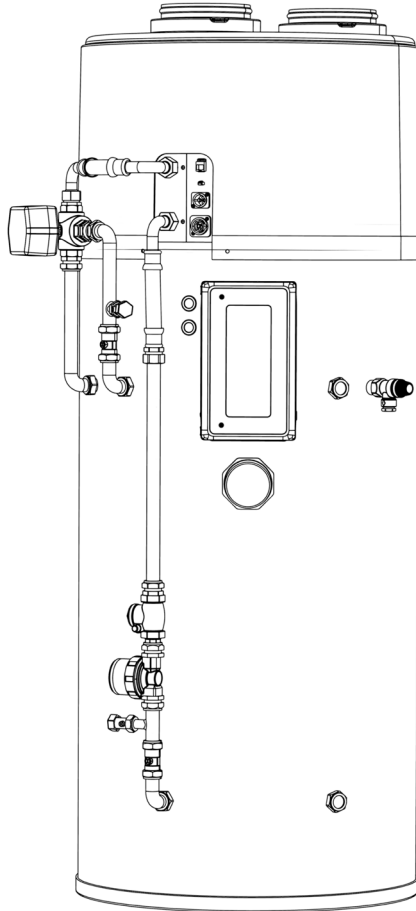


Mixergy iHP

Installation and Servicing Instructions

MDC0031-02

For stainless steel integrated heat pump cylinders



PLEASE LEAVE WITH HOUSEHOLDER

Failure to install and maintain this system in accordance with these instructions will invalidate the manufacturer's warranty.

mixergy[®]

Cylinder details

MX number

Your cylinder MX number can be found on the label placed on the front of the cylinder.

For all queries, please contact us:

Tel: 01865 884343

Email: enquiries@mixergy.co.uk

Technical data

Max. supply pressure to pressure reducing valve	1 MPa (10 bar)
Operating pressure	0.3 MPa (3 bar)
Expansion vessel charge pressure	0.3 MPa (3 bar)
Expansion relief valve setting	0.6 MPa (6 bar)
P&T relief valve setting (pressure)	0.7 MPa (7 bar)
P&T relief valve setting (temperature)	90 °C
Thermostat safety cut-out temperature	80 °C
Adjustable temperature range (digital)	45 - 55 °C
Heat Pump Consumption (Cont.)	230-240 V~ 850W
Heat Pump Rating	2.5kW
Refrigerant (Charge)	R134a (560g)
Refrigerant leakage rate (g/Yr)	2.0

Contents

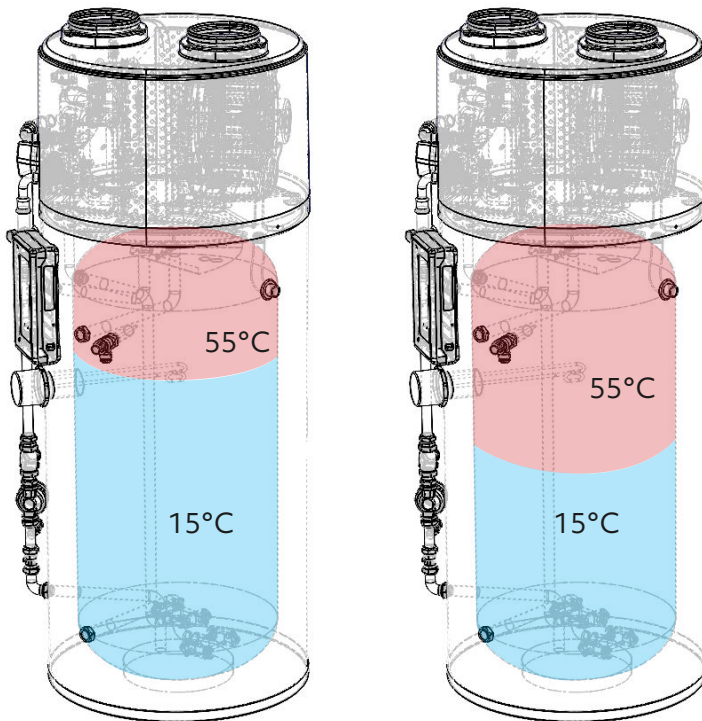
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About your cylinder

The Mixergy Intergrated Heat Pump Cylinder is a hot water storage cylinder which uses thermal stratification on charge (top-up) and discharge (from top-up and full circulation).

This stratification technology allows the Mixergy cylinder to partially heat (or 'charge') the water, reducing heat losses, improving available renewable capacity and allowing for exploitation of smart tariffs.

Mixergy's unique approach to the iHP cylinder allows full circulation of the tank to achieve the greatest COP (Coefficient of Performance), or top-up for faster reheat times whilst still retaining better performance than a standard electric heater. The modular design brings ease of installation and servicing, with the head unit being completely removable from the cylinder via hydraulic connections.



For more information on how your cylinder works and how to get the most out of your system, please refer to the Mixergy iHP User Guide.

About your cylinder: Heating modes

Top-up

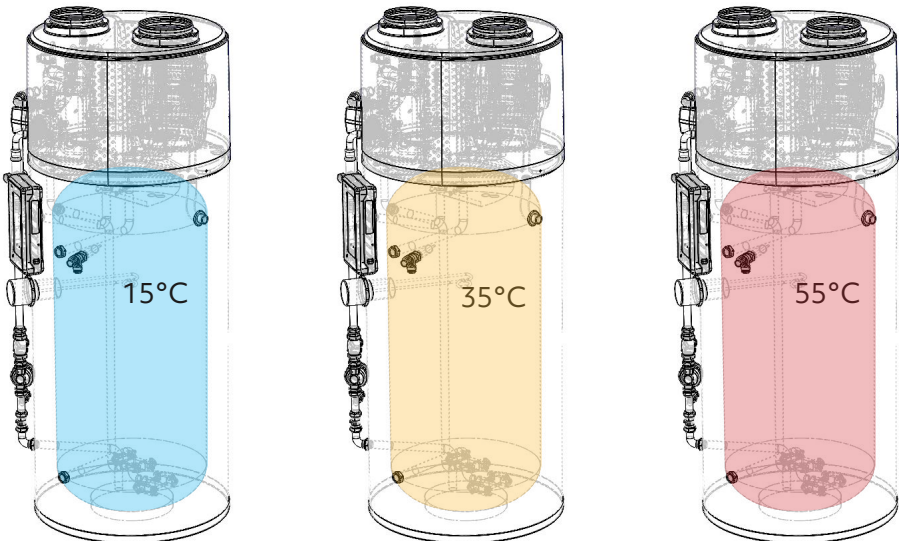
The top-up heating mode is designed to provide hot water quickly.

Water is heated from the top of the cylinder and pushed downwards, creating a layer between hot (55°C) and cold ($\sim 15^{\circ}\text{C}$) (as shown on page 4). This provides the user with hot water in as quickly as 30 minutes, while also allowing for on-demand heating if more hot water is required in the short term. There is a performance impact when heating via top-up, however the Mixergy iHP can also operate in full circulation. The performance (CoP) drop from top-up compared to full circulation is approximately 20-30%.

Full Circulation

The full circulation mode is designed for maximum efficiency.

If the highest cost savings are desired, if you are operating via schedule or hot water is required in the long term, full circulation mode can be used. This will improve the efficiency of the product. Instead of passing cold water through the head unit and returning hot water to the top of the cylinder, in full circulation mode the water is passed through the head unit at a high flow rate. It is then returned to the bottom of the cylinder. This stirs the whole tank and gradually brings the temperature from cold to hot.



Additional components

- Monobloc kit incl. pressure reducing valve, check valve, pressure and temperature relief valve and expansion relief valve
- Gauge
- Tundish
- Expansion vessel incl. mounting bracket and 3/4" x 22mm adapters
- 2 kW back-up immersion heater(s) 1.3/4" BSP (fitted)
- Powerline to Ethernet adapter TL-PA4010
- Ethernet cable
- Mixergy iHP User Guide



Note - Ducting note included

Design notes

The Mixergy iHP cylinder can be fitted with the following optional accessories:

- **The Mixergy current clamp for binary head unit control (<250w)**
- from your excess solar PV, the Mixergy iHP can produce up to 3x the heat energy of a standard electric heater, making the most of your excess energy. The iHP will switch on when a minimum of 250w excess solar PV is being produced.



