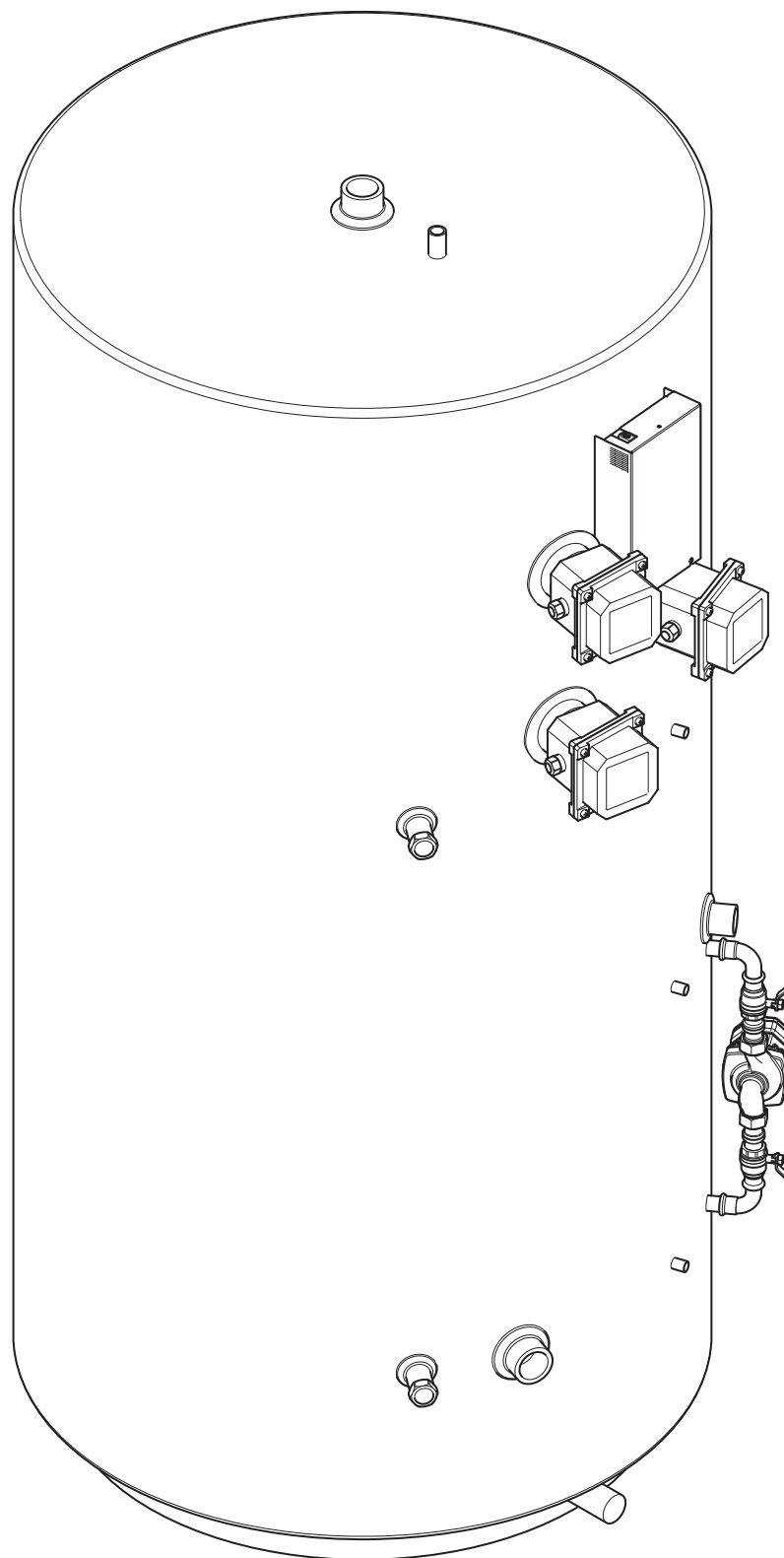


Commercial Installation & Servicing instructions

For Mixergy Commercial hot water cylinders



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

mixergy[®]

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1.0 Safety



This equipment must be connected to a protective earthing (PE) conductor.



This equipment is designed for connection to single phase supplies with the neutral conductor at earth potential – category TN or TT. This equipment is not designed for use with live and neutral connections reversed or where the neutral conductor is not at earth potential (IT supplies).

This device must be connected via a 16A MCB protected supply.

Always disconnect the device from the supply before removing or replacing the cover. This device has been manufactured in accordance with current safety standards. However, incorrect operation or misuse may result in:

- Injury or death to the operator or third parties.
- Damage to the device and other property of the operator.
- Incorrect operation of the device.

All persons involved in commissioning, maintaining, and servicing the device must:

- Be suitably qualified and competent.
- Have knowledge of and experience in dealing with electrical installations.
- Read and follow these operating instructions carefully.



Unvented hot water cylinders must not be used with solid fuel boilers as the energy source. All models are factory fitted / supplied with immersion heaters that have built-in thermal cut-outs. 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.

2.0 Cylinder details - MX number

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

For detailed guidance on how a Mixergy cylinder operates and how to optimise system performance, visit support.mixergy.co.uk

Model code	MX-180-ELE-EXT-550-1-1-A
Total weight	227 kg (wet), 54 kg (dry)
Immersion heater rating	230-240 V~ 2.7-3.0 kW
Immersion heater type	1 3/4" BSP – 400mm Incoloy
Standing heat loss/24 hr	1.8 kWh
Heat exchanger rating	-- kW
Max. supply pressure	1 MPa (10 bar)
Expansion relief pressure	0.6 MPa (6 bar)
Max. operating pressure	0.55 MPa (5.5 bar)
Max. coil pressure	0.35 MPa (3.3 bar)
MX000000 Scan the QR code to add your tank to your account or visit www.mixergy.io/register mixdevice-aaaaa-bbbbbb-cccc--ddddd-eeee	

Fig. 1

3.0 Technical data

3.1 Electrical

Supply requirement	230 - 240 V~, 6A
Ambient temperature operating range	-15 °C to 45 °C
Safety cut-out temperature	85 °C
IP rating	IP21

3.2 Hydraulic

Max. supply pressure to PRV	1 MPa (10 bar)
Operating pressure	0.3 MPa (3 bar)
Expansion relief valve setting	0.6 MPa (6 bar)
T&P relief valve setting	0.7 MPa (7 bar)

3.3 Mechanical

Cylinder construction material	Duplex Stainless Steel
Insulation material	CFC/HCFC free polyurethane foam
Water connection specification	1" BSPF (300,400,500), 1.1/2" BSPF (800,1125), 2" BSPF (2000)

4.0 Performance

Direct						
Specification	300L	400L	500L	800L	1125L	2000L
Product Code	MX-300-COM-750	MX-400-COM-750	MX-500-COM-750	MX-800-COM-990	MX-1125-COM-990	MX-2000-COM-1290
Nominal Capacity (L)	300	400	500	800	1125	2000
ErP Rating	B	B	C	C	C	C
Max. pressure (bar)	6	6	6	6	6	6
CWS Connection	1" BSP	1" BSP	1" BSP	1 ½" BSP	1 ½" BSP	2" BSP
DHW Connection	1" BSP	1" BSP	1" BSP	1 ½" BSP	1 ½" BSP	2" BSP
Secondary return Connection	1" BSP	1" BSP	1" BSP	1" BSP	1" BSP	1" BSP
Immersion options	1 No. 3 / 6 / 9 kW	2 No. 3 / 6 / 9 / 12 kW	3 No. 6 / 9 / 12 kW	3 No. 6 / 9 / 12 kW	3 No. 9 / 12 / 15 kW	3 No. 9 / 12 / 15 / 18 kW
Height (mm)	1380	1430	1720	1604	2100	2117
Diameter (mm)	750	750	750	990	990	1290
Weight Empty (kg)	55	85	95	155	190	295
Packaged Weight (kg)	65	95	105	165	200	315
Weight Full (kg)	355	485	595	955	1315	2295
Standing Heat Loss (kWh/24h)	1.77	2.35	2.74	3.29	3.6	4.2
Reheat Time 25% *	3kW - 114 mins 6kW - 54 mins 9kW - 36 mins	6kW - 72 mins 12kW - 36 mins 18kW - 24 mins 24kW - 18 mins	12kW - 45 mins 18kW - 30 mins 36kW - 15 mins	18kW - 48 mins 27kW - 31 mins 36kW - 24 mins	27kW - 45 mins 36kW - 33 mins 45kW - 26 mins	27kW - 79 mins 36kW - 57 mins 45kW - 47 mins 54kW - 40 mins
Reheat Time 50% *	3kW - 210 mins 6kW - 102 mins 9kW - 66 mins	6kW - 132 mins 12kW - 68 mins 18kW - 44 mins 24kW - 33 mins	12kW - 84 mins 18kW - 55 mins 36kW - 28 mins	18kW - 90 mins 27kW - 59 mins 36kW - 44 mins	27kW - 83 mins 36kW - 63 mins 45kW - 49 mins	27kW - 147 mins 36kW - 111 mins 45kW - 87 mins 54kW - 73 mins
Reheat Time 75% *	3kW - 294 mins 6kW - 144 mins 9kW - 96 mins	6kW - 192 mins 12kW - 96 mins 18kW - 63 mins 24kW - 48 mins	12kW - 120 mins 18kW - 78 mins 36kW - 40 mins	18kW - 126 mins 27kW - 84 mins 36kW - 63 mins	27kW - 120 mins 36kW - 90 mins 45kW - 72 mins	27kW - 210 mins 36kW - 156 mins 45kW - 120 mins 54kW - 104 mins
Reheat Time 100% *	3kW - 370 mins 6kW - 180 mins 9kW - 120 mins	6kW - 240 mins 12kW - 120 mins 18kW - 78 mins 24kW - 60 mins	12kW - 150 mins 18kW - 99 mins 36kW - 50 mins	18kW - 156 mins 27kW - 105 mins 36kW - 78 mins	27kW - 147 mins 36kW - 108 mins 45kW - 84 mins	27kW - 251 mins 36kW - 196 mins 45kW - 156 mins 54kW - 130 mins

* Based on $\Delta T = 50^{\circ}\text{C}$ rising from $10^{\circ}\text{C} - 60^{\circ}\text{C}$

5.0 Sequence of Operation

5.1 Direct electric operation (immersion(s))

1. **Heat input at the top of the cylinder.** The cylinder is heated directly by immersion heater(s) located in the upper section of the vessel (single-phase or three-phase). Heating therefore begins in the zone from which hot water is drawn, so usable hot water is available within minutes of a demand or scheduled charge starting, rather than after the whole volume has come up to temperature.
2. **Top-down volumetric charging.** Once the water surrounding the immersion approaches setpoint, the integral top-up pump draws cooler water from the base of the cylinder and delivers it to the heating zone via a top-mounted diffuser. The newly heated water displaces the existing hot layer downwards, so the heated volume grows from the top of the cylinder towards the bottom while a sharp thermocline is preserved between the hot and cold regions. Charging stops when the target volume has been heated, so only the fraction of the cylinder actually required is brought up to temperature.
3. **Live state-of-charge measurement.** A sensor strip mounted top to bottom on the inner vessel tracks the position of the thermocline and reports the live state of charge as a percentage of usable hot water. This allows the controller to charge to a target percentage (for example 40% ahead of a low-demand period, 100% ahead of peak) rather than reheating the full volume on every cycle. The result is faster recovery, lower standing losses, and the ability to shift heating into off-peak tariff windows.
4. **Draw-off.** On demand, hot water leaves from the top of the cylinder while cold mains water enters through the lower diffuser. The diffuser prohibits mixing so that stratification is maintained and the state-of-charge reading remains accurate throughout the draw.
5. **Recovery.** Following draw-off, the controller compares the measured state of charge against the schedule or BMS demand and initiates a recharge cycle as described in steps 1 to 3.

5.2 Indirect operation via the plate heat exchanger (PHEX) kit

Where an external heat source is available (gas boiler, air or ground source heat pump, or recovered heat from a VRF system), the cylinder is heated indirectly through an externally mounted plate heat exchanger and circulator pump in place of a conventional internal coil.

7. **Heat transfer arrangement.** The primary circuit from the heat source passes through one side of the plate heat exchanger. On the secondary side, the circulator pump draws stored water from the base of the cylinder, passes it across the plates, and returns it to the lower part of the vessel. Heat is transferred by forced convection on both sides of the exchanger rather than by natural convection around an immersed coil, giving a substantially lower temperature difference between the primary flow and the stored water. For a heat pump this means the primary loop can run at a lower flow temperature for a given cylinder temperature, improving the coefficient of performance during charging (Mixergy testing has shown up to 10% improvement against a coil cylinder of equivalent size); for a boiler or VRF heat recovery circuit it means a smaller approach temperature and faster heat transfer for a given primary temperature.

5.0 Sequence of Operation

8. **Full-volume utilisation.** Because the secondary side draws from and returns to the bottom of the vessel, the entire stored volume is heated from the base upwards. A conventional coil cylinder leaves a persistent cold volume below the coil that is never usefully heated; the PHEX arrangement removes this, giving up to 20% more usable hot water from the same nominal capacity and, importantly for water hygiene, allowing disinfection temperatures to be reached all the way to the base of the cylinder. The bottom sensor of the thermocline array verifies that this temperature has been achieved.
9. **Charging strategy on the indirect circuit.** When charging from a heat pump, the controller heats the stored volume in a single continuous cycle rather than in top-up increments. This is deliberate: a heat pump's COP is highest when the cylinder is cold and falls as the water approaches setpoint, so heating the whole volume in one pass yields a higher average COP than repeated short top-ups at or near the final temperature. The same state-of-charge measurement, scheduling and Mixergy server logging described in section A apply throughout.
10. **Immersion boost.** The immersion heater(s) remain available as a fast-response backup. If demand exceeds the indirect recovery rate, or the heat source is unavailable, the controller can bring the top section of the cylinder to a usable temperature within approximately 20 minutes via the top-down charging sequence in section A, rather than waiting for the full volume to recover from the external source. Priority between the indirect circuit and the immersion is set in the controller.
11. **Disinfection on indirect systems.** The scheduled disinfection cycle operates as in step 6. Where the external source can reach 60 °C or above (boiler, high-temperature heat pump), the cycle can run on the indirect circuit; where it cannot, the controller completes the cycle using the immersion heaters. In either case the full-volume temperature is verified by the sensor strip, and the cycle is logged on the Mixergy server.

