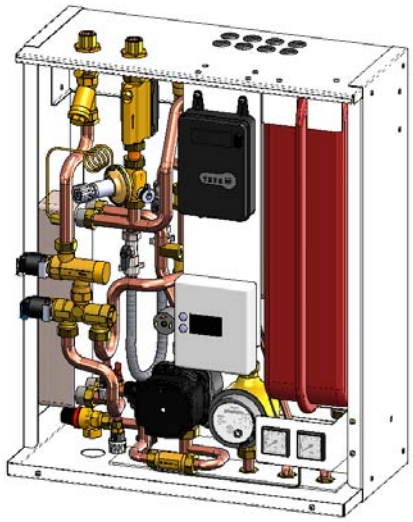
ECONOPLATE H2
HEAT INTERFACE UNIT

Installation, Commissioning and Servicing Instructions



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

THE ECONOPLATE H2 UNIT IS INTENDED FOR USE IN LOW TEMPERATURE DISTRICT HEATING SCHEMES.

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ECONOPLATE H2 IO&M 160401 DOC162-V6

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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.

1.0 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.

2.0 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 Econoplate H2 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.

3.0 PRODUCT DESCRIPTION

This district heat interface unit is designed to be used on low temperature district heating supply of up to 85°C. The unit is configured to provide indirect heating, either supplying underfloor heating or radiator systems via a heat exchanger, and hot water supply via a separate heat exchanger.

The Econoplate H2 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.

4.0 TECHNICAL DATA

The basic overall dimensions of the unit are shown below in Figure 1.

