MHG HEATING LTD

TELEHEAT TPE04
Heat Interface Unit.

Installation, Commissioning and Servicing Instructions

Note: THESE INSTRUCTIONS MUST BE READ AND UNDERSTOOD BEFORE INSTALLING, COMMISSIONING, OPERATING OR SERVICING THE EQUIPMENT.

THE TELEHEAT TPE04 UNIT IS INTENDED FOR USE IN LOW TEMPERATURE 'DISTRICT HEATING' SCHEMES.

THIS HEAT INTERFACE UNIT COMPLIES WITH THE ESSENTIAL REQUIREMENTS OF THE LOW VOLTAGE DIRECTIVE 2006/95/EC AND THE ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2004/108/EC.

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1. GENERAL WARNINGS

Caution – Risk of Electrical Shock

Caution – Risk of Danger

Inside the unit there is 230V, so unit MUST be isolated when being worked on and must only be serviced by a competent and authorised person.

Water inside the unit can be at temperatures of up to 85°C so great care must be taken when changing, adjusting or servicing components within the unit and again must only be done by a competent and authorised person.

The unit weighs 32 kgs so should be lifted by two people to reduce potential injury from lifting heavy objects.

2. GENERAL REQUIREMENTS

2.1 Related Documents

The Pressure Systems Safety Regulations 2000

It is the law that pressure system appliances are installed, maintained and serviced by competent persons in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest and that of safety, to ensure that this law is complied with.

The installation of the Teleheat TPE04 unit should be in accordance with the relevant requirements of the Pressure System Regulations, Building Regulations and IEE Regulations.

2.2 Mains Water Connections

All connections to local water mains must comply with local requirements.

3. PRODUCT DESCRIPTION

This district heat interface unit is designed to be used on low temperature district hot water supply of up to 85°C. The unit is configured to provide indirect heating via underfloor heating system, and hot water supply both via separate heat exchangers.

The Teleheat TPE04 unit is housed in a powder coated steel cabinet with a removable front cover. Inside there is prefabricated pipework assembled together with a set of electronic valves that are controlled by an electronic controller which takes care of heating and hot water demand.

4. TECHNICAL DATA

Figure 1 - Basic Overall Dimensions

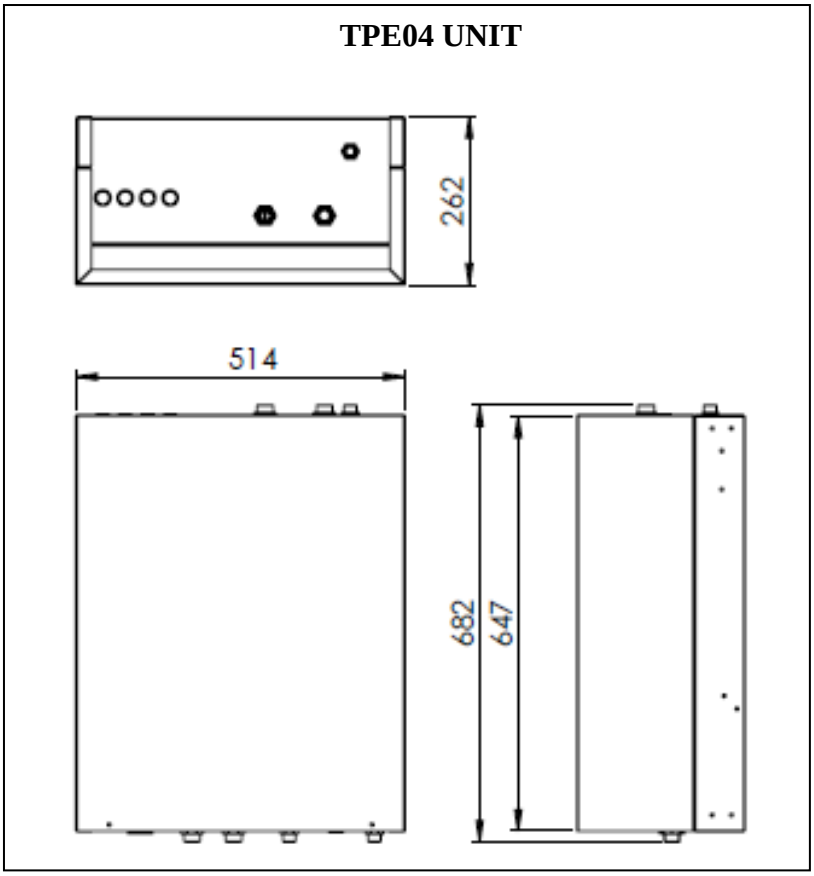


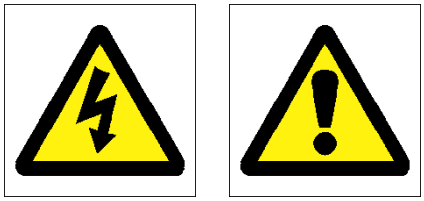
Figure 2 - TPE04 Technical Specifications

	Units	Standard
General		
Max Pressure – District Heat Circuit	Bar	6
Max Pressure – Heating Circuit	Bar	3
Max Pressure – Cold/Hot Water Circuit	Bar	10
Min Flow Rate – Hot Water Circuit	l/m	2.6
Max Flow Rate – Hot Water Circuit	l/m	14
Hydraulic Resistance excluding Heat Exchangers @ 12 l/m	kPa	17
Unit Weight - Empty	Kgs	32
Available Settings		
Heating Circuit Flow Temperature	°C	30 – 45
Hot Water Flow Temperature	°C	40 – 60
Hot Water Performance		
10°C to 50°C @ 14l/m	kW	38.83
Primary Return [Flow 80°C @ 11.7 l/m]	°C	31.02
Heat Exchanger Pressure Drop	kPa	10.7
Heating Performance		
Pump		UPS15-60
Flow Curve		See Appendix 4
Delta T of 10°C at 18l/m	kW	12.46
Heat Exchanger Pressure Drop	kPa	7.88
District Heat Provision		
Minimum flow rate @ 80°C to provide DHW at above rates	l/m	11.70
Electrical Data		
Electrical Supply		230V / 50HZ AC
Run Current	Watts	105
Connection Data		
'District' Inlet and Outlet		¾" Male BSP
Heating System Inlet and Outlet		¾" Male BSP
Cold/Hot Water Inlet and Outlet		½" Male BSP