5.3 Secondary hot water return

12. **Connection.** All commercial cylinders of 300 L and above are supplied with a dedicated secondary return connection (domestic cylinders 210L, 250L and 300L) in the top third of the vessel. Returning water from the distribution circuit therefore re-enters the cylinder within the heated zone rather than at the base, so the secondary circulation does not disturb the thermocline or mix the cold lower volume with the hot upper volume. This preserves both the stratification and the accuracy of the state-of-charge reading while the return pump is running.
13. **Pump control.** The secondary return pump can be connected to the Mixergy controller via the Modbus interface. This allows the pump to be controlled and monitored alongside the cylinder rather than as a separate stand-alone circuit: for example, running to a schedule aligned with the building's occupancy, being enabled during the disinfection cycle so that the distribution pipework is brought up to temperature at the same time as the stored volume, and having its status logged on the Mixergy server with the rest of the cylinder data.

5.0 Sequence of Operation

5.4 Controls integration

- Controlled by the Mixergy controller with a scheduling interface; full BMS integration is available via Modbus RTU (register map provided) for monitoring and control of setpoint, target charge, heating windows, heat source priority, fault and secondary return pump.
- Cylinder performance and disinfection history are logged on the Mixergy server and accessible remotely.
- Heat-pump ready as standard, with dedicated ports and the optional PHEX kit, allowing indirect or hybrid operation to be added at installation or retrofitted later without replacing the cylinder.
- Control of the PHEX pump is strictly via the Mixergy controller to allow appropriate control when heating indirectly, the controller has a Modbus fault code for this pump. The pump has a 15-minute override once the heating schedule is completed.

6.0 Additional components

- Inlet control group or PRV (subject to cylinder size)
- Tundish (unvented only)
- Expansion vessel including mounting bracket
- USB to ethernet adapter
- Blanking caps for PHEX kit connections (2 No.)
- WIFI dongle TL-WN823N
- Ethernet cable
- User guide
- Gauge
- Plate heat exchanger assembly: Optional Extra available from Mixergy

7.0 Design notes

The Mixergy commercial cylinder is direct electric; it provides hot water heated by electricity.

In addition, Mixergy cylinders can be fitted with the following options:

- Heat pump exchanger module for use with heat pumps, an indirect circuit from a gas boiler or with waste heat recovery via VRF systems.



Unvented hot water cylinders must not be used with solid fuel boilers as the energy source.

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.

8.0 Schematic: Direct

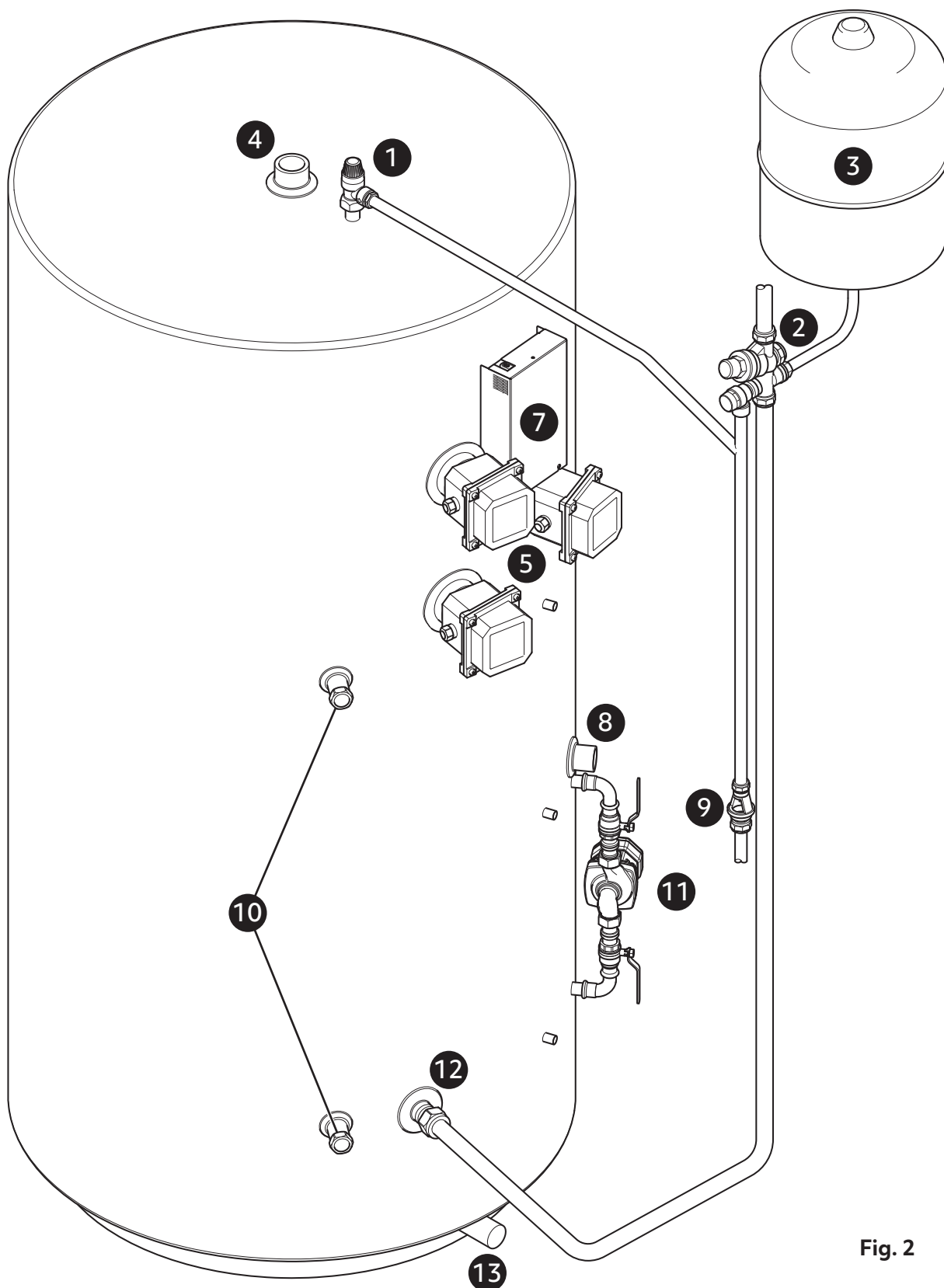


Fig. 2

- | | | | |
|----|------------------------|-----|---|
| 1. | T&P relief valve | 8. | Secondary return |
| 2. | Inlet control monobloc | 9. | Tundish and discharge pipework |
| 3. | Expansion vessel | 10. | Heat pump ready ports (Cap off if not used) |
| 4. | Hot water outlet | 11. | Pump assembly |
| 5. | Primary immersion | 12. | Cold inlet |
| 6. | N/A | 13. | Drain valve |
| 7. | Controller | | |

9.0 Hydraulic schematics

9.1 Direct unvented

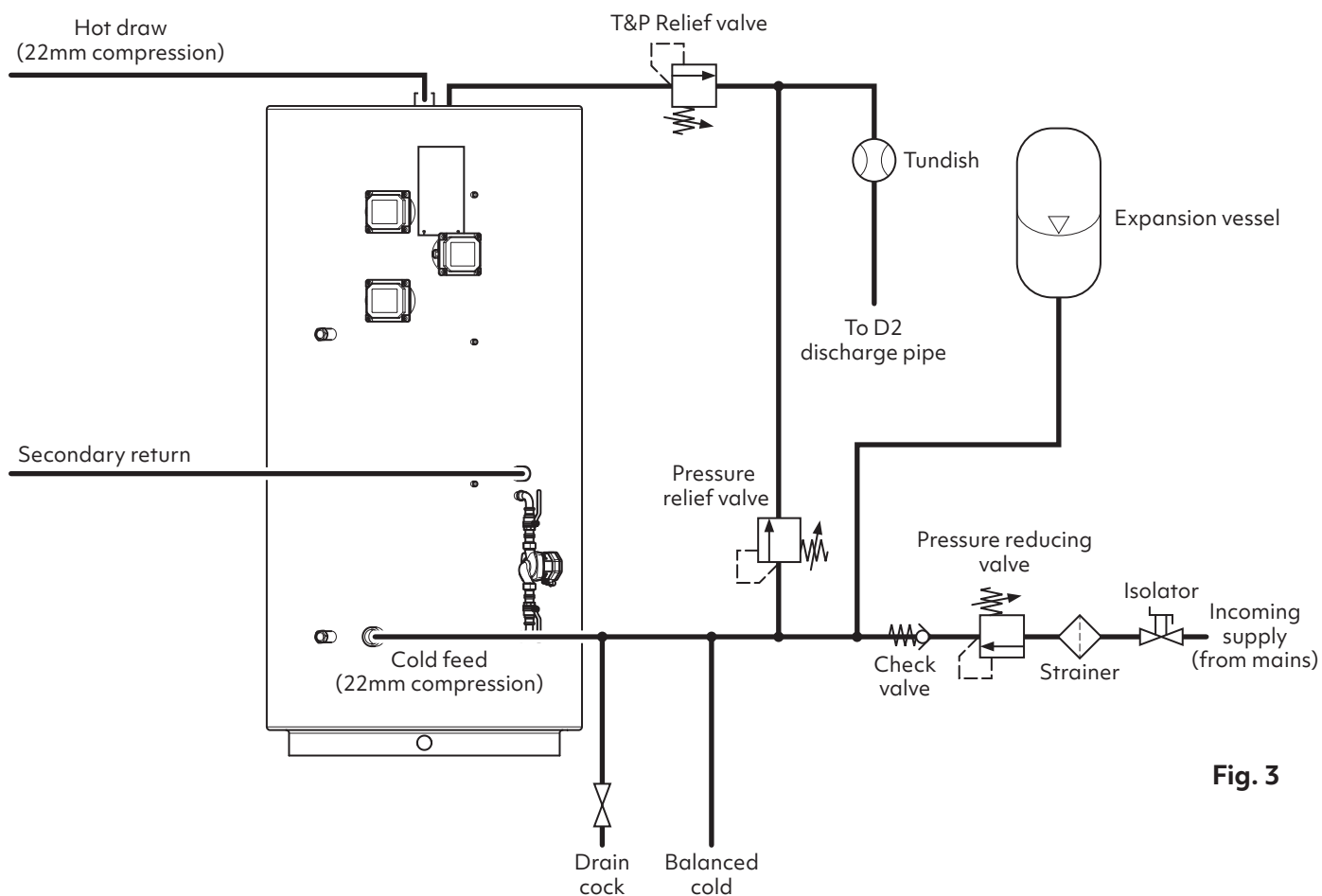
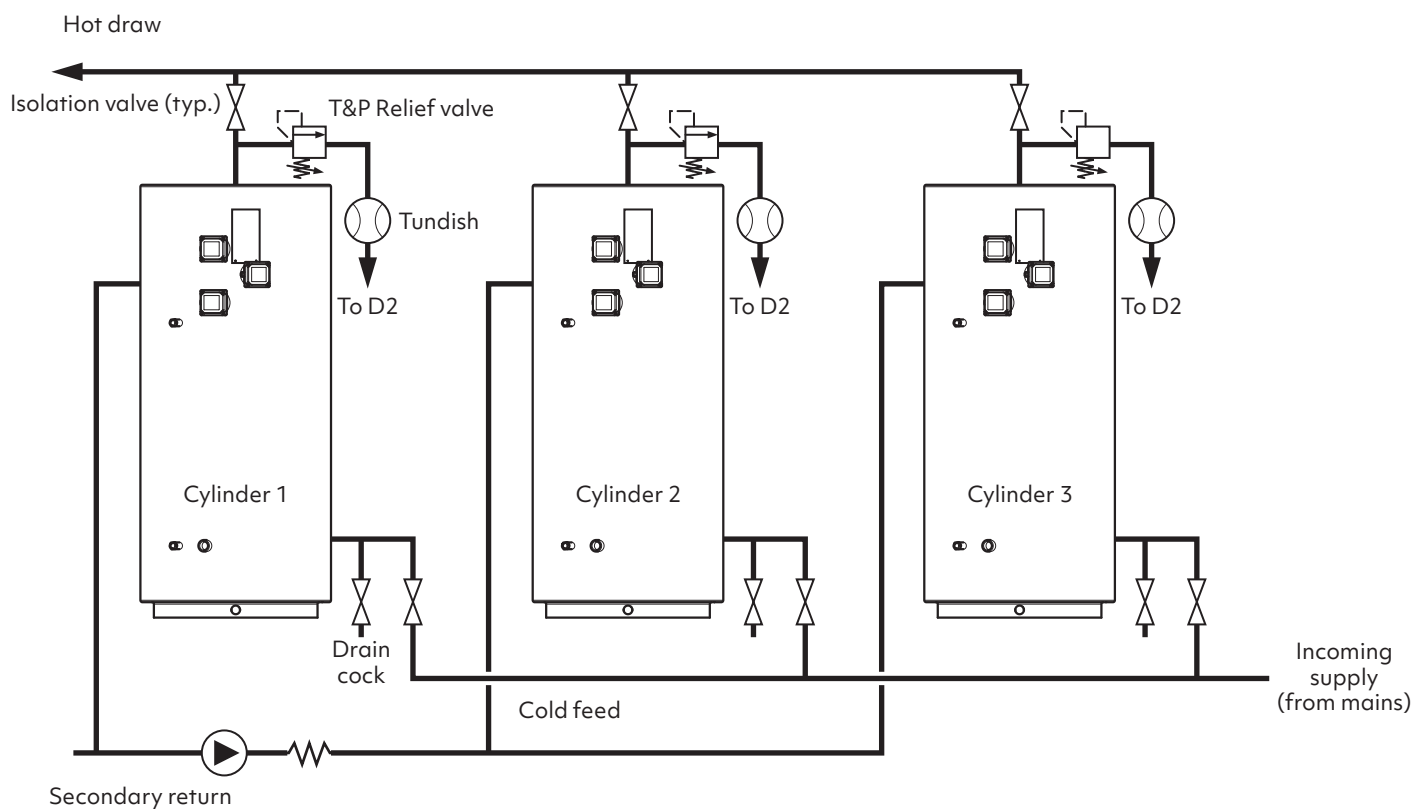


Fig. 3

9.2 Parallel reverse return installations



10.0 Installation: general guidelines



In the case of an unvented installation, this product should only be installed by a “competent operative” i.e. the installer must have attended a recognised course in unvented hot water systems.

The installation area should be able to cope with the weight, incoming pipes and discharge pipe when full.