Figure 1 – Basic Overall Dimensions

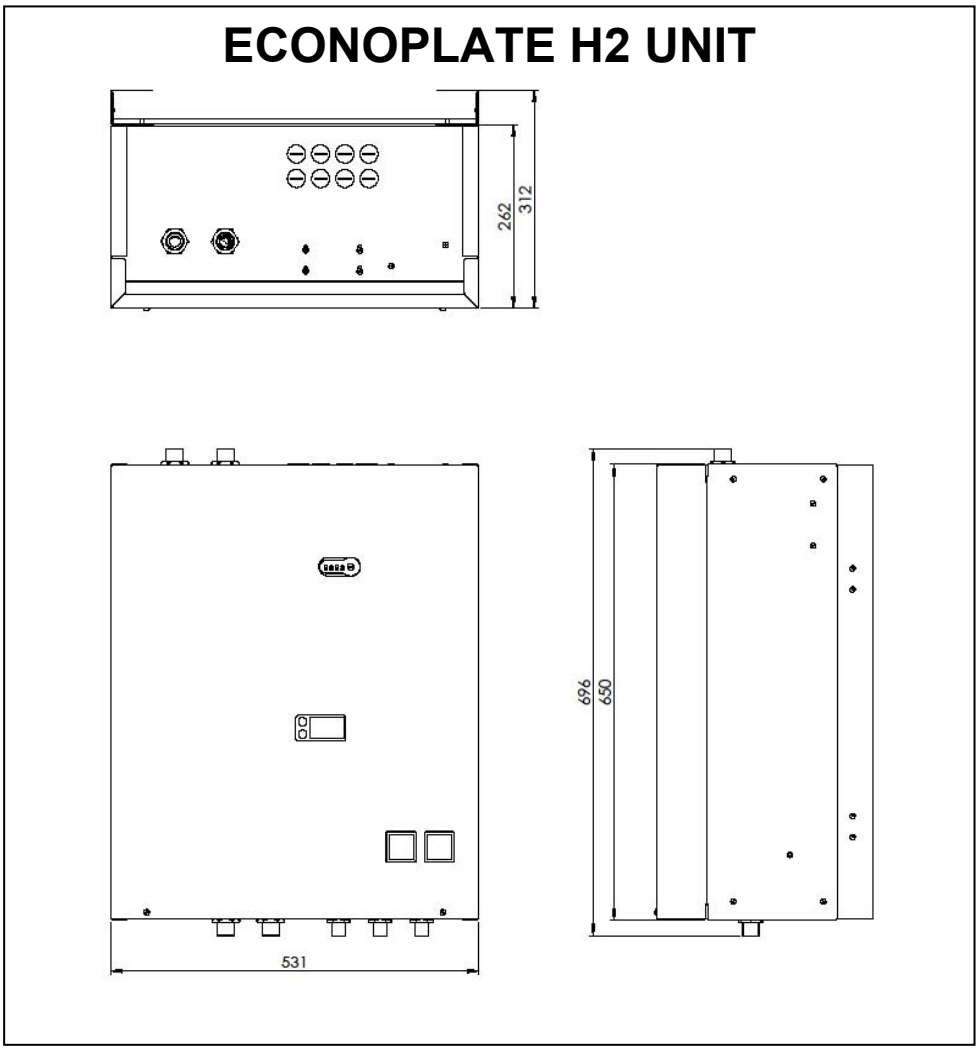


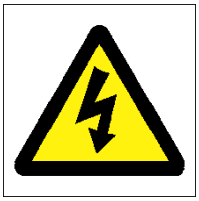
Figure 2 – Econoplate Technical Data

GENERAL DATA	Units	INDIRECT HEATING AND DHWS		
		H2-24/14	H2-24/24	H2-24/40
Maximum Pressure - District	Bar	10		
Maximum Pressure - Heating	Bar	2.5		
Maximum Pressure - ColdFeed/Domestic Hot Water	Bar	10		
Maximum District Temperature	°C	85		
Maximum District Flow Rate	l/min	18		
Weight Empty Without Spacer Plate	kg	32		
Weight Empty With Spacer Plate	kg	34.5		
Dimensions HxWxD Without Spacer Plate	mm	696x531x262		
Dimensions HxWxD With Spacer Plate	mm	696x531x312		
Electrical Supply		230/50Hz AC		
Power Consumption	W	70		
TEMPERATURE RANGES				
Heating Temperatures - Underfloor System	°C	30-45		
Heating Temperatures - Radiator System	°C	30-80		
Hot Water Temperatures	°C	40-60		
WATER CONNECTIONS				
District - Inlet & Outlet	BSP male	3/4"		
Heating System - Inlet & Outlet	BSP male	3/4"		
Cold Inlet/Outlet & Hot Water Outlet	BSP male	1/2"		
HEATING PERFORMANCE				
Heat Output @ ΔT11K Heating Circuit	kW	21		
Heat Output @ ΔT15K Heating Circuit	kW	24		
Heat Output @ ΔT20K Heating Circuit	kW	27		
Note: The output is based on a **district** flow rate of 18 l/min @ 85°C and a heating flow temperature of 75°C				
XS Head from Integral Pump @ ΔT11K	kPa	16		
XS Head from Integral Pump @ ΔT15K	kPa	28		
XS Head from Integral Pump @ ΔT20K	kPa	34		
HOT WATER PERFORMANCE				
Nominal Hot Water Output @ 10-50°C	l/min	14		
	kW	39		
District Flow Rate Required @ 80°C	l/min	11.70	10.11	9.36
District Flow Rate Required @ 70°C	l/min	16.76	13.45	11.98
Maximum Hot Water Output	°C	45.7	49.5	52.3
	kW	44.7	49.5	53.0
District Flow Rate Required @ 70°C	l/min	18		
Maximum Hot Water Output	°C	52.0	56.5	59.7
	kW	52.7	58.2	62.3
District Flow Rate Required @ 80°C	l/min	18		
Maximum Hot Water Output	°C	55.2	60.0	60.0
	kW	56.7	62.6	62.6
District Flow Rate Required @ 85°C	l/min	18		

Figure 3 - System Features:

Hot water priority
Preheat function to keep hot water heat exchanger warm
Gradual heating temperature ramp up time 3 minutes
Unit shutdown if heating circuit pressure goes below 0.8 bar
Pump anti-lock feature – runs pump 5 seconds every 24 hours