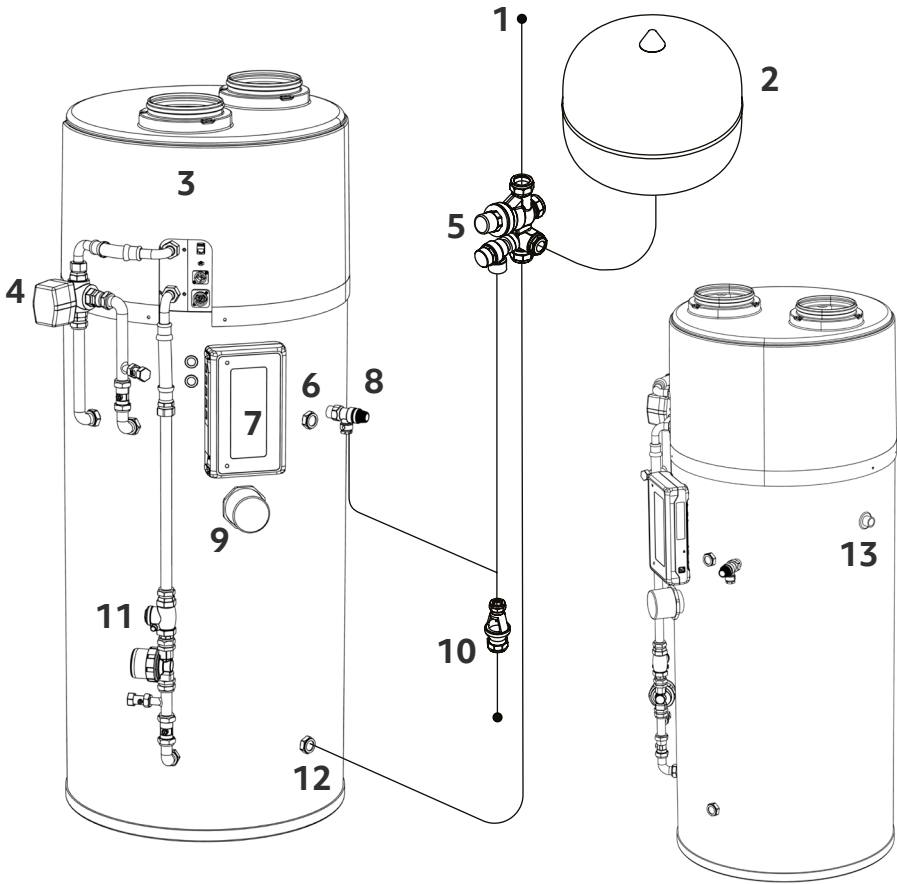
Installers must be appropriately qualified to G3 standard to install this cylinder.

All models are factory fitted / supplied with immersion heaters that have built-in thermal cut-outs. Immersion heaters without thermal cut-outs must not be fitted.

All unvented installations must be fitted with a pressure reducing valve (supplied) and P&T relief valve (fitted). These must not be removed or used for any other purposes than what they are designed for.

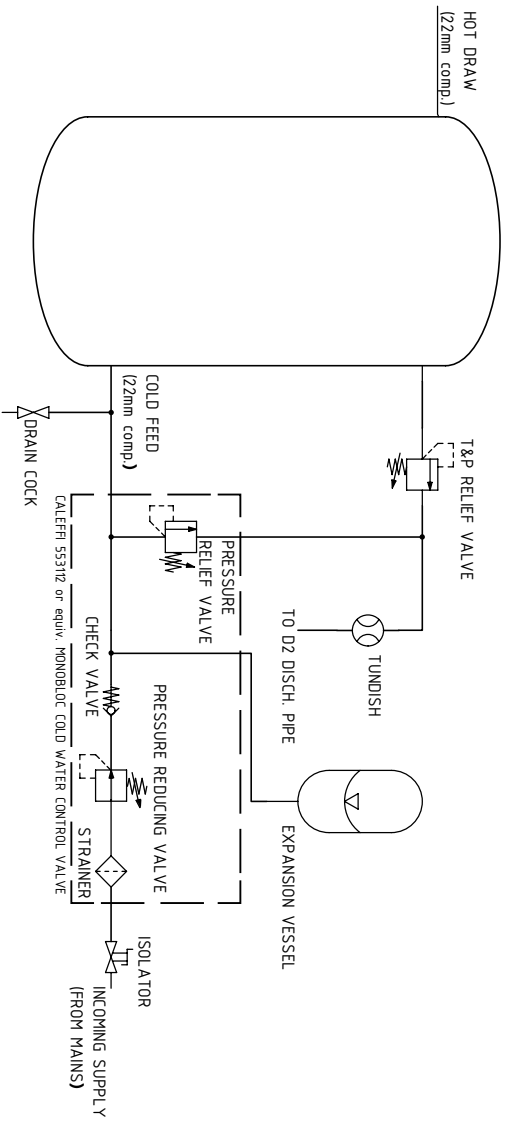
The unit should be handled with care in order to avoid damage. It should be stored upright in a dry place.

Schematic



1	Cold feed	8	T&P relief valve
2	Expansion vessel	9	Back-up immersion
3	Heat pump head unit	10	Tundish and discharge pipework
4	Circulation mode valve	11	Pump assembly
5	Cold water control monobloc	12	Cold inlet
6	Hot draw	13	Condensate drain
7	Controller		

DIRECT UNVENTED



Hydraulic schematics

Installation: general guidelines



Installation of the appliance must be carried out by a qualified engineer in accordance with prevailing and national regulations as listed below:

Building Regulations G3

The Building Standards (Scotland)

The Building Regulations (Northern Ireland)

I.E.E. Electrical Regulations (Latest edition thereof)

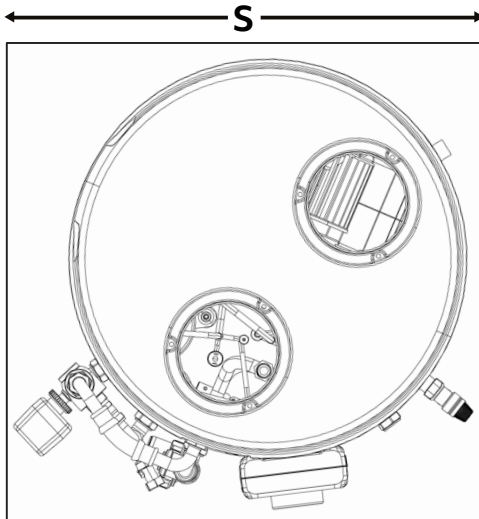
UK Water Regulations

The installation area should be able to cope with the weight of the iHP (approx. 320kg for a full 250L cylinder), incoming pipes and discharge pipe when full.

Positioning of the cylinder

The position of the cylinder should suit the installation; all connections should be to the front for ease of access.

Ensure suitable space is left for access for repair and/or replacement of immersions and valves etc. **Ensure at least 350mm of vertical clearance above the cylinder from the top of the ducting spigots.**



Nominal diameter nD (mm)	Space requirement S (mm)
580	700

Tank Capacity (L)	Tank Height (mm)
090	1186
120	1326
150	1516
180	1696
210	1886
250	2146

Installation: general guidelines

Unvented installations

Installers should ensure incoming mains pressure is less than 1 MPa (10 bar) and at-least 0.1 MPa (1 bar) with a minimum flow rate of 10 L/min. Local authority approval for installation of unvented systems must be granted.

Use of flux and sterilisation

Excessive use of flux can damage the unit and especially the valves and expansion vessel (if supplied). Avoid over-use and ensure the system is fully flushed of any debris or flux after connection.

If a full sterilisation of all the pipework including the cylinder is required then a complete drain down and flush of the unit is essential. A simple flush through with water is not adequate in removing all sterilising solution within the cylinder.

Under no circumstances should sterilising solution be left in the cylinder any longer than required (seek dosage requirements from the chemical manufacturer).

Pipework and cold water control group

The unit should be piped in with a nominal **22mm pipe** to ensure adequate flow rate.

The unit is supplied with a monobloc pressure reducing valve that has a set pressure of 0.3 MPa (3 bar). The valve also consists of a serviceable strainer, non-return valve, expansion relief valve, connection for an expansion vessel and balanced cold feed supply.

We would strongly recommend fitting an isolating valve (not supplied) prior to the monobloc valve for ease of maintenance at a later date.

Under no circumstances should an isolating valve be fitted between the expansion vessel and the storage cylinder.

Fitting a drain valve

Please ensure that a drain valve is fitted to the lowest part of the unit, The drain valve must be fitted as low as possible so that at least 80% of the cylinder's total capacity can be drained off.

Installation: general guidelines

Positioning the tundish

The tundish, which shows visible discharge from the relief valves, is to be in a prominent, visible and safe position away from any electrical devices. See discharge and safety devices on page 28.

Checking the pump and T&P relief valve

The temperature and pressure relief valve is set at 7 bar and 90°C. Both the pump and T&P valve are factory fitted and sealed prior to dispatch. Whilst we endeavour to make sure there are no leaks from these seals, we would advise checking the connection as the valve/pump may have been disrupted in transit.

Fitting the expansion vessel

The expansion vessel should be checked and if required, charged at 3.0 bar.

