-port valve into any port N of the Cosy Hub
- PE: Connect the green/yellow PE wire to any other PE port in the Cosy Hub.

Note: Do not connect gray, white, or orange wires of the two-port valve to the system.

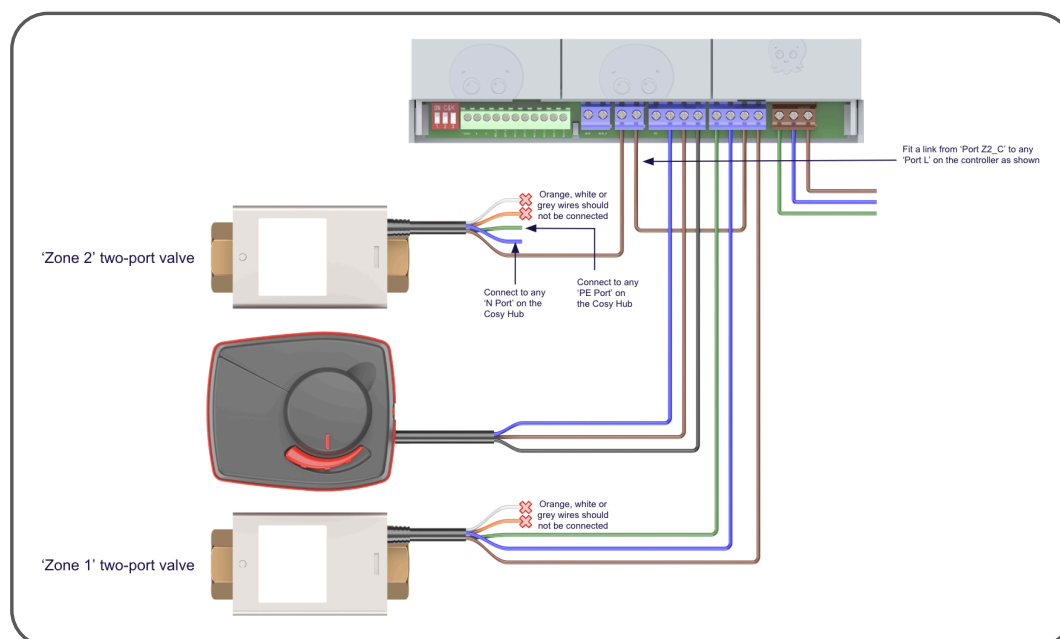


Figure 10.6 - DHW and Two Heat Zones Wiring with an ESBE valve and two two-port valves

10.5.3 DHW zone / three heating zones / ESBE & three 2-port valves

Hot Water Ports: Follow the instructions in Section 10.4.1 above.

Zone 1 Heating Ports: Follow the instructions in Section 10.4.2 above.

Zone 2 Heating Ports: Follow the instructions in Section 10.4.2 above.

Aux/Zone 3 Heating Ports: Connect the third heating zone Aux/Zone3 ports as follows below.

- AUX: Connect brown wire from port L of the two-port valve into port Z2 of the cosy hub
- AUX_C: Connect a brown link wire from AUX_C port to the nearest L port of the cosy hub.
- N: Connect blue wire from port N of the two-port valve into any port N of the cosy hub
- PE: Connect green/yellow wire from port E of the two-port valve into any port PE in the Cosy Hub

Note: Do not connect gray, white, or orange wires of the two-port valve to the system.

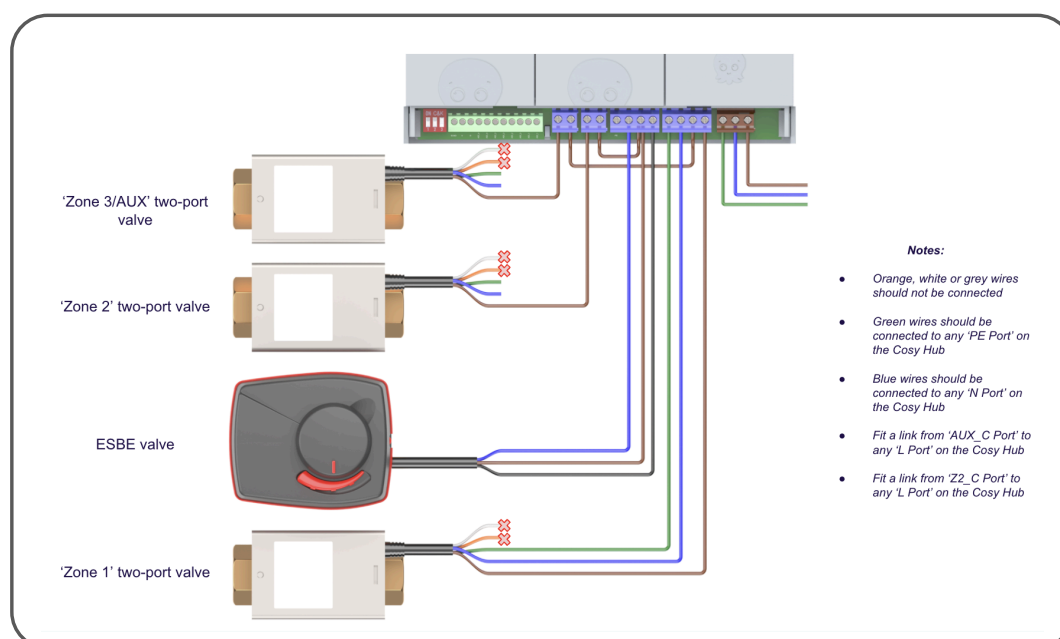


Figure 10.6 - DHW and Three Heat Zones Wiring with an ESBE valve and three two-port valves

10.5.4 DHW zone / three heating zones using four 2-port valves

Hot Water Ports: Connect the hot water zone ports as follows below.

- HW: Connect brown wire from port L of the two-port valve into port HW of the Cosy Hub
- N: Connect blue wire from port N of the two-port valve into port N of the Cosy Hub
- PE: Connect green/yellow wire from port E of the two-port valve into port PE of the Cosy Hub

Zone 1 Heating Ports: Follow the instructions in Section 10.4.2 above.

Zone 2 Heating Ports: Follow the instructions in Section 10.4.2 above.

Aux/Zone 3 Heating Ports: Follow the instructions in Section 10.4.3 above (only if a third heating zone is required).

Note: Do not connect gray, white, or orange wires of the two-port valve to the system.