System Features:

- Hot water priority
- Preheat function available to speed up hot water production
- Heating ramp up within 3 minutes
- Automatic unit shut down if heating flow temperature exceeds 50°C
- Pump Antilock feature which runs pump 5 Seconds Every 24 hours

5. INSTALLATION



Note – when working with the unit, supply services when connected could reach 85°C, and once electrically connected the station has 230V present within. The unit weighs 32 kgs so should be lifted into place by two persons.

5.1 Location

Refer to below Figure 3 for connection dimensions. You will need access from above and below the unit to run the relevant pipework to and from the unit. Find a suitable space to mount the unit.

Figure 3 - Connection Locations & Dimensions

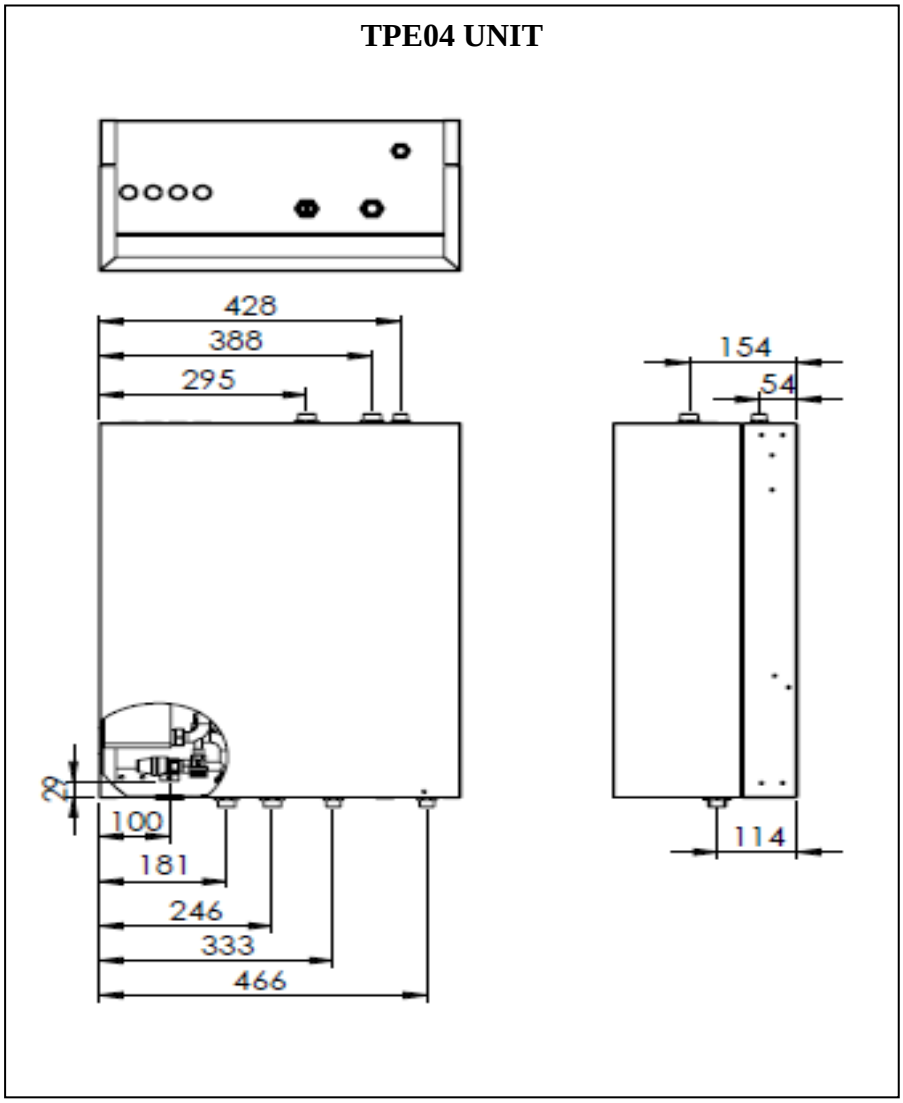
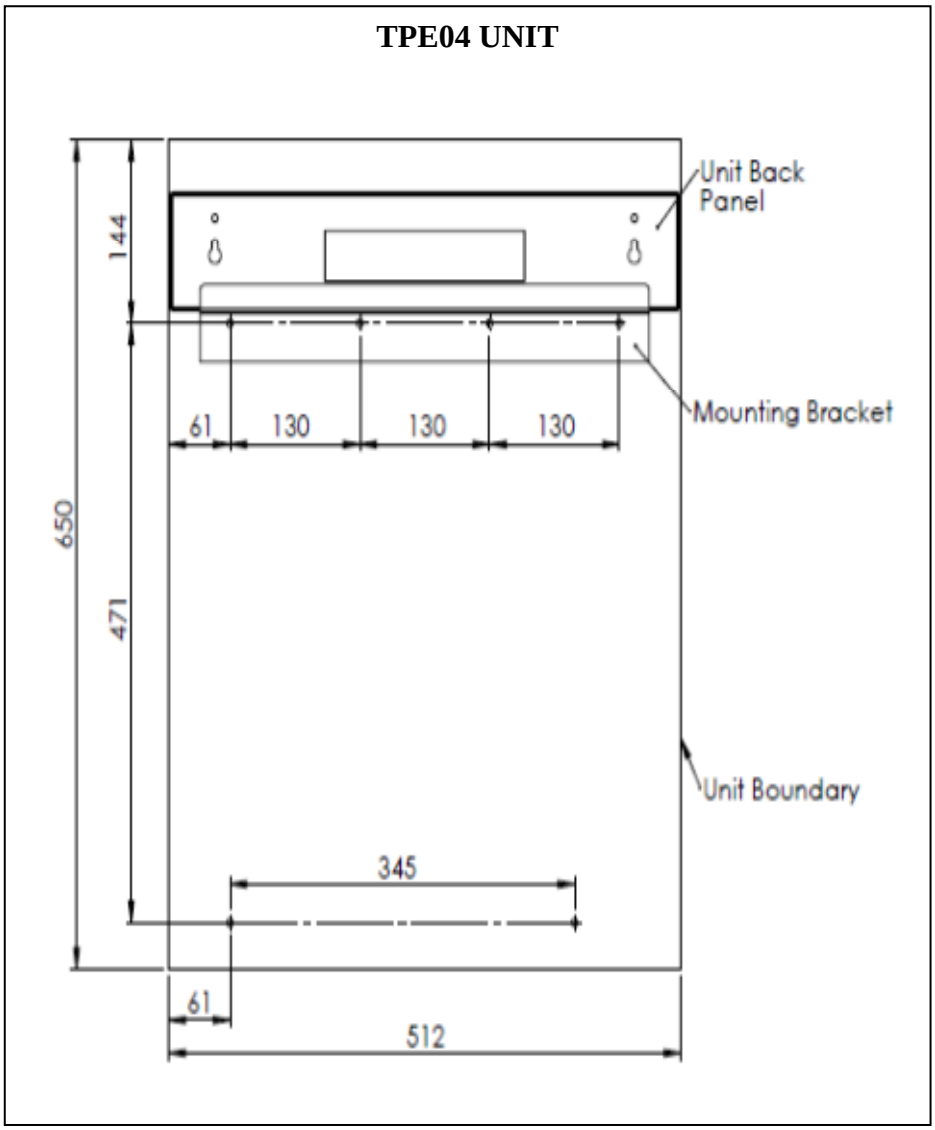