The vessel should be mounted securely to the wall or sufficient support with the fixing kit supplied.

The connection should be made between the vessel and monobloc kit using the included 3/4" x 22mm compression adapter.



The relief valves are only to be used for relief discharge purposes. No valves should be fitted between the relief valves and the cylinder.



The electrical supply to the controller must be installed by a qualified electrician.



Ensure that any apertures (such as loft hatches) that the cylinder must pass through, meet the minimum space requirement S. (Pg. 10)

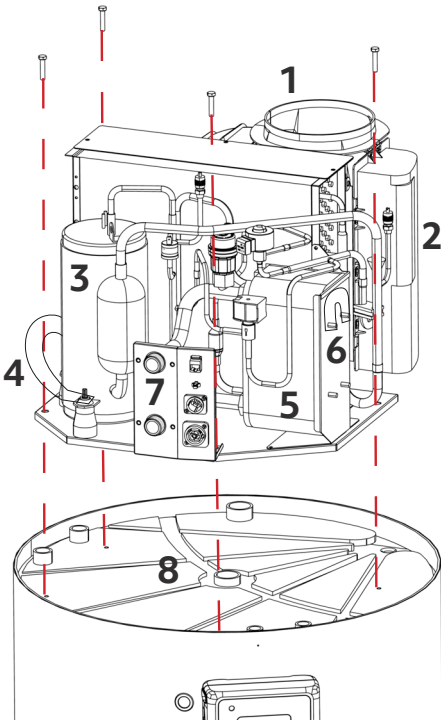
Installation: Heat Pump Head Unit

Assembling the head unit onto the cylinder

The head unit is delivered separately to the cylinder to aid ease of installation. Once the cylinder is in the desired location, the bare head unit can then be lifted onto the top of the cylinder. **Ensure to fix the head unit to the cylinder using the four M6x30 bolts provided.**



The bare head unit weighs 33kg. Lifting should be undertaken by two persons at all times. There are two lifting loops at the front of the head unit: One on the compressor, and one on the plate heat exchanger. These should be divided one per person, with your remaining hands lifting on the fan and electronic housings. **DO NOT** lift by the refrigerant pipe work as this can easily lead to damage of the head unit. Lifting via the refrigerant pipe work will void the head unit warranty.



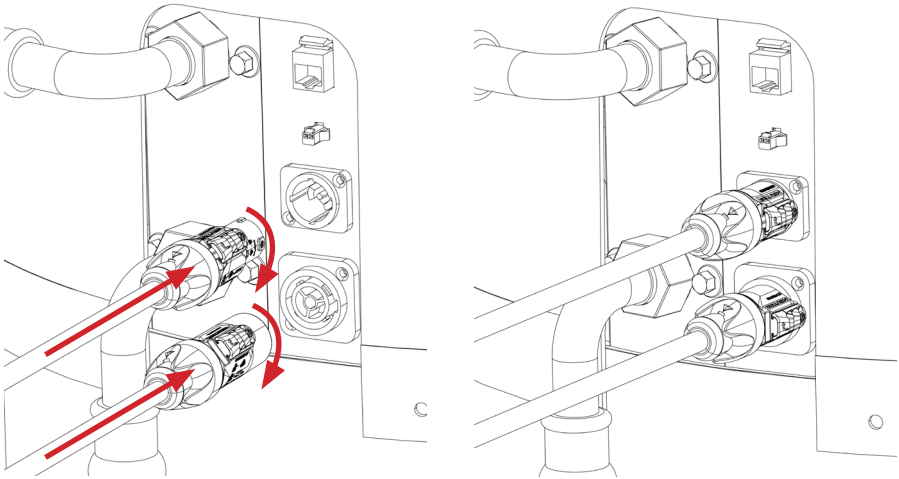
1	Fan housing
2	Electronics housing
3	Compressor
4	Compressor lifting handle
5	Plate heat exchanger
6	Plate heat exchanger lifting handle
7	External connection panel
8	Condensate tray

Installation: Heat Pump Head Unit

Making the electrical connections

There are a total of four electrical connections to make to the head unit. All are connectorised to aid ease of assembly.

The head unit and immersion feeds use PowerCON connections. They are opposite genders to avoid incorrect assembly. To attach the mains connections, orient the largest notch on the female end with the largest socket on the male end. This will result in the connector latches sitting at around 45°, as per the figure below. They cannot be assembled in the incorrect orientation. Push connectors into the sockets, and twist clockwise to lock into place.



These electrical connections are imperative to the operation of the iHP. Commissioning of the product when powering on will be impossible if these are left disconnected.



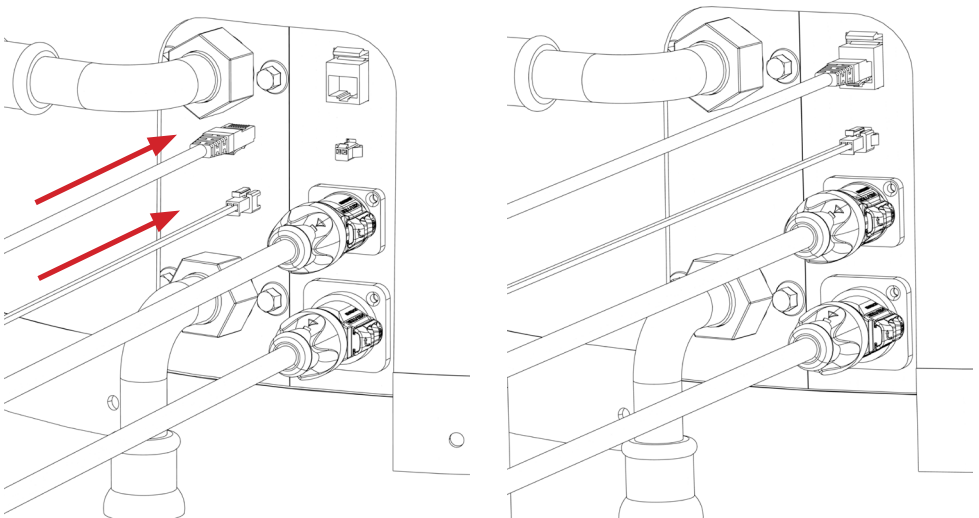
The PowerCON connections are gendered to avoid incorrect assembly. It should be noted that the two cable ends can also be connected to one another. Whilst this does not pose a risk, the head unit will not function and the immersion will be permanently powered. Heating control will be left solely to the immersion stat. For normal head unit and immersion operation, the electrical connections must be assembled as per the instructions above.

Installation: Heat Pump Head Unit

Making the data connections

There is a Sensor and Data cable to connect to the head unit from the controller. The Sensor cable uses a simple two pin connector. The female end of the connector (the socket) is protruding from the connector panel and is labelled accordingly. Take the two pin male end (the plug) from the controller and slide it onto the socket protruding from the connector panel. This sensor connection can only be inserted in one orientation, and has a latch to prevent accidental removal.

The Data connection is made via Ethernet cable just above the Sensor connector panel. This Ethernet cable is already installed on the controller and is labelled accordingly. Simply plug the Ethernet cable into the RJ45 socket labelled Data on the connector panel. Ethernet cables are designed such that they can only be installed in one orientation, and have a latch to prevent accidental removal.



These Data and Sensor connections are imperative to the operation of the iHP. Commissioning of the product when powering on will be impossible if these are left disconnected.

Installation: Heat Pump Head Unit

Assembling the pipework

The external pre-plumb pipe work is supplied separately of the tank, and will need to be assembled after the installation of the head unit onto the tank. The diagrams shown on this page detail the assembly of the supplied components to prepare them for installation onto the tank.

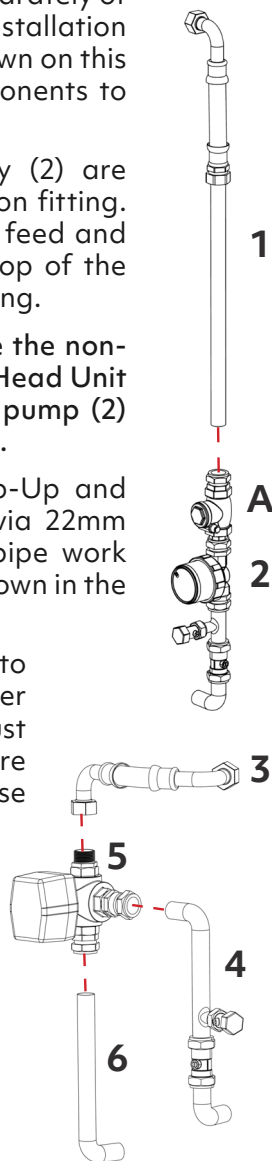
The Head Unit Feed (1) and Pump Assembly (2) are connected together through a 22mm compression fitting. Take the 22mm copper pipe from the head unit feed and slot into the 22mm compression fitting at the top of the pump assembly, and tighten the compression fitting.