10.1 Positioning of the cylinder

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 100mm of vertical clearance above the cylinder.

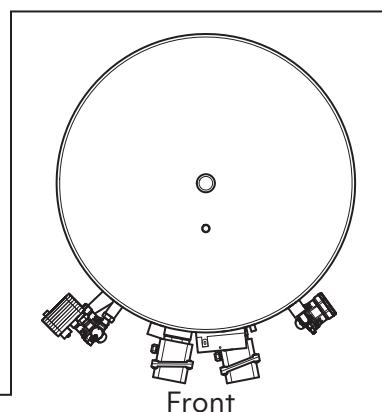


Fig. 4

Model	300L	400L	500L	800L	1125L	2000L
Height	1380mm	1430mm	1715mm	1547mm	2040mm	2107mm
Diameter	750mm	750mm	750mm	990mm	990mm	1290mm
Weight empty	55kg	85kg	95kg	155kg	190kg	295kg
Weight full*	355kg	485kg	595kg	955kg	1315kg	2295kg

* Add 20kg to the full cylinder weight for cylinders with an external heat exchanger fitted.

10.0 Installation: general guidelines

10.2 Unvented installations

In the case of an unvented installation, installers should ensure incoming mains pressure is less than 10 bar and at-least 1 bar with a minimum flow rate of 10 L/min.

10.3 Pipework and cold water inlet control group

The unit should be piped in with a supply to ensure adequate flow rate. Cylinders up to 500L are supplied with a monobloc pressure reducing valve that has a set pressure of 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 valve and the storage cylinder.

Cylinders over 500L are supplied with inlet valve kits which have separate SRV and NRV within the box.

10.4 Drain valve

The drain valve is located at the bottom of the cylinder.

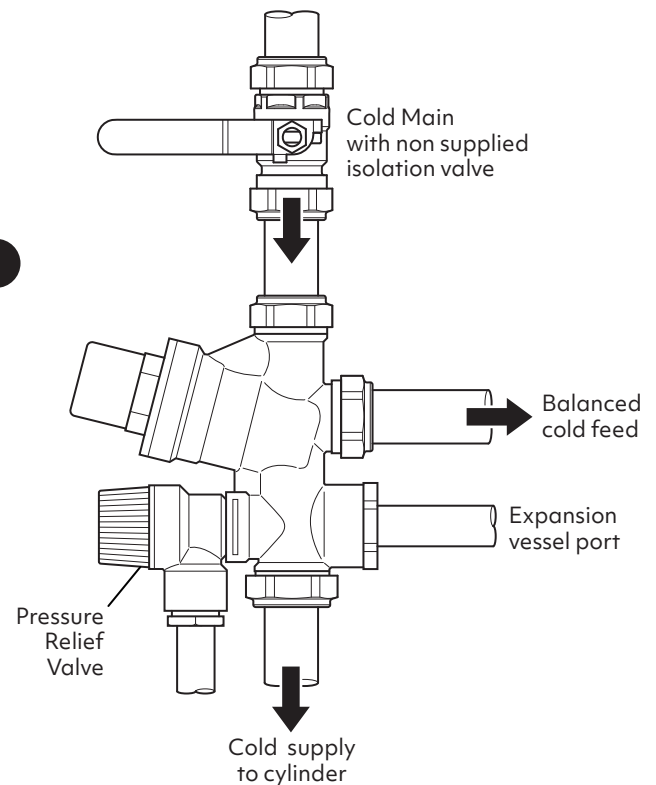


Fig. 5

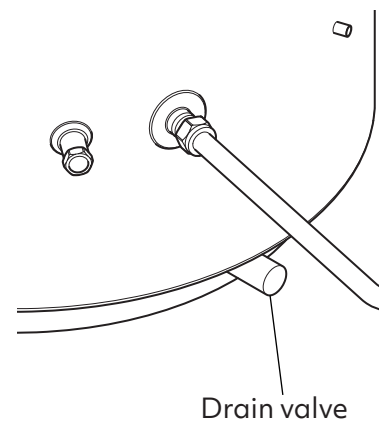


Fig. 6

10.0 Installation: general guidelines

10.5 Positioning the tundish

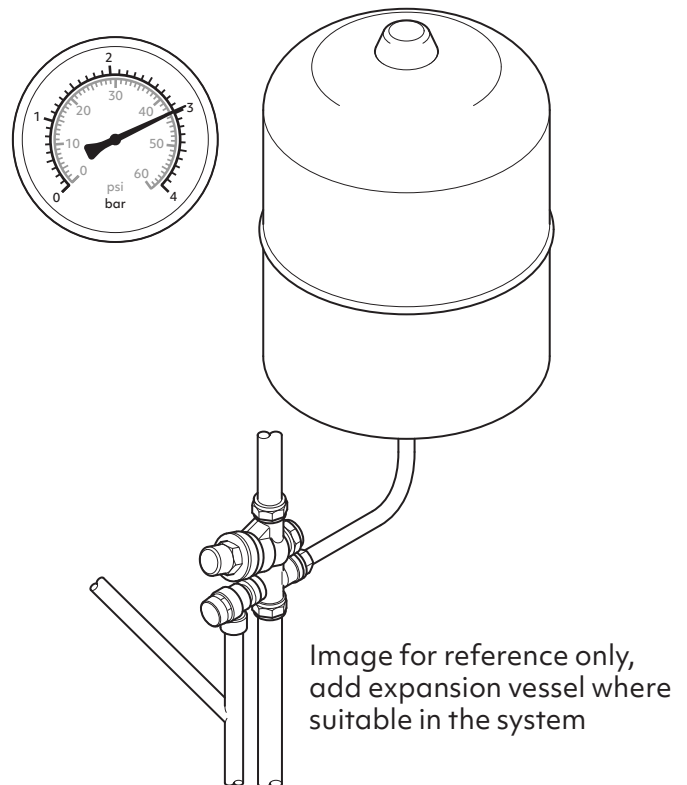
The tundish, which shows visible discharge from the relief valves, is to be in a prominent, visible and safe position away from any electrical devices. See 11.1 Discharge pipes from safety devices on page 19.

10.6 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.

10.7 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 adaptor.



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

Fig. 7

11.0 Discharge pipework

11.1 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 (Fig. 9).
- 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.

11.2 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.

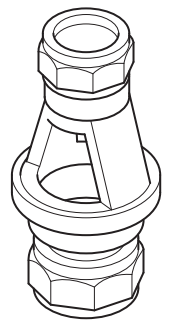


Fig. 8

11.3 Typical discharge pipe arrangement

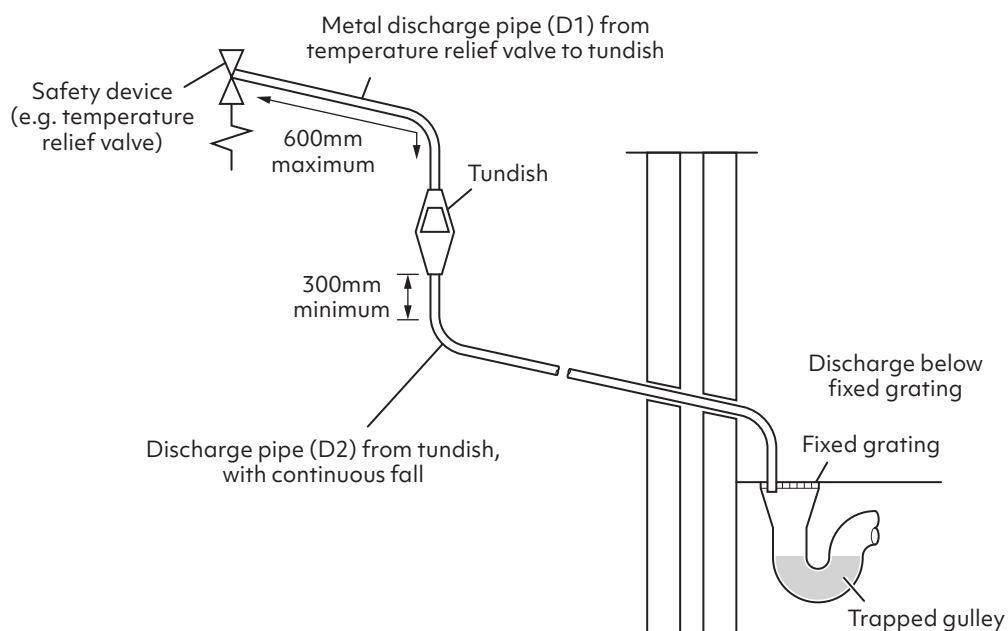


Fig. 9

11.0 Discharge pipework

11.4 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"	15mm	22mm	< 9m	0.8m
		28mm	<18m	1.0m
		35mm	<27m	1.4m
G 3/4"	22mm	28mm	<9m	1.0m
		35mm	<18m	1.4m
		42mm	<27m	1.7m
G1"	28mm	35mm	<9m	1.4m
		42mm	<18m	1.7m
		54mm	<27m	2.3m

11.5 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 (Fig. 9).
- 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.

11.0 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.

11.6 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.

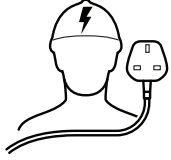
Examples of acceptable discharge arrangements are:

- 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 3m from any plastic guttering system that would collect such discharges.

12.0 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

12.1 Accessing the controller



ENSURE ALL ELECTRICAL SUPPLIES ARE SWITCHED OFF BEFORE REMOVING OR REPLACING THE CONTROLLER LID.

Access to the electronics can be made by loosening the two screws at the bottom of the controller and lifting up on the lid (Fig. 10).

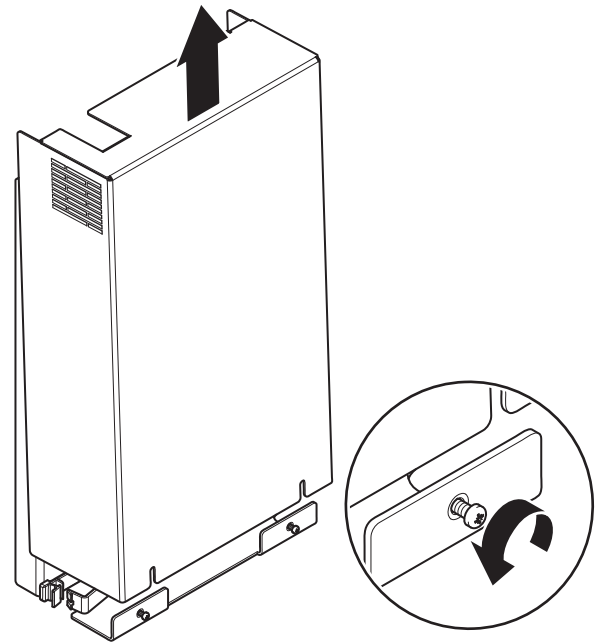


Fig. 10

12.2 Fitting the gauge

Self adhesive pad

Magnetic strip

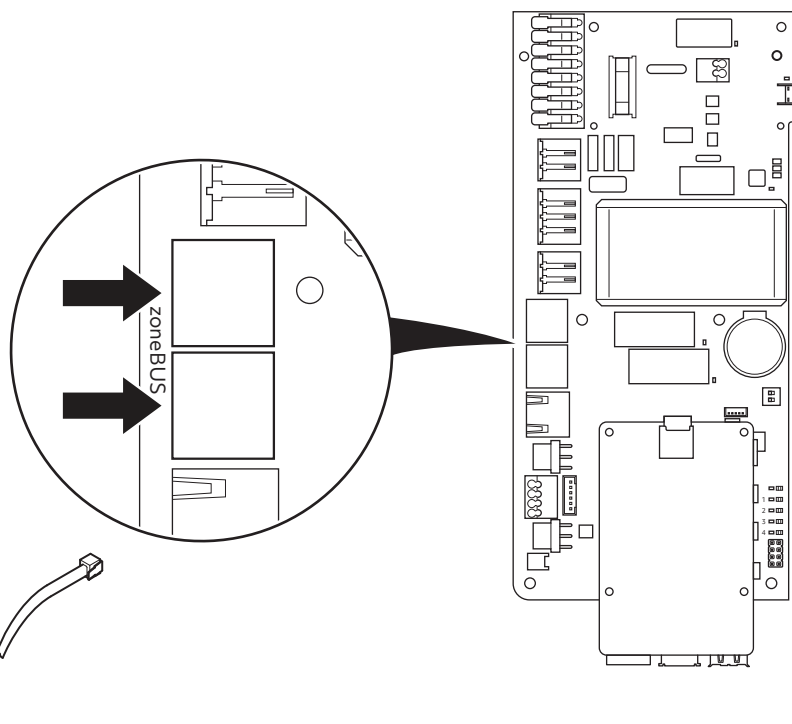


Fig. 11

12.0 Installation: electrical

The gauge has a magnetic backing strip to attach directly to the cylinder, or by using the self adhesive pad can be installed outside of the cylinder cupboard for easy user access.

If required, the cable can be extended by using a RJ11 extension cable optional extra, available from Mixergy.

Remove the controller lid (Fig. 10). Insert the connector into either of the zoneBUS ports in the controller (Fig. 11).

12.3 General guidelines

All high voltage connections to this unit are made to spring clamp terminals. Cables should be stripped back 10mm for insertion into these terminals. It is recommended to ensure that the protective earth conductor is kept at least 10mm longer than all other terminated conductors in the cable. No more than 55mm of outer insulation should be removed. Terminals can be accessed by lifting up the orange levers. Cables must be appropriately sized according to latest I.E.T regulations.

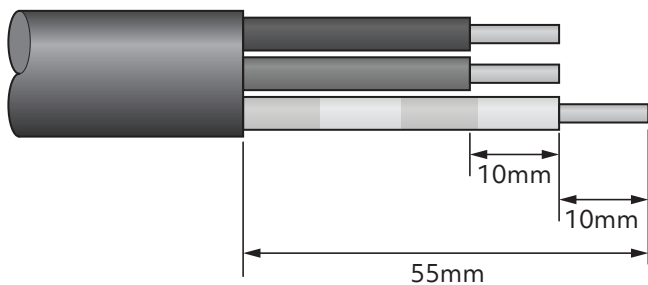


Fig. 12

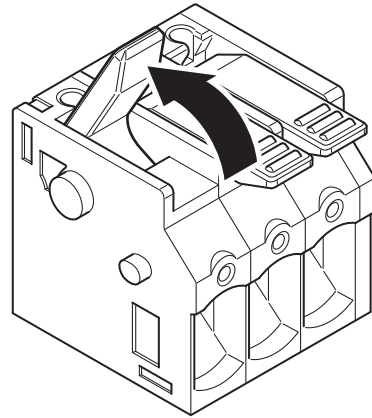


Fig. 13

12.4 Strain relief

Screwed strain relief is provided for all high voltage connections. A PZ1 screwdriver is required to tighten the strain relief. Low voltage cables should be routed through the support pillars to provide strain relief.