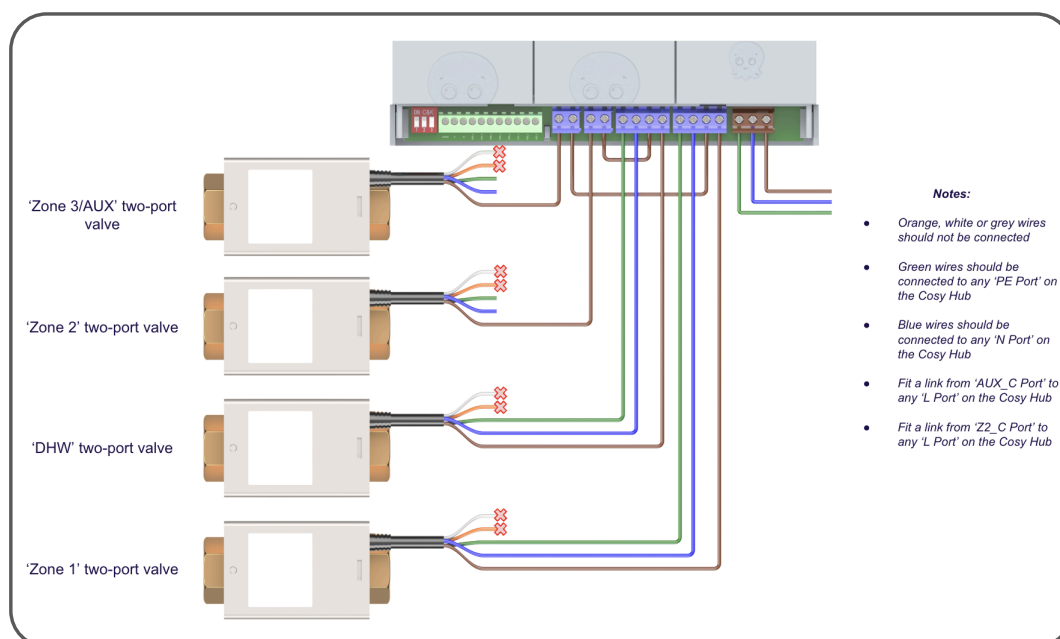


Figure 10.7 - DHW and Three Heat Zones Wiring with an ESBE valve and three two-port valves

10.6 Wiring for Circulating Pump with 4-pipe buffer

This section details the methods and diagrams for connecting a circulating pump where installed on either a single-zone or multi-zone system

10.6.1 DHW zone / single heating zone with circulating pump

Hot Water Ports: Connect as shown in section 10.5.1

Circulating Pump: Connect as described below. See *Figure 10.8*

- PE: Connect the green/yellow wire from the pump to the PE connection of the 5A fused supply for the Cosy Hub
- N: Connect the blue wire from the pump into port N of the Cosy Hub space heating block
- L: Connect the brown wire from the pump into port CH of the Cosy Hub

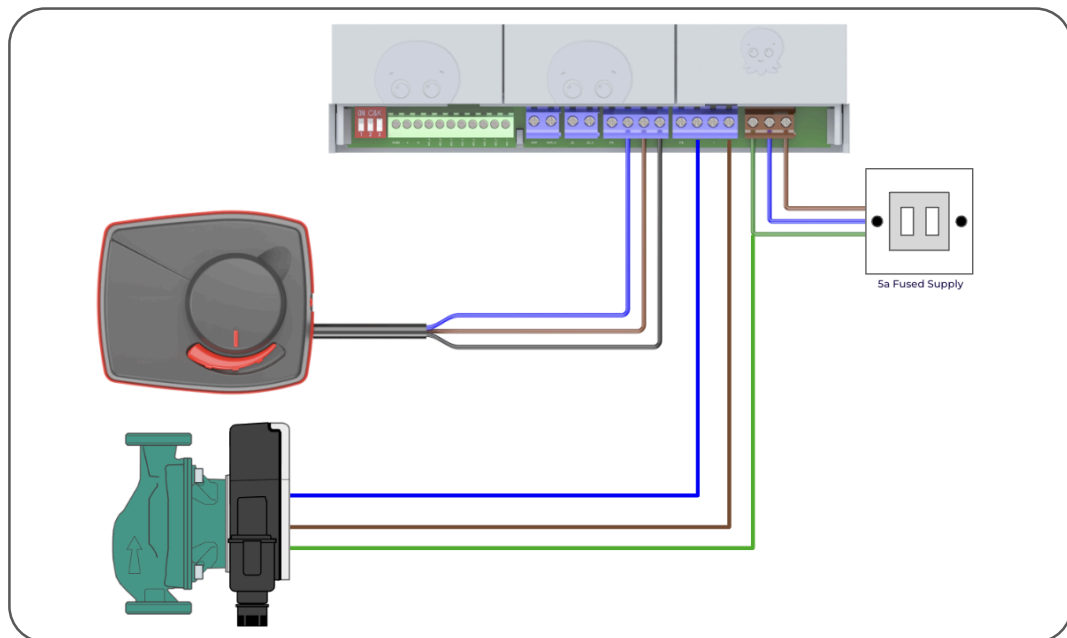


Figure 10.8 - Circulating pump wiring with the Cosy Hub and single-zone heating

10.6.2 DHW zone / multiple heating zones with circulating pump

Hot Water Ports: Connect as shown in section 10.5.1

Circulating Pump: Connect as described below. See *Figure 10.9*

- PE: Connect the green/yellow wire from the pump to the PE connection of the 5A fused supply for the Cosy Hub
- N: Connect the blue wire from the pump into port N of the Cosy Hub space heating block (shared with Zone 1 valve)
- Switched Power: Connect the orange wire (depicted) to the orange wires on all zone valves to ensure pump is powered when any heating zone is active.

