STOKVIS ECONOPLATE ‘E3A’ SERIES.

TECHNICAL SPECIFICATION
E3A100(UK) RANGE.

-Chassis Plate. : epoxy coated steel 25mm thick.
-Front Plate. : epoxy coated steel 20mm thick.
-Heat Exchanger Plate. : 316 grade stainless steel.
-Plate Gaskets. : EPDM.
-Retaining bolts. : 16mm carbon steel.
-Maximum primary operating pressure. : 10 bar.
-Maximum primary operating temperature. : 110°C (120°C for CV120)
-Minimum primary pump inlet pressure (at 82°C) : 2.5 mwg
-Minimum primary pump inlet pressure (at 110°C) : 11.0 mwg
-Cold water feed. : Bronze 1 1/2” BSPF.
-Hot water service flow : Bronze 1 1/2” BSPF.
-Hot water service return. : Bronze 1” BSPF (1/4” BSPF when HWS secondary pump fitted).
-Primary water connections. : Inlet cast iron DN40 PN10
-Primary Pump E3A100. : UPS 40.80F, 1 Phase , 250 Watt.
-Primary Pump E3A100(CV120). : TP40-60/2 1 Phase, 250 Watt
-Primary Pump E3A100(CV120). : TPD40-60/2 on Duplex Units

The Pump is fitted with an integral thermal protection relay.
-Primary Pump E3A100(CV120).:

The Pump is supplied from a contactor and overload for motor protection.
-HWS Secondary pump (optional). : UP20-45N, (1 phase, 115 Watt.)
-HWS Transfer pumps (optional). : UP20-45N, or UPS32-55B, or UPS32-80B
-Control valve. : 3 port, Cast Iron, PN10.
-Valve Actuator. : 240V, modulating, motor open/motor close.
-CONTROL PANEL. : Polycarbonate enclosure.
 : Electronic PID temperature controller.
 : 7 day time clock control of 2 temperature settings and/or 1 temperature /night off, per day.
 : Safety extra low voltage circuit for external “clock” control of 2 temperatures or one temperature and off.
 : Safety extra low voltage circuit for external interlock.
 : Adjustable high limit and low limit temperature alarms, temp. alarm lamp, common volt free temp. alarm and selectable high temp. lockout modes.
 : Functional indication of: primary pump(P1 or P2) enabled, valve opening or closing.

 : LCD Digital display of day and time, and secondary flow temperature and any faults.
 : 4-20 mA output of secondary flow temperature.
 : Pump mode selection including duplex pump duty share.
 : Full menu driven interrogation of parameters and operating modes.
 : 500mA control fuse, 10A output fuse.

WEIGHT: 140Kg (Maximum) LENGTH: 700mm (excluding optional transfer pump)
HEIGHT : 1110mm WIDTH : 360mm (excluding optional secondary pump)
TECHNICAL SPECIFICATION
E3A300(UK) RANGE.

- Chassis Plate. : epoxy coated steel 25mm thick.
- Front Plate. : epoxy coated steel 20mm thick.
- Heat Exchanger Plate. : 316 grade stainless steel.
- Plate Gaskets. : EPDM.
- Retaining bolts. : 16mm carbon steel.

- Maximum primary operating pressure. : 10 bar.
- Maximum primary operating temperature. : 120°C
- Minimum primary pump inlet pressure (at 82°C) : 2.0 mwg
- Minimum primary pump inlet pressure (at 110°C) : 18.0 mwg
- Cold water feed. : Bronze 2” BSPF.
- Hot water service flow. : Bronze 2” BSPF.
- Hot water service return. : Bronze 1” BSPF (\(\frac{3}{4}”\) BSPF when HWS secondary pump fitted).
- Primary water connections. : Inlet cast iron DN40 PN10
  Outlet 1 ½” BSP

- Primary Pump E3A300. : UPS 40.120/2 , 1 Phase, 470Watt.
  (UPSD40.120/2 on Duplex Units)

The Pump is supplied from a contactor and overload for motor protection

- HWS Secondary pump (optional). : UP20-45N, (1 phase, 115 Watt.)
  (complete with bronze non return valve).
- HWS Transfer pumps (optional). : UP20-45N, or UPS32-55B, or UPS32-80B
  dependent upon model
- Control valve. : 3 port, Cast Iron, PN10.
- Valve Actuator. : 240V, modulating, motor open/motor close.
- CONTROL PANEL. : Polycarbonate enclosure.
  : Electronic PID temperature controller.
  : 7 day time clock control of 2 temperature settings
    and/or 1 temperature /night off, per day.
  : Safety extra low voltage circuit for external “clock”
    control of 2 temperatures or one temperature and off.
  : Safety extra low voltage circuit for external interlock.
  : Adjustable high limit and low limit temperature alarms,
    temp. alarm lamp, common volt free temp. alarm and
    selectable high temp. lockout modes.
  : Functional indication of: primary pump(P1 or P2)
    enabled, valve opening or closing.
  : LCD Digital display of day and time, and secondary
    flow temperature and any faults.
  : 4-20 mA output of secondary flow temperature.
  : Pump mode selection including duplex pump
    duty share.
  : Full menu driven interrogation of parameters and
    operating modes.
  : 500mA control fuse, 10A output fuse.