12.0 Installation: electrical

12.5 Heat pump kit - Sensor

Heat pump sensor interface for control of a non-modbus heat pump. Allows the Mixergy cylinder to intercept and control the heat pump's perceived temperature reading within the cylinder.

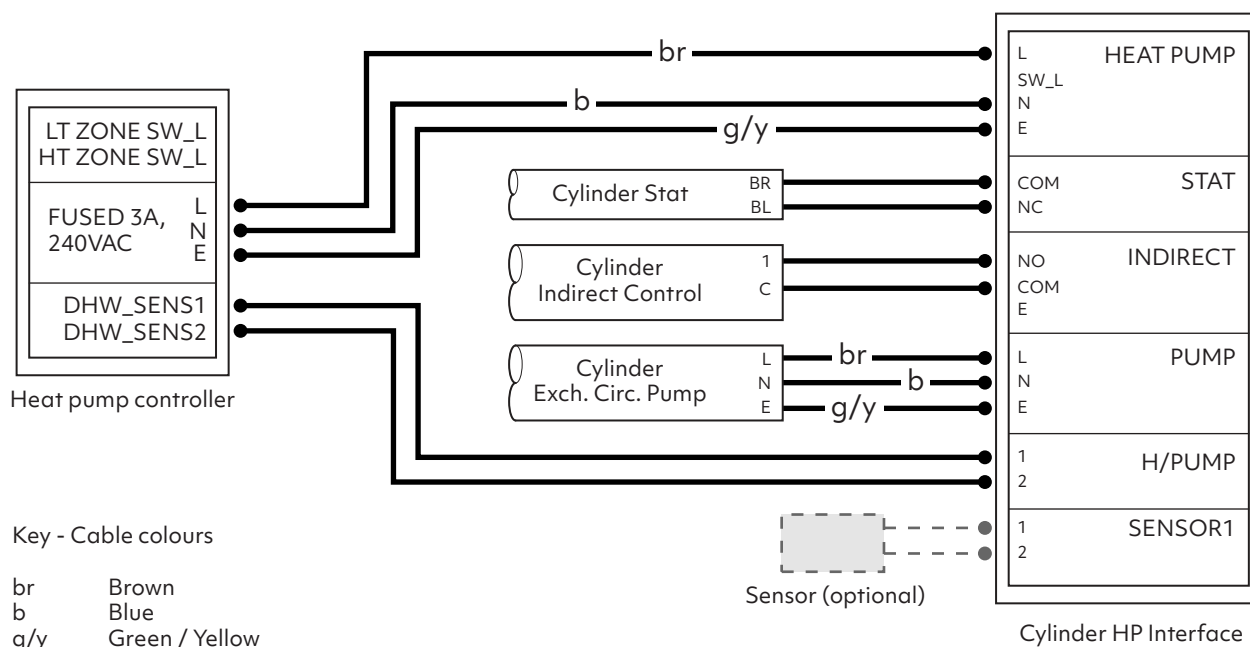


Fig. 14

For installations where the HP sensor is used to control the heat pump, the sensor should be routed through the HP sens terminals on the heat pump kit board as described. Additional software setup is also required to configure the system for the specific heat pump fitted. Please refer to the installation manual for the commercial heat pump kit.



Note: If HP sens is used for control of the heat pump in place of RTU, diagnostic information such as fault monitoring will be reduced in scope.

12.0 Installation: electrical

12.6 3 phase immersion heaters

For cylinders installed with >3kW 3 phase immersion heaters, it is necessary to specify an additional third party contactor or solid state relay (SSR) control for switching of the immersion(s). This equipment is not supplied directly by Mixergy and must be fitted and wired to the system on site. In order to interface the Mixergy controller with the third party controls, one of the following two methods is recommended:

12.7 Direct switched live integration

If no BMS system is present, it is recommended to use the switched live exposed on the 'HEATER1' header (SL) on the Mixergy controller PCBA to provide a switched 230V~ signal to the third party controller. This signal will go live whenever the cylinder attempts to heat. Note that the voltage level of this signal may have to be altered (i.e. via intermediate relay/optoisolated IO) to interface with the chosen immersion controller.

12.8 BMS integration

If a BMS system is present, it is recommended to use the BMS to control the third party immersion controller directly via Modbus TCP. Specific guidance on the modbus integration required on the BMS is given in this manual in section 14.

12.0 Installation: electrical

12.9 Wiring diagram - Direct (3kW immersion)

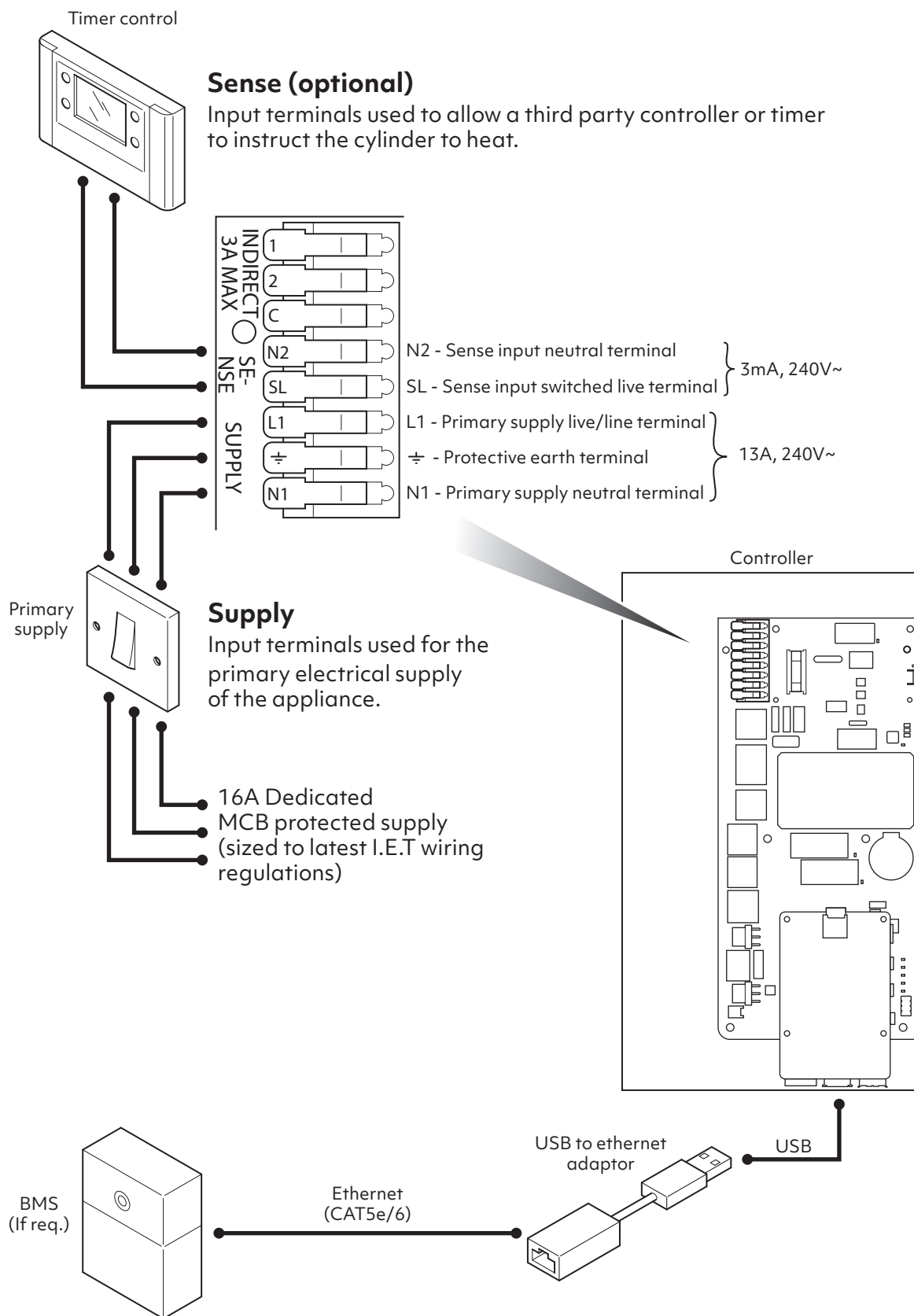
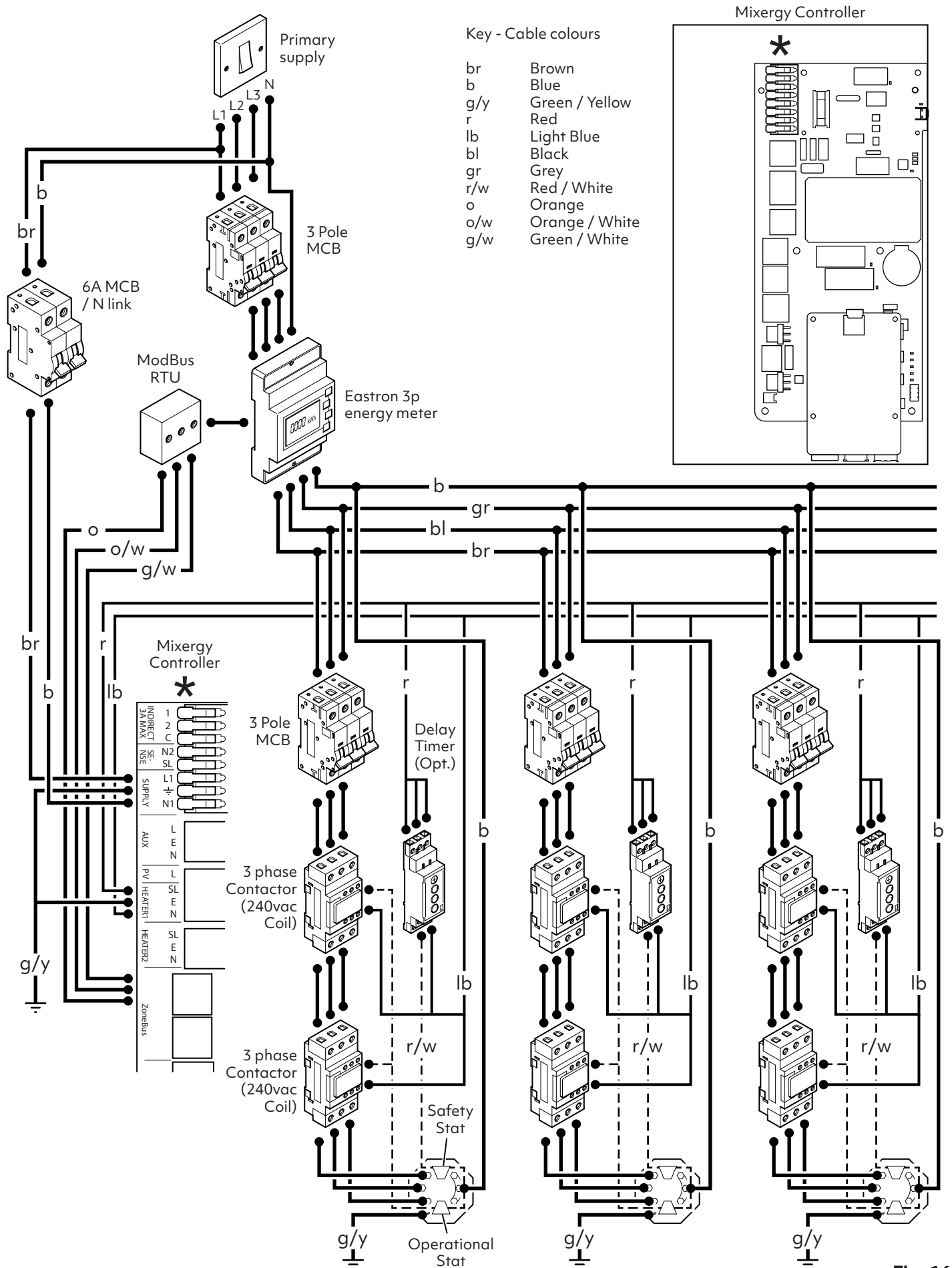