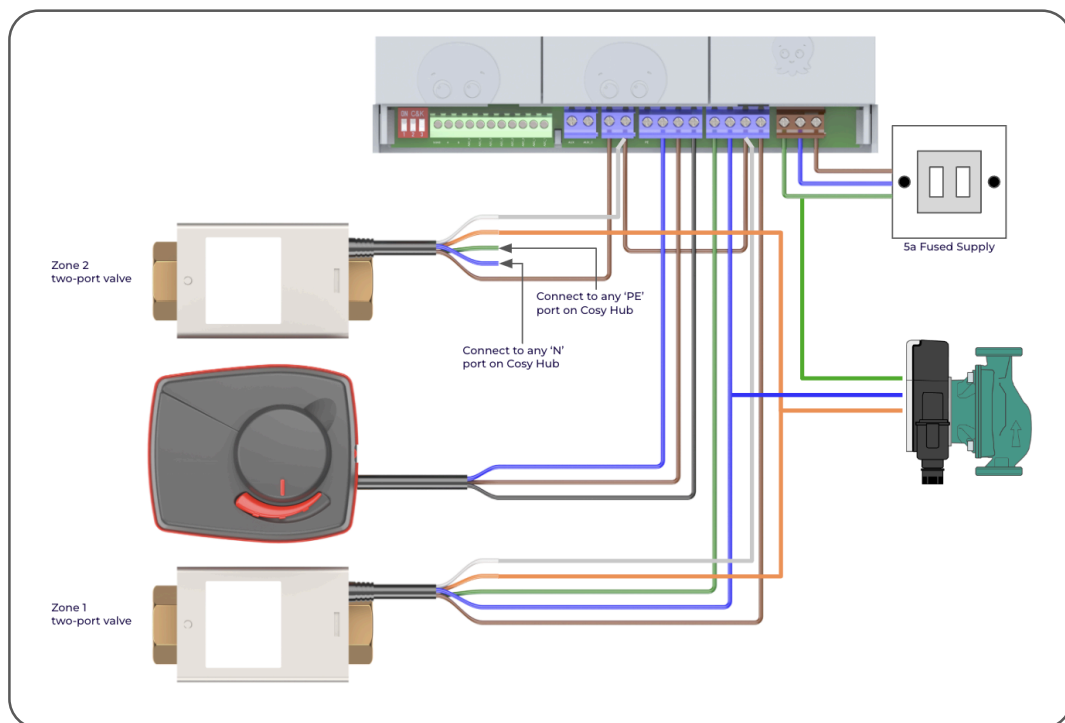


Figure 10.9 - Circulating pump wiring with the Cosy Hub and multi-zone heating

11. Commissioning

The following instructions must be read and understood prior to beginning the process to commission the Cosy 6 heat pump.

The full system and installation must meet all requirements specified in this document before being used. If there are any aspects in which the system or installation does not comply, the heat pump must not be commissioned



CAUTION: Attempting to commission a heat pump without verifying that all requirements have been met may result in severe damage to the system.

11.1 Pre-commissioning Checks

Before beginning the commissioning of the unit, check the following:

- Installation location and all clearances acceptable
- Condensation drain routed correctly and pipes to drain/soakaway
- Correct RCD and overcurrent protective device fitted
- Correct power cable (4mm 3-core NYY-J) and lockable isolator are installed
- Modbus cable is correct and connected
- Cabling has been correctly routed and clamped
- Hydraulic connections are correct and free of leaks
- System is pressurized and reading 1-1.5 bar cold
- Check 3 bar pressure relief valve is fitted
- G3 compliance label completed by installer
- Corrosion inhibitor has been correctly added
- Magnetic filter fitted
- Air tightness of the connections
- All required valves are open including pump valves
- The correctly sized volumizer/buffer tank has been fitted with 3 bar PRV (as required)
- Check nothing has been left inside the heat pump
- Inspect to ensure that all casing components have been refitted correctly
- Radiator lockshield valves set for commissioning

11.2 Filling the system

11.2.1 System Additives

If all conditions in section 10.1 are met, the system can be filled. The system should have the correct corrosion inhibitor added to the correct volume *before* filling with water.



CAUTION: Failure to add corrosion inhibitor will lead to premature corrosion and clogging of the filter element, resulting in low flow and other issues.



CAUTION: Addition of glycol is not recommended as it will lead to poor running and lower efficiency.

11.2.2 Filling with water

1. Add correct amount of corrosion inhibitor
2. Begin filling the system *cold* through a fill loop via a filling loop isolation valve.
3. Once the system pressure has reached 1 bar, air should begin to dispel through the system auto-vents. Continue to fill until all air is dispelled.
4. Check that system pressure maintains 1 bar cold once filled.
5. To bleed the heat pump of any remaining air, a Schrader bleed valve is located above the circulating pump as shown in the diagram below. See *Figure 11.1*



CAUTION: Do not confuse the air bleed valve with the schrader valves for the refrigerant loop. The air bleed valve is clearly marked.

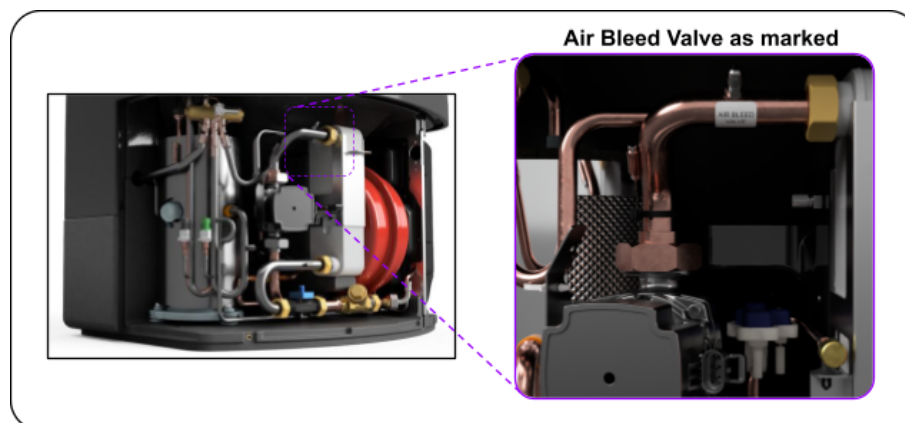


Figure 11.1 - Bleed Valve

6. By surpassing the valve, air can escape from the heat pump heat exchanger. Activate the Schrader valve to release air.



CAUTION: Ensure that the Schrader cap is replaced after bleeding to prevent fouling or water ingress, which may cause valve failure.

7. Once substantially all air has been removed, the circulating pumps can be run manually to remove any trapped air. Note that the unit will require bleeding again during the running of the circulating pump.