Note - Some versions of the tank do not include the non-return valve (Labelled A). In this case install the Head Unit Feed (1) directly into the top of the circulation pump (2) below the non-return valve shown in the diagram.

The 3-Way Ball Valve (5) attaches to the Top-Up and Full Circulation Returns (4 and 6 respectively) via 22mm compression fittings. Simply insert the 22mm pipe work into the compression fittings in the orientation shown in the diagram and tighten.

The Head Unit Return (3) uses a 3/4" face seal to attach to the 3-Way Ball Valve (5). To make a water tight connection, a 3/4" fibre washer (supplied) must be included when assembling the face seal. Failure to include this washer when assembling will cause the fitting to leak.

1	Head Unit Feed
2	Pump Assembly
3	Head Unit Return
4	Top-Up Return
5	3-Way Ball Valve
6	Full Circulation Return



Installation: Heat Pump Head Unit

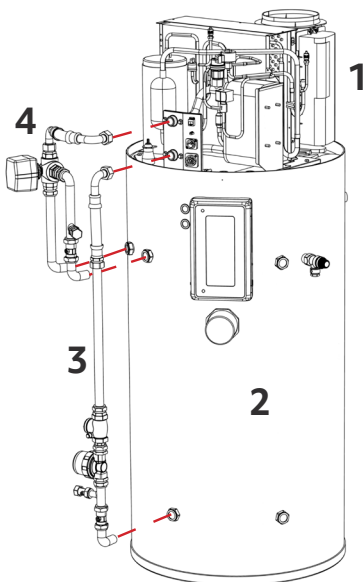
The Head Unit Feed Assembly (3) is connected to the Tank (2) via a 22mm compression. Insert the bottom of the Head Unit Feed Assembly (3) into the compression fitting as shown below and tighten.

The Head Unit Return Assembly (4) is connected to the Tank (2) via two 22mm compression fittings. Insert the two 22mm copper pipes at the bottom of the Head Unit Return Assembly (4) into the two 22mm compression fittings on the Tank (2) as shown below and tighten.

The top of the Head Unit Feed Assembly (3) and Head Unit Return Assembly (4) are connected to the Head Unit (1) via two 3/4" face seals. To make a water tight connection, a 3/4" fibre washer (supplied) must be included when assembling each face seal. Failure to include this washer when assembling will cause the fitting to leak.



Whilst some of the pre-plumb pipe work will arrive pre-assembled, it is the responsibility of the installer to ensure all compression and face seal fittings are tight and do not leak before leaving the property.



Do not attach the top cover until commissioning has taken place.

Before use, the system will need bleeding.

For more information, see the commissioning section of this manual (Pg. 33).

- | | |
|---|---------------------------|
| 1 | Head Unit |
| 2 | Tank |
| 3 | Head Unit Feed Assembly |
| 4 | Head Unit Return Assembly |

Installation: Heat Pump Head Unit

Assembling the valve actuator

The valve actuator (2, please see pg. 19 for diagram) will arrive separately from the valve body (1). Once the valve body (1) and associated pipe work have been installed onto the cylinder, the actuator (2) will need mounting to the valve body (1) and connecting to the controller.

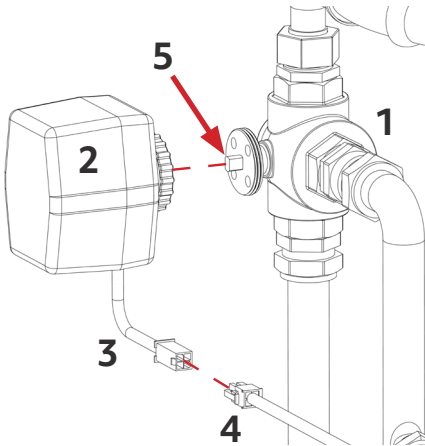
There are a couple of key factors that need to be checked when installing the actuator (2).

1. Firstly, ensure the flats of the valve body (1) stem (Indicated by the red arrow, 5) are aligned vertically when the valve body (1) is installed on the tank.
2. The actuator (2) is installed with the cable (3) exiting downwards. The socket on the actuator (2) that receives the valve stem (5) should match the orientation of the stem (5) as described above.
3. Slot the actuator (2) onto the stem (5) of the valve until the base of the actuator sits flush with the flange surrounding the valve stem (5). There are two locating pins on the base of the actuator (2) which slot into the holes surrounding the valve stem (5). These are to maintain the alignment of the actuator respective to the valve body. These locating pins can sometimes be stiff to insert into the valve body (1).
4. Once the actuator (2) is seated onto the flange, slide the locking nut on the actuator (2) to the thread on the valve flange and tighten by hand in a clockwise direction.
5. Finally, take the cable from the actuator (3) and connect to the corresponding cable leading from the controller (4). The connector can only be assembled in one direction and is latched to avoid accidental disconnection.



Failing to check the alignment of the valve when installing will lead to the iHP functioning incorrectly. It is the responsibility of the installer to check the alignment when installing.

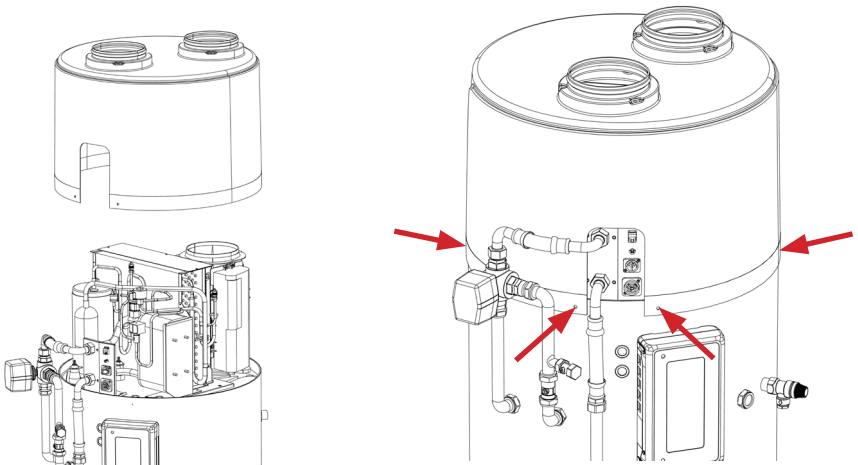
Installation: Heat Pump Head Unit



- | | |
|---|-----------------------------------|
| 1 | Valve Body |
| 2 | Actuator |
| 3 | Actuator Cable |
| 4 | Actuator Supply (From controller) |
| 5 | Valve Stem |

Installing the top cover

The top cover is simply placed over the top of the head unit with the side cut-out aligned with the connector panel. The top cover is then secured in place with four self tapping screws (included). The locations for the screws is as indicated below by the red arrows.



Not installing the top cover mounting screws will result in air, and therefore heat, to be taken from the house. The screws help ensure the flow from the house is kept to a minimum.

Installation: Heat Pump Head Unit

Air handling

The iHP cylinder uses 150mm (6") i.d. ducting for the exhaust and intake of air to the heat pump head unit. Depending on the complexity of the duct, the maximum length will vary.

All set-ups referred to within this manual are for the combined total duct length connected to the head unit's inlet and outlet.

Here are some considerations to be made when specifying your ducting:

- Having a completely straight duct will always be the lowest loss option. The pressure loss from a 90° elbow can add up to the equivalent pressure loss of 15 metres of straight ducting. Straight ducting can be achieved by passing the duct vertically through the roof directly from the head unit, with two weather cowls to eliminate water ingress. An entirely straight run on both ducts will be impossible if proper separation of the ducting is desired at the external termination. It is recommended to separate the duct runs via a 45 degree section in the loft space to either take one of the ducts to the opposite side of the roof, or separate the terminations by at least 1.5m
- If side exits are desired, the ducting run should be kept as simple as possible to ensure maximum performance from the iHP cylinder.
- Avoid flexible ducting, the pressure (and therefore performance) losses are too great to consider using it.
- Avoid high-loss louvres for side exits. If louvres are desired for aesthetic reasons, ensure they are appropriately oversized to minimise losses. Otherwise, the use of bird-beak style side exits are recommended.
- If intaking and exhausting to the exterior of the building, the intake and exhaust ports should be no closer than 1.5m from each other. If there is a wall closer than 1.5m opposite, increase the minimum spacing to 2.5m.
- The recommended minimum spacing of an opposite wall is 1m.
- If there are any air handling ports on an opposite wall 2m or closer (iHP, MVHR etc.), placement of the intake/exhaust ports should be no closer than 3.5m.