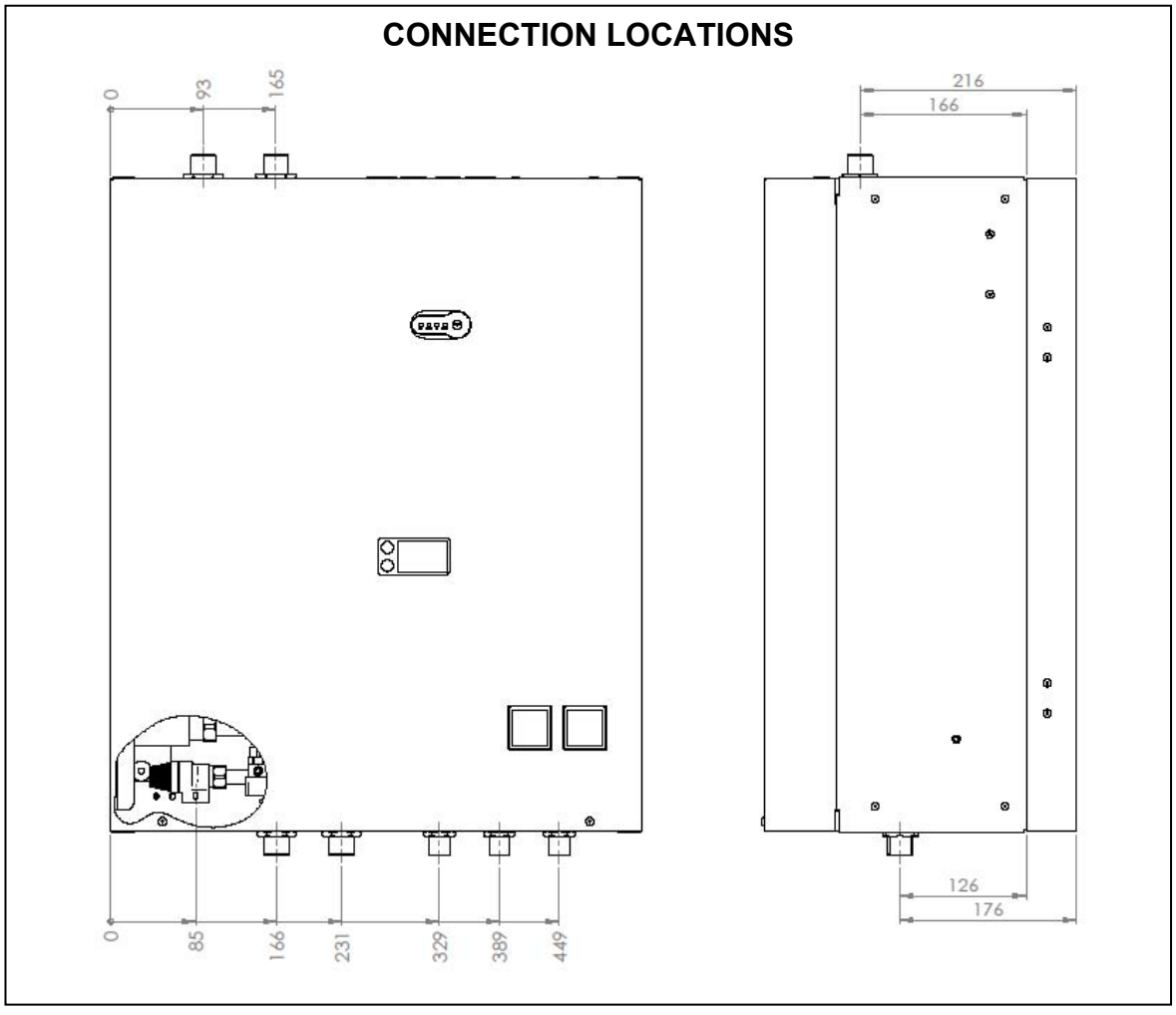
5.0 INSTALLATION



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

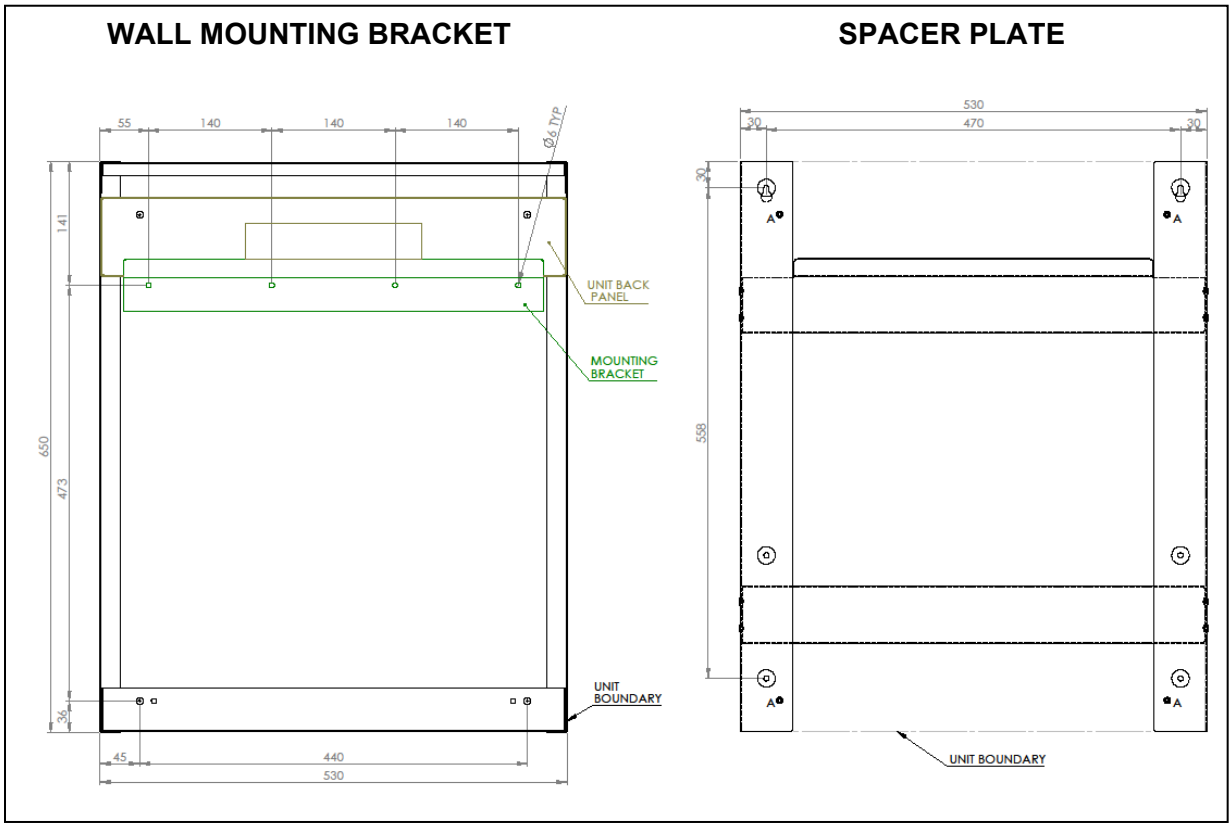
5.1 Location

Figure 4 – Connection Locations & Dimensions



Refer to Figure 4 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 5 – Wall Mount / Spacer Plate Dimensions



Unit can be mounted to the wall using either wall mounting bracket provided or using the optional spacer plate (not included purchased separately). See below for the relevant mounting procedure.

Wall mounting bracket:

Using the mounting bracket provided [see Figure 5], secure it to the wall using suitable fixings in the pre drilled holes, then mount unit on to the bracket. Once mounted, mark the bottom two holes on wall [the holes marked in the diagram with dimensions – the other 2 holes will not be readily accessible on this unit]. Then take unit back off the bracket, drill the two holes, insert wall plugs, re-hang the unit and then secure the unit to the wall.

Spacer plate (optional):

You will need access from above and below the unit to install the relevant pipework to and from the unit. A spacer plate facilitates pipework to be run behind the unit if necessary.