Figure 4 – Wall Mount Dimensions

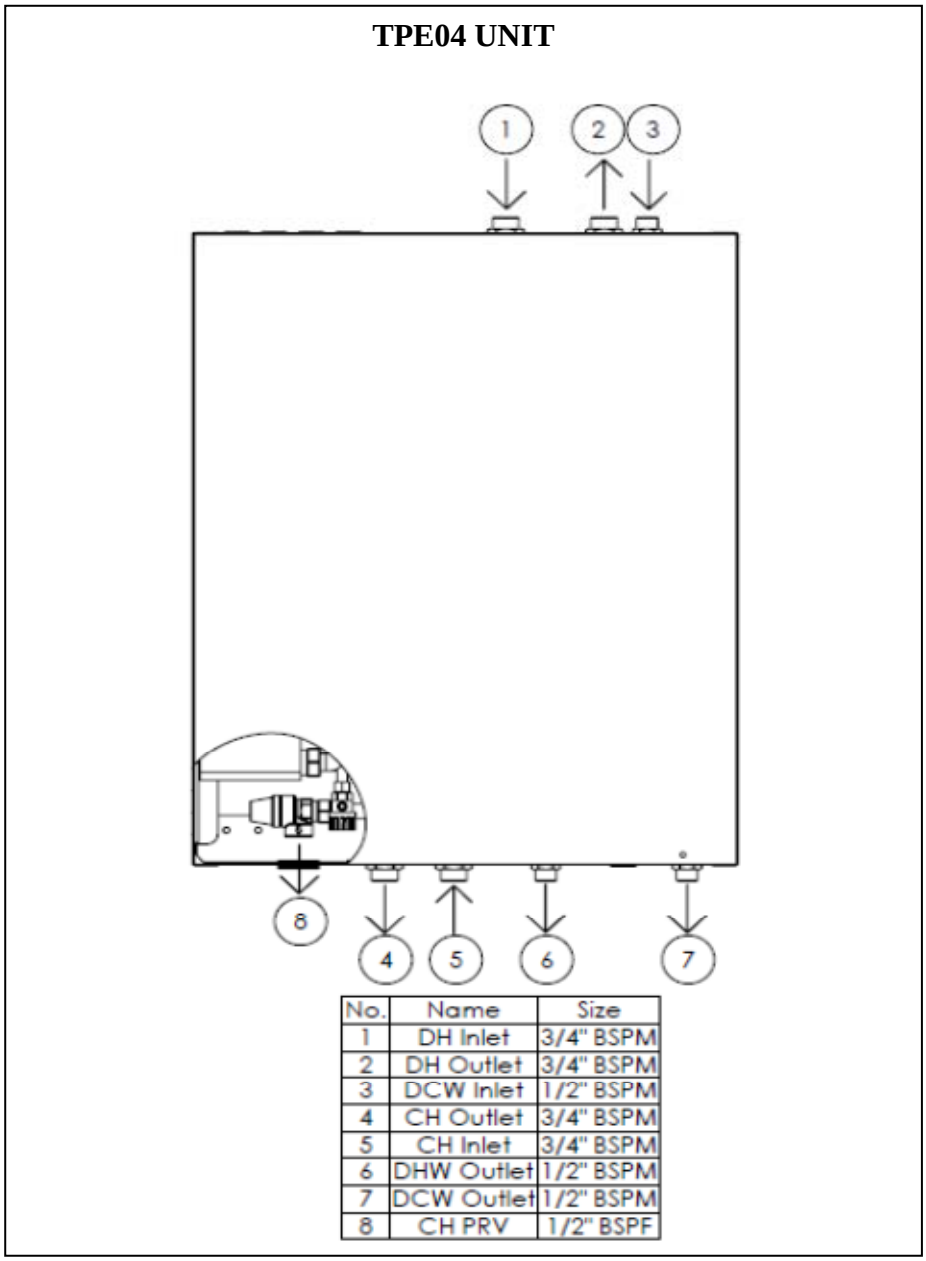


Using the hanging bracket provided [see Figure 4], secure the bracket to the wall and mount station on to the bracket hanging from the unit back panel as shown above. Once mounted, mark the bottom two holes on wall, take station back off the bracket, drill the two holes, insert wall plugs, re-hang the station and then secure using the bottom two holes just provided.