11.3 Commissioning of controls

The Cosy Hub has five LEDs that indicate the operating mode and status. A list of indications can be found below. These LED indications will be used during commissioning. See *Figure 11.2*

- 2x LEDs indicating hot water mode
- 2x LEDs indicating space heating mode (Zone 1 only)
- 1x LED indicating the status of the Cosy heating system

The Cosy hub also has three buttons for key inputs and backup control. These buttons are found at the bottom of the hub face. See *Figure 11.2*

- 1x button to change the hot water mode
- 1x button to change the heating mode (Zone 1 only)
- 1x button to enable Bluetooth or Wi-Fi

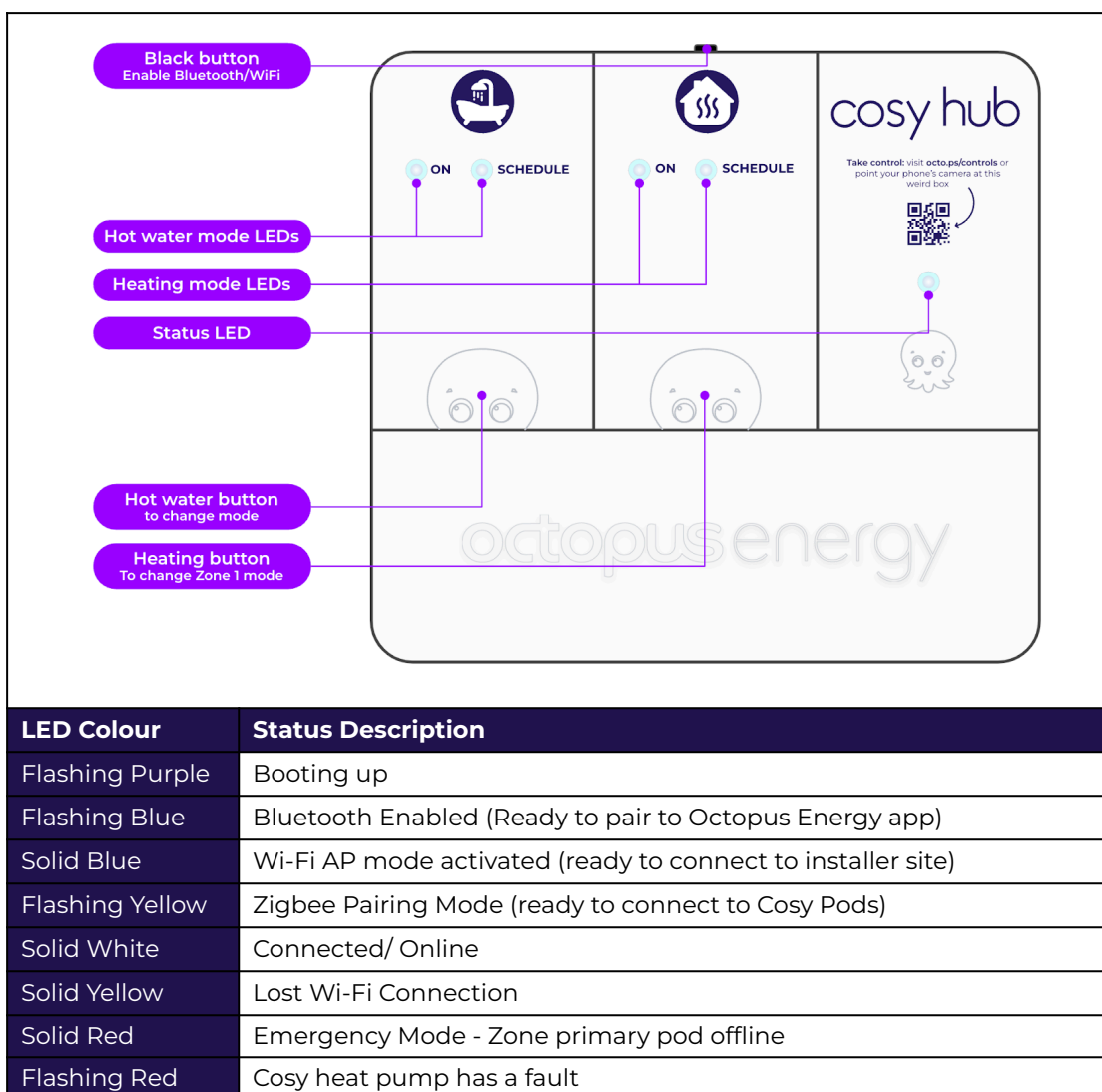


Figure 11.2 - LEDs and Buttons

11.3.1 Cosy Hub commissioning - Enabling 'Installer Mode'

The Cosy heat pump system is configured and commissioned via the installer website. The Cosy Hub needs to be put into 'Installer Mode' to enable access to the installer website.

Follow the steps below:

1. When the Cosy Hub is first powered up, the status LED should change from flashing purple to solid red.
2. Enable 'Installer Mode' by pressing the black button at the top for 10 seconds until the status LED goes solid blue.
3. Go to your Wi-Fi settings on your tablet (or laptop or mobile), select OCTO-COSYHUB
4. Locate the password on the side of the Cosy Hub or on the inside of the wiring cover.



Figure 11.3 - Password location

5. Once you have connected to OCTO-COSYHUB, you will be able to access the installer website by typing 192.168.1.1 into the browser on your tablet (or laptop or mobile) and you will be taken to the 'Home' page as default:

Home

Heat Pump Status

Machine Standby

Date + Time

01/02/2024 14:25:36

Heatpump consumption

9

External Air Temp

-1426.8°C

Flow Water Temp

1.2°C

Return Water Temp

0.0°C

Zones

Zone	Mode	Setpoint	Temperature
WATER	Off		-77.7
ZONE1	Off		0.0
ZONE2	Off		0.0
AUX	Off		0.0

Figure 11.4 - Installer Site page

11.3.2 Cosy Hub configuration

Press the menu button in the top left corner and select *System Configuration* and scroll down to *Manual Pump Control*, which will allow configuration of system modes.

The screenshot shows the 'System Configuration' page with a menu icon in the top left. Below the title bar, there are two main sections: 'Zones' and 'ADC sensors'.

Zones

Name	Friendly name	Type	Primary sensor	Enabled
DHW	WATER	Hot Water	ADC1	☒
Zone 1	ZONE1	Heating	Choose sensor...	☒
Zone 2	ZONE2	Heating	Choose sensor...	☐
Aux	AUX	Aux		☐

ADC sensors

Sensor ID	Sensor display name	Zone	ADC Type	Enabled	Temperature
ADC1	ADC1	WATER	NTC	☒	23.6
ADC2	ADC2	WATER	NTC	☐	0.0
ADC3	ADC3	WATER	NTC	☐	0.0
ADC4	ADC4	WATER	NTC	☐	0.0

Below the ADC sensors table, there are two toggle switches: 'Heatpump compatible DHW tank' (disabled) and 'RED Modbus Manifold' (disabled).