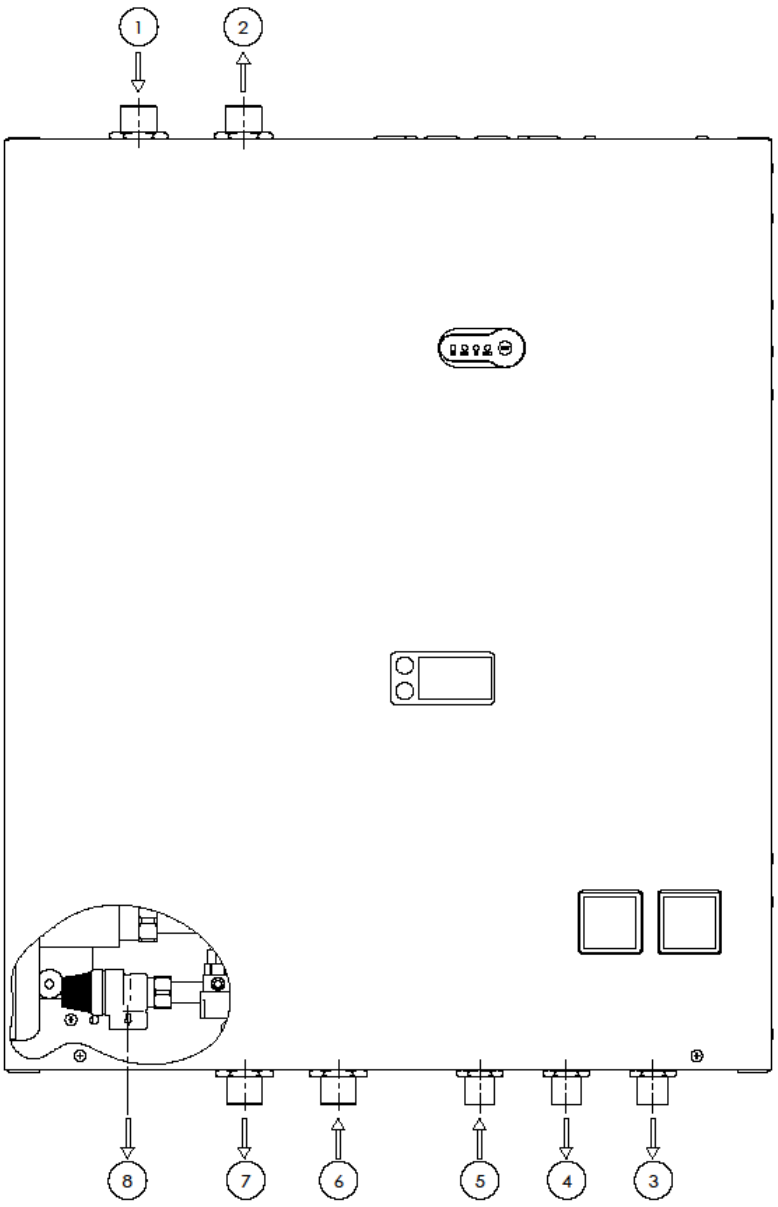
Secure the spacer plate to the wall using suitable fixings through 4 points provided [see Figure 5: 2 off key hole on top and 2 off round holes at bottom]. Hang the unit on the spacer plate. Secure it to the spacer plate with screws provided [at location 'A' see Figure 5 – Depending on model one or two fixings may be obscured by internal components – only two fixings necessary].

5.2 Pipework Connections

The district and apartment pipework should be connected to the appropriate points labelled on the figure 6. 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 and have been flushed out appropriately.

Figure 6 – Pipework Connections

PIPEWORK CONNECTIONS



NO.	NAME	SIZE
1	DH INLET	3/4" BSPM
2	DH OUTLET	3/4" BSPM
3	DHW OUTLET	1/2" BSPM
4	DCW OUTLET	1/2" BSPM
5	DCW INLET	1/2" BSPM
6	CH INLET	3/4" BSPM
7	CH OUTLET	3/4" BSPM
8	CH PRV	1/2" BSPF

DH – DISTRICT HEATING
DHW – DOMESTIC HOT WATER
DCW – DOMESTIC COLD WATER
CH – CENTRAL HEATING
PRV – PRESSURE RELIEF VALVE
BSPM – BRITISH STANDARD PIPE MALE
BSPF – BRITISH STANDARD PIPE FEMALE

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

These are situated at the top of the unit, with inlet on the left [Connection 1, Figure 6] and outlet in the middle [Connection 2, Figure 6]. 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 [Connection 6&7, Figure 6] with the heating outlet on the left. 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 bottom of the unit [Connection 5, Figure 6]. Connect mains water supply to this connection. This then connected to the heating circuit via a filling loop within the station. You may use this point for filling of heating circuit, and you need to ensure heating circuit is above 0.7 bar for the unit to operate. **Once filled you must disconnect the filling loop hose after closing the isolation valve of the filling loop, but leave the house on bottom tray for use when required.**

Both cold and hot water outlets are also at the bottom of the unit. The cold water outlet [Connection 4, Figure 6]. The hot water outlet [Connection 3, Figure 6]. Connect cold water outlet to the cold water distribution pipe in accordance with local bylaws, and connect your hot water distribution pipe to the hot water outlet on the unit.