Fig. 15

12.0 Installation: electrical

12.10 Wiring diagram - Direct (Solid state relay controlled 3ph immersion)



12.0 Installation: electrical

12.11 Wiring diagram - Heat pump (3kW immersion)

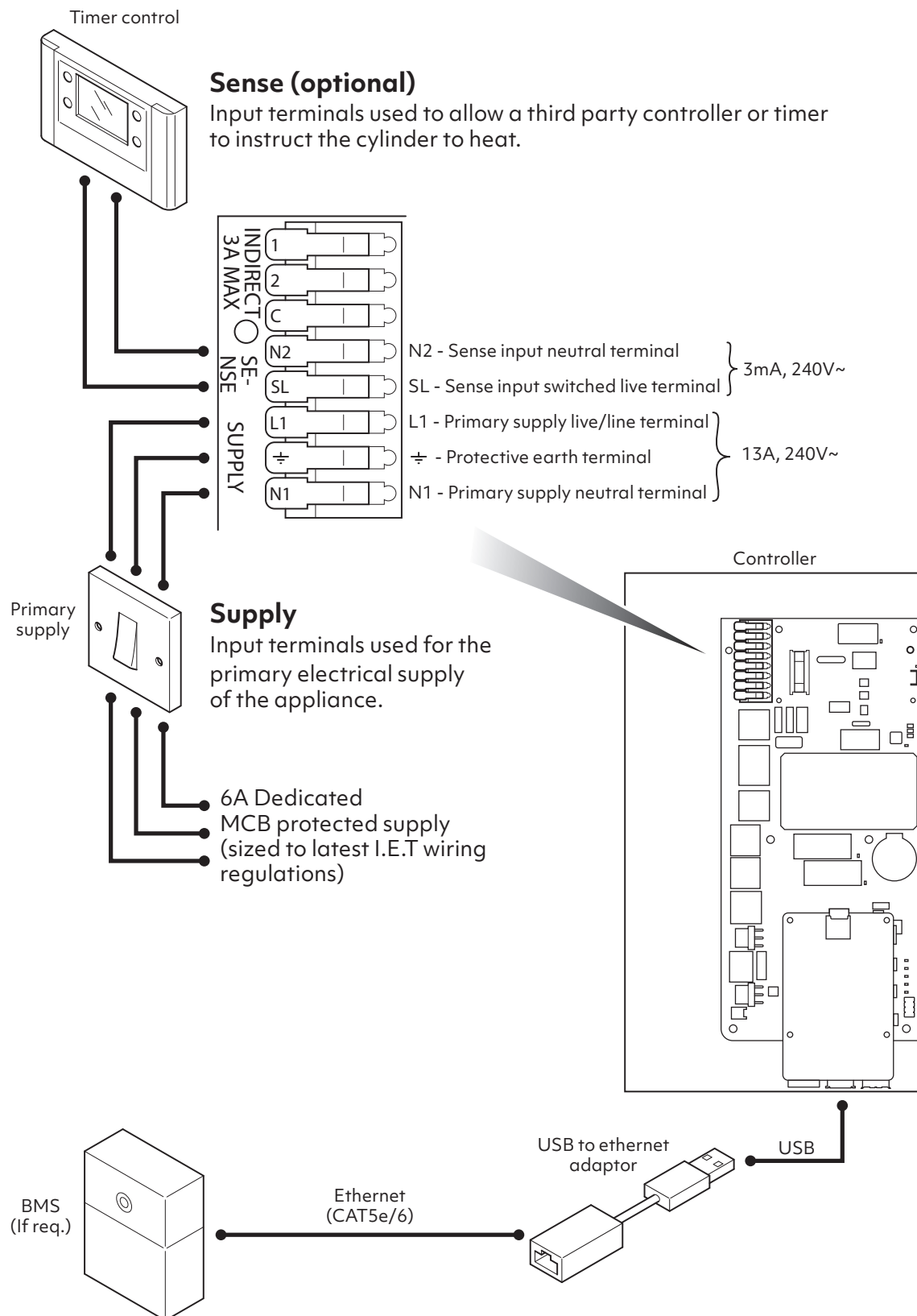


Fig. 17

12.0 Installation: electrical

12.12 Wiring diagram - Heat pump (Controlled 3ph)

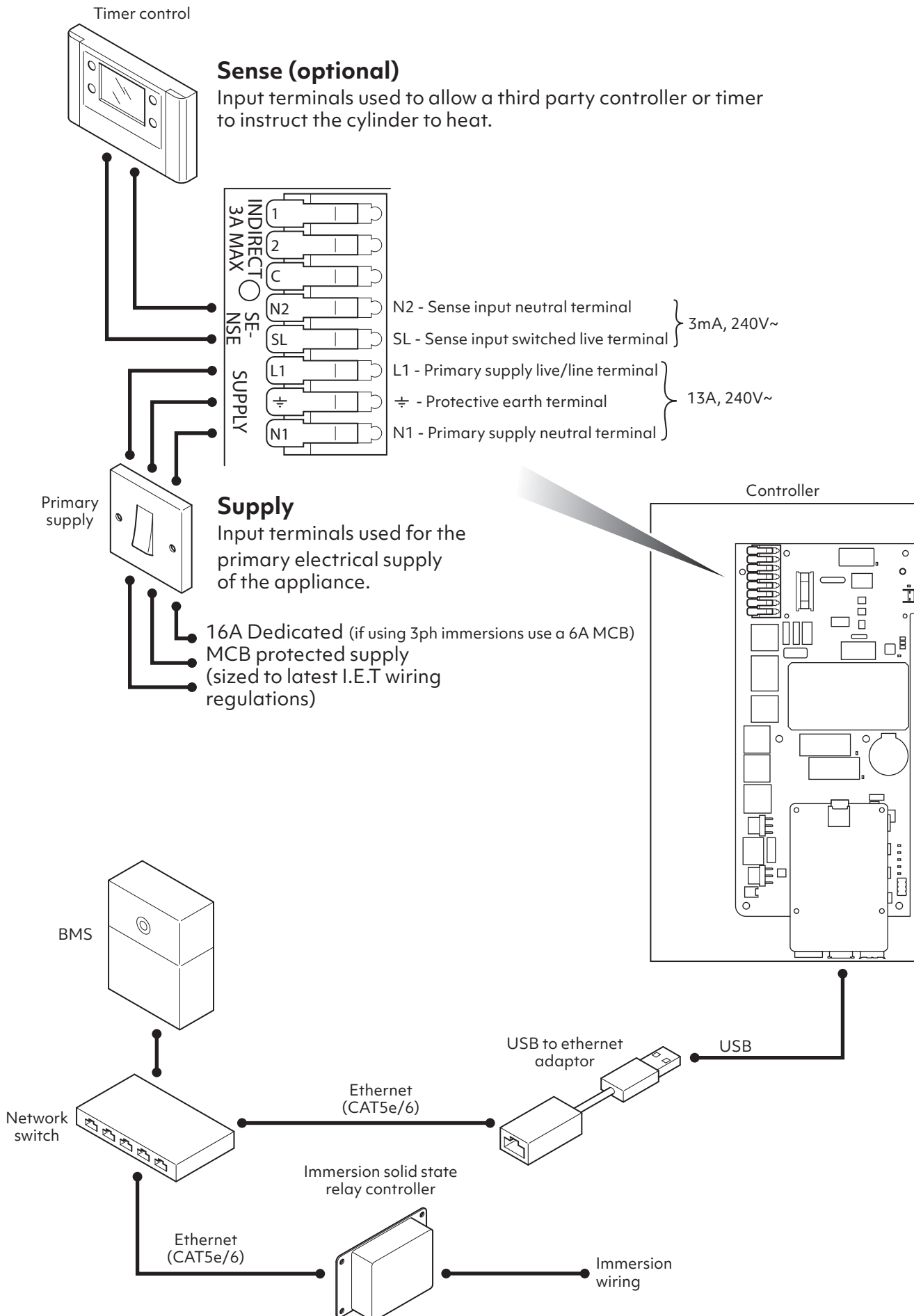


Fig. 18

12.0 Installation: electrical

12.13 Wiring diagram - Heat pump (HP sensor, 3kW immersion)

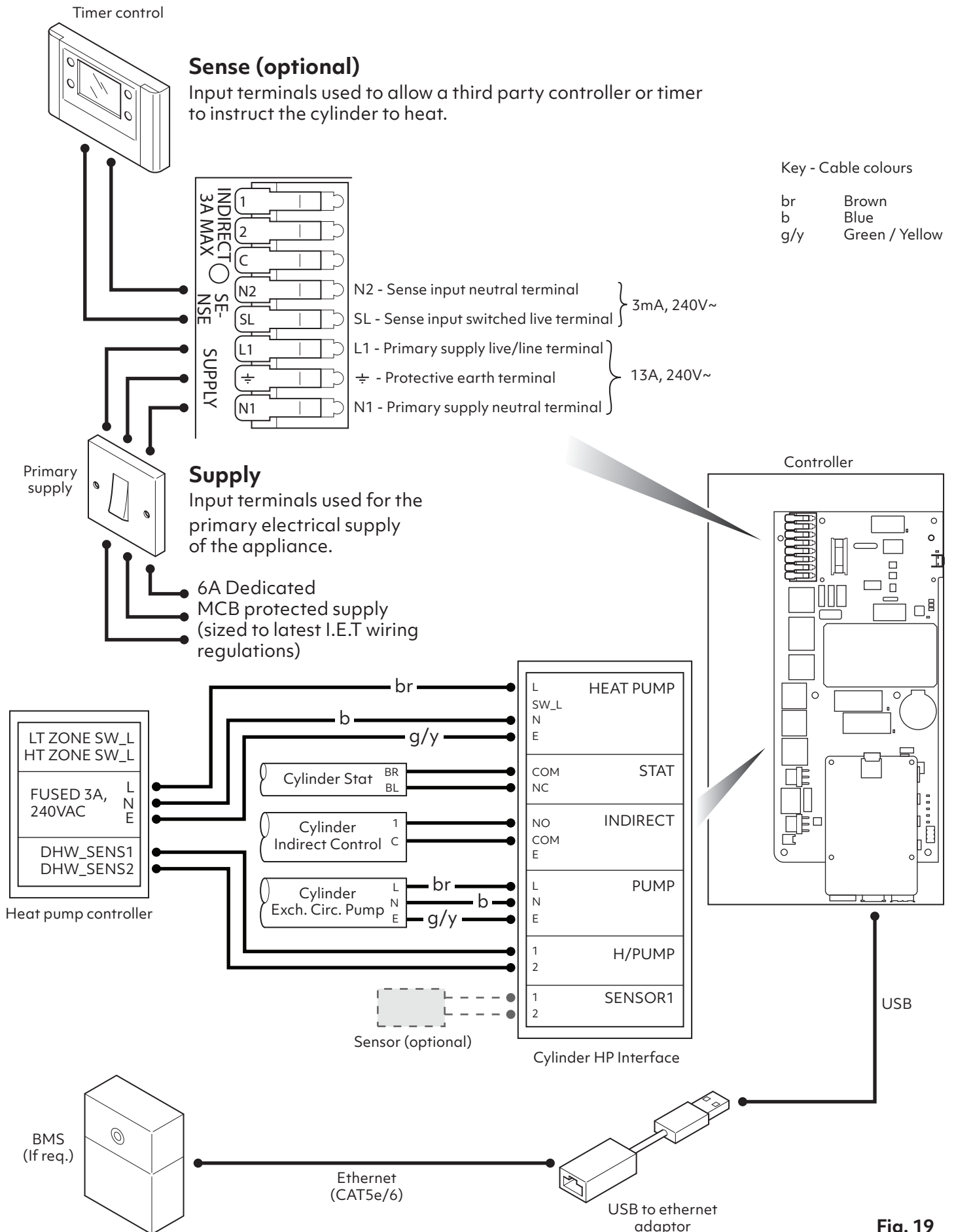


Fig. 19

12.0 Installation: electrical

12.14 Wiring diagram - Heat pump (HP sensor, Solid state relay controlled 3ph)

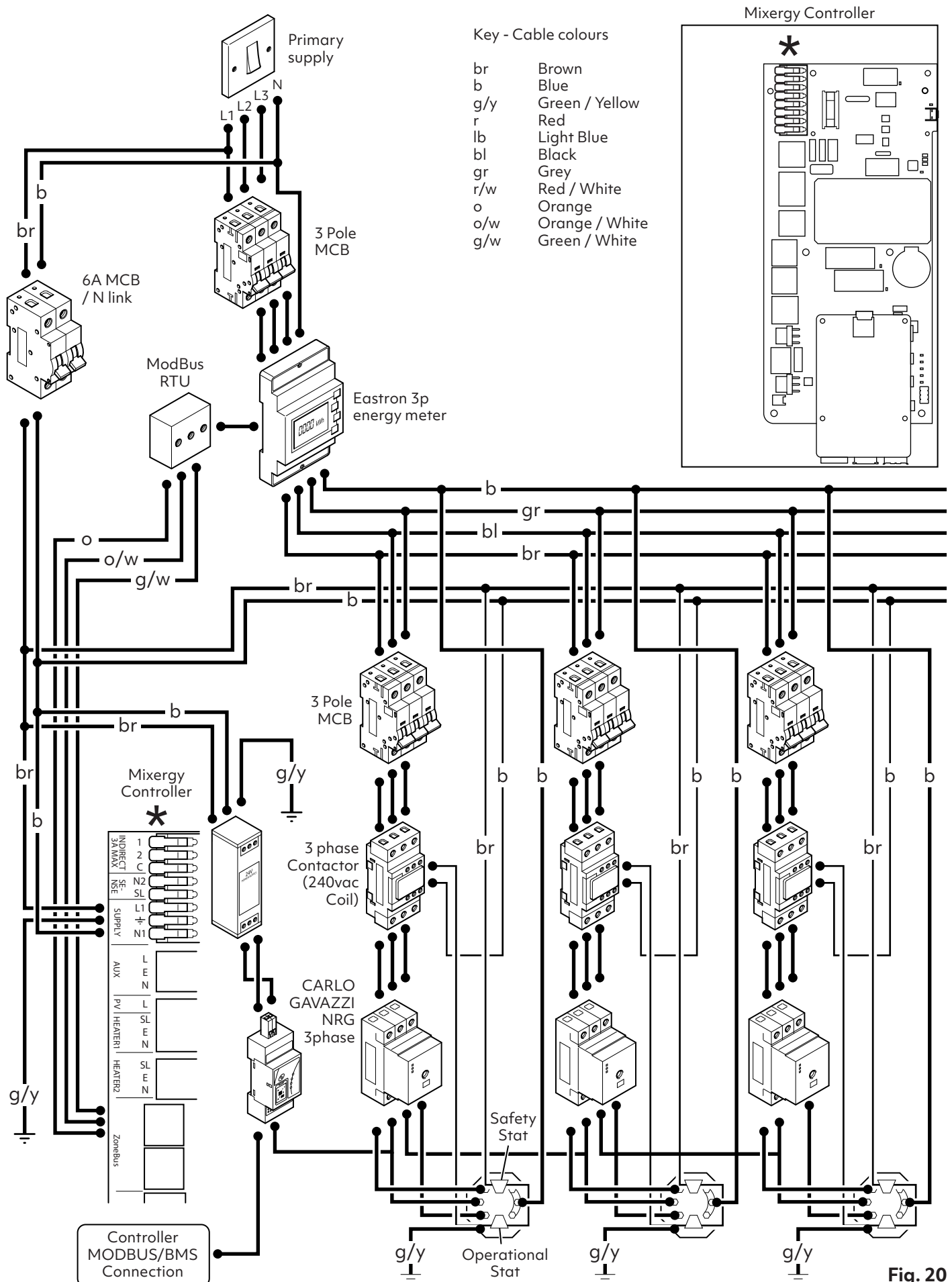


Fig. 20

13.0 Installation: connectivity

13.1 Connectivity

The Mixergy cylinder delivers the best experience when the controller is connected to the internet.