WEIGHT: 170Kg (Maximum)
HEIGHT : 1110mm
LENGTH: 700mm (excluding optional transfer pump)
WIDTH : 460mm (excluding optional secondary pump)
### PERFORMANCE GUIDE FOR E3A100 RANGE (PRIMARY TEMPERATURE 82°C, COLD FEED 10°C)

<table>
<thead>
<tr>
<th>ECONOPLATE MODEL</th>
<th>107</th>
<th>109</th>
<th>111</th>
<th>113</th>
<th>115</th>
<th>117</th>
<th>119</th>
<th>121</th>
<th>123</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td>SECONDARY FLOW RATE AT 60°C l/min</td>
<td>22.8</td>
<td>31.8</td>
<td>40.2</td>
<td>48</td>
<td>55.2</td>
<td>62.4</td>
<td>68.4</td>
<td>74.4</td>
<td>79.8</td>
<td>85.2</td>
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<tr>
<td>SECONDARY PRESSURE DROP AT PEAK OUTPUT kPa</td>
<td>23</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>23</td>
<td>22</td>
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<tr>
<td>PRIMARY FLOW RATE l/sec</td>
<td>0.65</td>
<td>0.82</td>
<td>0.97</td>
<td>1.11</td>
<td>1.23</td>
<td>1.35</td>
<td>1.45</td>
<td>1.53</td>
<td>1.62</td>
<td>1.70</td>
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<tr>
<td>HEAT LOAD REQUIRED kW</td>
<td>79</td>
<td>111</td>
<td>140</td>
<td>167</td>
<td>192</td>
<td>217</td>
<td>238</td>
<td>259</td>
<td>278</td>
<td>297</td>
</tr>
</tbody>
</table>

Available pump head in kPa from optional secondary recirculation pump, at various flow rates

| RECIRCULATION RATE OF 1/2m³/hr | 30 | 34 | 36 | 36 | 37 | 37 | 38 | 38 | 38 | 38 |
| RECIRCULATION RATE OF 1m³/hr | 7 | 20 | 25 | 28 | 29 | 30 | 31 | 31 | 32 | 32 |
| RECIRCULATION RATE OF 2m³/hr | - | - | - | 2.5 | 7 | 10 | 12 | 13 | 14 | 15 |
| RECIRCULATION RATE OF 3m³/hr | - | - | - | - | - | - | - | - | - | - |

### PERFORMANCE GUIDE FOR E3A300 RANGE (PRIMARY TEMPERATURE 82°C, COLD FEED 10°C)

<table>
<thead>
<tr>
<th>ECONOPLATE MODEL</th>
<th>323</th>
<th>325</th>
<th>327</th>
<th>329</th>
<th>331</th>
<th>333</th>
<th>335</th>
<th>337</th>
<th>339</th>
<th>341</th>
<th>343</th>
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</thead>
<tbody>
<tr>
<td>SECONDARY FLOW RATE AT 60°C l/min</td>
<td>103.8</td>
<td>112.2</td>
<td>118.8</td>
<td>125.4</td>
<td>132</td>
<td>138</td>
<td>144.6</td>
<td>149.4</td>
<td>154.8</td>
<td>159.6</td>
<td>165</td>
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<tr>
<td>SECONDARY PRESSURE DROP AT PEAK OUTPUT kPa</td>
<td>34</td>
<td>34</td>
<td>33</td>
<td>32</td>
<td>31</td>
<td>30</td>
<td>30</td>
<td>29</td>
<td>28</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>PRIMARY FLOW RATE l/sec</td>
<td>2.40</td>
<td>2.55</td>
<td>2.66</td>
<td>2.76</td>
<td>2.85</td>
<td>2.95</td>
<td>3.05</td>
<td>3.10</td>
<td>3.17</td>
<td>3.23</td>
<td>3.3</td>
</tr>
<tr>
<td>HEAT LOAD REQUIRED kW</td>
<td>361</td>
<td>391</td>
<td>414</td>
<td>437</td>
<td>460</td>
<td>481</td>
<td>503</td>
<td>520</td>
<td>539</td>
<td>556</td>
<td>575</td>
</tr>
</tbody>
</table>

Available pump head in kPa from optional secondary recirculation pump, at various flow rates

| RECIRCULATION RATE OF 1/2 m³/hr | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| RECIRCULATION RATE OF 1 m³/hr | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| RECIRCULATION RATE OF 2 m³/hr | 14 | 15 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 |
| RECIRCULATION RATE OF 3 m³/hr | - | - | - | - | - | - | - | - | - | - | - |

**NOTES:**
- The extra primary pump head available to overcome pipework resistance is 6 kPa (variable on request).
- Models with lower secondary resistance can be produced on request.
- Output figures vary with primary temperature; e.g., capacity is increased by approx. 30% with a primary of 105°C.
INSTALLATION

PRIMARY ON 3 PORT VALVE MODELS:
The flow from the primary heat source is connected to the flange of the 3 port valve, the return is from the lower, yellow, epoxy coated threaded pipe connection.