5.2 Pipework Connections

The 'district' and apartment pipework should be connected to the appropriate points labelled on the figure below. It is advisable to provide means of isolation and disconnection [via unions] on all connections to the unit to facilitate replacement of the unit if this is ever required. You need to ensure that the systems you are connecting to, are clean or have been flushed out appropriately.

Figure 5 – Pipework Connections



No.	Name	Size
1	DH Inlet	3/4" BSPM
2	DH Outlet	3/4" BSPM
3	DCW Inlet	1/2" BSPM
4	CH Outlet	3/4" BSPM
5	CH Inlet	3/4" BSPM
6	DHW Outlet	1/2" BSPM
7	DCW Outlet	1/2" BSPM
8	CH PRV	1/2" BSPF

1) ‘District’ Inlet and Outlet – 3/4" Male BSP

These are situated at the top of the station, with inlet on the left [Connection 1 – Figure 5] and outlet in the middle [Connection 2 – Figure 5]. When connecting the district supply to and from the unit, ensure to provide air eliminator at upper most point of pipework.

2) Heating Inlet and Outlet – 3/4" Male BSP

These are situated at the bottom of the station with the heating flow on the far left [Connection 4 - Figure 5] and heating return on the next right [Connection 5 – Figure 5]. Connect these to your heating distribution system.

3) Cold Water Inlet/Outlet and Hot Water Outlet – 1/2" Male BSP

The inlet is situated at the top of the unit [Connection 3 - Figure 5]. The outlets are at the bottom being the ½" connections. The cold water outlet is the far right connection [Connection 7 - Figure 5]. The hot water outlet is to the left of this [Connection 6 - Figure 5]. Connect your mains cold water to the cold water inlet and cold water outlet to the cold water distribution pipe in accordance with local by-laws, and connect your hot water distribution pipe to the hot water outlet on the unit.

4) Safety Relief Discharge – ½" Female BSP

This is provided on the heating circuit and needs to be safely piped away via a suitable tundish according to local bylaws. A hole is provided in the metalwork to allow pipework to leave the unit.

5.3 Electrical Connections

All wiring to the unit must be in accordance with the IEE regulations, and any local regulations which apply. Note: If in any doubt a qualified electrician should be consulted.

The unit is supplied with a 2m 3-core flying lead for connection to mains supply. Mains connection must be done through a fused isolator rated at 3 Amps and positioned locally to the unit.

The unit is also provided with a 2m 2-core flying lead for connection to a remote controller.

6. OPERATION OF THE UNIT

Refer to Appendix 1 for unit schematic to help understand how the unit works.

6.1 Unit Operation

Whenever power is applied to the unit, the stepper motors are reset to ensure they are in their correct position, so you are likely to hear a clicking noise from the motors. This is normal. Once the motors are in their correct position the unit is ready for its operation.

6.2 Heating

The unit can be operated by an Open Therm controller, and when there is a heating demand, the solenoid valve opens and allows full flow of district supply which then goes through a modulating control valve. The diverter valve will send the district supply to the heating exchanger. The pump on the secondary side also comes on.

On the secondary side of heat exchanger a temperature sensor is fitted at the outlet of heat exchanger which measures the heating flow temperature. The electronics will ramp up the flow temperature over a period of 3 minutes and will then aim to keep the flow temperature at the desired setting whilst there is a heating demand.

When the heating cycle finishes, the solenoid valve will close, and the pump will stop.

The unit is set for underfloor heating mode and comes with a safety Klixon which is attached to the heating outlet. This device will lock out the unit if the temperature of heating flow exceeds 50°C. If this happens the electronic box will have to be reset manually [see section 9 Fault Finding].

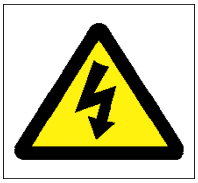
6.3 Hot Water

Hot Water has priority and when the flow sensor detects water flow above 2.6l/m, the unit switches into hot water mode. The solenoid valves opens and allows full flow of district supply which then goes through the modulating control valve. The diverter valve will send the district supply to the hot water exchanger.

On the secondary side of the heat exchanger a temperature sensor is fitted to measure the hot water flow temperature. The electronics will control the flow of district supply in order to provide hot water at the set temperature.

When the hot water flow falls below 2.4l/m, unit will switch out of hot water mode. The solenoid valve will close and the unit will then return to heating mode if required.

7. COMMISSIONING




Note – when working with the unit, supply services when connected could reach 85°C, and once electrically connected the station has 230V present within.

7.1 Filling Heating Circuit

You can fill the heating circuit using the filling loop provided within the system. The expansion vessel charge pressure has been pre-set to 1.5 bar. Adjust and fill system accordingly. Once you have bled and filled the heating circuit, you must disconnect the hose from both ends.

7.2 Heat Meter

The m-bus heat meter has been fitted to the flow pipe within the unit. You can connect an electricity meter for onward transmission. We attach booklet provided by Heat Meter company.