Installation: Heat Pump Head Unit

- For roofs (flat or otherwise) the spacing guidelines are the same as if the ducting is terminated on an external wall
- The intake/outlet ports should be no closer than 1m from any protruding wall or opening window. The same clearance should be given for open eaves.
- If installing for loft intake, ensure the intake is at least 500mm from any surface, especially any surface using Rock wool style insulation, as this will cause serious dust build up within the head unit.



If installing near a conventional boiler or property operating a conventional boiler, it is important to consider the impact of the iHP on the flues and subsequent air flow in the boiler. If the iHP intake/exhaust are too close to a boiler flue, it will affect the air flow to the boiler system which could lead to incomplete combustion. The following considerations should be made:

- **For opposite walls under 2m away, the iHP intake/exhaust should be no closer than 4m to any boiler flue.**
- **The iHP intake/exhaust should be installed no closer than 2m from a protruding (perpendicular) wall containing a boiler flue.**
- **If installing on the same wall as a boiler flue, the intake/exhaust should be no closer than 2m to the flue. If there is an opposite wall less than 2m way, increase this distance to 4m.**
- **If the iHP intake/exhaust are exiting a wall, they should not be aimed directly at any vertical flues within 4m. If a vertical boiler flue is closer than 4m to the desired wall, the installer should aim to offset the iHP intake/exhaust by a minimum of 1m, while maintaining a minimum distance of 3m from the flue.**

These are guidelines only. It is the responsibility of the installer to ensure that the iHP installation has no effect on the operation any boiler system in close proximity to the iHP installation.

Installation: Heat Pump Head Unit

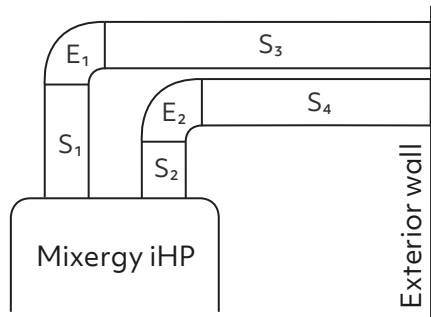
Mixergy recommends the use of **Ubbink Aerfoam** for all iHP ducting installations. The design of this ducting means the losses created by typical PVC elbows are reduced by approximately 30%. This helps ensure the best performance from the iHP cylinder.

Below is a table of typical iHP ducting installations using generic PVC 150mm ducting. These installations have associated COP figures, intended to act as a guide for what to expect from your Mixergy iHP. These COP figures are not a guarantee of performance, as there are many real world variables that will affect the achieved COP.

Duct Length (m)	Instantaneous COP				
	Straight	2x Elbow, 90°	4x Elbow, 90°	2x Elbow, 90° + 2x Elbow, 45°	4x Elbow, 90° + 4x Elbow, 45°
1.00	3.33	2.84	2.55	2.75	2.40
5.00	3.27	2.79	2.51	2.71	2.36
10.00	3.19	2.74	2.47	2.66	2.31
15.00	3.10	2.69	2.42	2.61	2.26
20.00	3.00	2.64	2.36	2.57	2.22

Mixergy recommends a maximum duct length of 20 metres. All figures shown are for total combined duct length on the inlet and outlet of the iHP.

In the example shown to the right, if the length sum of S_1 , S_2 , S_3 and S_4 is 10 metres, and there are two 90° elbows, E_1 and E_2 , the resulting approximate COP would be 2.74 as per the table.



Instantaneous COP refers to the achieved COP after a single full reheat (full circulation) of the cylinder, from 10°C to 55°C, with 14°C inlet air. The figures shown are for a 150L cylinder, however cylinder volume will have little effect on the instantaneous COP figure.

If you need more in-depth information regarding fan and COP data for your installation, please contact Mixergy.

Installation: electrical



ENSURE ALL ELECTRICAL SUPPLIES ARE SWITCHED OFF BEFORE MAKING ANY CONNECTION TO THE UNIT.



ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY COMPETENT ELECTRICIAN AND BE IN ACCORDANCE WITH THE LATEST I.E.T. REGULATIONS.

External wiring

Mixergy cylinders come supplied with cable included. Any extensions to the supplied cabling should match or exceed the current and voltage ratings of the cables to be extended.

Primary supply (13A, 230-240V~, 1.5mm² CSA)

The white 3-core (L,N,E) cable labelled '**PRIMARY SUPPLY**' must be connected to the household's main supply via a dedicated 16A MCB protected circuit with a 13A DP fused spur. This is the primary power supply for the control electronics and is used to power the heat pump (or immersion) when the cylinder is set to heat.

Timer control (VOLT-FREE, 10mA 80-240V~, 0.5mm² CSA)

The black 3-core (L,N,E) cable labelled '**TIMER CONTROL**' can be used to integrate the Mixergy cylinder with any existing timers or controllers i.e. economy 7 timer or a Hive dual channel controller. This cable detects a 80-240VAC signal and instructs the cylinder to heat unless otherwise disabled in software.

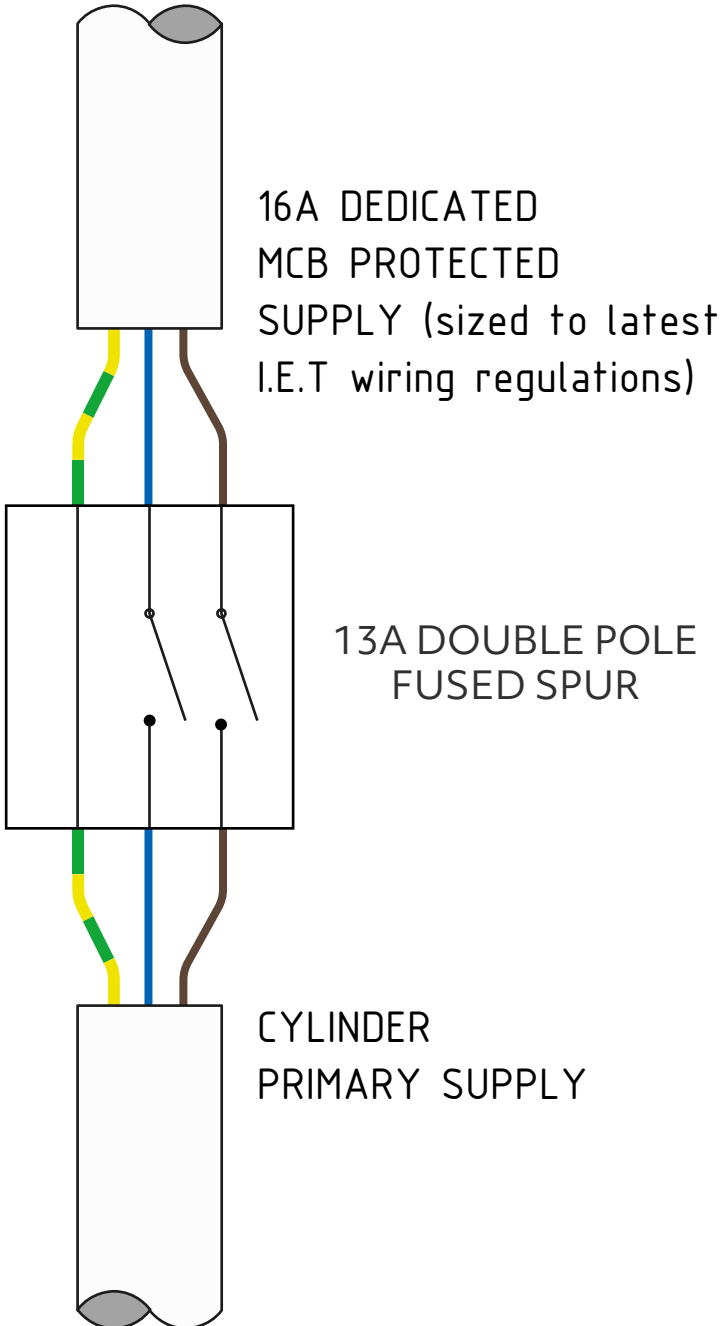


The timer control cable is attached to volt free contacts within the controller and can be safely left tucked away if not required.



Please note - All figures shown in this manual are for the R134a version of the Mixergy iHP

Installation: electrical (PRIMARY SUPPLY)



Installation: connectivity

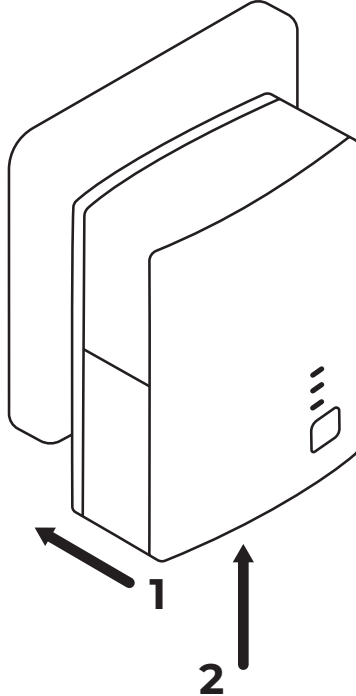
Installing the powerline adapter

The Mixergy cylinder requires internet connectivity to allow for full control of the system. Connection to the cylinder can be made using the provided Ethernet to powerline adapter or by hard-wired Ethernet.