Manual Pump Control.
Only operative in 'standby mode'. Pumps will automatically turn off after 5mins.
Heat Pump status: Standby

There are several toggle switches and input fields in this section:

- Primary pump: ☐
- DHW pump enabled: ☐
- Zone 2 pump enabled: ☐
- Pump speed: 0 % (input field)
- Zone 1 pump enabled: ☐
- Zone 3 pump enabled: ☐
- Primary flow rate: 0.0 l/min (input field)

Figure 11.5 - Manual Pump Control page

From the *Manual Pump Control* page, configure the heat pump systems as follows:

1. DHW Tank - Enable 'Heat Pump compatible DHW tank' **only if a heat pump compatible tank is being installed**, otherwise leave disabled.
2. Modbus Manifold - Enable 'Modbus Manifold' only for systems with a manifold, otherwise leave disabled.
3. Once complete, do NOT exit the page - proceed to purging the system as detailed in section 10.3.3 below

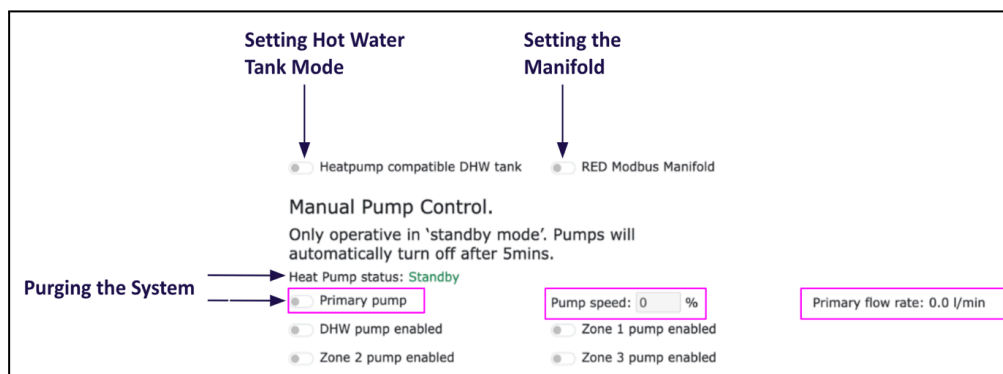


Figure 11.6 - System Purging instructions.

11.3.3 Purging the system

While remaining on the Manual Pump Control page, purge the system according to the following procedure, referring to *Figure 11.4* as needed:

1. Ensure *Heat Pump status* is *Standby* (if not, go to the Home page and turn off all zones – once you have done this, it may take a few minutes for *Heat Pump Status* to update to *Standby*).
2. Turn the primary pump on (this will automatically set the pump speed to 100%), purge/bleed the system as needed until a good 'Primary flow rate' is achieved.
3. If the system has other pumps outside of the primary pump installed, they can be enabled through the same System Configuration page via DHW, Zone 1, Zone 2, and AUX/Zone 3 pumps.

Once complete, proceed to DHW and heating zone configuration (section 11.3.4)

11.3.4 Configuring hot water and heating zones

Configure the hot water and heating zones (if applicable) as follows, referring to *Figure 11.7* below as needed:

1. Hot water (DHW) - Enabled by default, leave as is.
2. Heating for main zone (Zone 1) - Enabled by default, leave as is.
3. Heating for second zone (Zone 2) - Only enable if a second zone is needed and installed architecture supports
4. Heating for third zone (Aux) - Set *Type* from *Aux* to *Heating*, and enable if a third zone is needed.

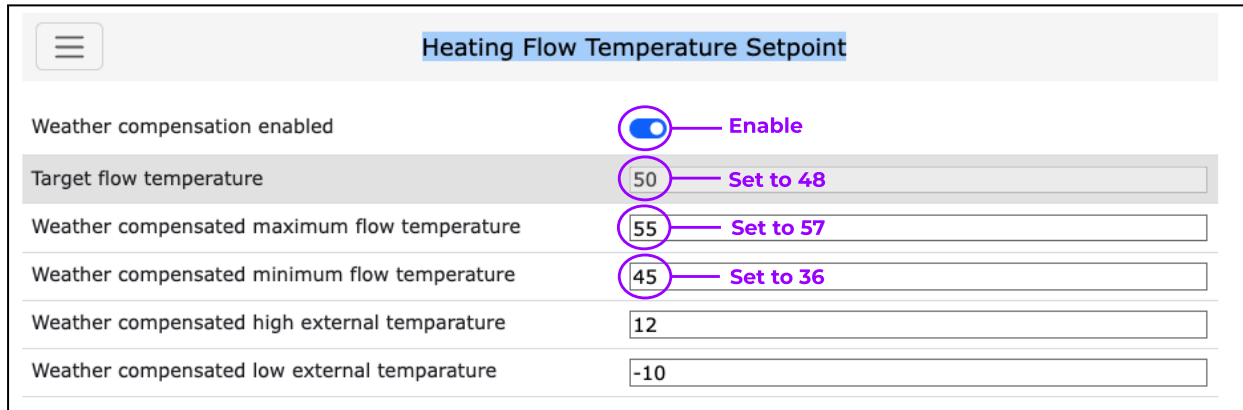
Name	Friendly name	Type	Primary sensor	Enabled
DHW	WATER	Hot Water	ADC1	☒ Enabled by default
Zone 1	ZONE1	Heating	Choose sensor...	☒ Enabled by default
Zone 2	ZONE2	Heating	Choose sensor...	☐ Enable if required
Aux	AUX	Aux		☐ Enable if required

Change to 'Heating' if Zone 3 required

Figure 11.7 - Hot Water & Zone Configuration

11.3.5 Setting the flow temperatures

To set the flow temperature, first press the menu button on the top left and go to the Setpoints page.



Heating Flow Temperature Setpoint	
Weather compensation enabled	☒ Enable
Target flow temperature	50 Set to 48
Weather compensated maximum flow temperature	55 Set to 57
Weather compensated minimum flow temperature	45 Set to 36
Weather compensated high external temperature	12
Weather compensated low external temperature	-10

Figure 11.8 - Setpoints page

From the Setpoints page shown above, set the flow temperature as follows:

1. Hot water store setpoint: Set to **48°**
2. Heating:
 - a. **Enable** Weather Compensation.
 - b. Set Weather compensated maximum flow temperature at **57°**
 - c. Set Weather compensated minimum flow temperature at **36°**
 - d. Leave the high external temperature at 12° and the low external temperature at -10° (default settings)



CAUTION: Setting the weather compensated minimum flow temperature below 36°C will result in poor performance and low efficiency.