7.3 Cold Water Meter

The pulsed cold water meter has been fitted in the pipework. We have wired the cable into the Heat Meter.

7.4 System Safety Relief Valve

A 3 bar system safety pressure relief valve is provided within the unit which **MUST** be piped away via a tundish according to local guidelines.

7.5 Pressure Differential Valve (Utilising a 20-40kPa Spring)

The unit is fitted with a Pressure Differential Valve which has been preset so that the unit will work in most situations. We attach booklet provided with this valve in case any adjustments are required.

7.6 Heating Flow and Hot Water Flow Temperatures

These have been factory preset, but if you wish to alter the temperatures, then you need to access the electronic box and take off the plug covering the potentiometers – P1 [hot water flow temperature] and P2 [heating flow temperature] [see appendix 4]. Twisting either potentiometer clockwise with a screwdriver will increase the temperature and anti clockwise will reduce the temperature. Refer to Figure 2 [page 4] to see the settable range.

8. FAULT FINDING

Below is a list of possible issues and their solutions in case the unit does not operate correctly.

In the first instance it is best to switch off power to the unit, wait 10 seconds and then re-start the unit as this will re-set the stepper motors and might clear the problem. Check the LED's on the controller for any faults [see appendix 3].

It the unit still does not operate, then the next step is to check all wiring is correctly connected to the right components. Refer to Appendix 2 to check the wiring.

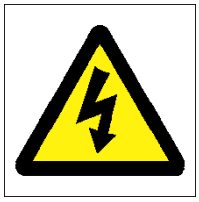
If the above does not rectify the problem then below are some suggested things to check to get unit working again.

Figure 6 - Fault Finding Guide

'District' water not entering the unit.	Blocked strainer	Unscrew the strainer cap bolt and take the strainer out, ensuring you have isolated station and waited for water to cool down. Clean or replace accordingly
	Solenoid valve not operating correctly.	Ensure there is positive pressure between inlet and outlet of valve. Check that 24V is being supplied to the DC coil. If above does not resolve issue, replace solenoid coil
No heating or hot water	Controller not calling for heating	Check controller settings
	Electronics in Fault Mode	Refer to appendix 3
	Solenoid valve not operating	See above
	Control Valve not operating or Diverter Valve not operating	Check that 24V is being supplied to either or both DC coils. If the above doesn't work then replace the relevant stepper motor.
	Pump not operating	Check that impeller has not seized. Check you have 240 volts going to the pump If above does not resolve issue, replace pump
	Hot Water Flow sensor not working	Check flow rate is above 2.6l/m If light on with no flow replace the sensor electronic If light doesn't come on with a flow rate of more than 2.5l/m replace sensor electronic
	Safety klixon tripped	Review why klixon has tripped out and re-set electronics [see appendix 2]

	'District' water temperature too low	If above does not resolve issue, replace Klixon Check 'District' supply conditions
Low Hot Water flow rate	Heat exchanger blocked Blocked cold water strainer	Flush or replace the heat exchanger Take out flow sensor cartridge and check strainer

9. SERVICING SCHEDULE




Note – when working with the unit, supply services when connected could reach 85°C, and once electrically connected the station has 230V present within.

It is recommended that the unit is serviced once every 12 months to maintain its efficiency and longevity.

a. Servicing the Strainer (Part 23 – Figure 7)

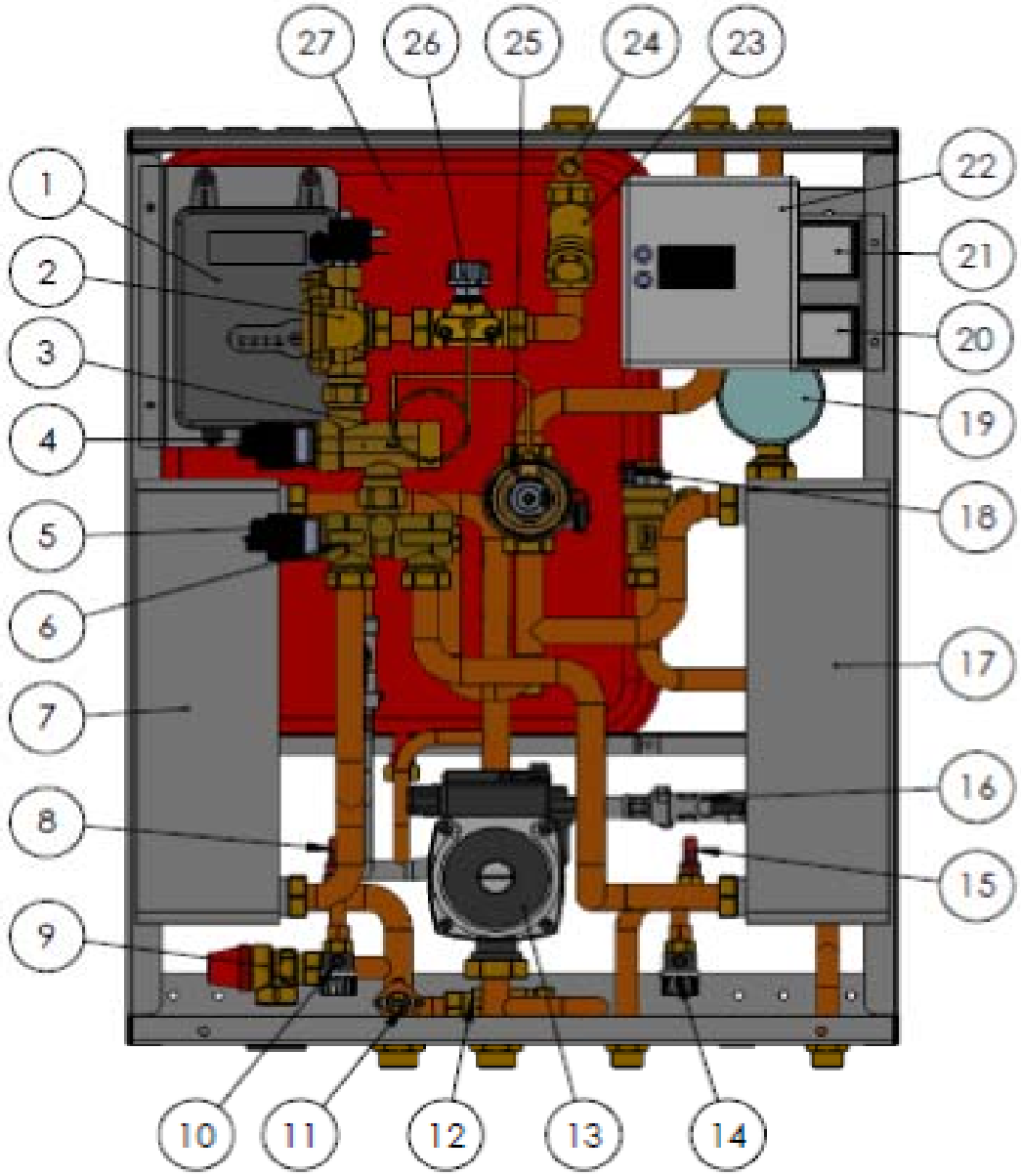
Isolate the unit from district supply. Open the screw cap from the strainer and take the filter cartridge out. Depending on the condition either clean it or replace it and put the screw cap back on again. Note the district water in the strainer could be 85°C.