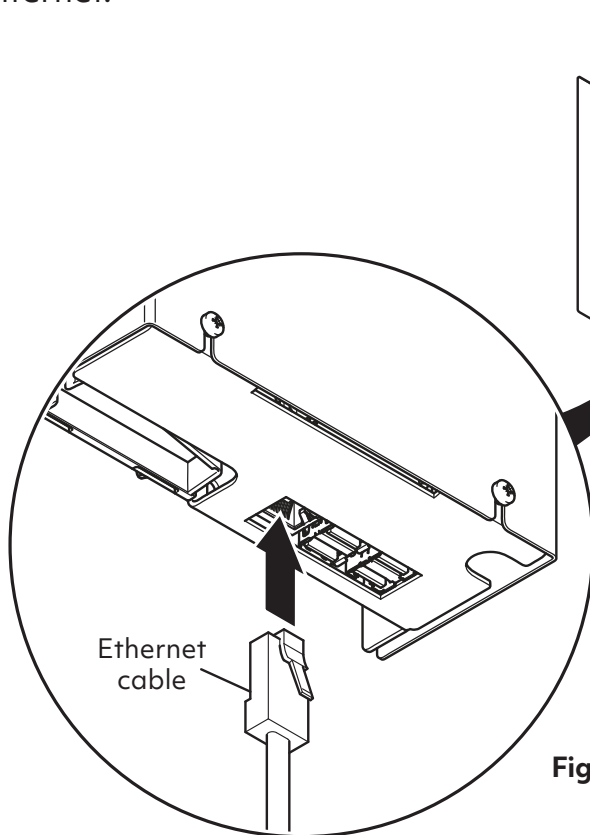


Fig. 21

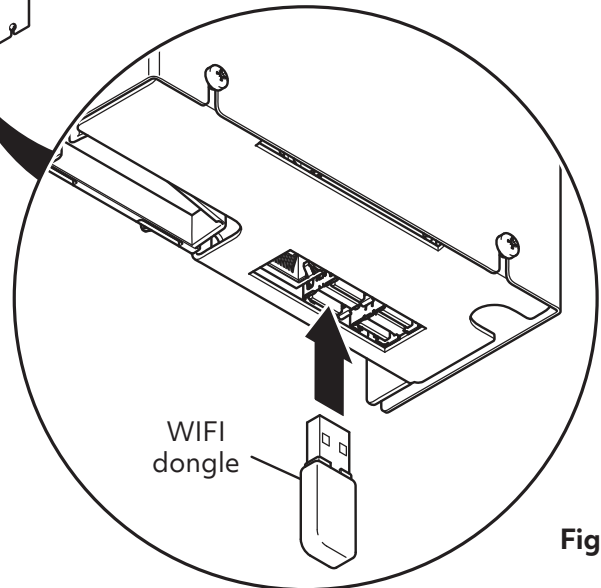
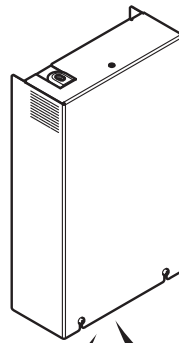


Fig. 22

Option 1: Hardwired connection (Ethernet)

Plug an Ethernet cable into the controller's network port. (Fig. 21).

Option 2: No hardwired connection (WiFi via dongle)

If the property does not have a hardwired connection, plug the supplied WiFi dongle into one of the controller's USB ports (Fig. 22).

13.2 Connect Modbus TCP

Modbus TCP connection is made using the provided USB to ethernet adapter. This adapter should be plugged into one of the USB ports on the bottom of the controller (Fig. 23).

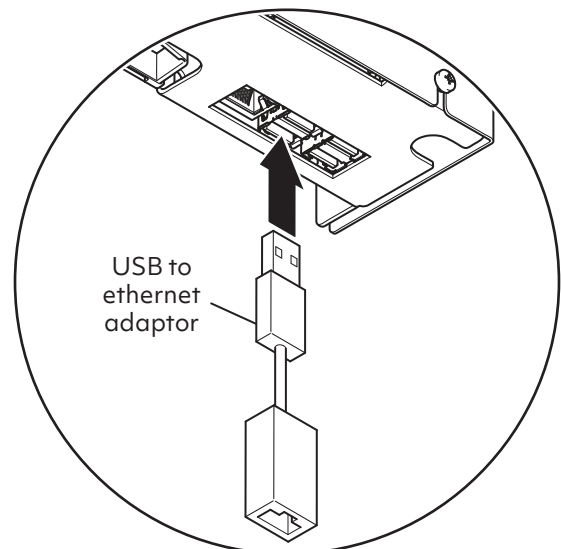


Fig. 23

13.0 Installation: connectivity

13.3 Modbus Interface 1.0.0 - Support Functions

Code	Operation
01	Read Coils
02	Read Discrete Inputs
03	Read Holding Registers
04	Read Input Registers
05	Write Single Coil
06	Write Single Register
15	Write Multiple Coils
16	Write Multiple Registers
23	Read/Write Multiple Registers

Note:

Writing multiple registers is atomic. If an error occurs while writing any register none of the target registers will be updated.

13.4 Register Types

Base Types

Code	Operation
UINT16	An unsigned 16-bit integer.
UINT32	An unsigned 32-bit integer across two registers. Attempting to access only one of the two registers will result in an illegal data address exception.
UINT64	An unsigned 64-bit integer across four registers. Attempting to access only a subset of the four registers will result in an illegal data address exception.

Array Types

A type denoted TYPE[N] indicates a sequence of N values of type TYPE.

Each individual TYPE is separately addressable, even if the individual registers within a TYPE are not.

13.0 Installation: connectivity

13.5 Modbus Coils

Address	Parameter	Description
00001	System Standby	Sets/shows whether the system is on standby. If on standby, heating for hot water, pasteurisation, and demand response is disabled for the tank.
00002	Inhibit Heating for Hot Water	Sets/shows whether heating for hot water is inhibited. If inhibit is enabled, heating for hot water and demand response is disabled, but heating for pasteurisation is unaffected.
00003	Override Heating for Hot Water	Sets/shows whether heating for hot water is overridden. If override is enabled, the heating schedule is ignored and the tank will attempt to maintain a state of charge between 95% and 100% at all times until disabled. Note: If heating for hot water is inhibited, override may still be enabled, but it will have no effect until the inhibition is disabled.
00004	Pasteurisation in Progress	Sets/shows whether pasteurisation is in progress. A pasteurisation cycle may be started manually by setting this value to true. A pasteurisation cycle - manual or scheduled - may be aborted by setting this value to false. Note: Setting this value to true when pasteurisation is already in progress has no effect and will not reset the pasteurisation timer.
00005	Pasteurisation Unsuccessful	Shows whether the last pasteurisation cycle timed out or was aborted. The value may be manually cleared or set for accounting purposes, but this has no effect otherwise. Note: This value is updated when a pasteurisation cycle ends. It is not cleared when a pasteurisation cycle begins.

13.6 Discrete Inputs

Address	Parameter	Description
10001	Immersion Heating in Progress	Shows whether heating is in progress using the electric heating element. Note: In setups where power to the electric heating element is managed by a BMS rather than by the tank, the BMS should read this value to determine when to switch it on.
10002	External Heating in Progress	Shows whether heating is in progress using the external heat source. Note: In setups where power to the external heat source is managed by a BMS rather than by the tank, the BMS should read this value to determine when to switch it on.

13.0 Installation: connectivity

13.7 Input Registers

Address/Type	Parameter	Description												
30001 - 30002 UINT32	MX Number	The serial number of the tank minus its “MX” prefix. E.g. a tank having the serial number MX123456 will have this register set to the value 123456.												
30003 - 30005 UINT16[3]	Firmware Version	In order, the major, minor, and patch versions of firmware release presently running on the tank.												
30006 - 30008 UINT16[3]	Modbus Interface Version	In order, the major, minor, and patch versions of modbus interface presently operational on the tank.												
31001 UINT16	State of Charge	The amount of water in the tank heated approximately to the target temperature as a tenth of a percentage.												
31002 UINT16	Heating Status	Shows the reason why the tank is heating if it is currently heating. Acceptable Values: <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td><i>Idle</i> The tank is not currently heating.</td></tr><tr><td>1</td><td><i>Hot Water</i> The tank is heating for hot water by request or due to the heating schedule.</td></tr><tr><td>2</td><td><i>Pasteurisation</i> The tank is heating for a requested or scheduled pasteurisation cycle.</td></tr><tr><td>3</td><td><i>DSR</i> The tank is heating due to receiving a Demand-Side Response event.</td></tr><tr><td>4</td><td><i>Maintenance</i> The tank is heating due to perform essential maintenance (e.g. frost protection).</td></tr></table>	Value	Description	0	<i>Idle</i> The tank is not currently heating.	1	<i>Hot Water</i> The tank is heating for hot water by request or due to the heating schedule.	2	<i>Pasteurisation</i> The tank is heating for a requested or scheduled pasteurisation cycle.	3	<i>DSR</i> The tank is heating due to receiving a Demand-Side Response event.	4	<i>Maintenance</i> The tank is heating due to perform essential maintenance (e.g. frost protection).
Value	Description													
0	<i>Idle</i> The tank is not currently heating.													
1	<i>Hot Water</i> The tank is heating for hot water by request or due to the heating schedule.													
2	<i>Pasteurisation</i> The tank is heating for a requested or scheduled pasteurisation cycle.													
3	<i>DSR</i> The tank is heating due to receiving a Demand-Side Response event.													
4	<i>Maintenance</i> The tank is heating due to perform essential maintenance (e.g. frost protection).													
31003 UINT16	Major Faults	Shows any fault conditions detected by the tank that may hinder or prevent heating. Flags in least-significant-bit order: <table><tr><th>Index</th><th>Description</th></tr><tr><td>0</td><td><i>Pump Failure Detected</i> The top-up pump does not appear to be functioning, or is functioning inadequately, based on monitoring measurements.</td></tr><tr><td>1</td><td><i>Immersion Failure Detected</i> The electric heating element does not appear to be functioning, or is functioning inadequately, based on monitoring measurements.</td></tr></table>	Index	Description	0	<i>Pump Failure Detected</i> The top-up pump does not appear to be functioning, or is functioning inadequately, based on monitoring measurements.	1	<i>Immersion Failure Detected</i> The electric heating element does not appear to be functioning, or is functioning inadequately, based on monitoring measurements.						
Index	Description													
0	<i>Pump Failure Detected</i> The top-up pump does not appear to be functioning, or is functioning inadequately, based on monitoring measurements.													
1	<i>Immersion Failure Detected</i> The electric heating element does not appear to be functioning, or is functioning inadequately, based on monitoring measurements.													

13.0 Installation: connectivity

13.7 Input Registers

Address/Type	Parameter	Description	
31004 UINT16	Minor Faults	Shows any fault conditions detected by the tank that prevent heating, but are temporary in normal operation.	
		Flags in least-significant-bit order:	
		Index	Description
		0	<i>Short Cycle Prevention</i> Heating is temporarily disabled to prevent rapidly cycling the external heat source on and off. The usual period is fifteen (15) minutes if the external heat source is a heat pump kit or two (2) minutes if it is some other indirect source.
		1	<i>Overheat Protection</i> Heating is temporarily disabled due to water in the tank being significantly above the target temperature. The lasts until the temperature has lowered sufficiently.
		2	<i>Diverter Overheat Protection</i> Heating is temporarily disabled due to the PV diverter having reached an unsafe temperature. The lasts until the temperature has lowered sufficiently.
		3	<i>High Current Protection</i> Heating is temporarily disabled due to an abnormally high current being detected. The usual period is one (1) minute.
31005 UINT16	Device Faults	Shows any communication issues with configured modbus devices.	
		Flags in least-significant-bit order:	
		Index	Description
		0	<i>Tank Comms</i> There is currently a problem communicating with the tank controller via Modbus.
		1	<i>PV Diverter Comms</i> There is currently a problem communicating with the PV diverter via Modbus.
		2	<i>Current Clamp Comms</i> There is currently a problem communicating with the current clamp via Modbus.
		3	<i>Heat Pump Comms</i> There is currently a problem communicating with a heat pump via Modbus.

13.0 Installation: connectivity

13.7 Input Registers

Address/Type	Parameter	Description
32001 _____ UINT16	Feed Temperature	The temperature of the water that will be drawn from the tank in c°C.
32002 _____ UINT16	Top Temperature	The temperature of the water at the very top of the tank in c°C.
32003 _____ UINT16	Bottom Temperature	The temperature of the water at the very bottom of the tank in c°C.
32004 _____ UINT16	Loop Temperature	The temperature of the water flowing from the external heat source to the tank in c°C. Note: If the temperature sensor is not connected, the value will be 0.
32005 _____ UINT16	Ambient Temperature	The temperature of the environment outside the tank in c°C. Note: If the temperature sensor is not connected, the value will be 0.
32006 _____ UINT16	Secondary Return Temperature	The temperature of the water flowing in the secondary return system in c°C. Note: If the temperature sensor is not connected, the value will be 0.
32007 - 32042 _____ UINT16[36]	Temperature Profile	The values of all the internal temperature sensors in the tank in c°C. Note: If your tank has fewer internal temperature sensors, the trailing values will be zero.
33001 _____ UINT16	Power	The power presently being consumed by the tank in W.
33002 _____ UINT16	Voltage	The voltage of the tank's mains supply in cV.
33003 _____ UINT16	Current	The current presently being consumed by the tank in cA.
33004 _____ UINT16	Frequency	The frequency of the alternating current supply to the tank in mHz.
33005 - 33008 _____ UINT64	Cumulative Energy	The energy used by the tank since it was powered on in Wh.