11.4 Setting up Cosy Pods

The Cosy Pods are room temperature and humidity sensors. Customers will be given a maximum of four Cosy Pods during install, though smaller homes may have only 2-3 pods.

There must be **at least one Cosy Pod installed per heating zone** (known as the **Primary Pod**). The heat pump will heat the zone based on the temperature of the Primary Pod. Other pods installed in the same zone are for temperature and humidity information only.

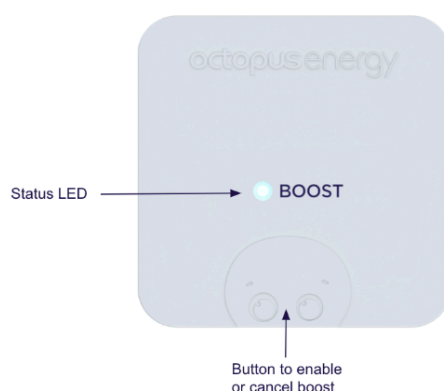


Figure 11.9 - Cosy Pod

Cosy Pods have a button to enable or cancel boost and an LED to show the status. LED status indications are detailed in the table below.

Note: the LED will never be constantly illuminated to preserve battery life.

Cosy Pod LED Color	Time out	Description
Flashing Purple	1 hour	Zigbee Enabled (ready to connect to cosy Hub)
Solid White	5 seconds	Paired to Cosy Hub
Solid Red	15 seconds	Lost Connection to Cosy Hub
Solid Green	15 Seconds	Boost for 1 hour (Boost = Current temp + 2°)
Fading Orange	3 seconds	Boost Canceled
Flashing Red	Every 30 secs	Low Battery

Table 11.A - Cosy Pod Status LED

11.4.1 Installing and pairing Cosy Pods

Cosy Pods can be mounted to any wall using the provided wall plate and the proper screws for the wall material. However, care should be taken to minimize the intrusion and disruption of walls where possible.

If necessary—or if the customer prefers—Cosy pods can be mounted by affixing the back plate to the wall using any of several commercial adhesive materials, provided the installation is sufficiently permanent.



Figure 11.10 - Pod and wall plate

Install the Cosy pod(s) as follows:

1. Remove the wall plate at the back of the Cosy Pod.
2. Identify a mounting point on the wall that is reasonably central in the room, and also:
 - a. not near a window or other source of moisture/air leakage
 - b. unlikely to receive extended periods of direct sunlight
 - c. not directly above a radiator or other heat emitter
 - d. away from other factors that might distort sensor readings
3. Affix the wall plate to the wall as necessary

Before attaching the pod to the wall plate, pair it to the controller as follows:

1. Ensure Cosy Hub AP Wifi Mode enabled (status LED is solid blue)
2. Remove the Cosy Pod battery tab and wait until the pod status LED flashes purple.
3. Scan the QR code on the back of the Cosy Pod with your tablet (**the first Cosy Pod you scan will become the Primary Pod for the zone**).



Figure 10.11 - QR code location

4. Scanning will automatically open the 'Link room sensor' page on the installer site

Link room sensor

Link Room Sensor

Install Code AAAAAAAAAAAAAA

Unique ID of Cosy Pod → EUI 123456789

Heating Zone the Cosy Pod will be assigned to (if you have set up more than one heating zone, you will need to choose the Zone the Pod should be assigned to) → Zone ZONE1

Name Lounge ← Name of the room the Pod has been installed in

Submit

Figure 11.12 - Link Room Sensor page

- If there is more than one heating zone, the pod must be assigned to a Zone. Note: every zone must have at least one pod.



CAUTION: Failing to properly assign at least one pod to each zone will result in a system fault and improper operation

- Name the Cosy Pod as per the room it will be installed in (e.g. “Lounge”).
- Print a label with the name of the room and stick it on the top of the Cosy Pod.
- Attach the pod to the mounted wall plate.
- Repeat the steps above to set up the other Cosy Pods.
- Use the menu to navigate to the Room Sensors page and ensure all Cosy Pods are listed properly.

Room Sensors

Zigbee sensors

EUI64	Sensor display Name	Zone	Online Batt (V)	RSSI (dBm)	Temp (C)	Remove	
001E5E090290305E	POD1	ZONE1 ▾	Yes	2.8	-24	23.0	Remove Sensor
001E5E090290302D	POD2	ZONE2 ▾	No	2.8	-26	23.3	Remove Sensor
001E5E090290305D	POD3	ZONE1 ▾	Yes	2.9	-30	23.3	Remove Sensor

Add room sensor

Figure 11.13 - Room Sensors page

- If the Primary Pod needs to be changed, go to the System Configuration page, and select the sensor from the drop-down Primary Sensor list.

System Configuration

Zones

Name	Friendly name	Type	Primary sensor	Enabled
DHW	WATER	Hot Water	ADC1	☒
Zone 1	ZONE1	Heating	ZONE1 - 001E5E090290305E	☒
Zone 2	ZONE2	Heating	ZONE2 - 001E5E090290302D	☒
Aux	AUX	Aux		☐

ADC sensors

Sensor ID	Sensor display name	Zone	ADC Type	Enabled	Temperature
ADC1	ADC1	WATER	NTC	☒	-90.3
ADC2	ADC2	WATER	NTC	☐	0.0
ADC3	ADC3	WATER	NTC	☐	0.0
ADC4	ADC4	WATER	NTC	☐	0.0

☒ Heatpump compatible DHW tank
 ☒ RED Modbus Manifold

Manual Pump Control.

Only operative in 'standby mode' and for 5mins only

☐ Primary pump
 ☐ DHW pump enabled
 ☐ Zone 2 pump enabled
 ☐ Zone 1 pump enabled
 ☐ Zone 3 pump enabled

Primary flow rate: 0 l/min

Figure 11.14 - System Configuration page

11.5 Octopus Energy app setup with Customer

The Octopus Energy app is the primary control method for the customer. To complete the commissioning, the heat pump must be onboarded to the app.

Onboarding procedure:

- Ask the customer to check the App Store or Google Play for the latest version of the Octopus app
- Ask the customer to download any updates and then fully restart their phone
- Ask the customer to scan the QR code on their Cosy Hub with their smartphone's camera
- The customer will be guided through the setup journey within the Octopus Energy app.
- Once the customer has completed the journey within the app, verify that the status LED on the Cosy Hub has turned white.

12. Post-Install Handover

A proper handover is crucial to the customer having confidence in their new heat pump system. Before calling the install complete and the system fully commissioned, ensure the following steps are completed.