9.2 Servicing the Expansion Vessel (Part 27 – Figure 7)

Drain the pressure from the heating system via the pressure relief valve. Check the charge of the pressure vessel according to system setting. Refill the system back to required pressure using the filling loop, but ensuring that you disconnect the hose both ends again after use.

10. INTERNAL COMPONENTS

Figure 7 – List of Components

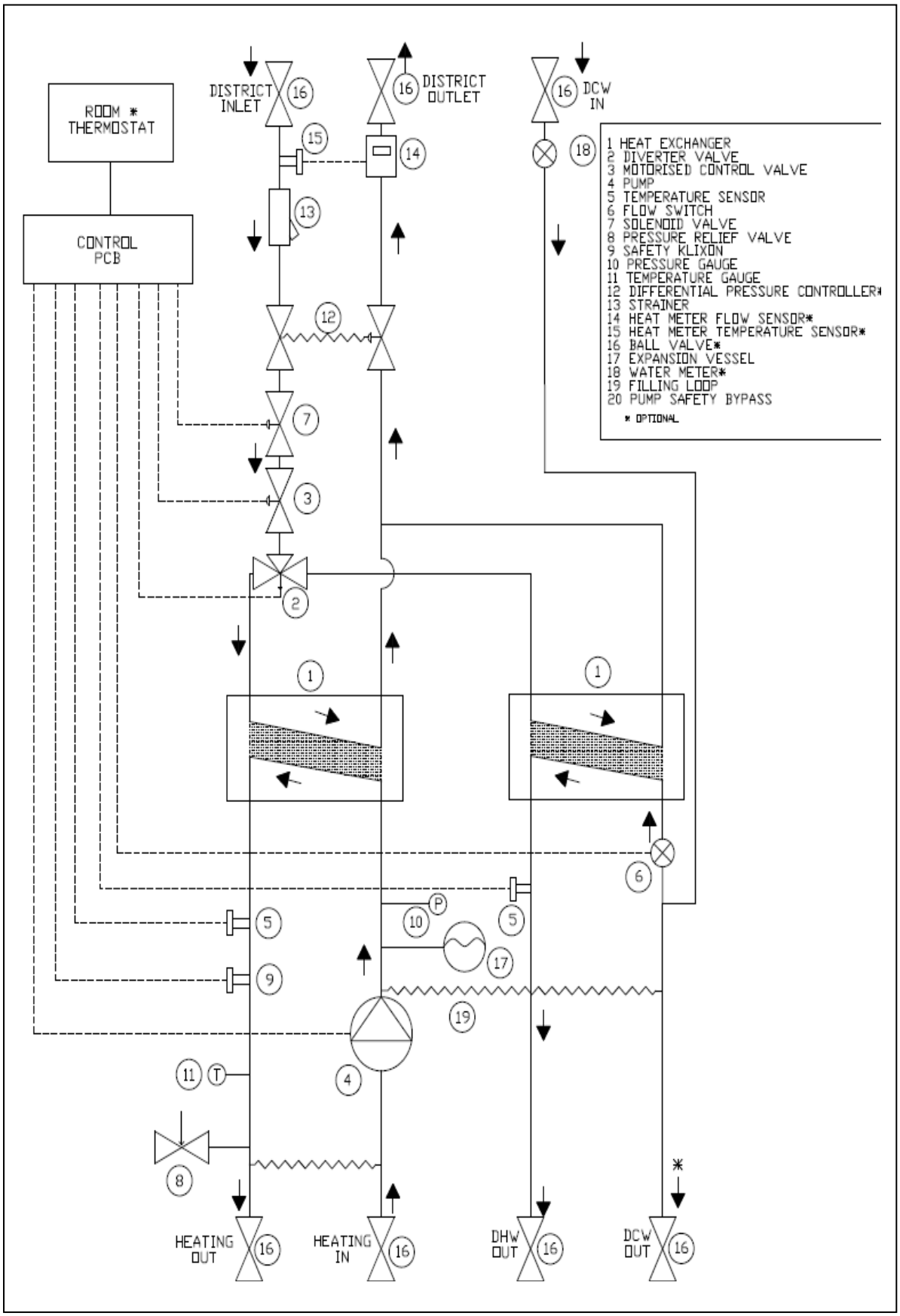


No.	Part
1	Electronic Control Box
2	Solenoid Valve
3	Motorised Control Valve
4	Stepper Motor
5	Stepper Motor
6	Diverter Valve
7	Heat Exchanger (CH)
8	Temperature Sensor (CH)
9	Pressure Relief Valve
10	Drain Valve
11	HT Klixon*
12	Pump Auto Bypass
13	Pump
14	Drain valve