If an existing HomePlug AV powerline network is installed at the property, it is recommended to pair the cylinder with the existing network as per page 36. Powerline connectivity between the cylinder and internet router is only possible in houses where both the cylinder and adapter are powered from the same electrical phase.

- Plug the powerline adapter into a wall socket within 2m of the internet router. Do not use an extension lead as this can cause connectivity issues.
- Plug the powerline adapter into the internet router using the included 2m Ethernet cable.



Installation: connectivity

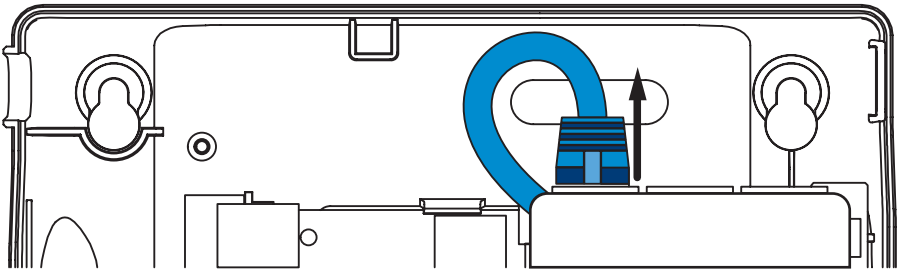
Wiring an Ethernet connection

If a hard-wired CAT5/CAT5e/CAT6 network connection is desired, this can be achieved as follows:

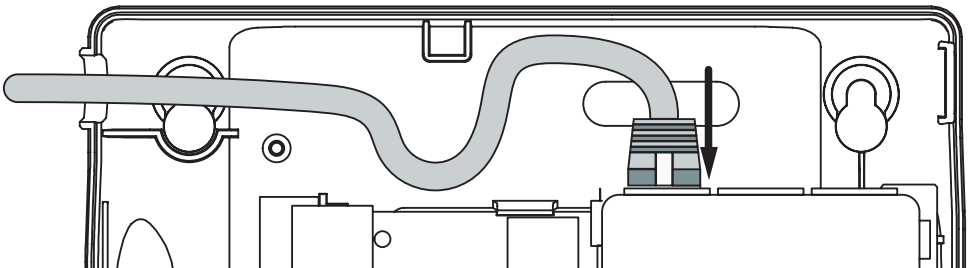


ENSURE ALL ELECTRICAL SUPPLIES ARE SWITCHED OFF BEFORE OPENING THE CYLINDER CONTROLLER COVER

1. Unscrew and remove the cylinder controller's cover and then disconnect the blue Ethernet cable as shown.



2. Replace the removed Ethernet cable with a suitable direct connection to the network (broadband router/switch).

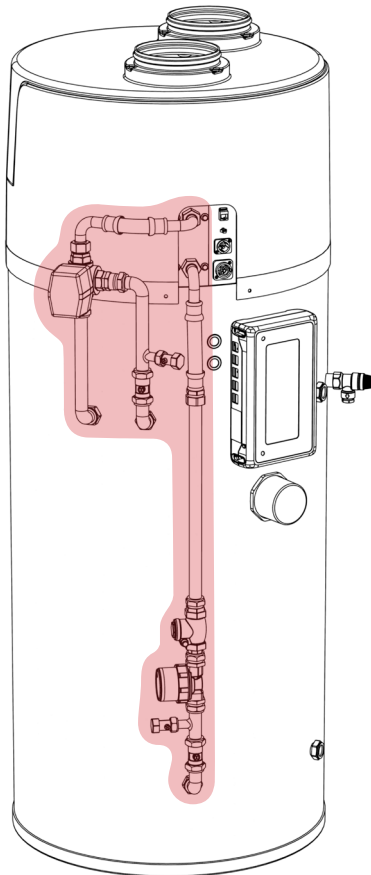


Installation: insulation

Pre-plumb pipework

The external pre-plumb pipework, highlighted in red below, should be insulated using class O insulation (not included). The quality of the insulation installation will affect the performance of the Mixergy iHP. Effort should be made to ensure there are no exposed sections of pipework, valves etc. This will minimise heat losses during operation.

The recommended thickness for class O insulation is 25mm for the best performance from your Mixergy iHP.



Discharge pipes from safety devices

- Safety devices such as temperature relief valves or combined temperature and pressure relief valves should discharge either directly or by way of a manifold via a short length of metal pipe (D1) to a tundish.
- The diameter of discharge pipe (D1) should be not less than the nominal outlet size of the safety device, e.g. temperature relief valve.
- Where a manifold is used it should be sized to accept and discharge the total discharge from the discharge pipes connected to it.
- Where valves other than a temperature and pressure relief valve from a single unvented hot water system discharge by way of the same manifold that is used by the safety devices, the manifold should be factory fitted as part of the hot water storage system unit or package.

Tundish

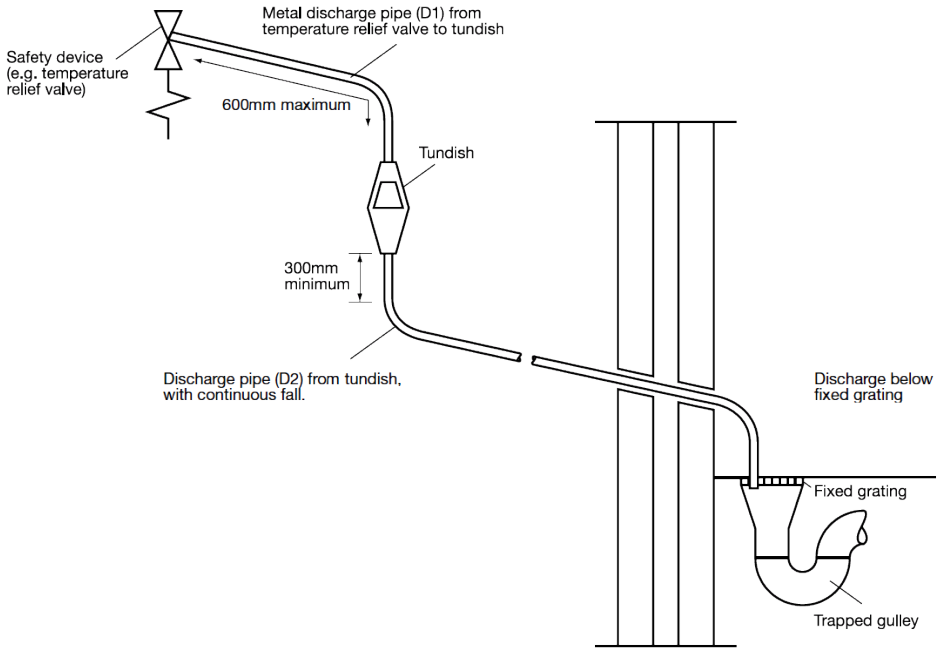
- The tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible to, and lower than, the safety device, with no more than 600mm of pipe between the valve outlet and the tundish. Note: to comply with the Water Supply (Water Fittings) Regulations, the tundish should incorporate a suitable air gap.
- Any discharge should be visible at the tundish. In addition, where discharges from safety devices may not be apparent, e.g. in dwellings occupied by people with impaired vision or mobility, consideration should be given to the installation of a suitable safety device to warn when discharge takes place, e.g. electronically operated.

Condensate drain hose

- The condensate drain is located to the right of the controller on the side of the cylinder. The hose, at any point in the routing, should not be installed horizontally or create a U-bend. Allowing this will cause the water discharging through the pipe to back up and overflow from the head unit.

Discharge pipework

Typical discharge pipe arrangement



Sizing of copper discharge pipe 'D2' for common temperature relief valve outlet sizes

Valve outlet size	Minimum size of discharge pipe D1	Minimum size of discharge pipe D2 from tundish	Maximum resistance allowed, expressed as a length of straight pipe	Resistance created by each elbow or bend
G 1/2"	15 mm	22 mm	< 9 m	0.8 m
		28 mm	< 18 m	1.0 m
		35 mm	< 27 m	1.4 m
G 3/4"	22 mm	28 mm	< 9 m	1.0 m
		35 mm	< 18 m	1.4 m
		42 mm	< 27 m	1.7 m
G 1"	28 mm	35 mm	< 9 m	1.4 m
		42 mm	< 18 m	1.7 m
		54 mm	< 27 m	2.3 m

Discharge pipework

Discharge pipe D2

- The discharge pipe (D2) from the tundish should have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework. It should be installed with a continuous fall of at least 1 in 200.
- The discharge pipe (D2) should be made of metal or other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the product and performance standard (e.g. as specified in the relevant part of BS 7291-1:2006).
- The discharge pipe (D2) should be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long, i.e. for discharge pipes between 9m and 18m the equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device; between 18 and 27m at least 3 sizes larger, and so on; bends must be taken into account in calculating the flow resistance.
- Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected.