12.1 Final checks

1. System clear of faults - confirm with Octopus support team
2. Radiators balanced and confirmed warming properly
3. DHW functionality working
4. Other systems working as customer wishes, e.g. home battery able to power home
5. All groundwork & install-related work on house completed and tidied
6. Commissioning document(s) completed

12.2 Document delivery

Every customer should receive a full set of documents via e-mail from their install support team (IST) specialist. If necessary, reassure the customer they will receive the following documents:

1. Cosy Heat Pump owners manual
2. Cosy Heat Pump Warranty documentation
3. System performance estimate (included in final sales agreement)
4. Commissioning report

12.3 System explanation

12.3.1 Basic heat pump functionality

Customers are more comfortable and confident in the product when they feel they have some sense of how it works, even at a basic level. Take a few moments to refer the customer to the “How heat pumps work” section of the owner's manual, and use your expertise to explain how a heat pump delivers efficient heat to their home. Some key points to highlight with the customer are:

- Cosy heat pumps work the same way a refrigerator does, but in reverse
- Cosy heat pumps are up to 4 times more efficient than a gas boiler
- Cosy heat pumps deliver warmth in ambient temperatures down to -25° C

12.3.2 Space heating vs. domestic hot water (DHW)

Inform the customer that their heat pump will deliver both space heating and hot water, but will flip between modes as necessary. This is important to explain so the customer understands that while they may turn their home temperature down

12.3.3 Legionella cycles

The Cosy heat pump does not run a pre-programmed cycle to heat the DHW temperature to prevent growth of legionella.

Though this is often done with a condensing boiler or combi-boiler, it is not a requirement in domestic installations due to the frequent and steady consumption of hot water from the tank.

The Octopus Energy app provides controls of the hot water temperature and schedules. If the customer chooses, they can enact a legionella cycle

12.3.4 Defrost cycles

Defrosting: When the outdoor temperature is low, it is possible for ice to form in and around the unit. This is perfectly normal. Ice can be created as part of the normal function of the heat pump when outside temperatures drop. As a result, the unit will defrost itself at set intervals. During this defrost cycle, the customer may notice steam rising from the unit.

It's important to communicate to the customer upon handover that the heat pump may produce steam during the defrost cycle and that this is within the unit's normal operation.

This defrost will also help to clear the unit of snow and any water created from the defrost process will drain away through the condensate drain.

If ice continues to form on and inside the unit and defrosting cycles do not appear to be effective, this could indicate a problem with either the defrost function, the outdoor fan, refrigerant levels, or a lack of airflow. An engineer should be called to address the issue.

Note: In case of especially heavy snowfall or ice it may be necessary to clean the unit as there may not be sufficient airflow to begin the heating cycle. The customer may need to do this themselves, and should refer to the owners manual for instructions and safety guidance.

13. Servicing

13.1 General precautions

Before beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized.

For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.



WARNING: Danger of fire or explosion due to flammable gasses. Do not smoke around the unit, or allow open flame in the vicinity of the unit.



WARNING: Due to risk of fire and explosion, work requiring the assistance of other personnel shall be carried out under the supervision of a person trained in the use of flammable refrigerants



WARNING: Evaporator fins and other sharp edges in the heat pump unit can cause injury to hands during work.



WARNING: Do not touch pipework during operation. Pipes can reach up to 75°C depending on the condition of the refrigerant.



WARNING: Components within the enclosed heat pump casing may be hot enough to cause severe burns after the unit has stopped operating.



All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.



Ensure adequate ventilation of workspace for the duration of servicing and repair work. Working in confined spaces should be avoided. A degree of ventilation should be maintained to disperse any leaked refrigerant.



Workspace shall be checked with an appropriate refrigerant detector prior to and during work to ensure no flammable atmosphere exists. Ensure the detector equipment used is suitable for use with flammable refrigerants.



If any hot work is to be conducted on refrigeration equipment or any associated parts, a dry powder or CO2 fire extinguisher adjacent to the charging area.



All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the workspace during any work in which flammable refrigerant can possibly be released to the surrounding space.

Where heat pump components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

13.2 Electrical safety guidelines

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- All capacitors are fully discharged: this shall be done in a safe manner to avoid possibility of sparking
- No live electrical components and wiring are exposed while charging, recovering or purging the system
- Verifying continuity of earth bonding

13.3 General servicing guidance

The Cosy 6 heat pump should be a low maintenance unit. A fundamental requirement is to keep the airflow path clear. This will keep the unit running as efficiently as possible.

Below are some other considerations to keep the unit operating well. However, please note that any other maintenance beyond keeping airflow paths clear should be performed as part of a formal service or repair.

13.3.1 Users self-service guidelines

- **Fan:** the fan grille will not allow fingers to pass, however other items such as sticks (or children's toys) may be able to pass into the fan cavity. This must be avoided and children should be made well aware that this could be dangerous.
- **Fan cap:** this must not be removed at any time. Water or debris may enter the unit and damage the fan if the cap is removed.
- **Casing:** the casing is impact resistant and can withstand bumps and knocks from normal activity, such as gardening or children playing. However if cracks appear in the casing, or there is other significant damage to its integrity, please contact technical support.
- **Covers:** the unit should only ever be opened by trained installers. Pipework may be extremely hot or cold depending on the stage of the cycle. Live components will hold charge for a period even if the unit is disconnected.
- **Evaporator:** while the outer casing of the unit is impact resistant, the evaporator is exposed behind the unit and has sharp fins. These fins can be easily deformed which may impact the effectiveness of the pump. It is important to take care while cleaning the evaporator. Do not store anything directly behind the unit. If the evaporator becomes damaged, please contact technical support.

13.3.2 Product ingress considerations & servicing

- **Leaves:** it is important to keep the Cosy 6 clear from garden debris such as leaves, bushes or tree branches. As outlined above, a suitable location should be chosen in order to avoid these materials entering the unit.
 - In the case that garden debris has built up around the unit, especially after high winds, use a soft brush to remove the debris and prevent any blockages. Take particular care around the flow and return pipes at the back of the unit. While performing maintenance, also check leaks or damage to the pipes. Arrange a service if any issues are found.
- **Algae/moss:** over time, it is possible that algae or moss may build up on the unit. Remove these with a damp cloth, but avoid the fan and flow and return pipes as these can operate at high temperatures.
- **Water:** rainfall will not affect the unit. Rain and light snow will pass through the fan, down the airflow path and into the drip tray, where it will drain off through the condensate management system. In the case of heavy snowfall or ice storms, it may be required to remove snow or ice from the top of the unit. Do so with care and do not remove the fan cover while removing the snow.