13.0 Installation: connectivity

13.8 Holding Registers

Address/Type	Parameter	Description								
40001 UINT16	Hot Water Temperature	Sets/shows the target temperature in °C for hot water. Note: Writing any value is legal, however it will be clamped to between a minimum and maximum determined by the type of tank.								
40002 UINT16	Pasteurisation Temperature	Sets/shows the target temperature in °C for pasteurisation. Note: Writing any value is legal, however it will be clamped to between a minimum and maximum determined by the type of tank.								
40003 UINT16	Pasteurisation Hold Duration	Sets/shows the duration in minutes the water in the tank must be held at the pasteurisation temperature to complete a pasteurisation cycle. If set to 0, the pasteurisation cycle completes as soon as the water in the tank is fully heated to temperature.								
41001 UINT16	Secondary Return Pump	Sets/shows the current speed of the secondary return pump from 0x0000 (slowest) to 0xFFFF (fastest). Note: Writing any value is legal, however if the pump is digital then any non-zero value will be changed to 0xFFFF.								
42001 UINT16	Selected Heating Schedule	Sets/shows the selected hot water heating schedule. Acceptable Values: <table><tr><th>Value</th><th>Description</th></tr><tr><td>0x0000</td><td><i>Idle</i> The tank has no scheduled heating events.</td></tr><tr><td>0xFFFE</td><td><i>Custom</i> The tank follows a heating schedule described by the holding registers below.</td></tr><tr><td>0xFFFF</td><td><i>Other</i> The tank follows a heating schedule that is not representable by the holding registers below.</td></tr></table> Notes: If the selected heating schedule is set to “Idle”, the heating schedule items will all be set to zero. If every heating schedule item register is set to zero, the selected heating schedule will be set to “Idle”. If the heating schedule is modified via the online portal and it is possible to represent the new schedule as either an “Idle” schedule or a “Custom” schedule, the selected heating schedule and heating schedule items will be updated accordingly. If the heating schedule is modified via the online portal and the new schedule may not be otherwise represented, the selected heating schedule will be set to “Other” and the heating schedule items will remain unchanged from their previous values. The value “Other” may only be set due to modification via the online portal. Trying to set the selected heating schedule to “Other” will result in an illegal data value exception.	Value	Description	0x0000	<i>Idle</i> The tank has no scheduled heating events.	0xFFFE	<i>Custom</i> The tank follows a heating schedule described by the holding registers below.	0xFFFF	<i>Other</i> The tank follows a heating schedule that is not representable by the holding registers below.
Value	Description									
0x0000	<i>Idle</i> The tank has no scheduled heating events.									
0xFFFE	<i>Custom</i> The tank follows a heating schedule described by the holding registers below.									
0xFFFF	<i>Other</i> The tank follows a heating schedule that is not representable by the holding registers below.									

13.0 Installation: connectivity

13.8 Holding Registers

Address/Type	Parameter	Description								
42002 - 42145 UINT16[144]	Heating Schedule Items	Sets/shows the hot water heating schedule items of a custom daily heating schedule. The day is divided into 48 periods of 30 minutes, beginning at 00:00. Each period is represented by 3 sequential modbus registers, which correspond to an initial target charge followed by minimum and maximum maintain bounds. Each value specifies a state of charge as a percentage. Notes: Writing any value is legal, however each state of charge will be clamped to between 0% and 100%. Additionally, maintain bounds will be adjusted to ensure at least a 5% difference between the minimum and maximum. If the selected heating schedule is set to “Idle”, the heating schedule items will all be set to zero. If every heating schedule item register is set to zero, the selected heating schedule will be set to “Idle”. If the heating schedule is modified via the online portal and it is possible to represent the new schedule as either an “Idle” schedule or a “Custom” schedule, the selected heating schedule and heating schedule items will be updated accordingly. If the heating schedule is modified via the online portal and the new schedule may not be otherwise represented, the selected heating schedule will be set to “Other” and the heating schedule items will remain unchanged from their previous values.								
42201 UINT16	Default Heat Source	Sets/shows the default heat source. Acceptable Values: <table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td><i>Immersion</i> Heat using the electric heating element.</td></tr><tr><td>2</td><td><i>External</i> Heat using the external heat source.</td></tr><tr><td>3</td><td><i>Immersion and External</i> Heat using the electric heating element and the external heat source simultaneously.</td></tr></table> Note: If the heat source schedule is modified via the online portal, the value of this register will be automatically updated.	Value	Description	1	<i>Immersion</i> Heat using the electric heating element.	2	<i>External</i> Heat using the external heat source.	3	<i>Immersion and External</i> Heat using the electric heating element and the external heat source simultaneously.
Value	Description									
1	<i>Immersion</i> Heat using the electric heating element.									
2	<i>External</i> Heat using the external heat source.									
3	<i>Immersion and External</i> Heat using the electric heating element and the external heat source simultaneously.									

13.0 Installation: connectivity

13.8 Holding Registers

Address/Type	Parameter	Description	
42202 UINT16	Selected Heat Source Schedule	Sets/shows the selected heat source schedule.	
		Acceptable Values:	
		Value	Description
		0x0000	Default The tank has no scheduled heat sources and will only use the default heat source.
		0xFFFE	Custom The tank follows a heat source schedule described by the holding registers below.
		0xFFFF	Other The tank follows a heat source schedule that is not representable by the holding registers below.
Notes: If the selected heat source schedule is set to “Default”, the heat source schedule items will all be set to “Default”. If every heat source schedule item register is set to “Default”, the selected heat source schedule will be set to “Default”. If the heat source schedule is modified via the online portal and it is possible to represent the new schedule as either a “Default” schedule or a “Custom” schedule, the selected heat source schedule and heat source schedule items will be updated accordingly. If the heating schedule is modified via the online portal and the new schedule may not be otherwise represented, the selected heat source schedule will be set to “Other” and the heat source schedule items will remain unchanged from their previous values. The value “Other” may only be set due to modification via the online portal. Trying to set the selected heating schedule to “Other” will result in an illegal data value exception.			

13.0 Installation: connectivity

13.8 Holding Registers

Address/Type	Parameter	Description
42203 - 42250 UINT16[48]	Heat Source Schedule Items	Sets/shows the heat source schedule items of a custom daily heat source schedule. The day is divided into 48 periods of 30 minutes, beginning at 00:00. Each period is represented by a modbus register, which corresponds to the preferred heat source. Each is set in the same way as the default heat source above. Notes: If the selected heat source schedule is set to "Default", the heat source schedule items will all be set to "Default". If every heat source schedule item register is set to "Default", the selected heat source schedule will be set to "Default". If the heat source schedule is modified via the online portal and it is possible to represent the new schedule as either a "Default" schedule or a "Custom" schedule, the selected heat source schedule and heat source schedule items will be updated accordingly. If the heating schedule is modified via the online portal and the new schedule may not be otherwise represented, the selected heat source schedule will be set to "Other" and the heat source schedule items will remain unchanged from their previous values.

13.9 Modbus network setup

By default, Mixergy cylinders ship with the modbus TCP link configured in DHCP mode. If DHCP is not used for the TCP ethernet network, a fixed IP can be configured. For further details on this process, go to support.mixergy.co.uk.

14.0 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.
4. 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.

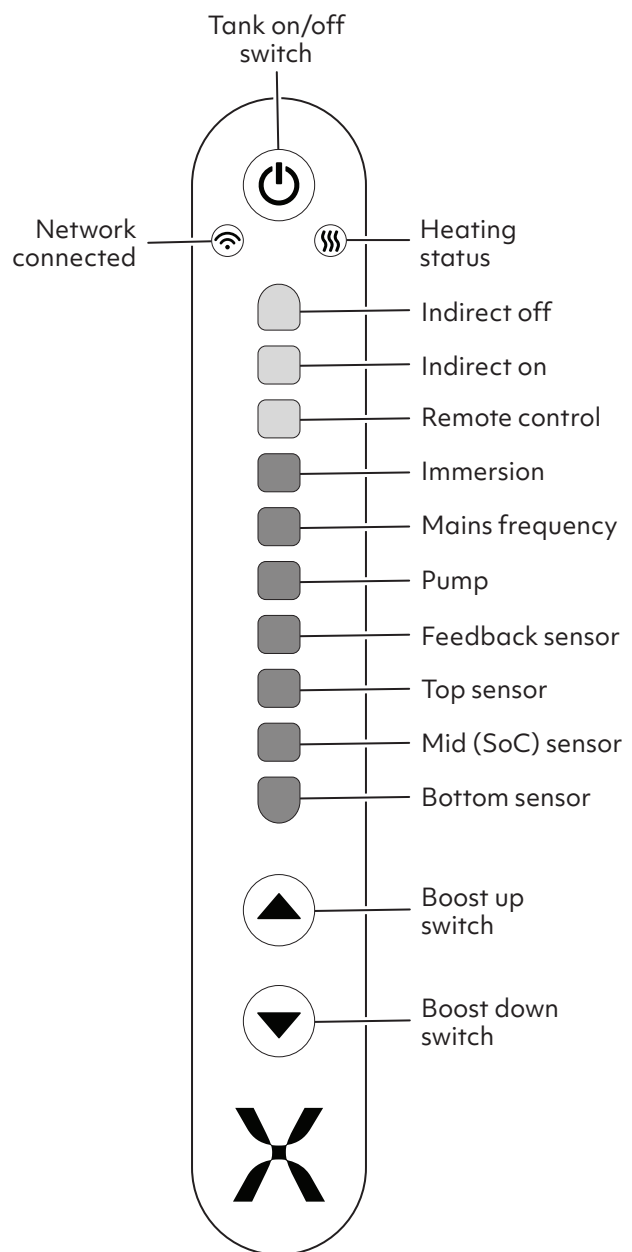
5. Switch on the Mixergy cylinder and check for correct operation. **Mixergy cylinders come supplied in 'eco mode'. Pressing any button on the gauge twice will exit eco mode.**

On power up the tank controller runs a series of tests and displays the results on the gauge.

Note that this will only run when the main controller has booted up which takes approximately 50 seconds.

Check that no LEDs light red and that the bottom seven LEDs light green.

Fig. 24 shows the meaning of each LED.



Key - Light colours

Blue

Green

Fig. 24

14.0 Commissioning

Note that if a voltage is applied to the Remote Control input the Remote Control LED will light green rather than blue.

Check that all buttons (boost UP, boost DOWN and power) work correctly.

Ensure the cylinder's gauge illuminates and all buttons (boost UP, boost DOWN and power) work correctly.

For more detailed guidance on gauge operation, please visit support.mixergy.co.uk

14.1 Access the controller

Access to the electronics can be made by loosening the two screws at the bottom of the controller and lifting up on the lid (Fig. 25).

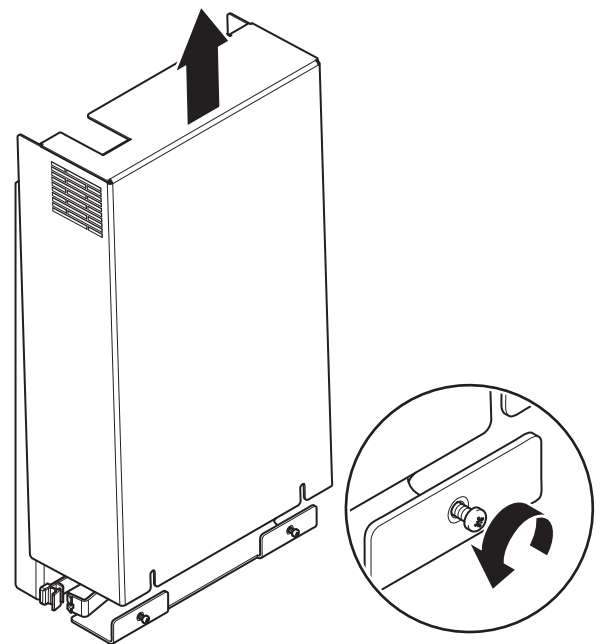


Fig. 25

14.2 Connect peripherals

Peripheral devices (such as the included gauge, PV diverter etc.) can be connected to the smart controller by plugging into the RJ-45 ports labelled 'zoneBUS'.

For specific installation instructions on devices other than the gauge, please refer to the installation manual included with that device.

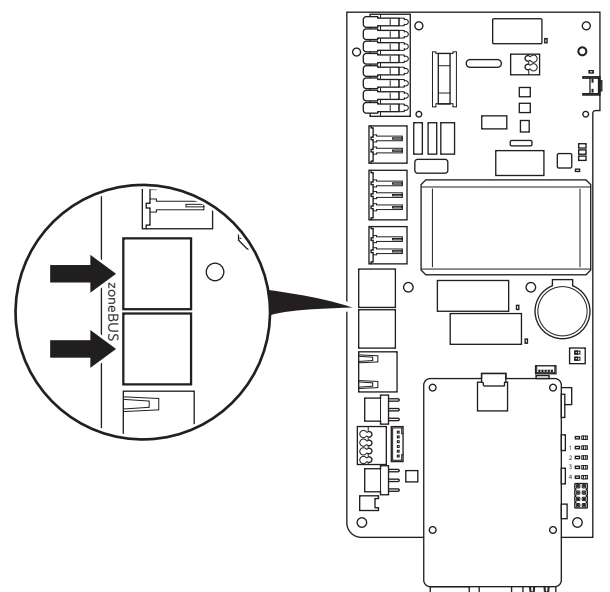


Fig. 26

14.0 Commissioning

14.3 Power and check status

Check status LEDs on the controller PCB. If any fault codes are lit, refer to the 'Fault code table' on page 49. Allow for 5 minutes of on time to ensure any pending firmware updates are completed before turning the controller off.

When the smart controller is first turned on, fault code 1 may appear for a short duration during the controller's boot sequence.

If fault code 2 is present (firmware update in progress), do not switch the controller off.

LED label	Location	Ideal state	Description
RELAY ON	1	ON (Green)/OFF	Indicates an indirect call for heat is active
STAT	2	OFF	Indicates indirect stat has tripped, press button to reset
PWR ON	3	ON (Green)	Indicates all power rails good on the control board
RELAY ON	4	ON (Green)/OFF	Indicates immersion output set to 'HEATER2'
RELAY ON	5	ON (Green)/OFF	Indicates immersion output on for either HEATER1 or HEATER 2
COM	6	Flashing (Green)	Indicates communication between SBC and controller
FAULT	7	OFF	Refer to "Fault code table" on page 34

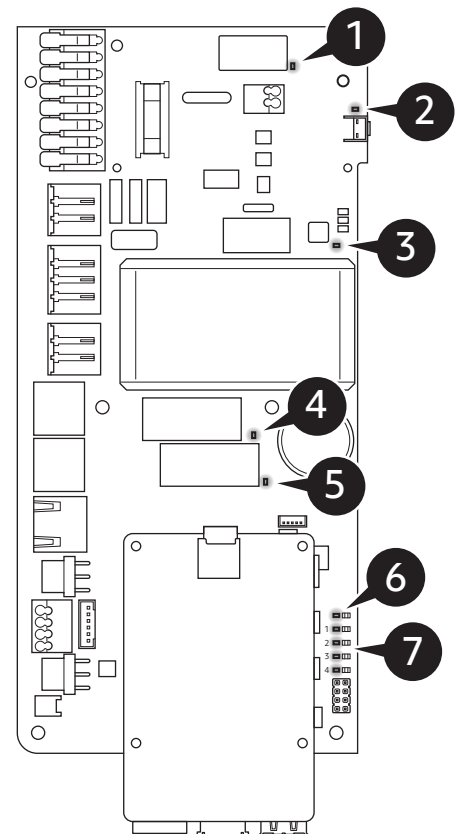


Fig. 27

14.0 Commissioning

14.4 Changing heat sources

All Mixergy systems leave the factory in direct (electric) operation. In the case of a heat pump or indirect (boiler) installation, the cylinder's primary heat source must be switched to their relevant setting to allow for operation of the 2 port valve and boiler or heat pump.