In hard water areas please be aware that your hot water heat exchanger may scale up prematurely and you should therefore take measures to prevent this using techniques readily available on the market.

4) Pressure Relief Discharge – ½" Female BSP

This is provided on the heating circuit [Connection 8, Figure 6] 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 or room thermostat.

6.0 OPERATION OF UNIT

Refer to Appendix 1 for system 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 a standard room thermostat and is also compatible with OpenTherm programming. When the room thermostat is calling for heat, the diverter valve will move to send the district supply to the heating heat exchanger. The heating pump will start and the modulating control valve will start to open to control the temperature of the water in the heating circuit.

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 modulating valve will close, and the pump will stop.

There is a pressure switch on the heating circuit to prevent the pump dry running. If the pressure goes below 0.7 bars the heating cycle will stop and go into fault mode with a flashing fault light. If this happens the heating circuit will need to be refilled and the electronic box will have to be reset by pressing the reset button. [See section 8 Fault Finding].

6.3 Hot Water

The unit is programmed with hot water priority. When the flow sensor detects water flow above 2.6l/m, the unit switches into hot water mode. The diverter valve will send the district supply to the hot water heat exchanger. The modulating valve opens to allow district flow.

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, and will then return to standby mode.

7.0 COMMISSIONING


Note – when working with the unit, supply services when connected could reach 85°C, and once electrically connected the unit 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. You need to ensure the pressure is above 0.7 bar as the unit will not work below this pressure to prevent dry running of the pump.

7.2 Heat Meter

Please see heat meter instructions if fitted.

7.3 Water Meter

Please see water meter instructions if fitted.

7.4 System Safety Relief Valve

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

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

The pressure differential valve is an optional component to be specified at point of purchase. The pressure differential valve comes pre-set so that the unit will work in most situations. If adjustments are required please see pressure differential valve instructions.

7.6 Heating and Hot Water Flow Temperatures

These have been factory pre-set, 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 2 – top right hand corner of electronic box]. 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.

8.0 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].

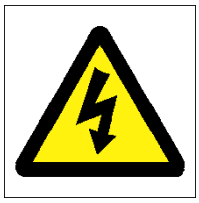
If the unit still does not operate, then the next step is to check all wiring is correctly connected to the right components. Refer to Appendix 2 to check the wiring.
If the above does not rectify the problem then in the table below are some suggested things to check to get unit working again.

Figure 7 - Fault Finding Guide

FAULT	CAUSE	RESOLUTION
District water not entering the unit.	Blocked strainer.	Isolate the unit from the district supply and wait for the pipes to cool down. Unscrew the strainer cap and remove the screen. Clean or replace accordingly.
	Control valve not operating.	Check that 24V is being supplied to the DC coil. If above does not resolve issue, replace stepper motor.
No heating	Room thermostat not calling for heating.	Check room thermostat settings.
	Electronics in fault mode.	Refer to Appendix 3
	Control valve or diverter valve not operating.	Check that 24V is being supplied to both stepper motors. If there is the correct power being supplied the replace the 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.
	Pressure switch tripped – heating pressure too low.	Top up heating circuit and re-set electronics [see appendix 3] If above does not resolve issue, replace pressure switch.
	District water temperature too low.	Check district supply conditions.
No hot water	Insufficient hot water flow.	Check flow rate is above 2.6l/m.

	Hot water flow sensor not working.	If light on with no flow replace the flow sensor electronics (plastic clip to top of flow sensor). If light doesn't come on with a flow rate of more than 2.5l/m replace sensor electronics (plastic clip to top of flow sensor).
	District water temperature too low.	Check district supply conditions.
Low hot water flow rate	Insufficient mains water pressure.	Check mains water pressure. Contact mains water supplier.
	Blocked cold water strainer (inside flow sensor).	Take out flow sensor cartridge and check strainer.
	Heat exchanger blocked.	Flush or replace the heat exchanger.

9.0 SERVICING



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.