13.4 Checking for hydraulic leaks

It is important to check the unit for hydraulic leaks. While the unit will create water through its regular operation due to moisture in the air, this water should drain away.

The principal areas to inspect are:

- **Condensate drain:** this is used to drain away rain and the water created from moisture in the air due to condensation. If this area becomes clogged with debris, it may and could overflow and create overflow or a puddle around your heat pump. The user can clean this.
- **The flow and return connections:** where the warm water leaves the unit and the cool water returns, if these connections are loose or damaged, it can cause leaks and could result in a drop in system pressure. This will require an engineer to repair.
- **Door:** some water may be present in the unit from rain and/or melting ice. However if a large volume of water is leaking from the bottom of the door, this could indicate an issue with the hydraulic pipework. An engineer should check the unit.

13.5 Noise trouble-shooting

During its regular operation, the heat pump will naturally make some noise - however some specific noises can indicate a problem.

- If the heat pump is louder than usual: this may just be the unit working harder than normal, possibly due to external factors such as cold weather. In this case, the customer should continue to monitor the unit. If the issue continues, it may be possible that the unit is struggling to meet the demand. Check if the heat pump is correctly sized for the heating capacity of the home.
- A gurgling sound: this may indicate a problem in the refrigerant circuit. It could be an indication of low levels of refrigerant due to a leak or insufficient charge.
- A grinding or squealing sound: this may be the result of motor wear and tear, a fault with the compressor, or possibly due to dirt build up on components that require lubrication.

13.6 Electrical maintenance

- If the heat pump is not heating water appropriately, this could be due to lost electricity supply. Ask the customer to check that both the indoor and outdoor units are switched on and check that the customer's Octopus Energy app is connected to the system. If both are on and the issue remains, the customer should check the circuit breaker for a tripped circuit. If neither are at fault, an engineer should visit the unit.
- If the heat pump is overheating or not cycling correctly this could be due to a faulty thermostat. Check that thermostats have been correctly connected and calibrated. If not, an engineer should be called to calibrate the system correctly.
- If the heat pump is running constantly, rather than cycling 2-3 times per hour, this may be due to the thermostat being set too high for reference or the unit is incorrectly sized for the home.
- The customer should contact an installer to deal with any exposed wires.
- In the case of severe electrical issues, a smoky or fishy smell may emanate from the unit; this could be a sign of components burning out.

13.7 Repairs involving refrigerant

13.7.1 Refrigerant leak detection

If a refrigerant leak is suspected an engineer should be called immediately and all electronics and sources of ignition should be kept clear of the unit.

A refrigerant leak will result in the unit working harder to meet the demand and if it continues the unit could stop working altogether. If there is hissing sound coming from the unit could be an indicator of a refrigerant leak.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. Detection equipment shall be calibrated in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

13.7.2 Refrigerant removal and evacuation during servicing

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant
- Purge the circuit with inert gas
- Evacuate
- Purge again with inert gas
- Open the circuit by cutting or brazing

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipework are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

13.7.3 Refrigerant charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

13.7.4 Repairs to sealed components

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands etc.

Ensure that apparatus is mounted securely. Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

Note: the use of silicone sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

13.7.5 Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

14. Decommissioning

14.1 Uninstalling the unit

1. Ensure heat and hot water demand have been switched off at the Cosy Hub and that the heat pump has entered standby mode.
2. Isolate power to the outdoor unit. To ensure the unit is safe from electrical risks, allow 10 minutes before interacting with the unit, as some components will require time to discharge.
3. Isolate and disconnect hydraulic connections from the system with isolating valves provided. This includes the flow, return and condensate drain.
 - a. Be aware that some system water will remain within the product and will drain when disconnected from the hydraulic connections.
4. Remove the outer casing door in order to access the mounting bolts described in the installation section.
5. Follow safe manual handling instructions for moving the product as described in the safety warnings section. In particular, ensure there are no trailing pipes, cables, or trip hazards.
6. Dispose of any waste material, substances, and liquids in accordance with local regulations.

14.1.1 Refrigerant removal and recovery during decommissioning



WARNING: Danger of fire or explosion due to flammable gasses. Do not smoke around the unit, or allow open flame in the vicinity of the unit.



WARNING: Due to risk of fire and explosion, work requiring the assistance of other personnel shall be carried out under the supervision of a person trained in the use of flammable refrigerants

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in

good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult the manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

14.1.2 Step-by-step instructions for refrigerant removal

1. If refrigerant needs to be removed from the system for any purpose such as decommissioning, service or maintenance, please follow the steps below.
2. Only persons competent and trained in handling R290 refrigerant should perform this operation and should be familiar with the equipment and its operation.
3. Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.
4. Ensure that the heat pump is electrically isolated at all connections, except for the ground connection.
5. Before attempting the procedure ensure that:
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - All personal protective equipment is available and being used correctly;
 - The recovery process is supervised at all times by a competent person;
 - Recovery equipment and cylinders are A3 approved and conform to the appropriate standards;
 - To remove refrigerant requires a refrigerant recovery machine, a vacuum pump, a two-way refrigerant manifold with correct hoses and a correctly labeled R290 recovery cylinder.
6. Connect to high and low-pressure sides of the system, but before commencing refrigerant recovery, ensure that all lines, the recovery vessel and all associated equipment have been vacuumed using the vacuum pump.
7. Check connections for any leaks before connecting to the system. If any leaks are found, close all refrigerant connections and tighten associated connections.

8. Make sure that cylinder is situated on the scales before recovery takes place.
9. Start the recovery machine and operate in accordance with the manufacturer's instructions.
10. Both gauges on the refrigerant recovery manifold should read and maintain a negative pressure of 0.3mbar to ensure the unit is free of refrigerant. This process may take up to an hour.
11. Do not overfill cylinders (no more than 80% volume liquid charge).
12. Do not exceed the maximum working pressure of the cylinder, even temporarily.
13. Disconnect from the heat pump, ensuring all refrigerant has been recovered into the recovery vessel and that the recovery vessel is now safely isolated.
14. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
15. If components from the refrigerant side need to be removed, ensure the system has been thoroughly flushed with nitrogen.
16. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.
17. If the refrigerant is to be disposed of, disposal must adhere to all local regulations.

14.2 Decommissioning labeling

Make sure the equipment is labeled stating that it has been decommissioned and emptied of refrigerant. The label should be dated and signed. Make sure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Appendix I: Diagrams of Cosy 6