During commissioning, the primary heat source can be set by holding the boost UP and DOWN buttons simultaneously (1). The display will illuminate 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 have changed to the required colour (BLUE for direct, RED for indirect, GREEN for heat pump). The display will then flash either blue, red or green to indicate the new default heat source (2). Switch the cylinder off and on (power cycle) for the change to take effect.

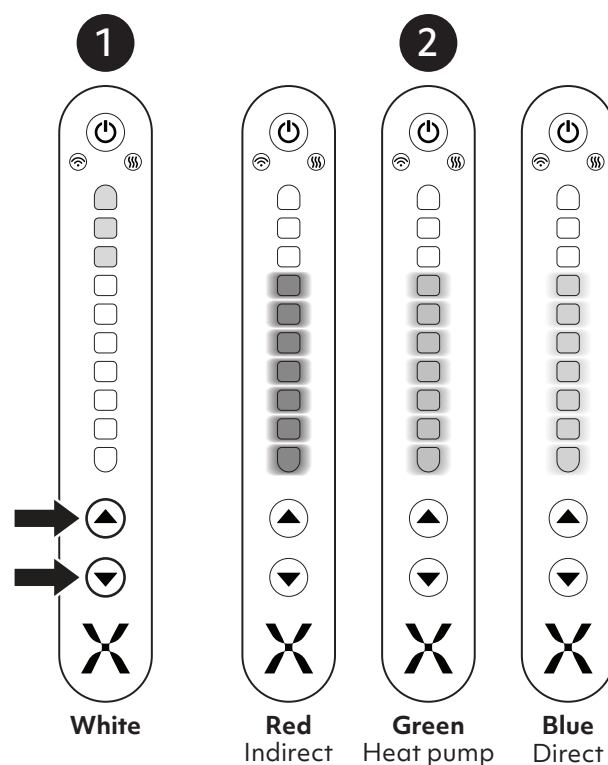


Fig. 28

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.

14.5 Self-test troubleshooting

Sensor

If any of the 4 sensor results (bottom, charge, top and feedback) show a red LED, double check that the 'CYL SENSOR' is correctly plugged in and the cylinder is within a safe temperature range (between 5 °C and 65 °C.) Try unplugging and plugging the sensor. If the problem persists.

Mains measurement

Double check the incoming supply connection. If the fault persists.

Pump

Check that the cylinder's circulator pump cable is plugged into the 'PUMP 1' header. Check the pump is correctly plugged into the pump cable extension. If the problem persists.

Immersion heater

Check that the cylinder's immersion heater is plugged into the 'HEATER 1' header. Check that the immersion thermostat is set to the maximum value. Ensure the cylinder is not overheated (>65 °C.) If a PV diverter is fitted, ensure it is plugged into the zoneBUS network of the controller. If the diverter has not been factory fitted, 'device discovery' may need to be run via the app in order to configure the PV diverter. If the problem persists.

Remote control, Indirect on/off

Check that a blue LED is shown. If a remote control signal is present, the remote control LED should light green. If any of these faults persist, go to support.mixergy.co.uk

14.6 Replace lid

Once commissioning is complete, power off the controller, replace the lid and switch the controller back on.

14.0 Commissioning

14.7 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.

Customer name:		Telephone No:	
Address:			
Cylinder model:			
Cylinder serial no:		Date:	
Commissioned by: (Print name)		G3 Certificate No:	
Company name:		Telephone No:	
Company address:			

ALL SYSTEMS

What is the incoming static cold-water pressure at the inlet to the system?					bar	
Has the strainer been cleaned of installation debris?	Yes		No			
Is the installation in a hard water area (above 200ppm)?	Yes		No			
If yes, has a scale reducer been fitted?	Yes		No			
What type of scale reducer has been fitted?						
What is the hot water temperature set to?						°C
What is the maximum hot water flow rate (measured at high flow outlet)?						min

14.0 Commissioning

ALL INSTALLATIONS

The hot water system complies with the appropriate Building Regulations	Yes	
The system has been installed in accordance with the manufacturer's instructions	Yes	
The system has been commissioned in accordance with the manufacturer's instructions	Yes	
The cylinder is ready to be connected to the internet and account registered	Yes	
The manufacturer's literature has been explained and left with the customer	Yes	
Commissioning Engineer's Signature		

- * All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulation Compliance Certificate will then be issued to the customer.

15.0 Problem solving



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

15.1 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 your original installer or contact Mixergy directly if your product is under warranty.



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

15.2 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. Should a replacement be required then only one supplied by Mixergy should be used.

15.3 Electrical fault

If an electrical fault of the controller is suspected or the electrical system does not operate as expected, please visit support.mixergy.co.uk for further guidance.

15.4 Connectivity issues

If a connectivity issue is suspected, please visit support.mixergy.co.uk for further guidance.

15.5 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.

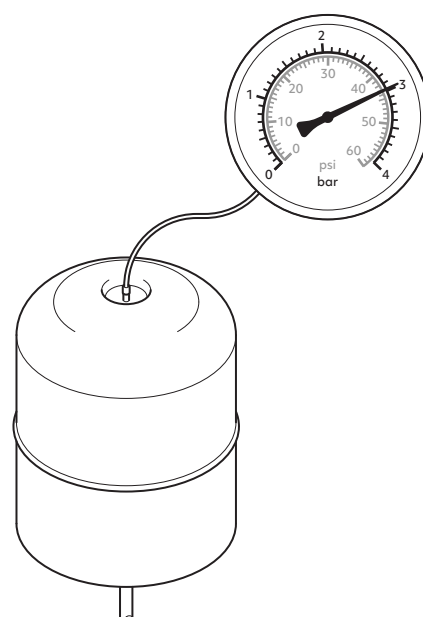


Fig. 29

15.6 Safety valves

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

15.0 Problem solving

15.7 Fault code table



Do not switch off power to the system if a firmware upgrade (code 2) is in progress.

The LEDs below are situated inside the Mixergy controller on the PCB marked **FAULT**, please follow safe isolation procedure before removing cover.

LED code				Fault code	Fault description	Fault condition
1	2	3	4			
				1	No comms from SBC	No comms received by cylinder MCU for >2 seconds
				2	Firmware update active	Firmware update currently in progress
				3	Cylinder sensor problem	Any thermocline sensor readings out of bounds
				4	Energy measurement issue	Unable to get energy readings from chip
				5	Heater 1 issue	Energy flow out of bounds when heater 1 is turned on
				6	Heater 2 issue	Energy flow out of bounds when heater 2 is turned on
				7	PV diverter not responding	No comms from PV diverter for >2 seconds
				8	Current sensor problem	No comms from EMC/ Current interface
				9	Ambient sensor issue	Ambient sensor reading out of bounds
				10	S1 issue	Sensor1 reading out of bounds
				11	S2 issue	Sensor2 reading out of bounds
				12	Pump1 issue	Energy flow out of bounds when pump1 is turned on
				13	Pump2 issue	Energy flow out of bounds when pump2 is turned on
				14	Reserved	
				15	Reserved	

Faults highlighted in grey are configuration specific and do not apply to standard direct/ indirect systems. If you are unable to rectify any fault yourself, please contact Mixergy directly and quote the fault code on the table above.

15.0 Problem solving

15.8 No PWR ON LED

If the PWR ON LED is not lit, this indicates an issue with the unit's power supply. Double check the incoming supply & check fuse F1 for continuity. If the fuse has failed, it is recommended to first disconnect and check the immersion heater(s) for faults before replacing the fuse.

15.9 STAT LED on/stuck on

If the STAT LED is solid red, this indicates a fault condition with the electronic thermostat. If the cylinder is in a safe condition ($<70^{\circ}\text{C}$), press the stat reset button on the right side of the controller. If the issue persists, double check the cylinder sensor is plugged in properly. If the installation is indirect, check that the cylinder 2-port valve is free to move and not stuck in the open position.

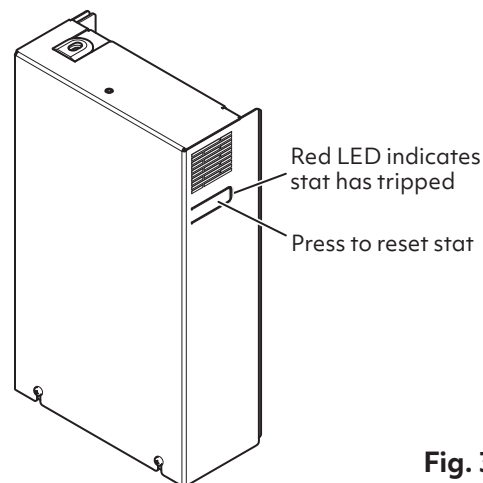


Fig. 30

16.0 Draining the cylinder

1. Switch off the immersion heater(s), boiler 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.

16.1 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.

17.0 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 visit: support.mixergy.co.uk

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.

Model code	MX-180-ELE-EXT-550-1-1-A
Total weight	227 kg (wet), 54 kg (dry)
Immersion heater rating	230-240 V~ 2.7-3.0 kW
Immersion heater type	1 3/4" BSP - 400mm Incoloy
Standing heat loss/24 hr	1.8 kWh
Heat exchanger rating	-- kW
Max. supply pressure	1 MPa (10 bar)
Expansion relief pressure	0.6 MPa (6 bar)
Max. operating pressure	0.55 MPa (5.5 bar)
Max. coil pressure	0.35 MPa (3.3 bar)

MX000000	
Scan the QR code to add your tank to your account or visit www.mixergy.io/register	
mixdevice-aaaaa-bbbbbb-cccc-ddddd-eeee	

Fig. 31

17.0 Replacement parts

Part description	Part number
Pump	MME0370
Controller	MAS0191
Gauge	MAS0043
Controller fuse	MEC0110
Pump cable	MAS0082-01

18.0 Guide to safe isolation

A Mixergy cylinder may have more than one incoming main electrical supply and point of isolation.

All of which must be “Proven Dead” before commencing work.

Primary supply: 16A MCB protected circuit with a 20A DP switch

Indirect control: 3A fuse spur

Timer control: 3A or 13A fuse spur

All of which must be isolated and locked-off before testing.

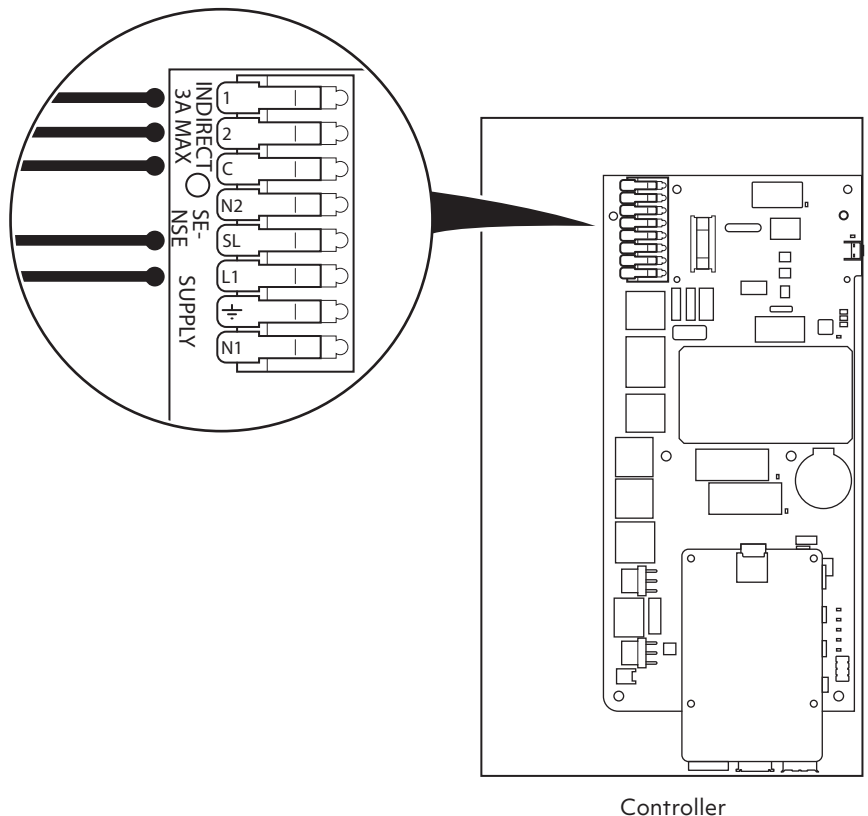


Fig. 32

For more information on safe isolation see www.electricalsafetyfirst.org.uk and search best practice.

19.0 Servicing and maintenance

ANNUAL MAINTENANCE should be performed by a competent operative.

A maintenance record should be kept on the service record on page 54 of this booklet.

19.1 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 48.

19.2 Disassociating an account

If a new user is moving into the property and the user of the account tied to the cylinder needs to be changed, the new user 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. For more information go to support.mixergy.co.uk.

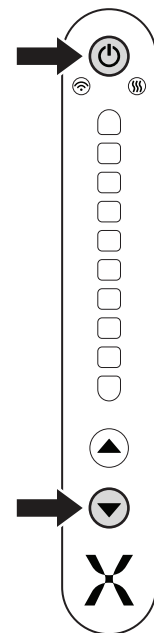


Fig. 33

20.0 Service Record

It is recommended that your hot water system is serviced regularly and that the appropriate service record is completed.

Before completing the service record below, please ensure you have completed the service in accordance with the manufacturer's instructions.

Service No.1	Date		Service No.2	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.3	Date		Service No.4	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		

20.0 Service Record

Service No.5	Date		Service No.6	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.7	Date		Service No.8	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.9	Date		Service No.10	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		

20.0 Service Record

Service No.11	Date		Service No.12	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.13	Date		Service No.14	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.15	Date		Service No.16	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		

20.0 Service Record

Service No.17	Date		Service No.18	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.19	Date		Service No.20	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.21	Date		Service No.22	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		

20.0 Service Record

Service No.23	Date		Service No.24	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.25	Date		Service No.26	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		
Service No.27	Date		Service No.28	Date	
Engineer name			Engineer name		
Company name			Company name		
Telephone No.			Telephone No.		
Email address			Email address		
Comments			Comments		
Signature			Signature		

For further guidance and troubleshooting
visit **support.mixergy.co.uk**

kiwa



 **hot water
association**

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