9.1 Servicing the Strainer (Part 25 – Figure 8)

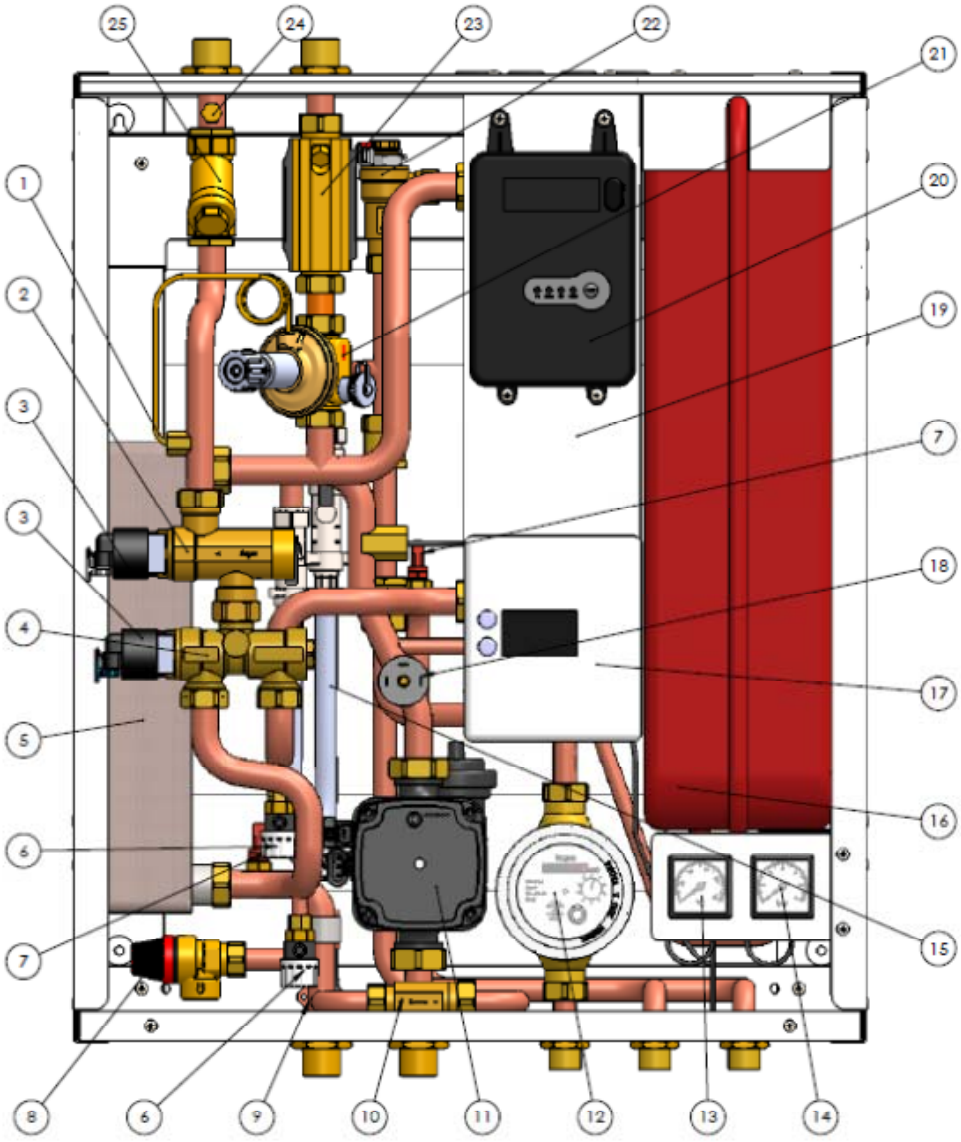
Isolate the unit from district supply and wait for pipes to cool down. Open the screw cap from the strainer and take out the strainer screen. Depending on the condition either clean it or replace it and put the screw cap back on again. Note the district water in the strainer could be 85°C.

9.2 Servicing the Expansion Vessel (Part 16 – Figure 8)

Isolate the unit from the heating circuit and wait for pipes to cool if necessary. Drain the heating water from the unit. 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 again after use.