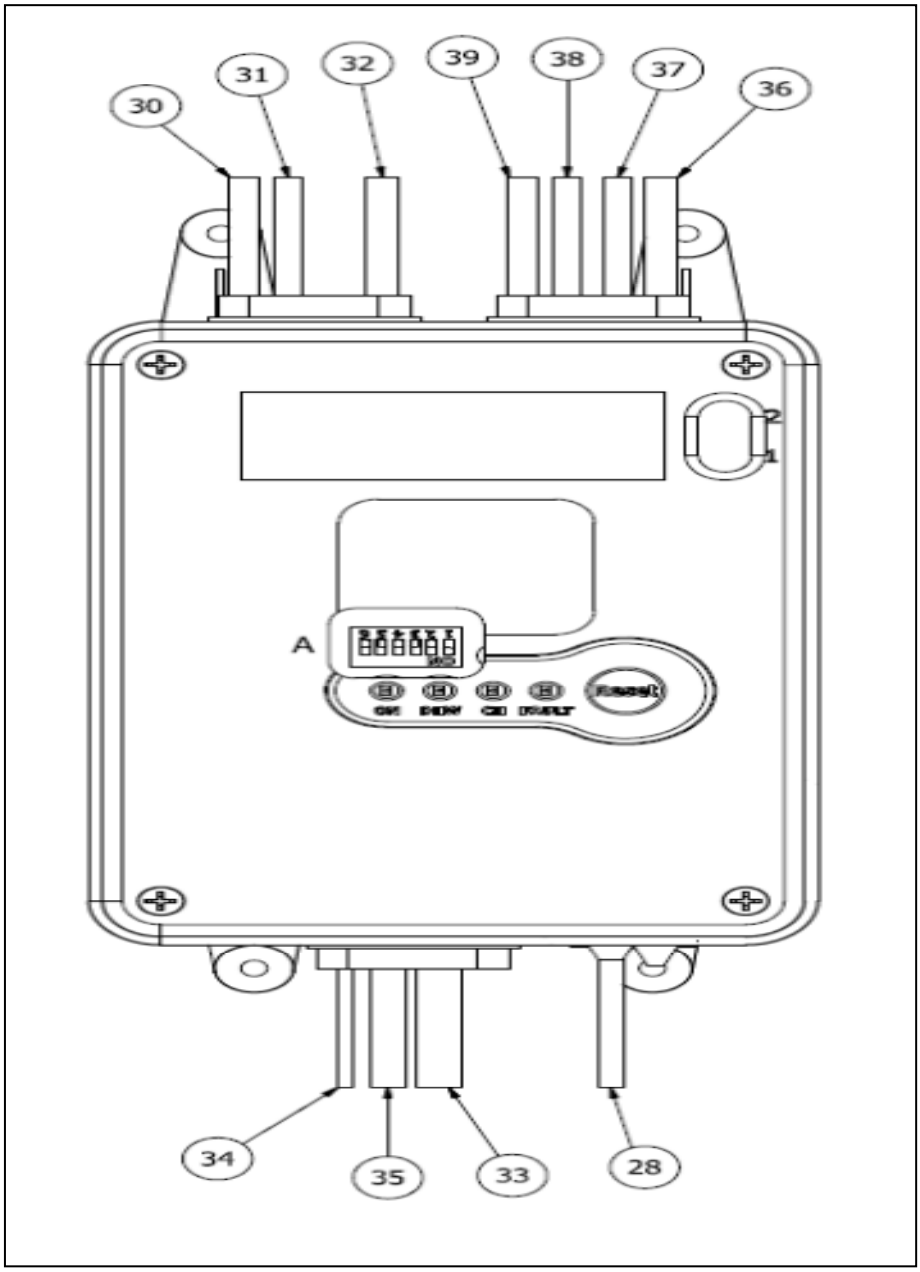
No.	Part
15	Temperature Sensor (DHW)
16	Filling Loop
17	Heat Exchanger (DHW)
18	Flow Sensor
19	Water Meter*
20	Temperature Gauge
21	Pressure Gauge
22	Heat Meter*
23	Strainer
24	Heat Meter Temperature Sensor*
25	PDV Balancing Valve*
26	PDV Adjusting Valve*
27	Expansion Vessel

*Optional

APPENDIX 1-CIRCUIT DIAGRAM.



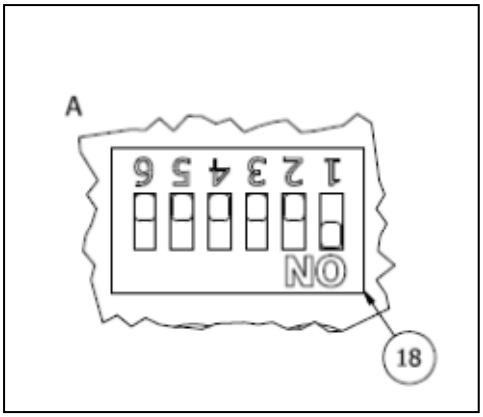
APPENDIX 2-WIRING SCHEMATIC.