An alternative approach for sizing discharge pipes would be to follow Annex D, section D.2 of BS 6700:2006 + A1:2009 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.

Discharge pipework

- The discharge pipe should not be connected to a soil discharge stack unless it can be demonstrated that the soil discharge stack is capable of safely withstanding the temperatures of the water discharged, in which case, it should contain a mechanical seal, not incorporating a water trap, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish.
- If plastic pipes are used as branch pipes carrying discharge from a safety device, they should be either polybutylene (PB) or cross-linked polyethylene (PE-X) complying with national standards such as Class S of BS 7291-2:2006 or Class S of BS 7291-3:2000 respectively; and be continuously marked with a warning that no sanitary appliances should be connected to the pipe.
- Where pipes cannot be connected to the stack it may be possible to route a dedicated pipe alongside or in close proximity to the discharge stack.



Plastic pipes should be joined and assembled with fittings appropriate to the circumstances in which they are used as set out in BS EN ISO 1043-1:2002.

Discharge pipework

Termination of discharge pipe

The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge.

Examples of acceptable discharge arrangements are:

- To a trapped gully with the end of the pipe below a fixed grating and above the water seal.
- Downward discharges at low level - i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.
- Discharges at high level - e.g. into a metal hopper and metal downpipe with the end of the discharge pipe clearly visible or onto a roof capable of withstanding high temperature discharges of water and 3 m from any plastic guttering system that would collect such discharges.

Termination of condensate hose

The head unit will discharge approximately 0.75L of water per hour under typical operating conditions. This water can be discharged into a grey water drain pipe, D2 of the tundish pipe work, or into a soil pipe.

Considerations should be made with any of these installation methods:

- If discharging into any kind of drain pipe, there is risk of foul odours rising through the hose and into the head unit. This can be controlled by using a U-bend. However, it should be noted that the outlet of the U-bend **MUST** be below the inlet to avoid water backing up into the head unit.
- When discharging into D2 of the tundish pipe work, a swept tee should be used to reduce the possibility of any tundish discharge traveling up the condensate drain hose.
- Consideration should also be made towards the outlet area of the tundish pipework. Some installations may not be suitable for continuous discharge.

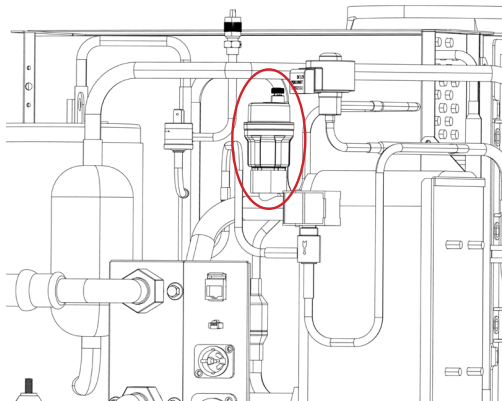
Commissioning



DO NOT SWITCH THE SYSTEM ON UNLESS THE CYLINDER IS COMPLETELY FILLED WITH WATER.

All factory fitted valves etc. are fitted using a thread sealant. If this seal is broken it should be re-sealed using a suitable sealant. It is the installer's responsibility to ensure all the connections are water tight prior to leaving the property.

1. Ensure the drain on the cold feed pipework is closed.
2. Open a hot tap the furthest distance from the unit.
3. Gradually open the cold mains isolator valve and fill cylinder until water appears at the hot tap. Attend to each hot water outlet in turn and ensure water flow is obtained at each outlet expelling any air within the pipework. Once finished, close all hot outlets to build pressure.
4. Locate the bleed valve on the head unit (highlighted in red below), and loosen the black cap by turning it counter-clockwise. Air should hiss from the valve and stop after a few seconds.
5. Re-tighten the auto air vent cap. Failure to replace/re-tighten the auto air vent cap may result in a leaking air vent after extended periods of time. Leaving the auto air vent open will void the warranty of the head unit. **It is the installers responsibility to ensure the cap of the auto air vent is tightened before leaving the property.**



Commissioning

6. To ensure the safety valves are operating correctly, turn the tops of the valves independently to ensure water passes through the valve and into the tundish. Once this is confirmed, open both valves together allowing as much water as possible to flow through the tundish. At this point make sure that your discharge pipework is free from debris and is transporting the water away to waste effectively. The valves can then be released and a check should be made to ensure they have re-seated correctly.
7. Switch on the Mixergy iHP cylinder and check for correct operation. Mixergy cylinders come supplied in 'eco mode' which is designed to satisfy the minimum charge requirements of BS EN 16147:2017 M draw profile. Pressing any button on the gauge twice will exit eco mode.
8. Connect the cylinder to the internet by pairing to the included powerline adapter. For more information on pairing the cylinder to the adapter, please reference page 36.
9. Furnish the Customer with the Mixergy iHP User Guide included with the cylinder and direct them to the "Getting started with your Mixergy iHP" video on YouTube.



Ensure the cylinder's gauge illuminates and all buttons (boost UP, boost DOWN and power) work correctly. For further information on gauge operation please reference the Mixergy iHP User Guide.

Changing heat sources

All Mixergy systems leave the factory in full circulation mode. If you wish to enable top-up mode, this can be achieved in a number of ways:

1. In the case where the cylinder has been commissioned and an internet connection has been established, the heating mode can be changed by the installer using the Mixergy Enterprise Installer app or by the user via the standard Mixergy app.
2. In the case where an internet connection cannot be made to the cylinder during commissioning, the heating mode can be set by holding the boost UP and boost DOWN buttons simultaneously. The display will light white to acknowledge that you have entered this mode. To change the heat source, let go of the buttons once any of the display LEDs has changed to the required colour (BLUE for Full Circulation, RED for top-up). The display will then flash either blue, red or green to indicate the new default heat source. Switch the cylinder off and on (power cycle) for the change to take effect.



Please note that any heat source that is set while the cylinder is offline will be overwritten once the cylinder establishes an internet connection, please ensure that the default heat source is set correctly on the app once the system is fully connected.

Status LED error codes

If the system is not behaving as expected, please check the status LED on the side of the controller enclosure and contact Mixergy:

- **Flashing green:** system OK
- **Solid green/red:** system updating (DO NOT REMOVE POWER)
- **Very slow flashing red (once every two seconds):** temp. sensor problem
- **Slow flashing red (once a second):** no gauge detected
- **Fast flashing red (twice a second):** energy measurement issue
- **Very fast flashing red (five times a second):** main processor issue

Commissioning

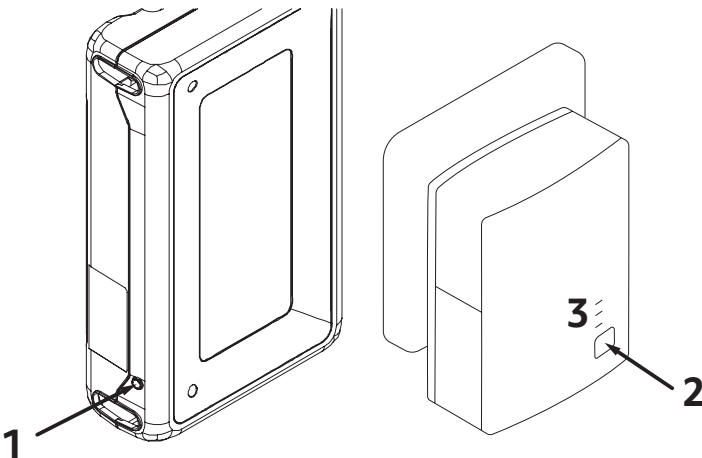
Pairing the cylinder and connecting to the internet

In the case that the cylinder does not automatically pair to the powerline adapter or connection to an existing homeplug AV network is desired, please follow the steps below to pair the cylinder to the network.

1. Use a thin tool to depress and hold the pair button for 1 - 2 seconds.
2. Depress the pair button on the powerline adapter for 1-2 seconds within 2 minutes of step 2.
3. Observe all 3 LEDs as solid green on the powerline adapter.



The cylinder must be registered and connected online in order to validate the manufacturer's 25 yr warranty.



Commissioning checklist

This Commissioning Checklist is to be completed in full (either in this booklet or on the side of the cylinder) by the competent person who commissioned the cylinder as a means of demonstrating compliance with the appropriate Building Regulations.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Please ensure all information is filled in correctly below and the Mixergy iHP Installation Manual left with the Customer. The information to be recorded in full on pages 37 and 38 will be required for any kind of warranty claim against the Mixergy iHP.