10.0 INTERNAL COMPONENTS

Figure 8 – List of Components

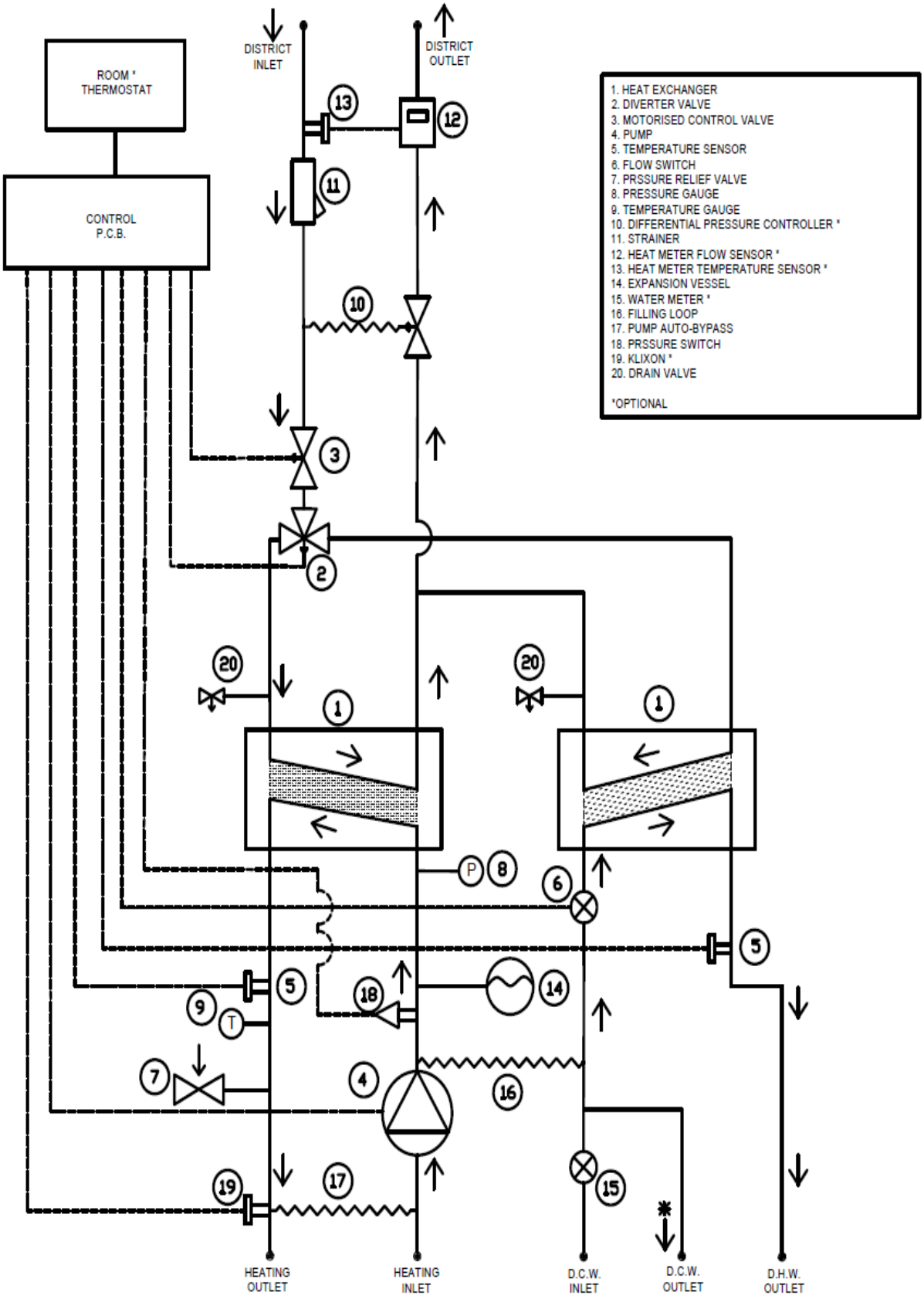


ITEM NO.	PART NUMBER
1	PDV IMPULSE TUBE*
2	MOTORISED CONTROL VALVE
3	STEPPER MOTOR
4	MOTORISED DIVERTER VALVE
5	HEAT EXCHANGER (CH)
6	DRAIN VALVE
7	TEMPERATURE SENSOR
8	PRESSURE RELIEF VALVE
9	KLIXON*
10	PUMP AUTO BYPASS
11	PUMP
12	WATER METER*
13	TEMPERATURE GAUGE

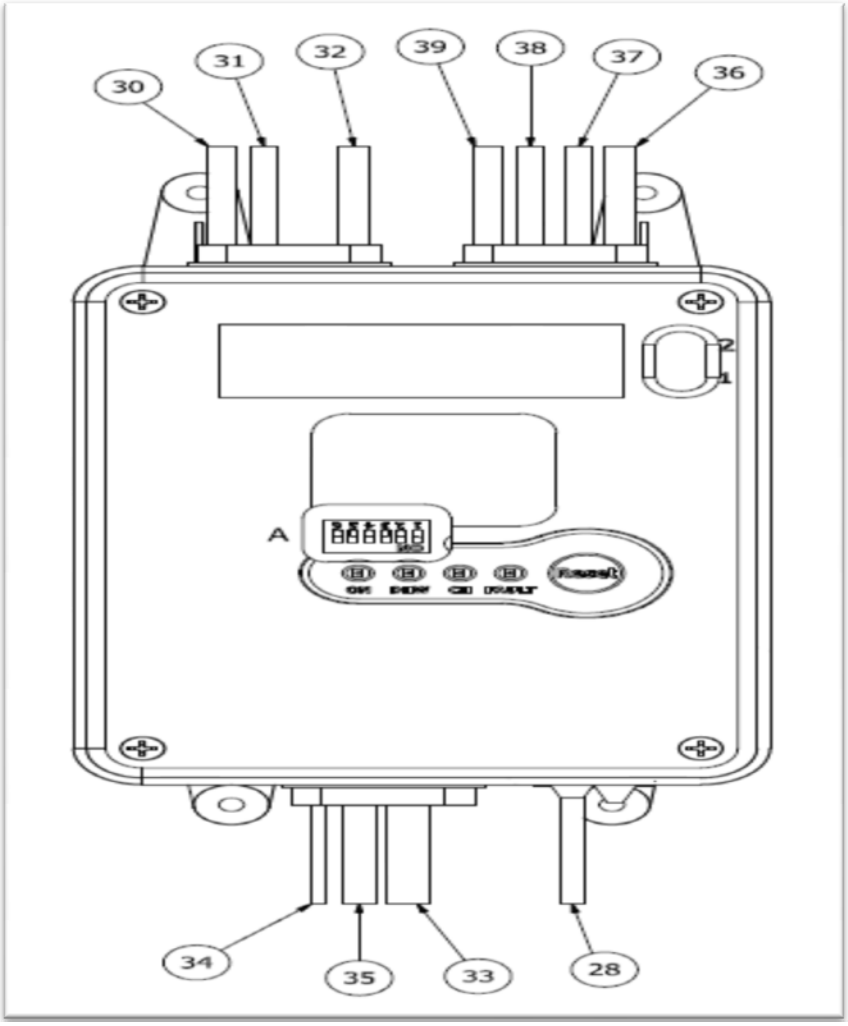
ITEM NO.	PART NUMBER
14	PRESSURE GAUGE
15	FILLING LOOP
16	EXPANSION VESSEL
17	HEAT METER*
18	PRESSURE SWITCH
19	HEAT EXCHANGER (DHW) BEHIND COVER
20	ELECTRONIC CONTROL BOX
21	PDV BALANCING VALVE*
22	FLOW SENSOR
23	HEAT METER FLOW SENSOR*
24	HEAT METER TEMPERATURE SENSOR*
25	STRAINER