No	Description	Individual Wiring	Connector
28	Remote Controller/Temperature Sensor	2 Black	n/a
30	DHW Temperature Sensor	2 White	Black Connector
31	DHW Flow Sensor	Red, White and Blue	White Connector
32	Mixing Valve Stepper Motor	Blue, Black, Brown and Green	White Connector
33	Mains Cable	Blue, Brown and Green/Yellow	n/a
34	Earth Cable	Green/Yellow	Non insulated Crimp Ring
35	Pump	N/a	Black Connector
36	Diverter Valve Stepper Motor	Blue, Black, Brown and Green	Blue Connector
37	CH Temperature Sensor	2 Red	Black Connector
38	Solenoid Valve	2 White	2 Terminal Crimps
39	CH Safety Thermostat	2 Black	2 Terminal Crimps

APPENDIX 3-DIP SWITCH AND LED LIGHTS

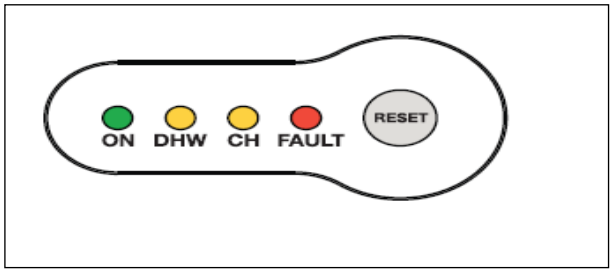
DIP SWITCHES



SWITCH	FUNCTION	ON	OFF
1	High temp / Low temp central heating	Low temp	High temp
2	N/A	N/A	Correct
3	N/A	N/A	Correct
4	Single plate / Twin plate	Twin	Single
5	DHW preheating	Enabled	Disabled
6	DHW sensor	Flow meter	Flow switch

N.B Switches 2 and 3 should always be in the off position, otherwise unit will not work. If in doubt do not make any changes.

MATRIX LED

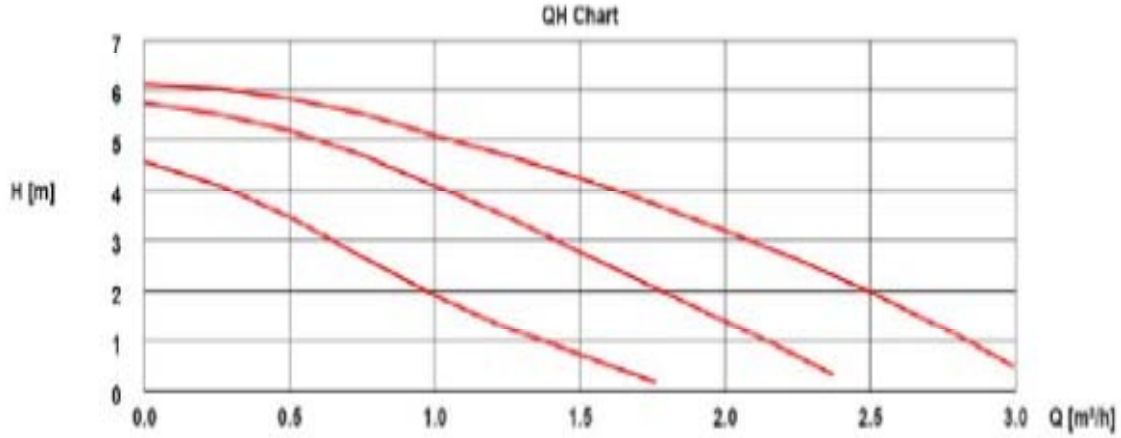


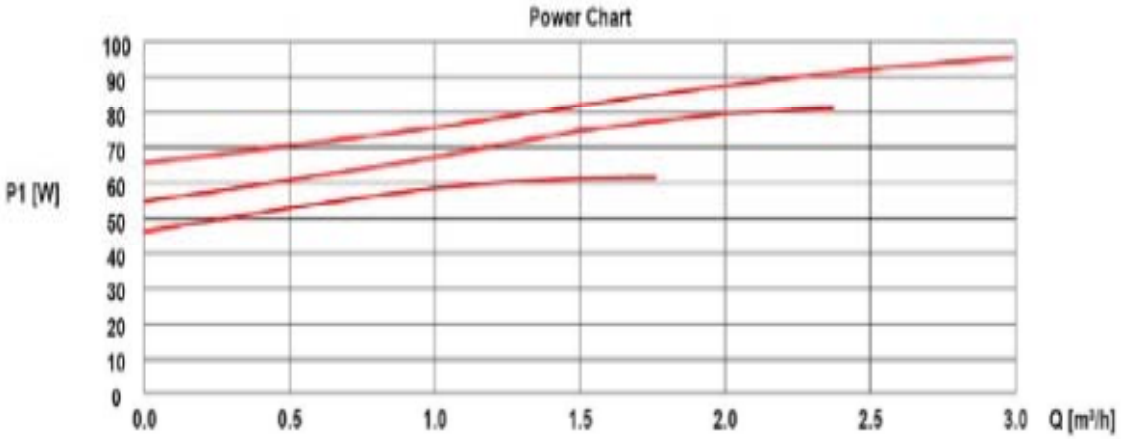
ANOTATION	COLOUR	LIGHT OFF	LIGHT ON	LIGHT FLASHING
ON	Green	Power Off	Power On	N / A
DHW	Yellow	No DHW Demand	In DHW Mode	Preheat Running
CH	Yellow	No CH Demand	In CH Mode	N / A
FAULT	Red	No Fault	Low Temperature lockout – requires reset	Sensor faults – replace failed NTC temperature sensor

APPENDIX 4 – PUMP INFORMATION

Performance curves :

UPSO15-60





Electrical data :

UPSO15-60 :

1x230V Max m3/h

Speed	P1 [W]	I1/1 [A]
3	96	0.42
2	81	0.37
1	62	0.29

Performance at 1 m3/h

Speed	P1 [W]	I1/1 [A]
3	76	0.33
2	67	0.30
1	53	0.24

Notes.