Fitter details	
System ID no.	
Commissioned by	
Registration operative no.	
Approval licence no.	
Company name	
Company address	
Commissioning date	
Telephone no.	
Building regulations notification no.	

Commissioning checklist

Cylinder primary settings

Set system pressure

bar

Unvented safety checks

Has a P&T relief valve and expansion relief valve been fitted and discharge tested?

Is a cut-out device fitted?

Pressure reducing valve setting

bar

Has the expansion vessel been checked?

Final checks

The cylinder has been filled with water, correctly wired into a 16A fused spur and powered on

The functionality of the system (including indirect wiring) has been checked and verified

The cylinder has been connected to the internet and the customer has been registered online

The cylinder controls have been demonstrated to and understood by the customer

The manufacturer's literature, has been explained and left with the customer

Commissioning engineer's signature

Customer's signature

Date

/ /

Problem solving



Discharge from either of the relief valves indicates a malfunction in the system and must be investigated immediately.

Overheated water

In the unlikely event of overheated (95°C) water being discharged, the Mixergy controller should be switched off immediately and a competent engineer called out. Please contact Mixergy directly.



Do not shut off the cold water supply to the unit.

Water discharge

If water is occasionally being discharged during heating, this likely indicates that the Expansion Vessel needs to be recharged. In the event of this occurring, switch off all power supplies to the cylinder, and re-charge the vessel. If water is continually being discharged, firstly check with a gauge that the pressure allowed through the PRV does not exceed 3 bar. If it does exceed 3 bar then the valve should be stripped, cleaned and inspected. Should a replacement be required then only one supplied by Mixergy should be used.

Electrical fault

If an electrical fault of the controller is suspected or the electrical system does not operate as expected, please contact Mixergy directly.

Connectivity issues

If a connectivity issue is suspected, please refer to the Mixergy iHP User Guide and FAQs for guidance.

Expansion vessel check and re-charging

Check pressure via the Schrader valve on top of the vessel which is situated under the removable plastic cap. The vessel can be checked and recharged by switching off the stopcock or isolating the water supply to the cylinder, then opening a hot tap to deplete the pressure inside the cylinder. Unscrew the black plastic cap on the expansion vessel to reveal the Schrader valve, with the aid of a pressure gauge ensure the pressure reads 3.0 bar. If there is insufficient pressure within the vessel, top up the vessel via a pump and recharge to 3.0 bar. A small amount of water may be discharged when connecting to the Schrader valve. This is due to condensation being trapped when pressurising the expansion vessel.

Safety valves

If all previous checks have been done and water is still being discharged from either safety valve, determine which valve is faulty and replace with one supplied by Mixergy.

Cross flow

If all the valves have been replaced and the vessel re commissioned, then the system could be suffering from cross flow. This is when the hot and cold systems are not balanced and higher pressure cold water is forced back into the cylinder. If this is the case, then an additional pressure reducing valve may be required to reduce the cold water supply pressure.

Immersion heaters

If the immersion heater is not heating the water adequately it has either failed (in which case a replacement immersion heater as supplied by Mixergy should be fitted), an electrical fault is present or the electrical cut-out has operated due to the control thermostat being set too low or being faulty. Activate the reset button under the immersion cover. If the problem persists please contact Mixergy directly.

Draining the cylinder

1. Switch off the immersion heater(s) and any other heat sources.
2. Switch off water at mains.
3. Open nearest hot tap.
4. Open drain to start draining the cylinder.

To re-fill follow the commissioning instructions.

Flushing the cylinder

To flush out the system, drain the unit as above, fill and repeat. If after recharging the expansion vessel the cylinder is still discharging, it may be due to cross-flow - ensure appropriate check valves are fitted. The pressure reducing valve, one of the relief valves, or the expansion vessel may have failed. The component should be identified and replaced by one supplied by Mixergy.

Replacement parts

Do not attempt to repair or replace any parts of the Mixergy cylinder unless you are a trained operative. If you suspect a fault or a replacement part is needed, please contact Mixergy directly.

To determine the correct parts for your system, please ensure you have your cylinder MX number which can be found on the nameplate located at the front of the cylinder.

Part description	Part no.
Immersion stat	MEL0018
Pump assembly	MAS0092/93/94
Controller	MAS0095
Gauge	MAS0043
Head unit	MEL0082
3-way ball valve	MME0217

Servicing and maintenance

Annual Maintenance

All annual maintenance and service checks should be performed by a competent operative.

If this system is not protected under an active Mixergy Care subscription, **failure to maintain this system in accordance with these instructions will invalidate the manufacturer's warranty.**

A maintenance record should be kept on the service record on page 45 of this booklet.

We would recommend either a Mixergy Care subscription or a third party service program is arranged on installation of the cylinder.

Annual service checks

- Expansion relief valve - manually open the twist cap and check that the water is discharged and runs clearly through the Tundish and out at the final discharge point. Ensure that the valve re-seats/re-seals itself.
- Pressure & temperature relief valve - repeat the above procedure. Ensure that the valve re-seats/re-seals itself.
- Strainer - turn off mains at stopcock. There will be a small amount of residual water in the pipework, remove the cartridge from Pressure Reducing Valve, clean Strainer and replace.
- Expansion vessel - check pressure via the valve on top of the vessel which is located under the plastic cap. Ensure pressure is 3 Bar. Vessel can be recharged if required as per "Expansion vessel check and re-charging" on page 40.
- Head unit - Remove the top cover and blow out the radiator with compressed air to remove dust/debris build up.

Disassociating an account

If a new tenant is moving into the property and the user of the account tied to the cylinder needs to be changed, the new tenant will have to disassociate the cylinder from the existing account before registering. This can be performed by pressing and holding the boost down and power buttons for approximately 15 seconds.

De-scaling loop

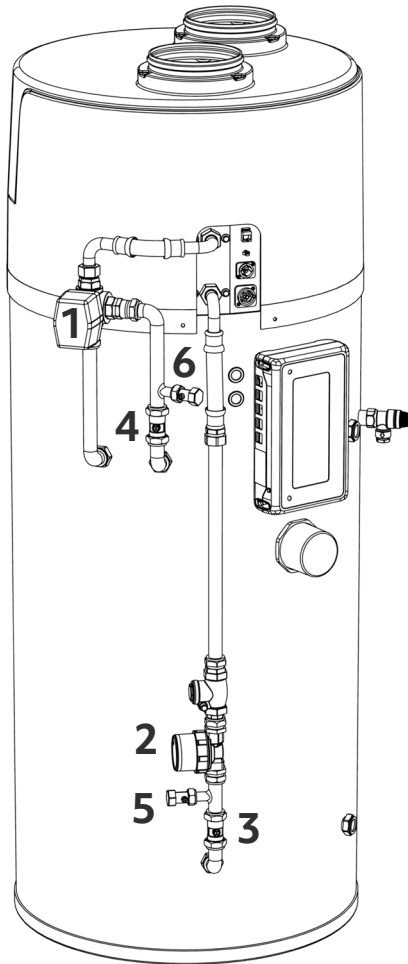
Occasionally, the Mixergy iHP may need the top-up loop de-scaling. The Mixergy iHP is fitted with two 1/2" BSP isolation valves for this purpose, one below the circulation pump (2, please see diagram on page 44) and the other is below the 3-way motorised valve (1) on the top-up return pipe.

1. To de-scale the unit, first boost the unit at the gauge to put the iHP into the top-up mode, and disconnect the iHP from the mains electricity. This will fix the valve in the top-up position while de-scaling takes place.
2. Close isolation valves (3) and (4) to isolate the de-scaling loop from the rest of the tank.
3. Connect a reservoir and pump to the two isolation valves (5) and (6).
4. Open isolation valves (5) and (6).
5. Pump de-scaling fluid through the loop for an hour.
6. Drain the de-scaling fluid from the loop and flush with water for a further 5 minutes to ensure all the de-scaling fluid has been removed.
7. Close isolation valves (5) and (6) and open isolation valves (3) and (4).
8. Remove the de-scaling pump and reservoir and ensure isolation valves (5) and (6) are not leaking.
9. The de-scaling procedure is now complete.



Upon commissioning, it is the responsibility of the installer to ensure isolation valves 3 and 4 are open and isolation valves 5 and 6 are closed to ensure proper functionality of the iHP.

Servicing and maintenance



- 1 3-Way valve assembly
- 2 Circulation pump
- 3 Pump feed isolation valve
- 4 Top-up return isolation valve
- 5 De-scaling loop feed isolation valve
- 6 De-scaling loop return isolation

Service record

Service date	Serviced by	Comments

For more information on our
hot water cylinders,
visit us at **www.mixergy.co.uk**
email us at **enquiries@mixergy.co.uk**
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