* OPTIONAL

11.0 APPENDIX 1 – UNIT SCHEMATIC



12.0 APPENDIX 2 – WIRING SCHEMATIC



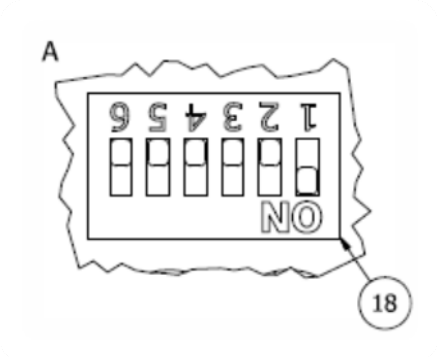
NO	DESCRIPTION	INDIVIDUAL WIRING	CONNECTOR
28	Remote Controller/Temperature Sensor	2 Black	N/A
30	DHW Temperature Sensor	2 White	Black Connector
31	DHW Flow Sensor	Red, White and Blue	White Connector
32	Control Valve Stepper Motor	Blue, Black, Brown and Green	White Connector
33	Mains Cable	Blue, Brown and Green/Yellow	N/A
34	Earth Cable	Green/Yellow	Non Insulated Crimp Ring
35	Pump	N/A	White Connector
36	Diverter Valve Stepper Motor	Blue, Black, Brown and Green	Blue Connector
37	CH Temperature Sensor	2 Red	Black Connector
38	Not Used – Taken Out		
39	CH Safety Thermostat/Pressure Switch	2 Black	Wired to Pressure Switch and Klixon

13.0 APPENDIX 3 – DIP SWITCH AND LED LIGHTS

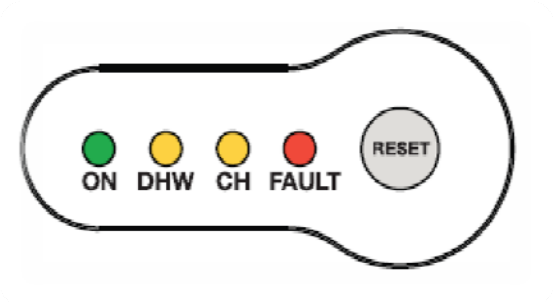
DIP SWITCHES

DIP SWITCH					
1	**2**	**3**	**4**	**5**	**6**
**	ON	OFF	ON	OFF	OFF

** : ON for underfloor heating mode
OFF for radiator heating mode



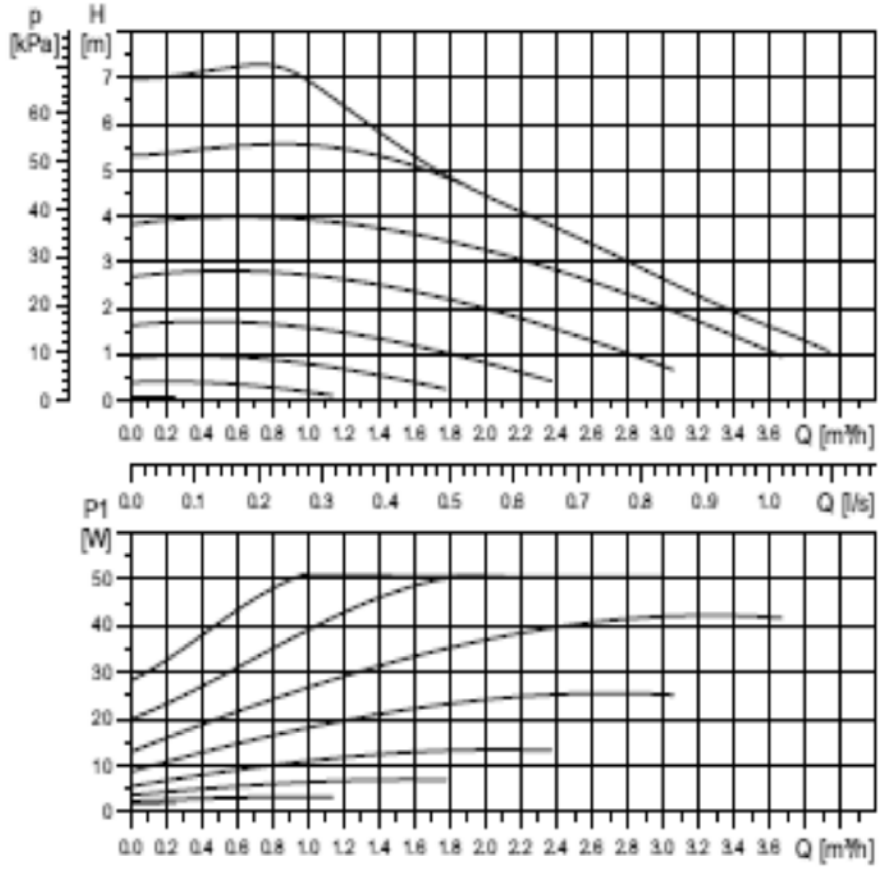
MATRIX LED



ANNOTATION	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	Pressure in heating circuit too low – Top up and reset Or Temperature in heating circuit too high – Check temperature and reset	Sensor faults – Replace NTC temperature sensor

14.0 APPENDIX 4 – PUMP INFORMATION

UPM3 15-70 130, 25-70 130, 25-70 180



High efficiency

Ready for Ecodesign 2015

EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 24 W

TM06 0579 0814

Performance curve

Electrical data, 1 x 230 V, 50 Hz		
Speed	P_1 [W]	$I_{1/1}$ [A]
Min.	2	0.04
Max.	52	0.51

Notes.