SECONDARY:
The cold water feed is connected to the bottom horizontal bronze connection, the hot water service flow to the top bronze connection. The flow connection can be recognised because of the electrical temperature probe fitted to it.

Secondary recirculation must be maintained at all times either around the installation or locally to the Econoplate. A connection is provided in the bronze cold feed casting for this purpose, or alternatively into the recirculation pump if supplied. Suitable isolating valves should be included in all circuits.

Typical Installation of Econoplate Heat Exchanger on a combined heating and hot water system
ASSEMBLY DETAILS: E3A100.

ASSEMBLY DETAILS: E3A300.
ELECTRICAL DETAILS

E3A100+1R: 230V - Single phase - 375 Watt
E3A100+1T: 230V - Single phase - 405 Watt (max)
E3A100(CV120)+1R: 230V - Single phase - 380 Watt
E3A100(CV120)+1T: 230V - Single phase - 410 Watt (max)

E3A300+1R: 230V - Single phase - 600 Watt
E3A300+1T: 230V - Single phase - 730 Watt (max)

An external electrical supply isolator should always be fitted adjacent to the unit. The supply itself should be provided with suitable protection in accordance with current regulations and codes of practice.

EXTERNAL CONNECTIONS

Power Supply.
The incoming supply should be connected to the 3 push fit terminals Ph, N, E located just below the p.c.b. in the terminal box.

Common Temperature Alarm.
A rise of 10°C above the set point or a fall of 20°C below the set point causes an alarm relay to be energised. A pair of volt free terminals, which close on a fault, are available for external indication.

External Interlock.
An external safety device can be connected to the Econoplate which will shut the unit down in case of a fault, it is a safety extra low voltage circuit, an open circuit should be used as a fault signal. To reset the fault the power must be turned off and on again.

External “Clock”.
An external device can be connected to switch between 2 temperatures, or to switch between a single set point and off. A closed contact across this safety extra low voltage circuit gives the day setting and an open circuit the night.

External Temperature indication.
A 4-20mA output gives an indication of the secondary flow temperature, it is a linear scale, 4mA = 0°C, 20mA = 99°C.

Fuse Protection.
The electronic controller is protected by a 500mA fuse and the main p.c.b. output side is protected by a 10A fuse, both are located on the p.c.b.
OPERATION

Prior to switching the Econoplate on it must be ensured that the unit is filled with water and that all pipework and pumps are vented.

Once this is complete and the unit is on, the Econoplate Controller should be set as described in the Controller Instructions, to suit the particular requirements of the client.

The pump(s) should be vented, and the overload settings checked and adjusted if necessary.

On all units the travel of the motorised valve should be checked by simulating a load / no load situation and the position adjusted if necessary to prevent the motor driving up against the mechanical stops.

MAINTENANCE

If the installation is set up as per the above instructions, and if the pre-set factory values are unchanged, the Stokvis Econoplate Unit should not need dismantling for service for many years.

Any clogging, may be detected as follows:

- A high pressure drop between inlet and outlet of the secondary hot water circuit.

- A small temperature drop between inlet and outlet of the primary circuit (under 30°C at full load the exchanger is clogged).

If it is required to clean the Plate Heat Exchanger the following instructions should be followed:

- Isolate the exchanger, primary first, then allow the temperature to fall below 40°C, then isolate the secondary.

- Drain both primary and secondary if possible.

- Carefully release the securing bolts between the frame and front plate. Slacken the bolts in sequence to reduce stress on individual bolts.
- Remove the plates one at a time from the unit. If possible keep the plates in order ready for re-assembly, otherwise refer to the following notes.

- Plates can be identified in the following way. G30 plates have octagonal gaskets around the ports, and the corner of the plates are cut at 45°.

- A plate pack always has a 4 hole first plate which has a gasket around all 4 ports. This plate sits against the fixed chassis plate. Next are a number of intermediate plates and finally a blank plate with no ports. On all of these units the direction of the chevron pattern, on the face of the plate, alternates across the whole assembly and alternate left and right top ports have a gasket around their circumference.

- Carefully clean the plates. (Do not use a metallic device). Use a nylon brush with water. A proprietary descaling agent may be used if necessary, always rinse thoroughly with clean fresh water. Always follow the correct safety procedures when handling chemicals.

- Any gaskets which have come loose should be refitted at this time, once the surfaces have been cleaned and the old glue removed and by using the correct adhesive.

- Re-assemble the plates in the same order that they were removed. Replace front plate and tighten the bolts in a similar manner to that used on an automobile cylinder head to ensure an even distribution of force over the surface of the plate. The distance between the front plate and the rear chassis plate should be between 3 and 3.1 mm per plate for G30 plates and should be measured next to each bolt to ensure even tightening of the bolts.

- If the plates are dirty it is important to also clean the temperature sensor.

- A visual check on the correct assembly can be made by looking at the edge of the plates. A pattern resembling a honeycomb should always be seen.
FAULT FINDING

E3A SERIES PLATE HEAT EXCHANGER

FLUCTUATING TEMPERATURES AT OUTLET.

1. Check that the secondary pump is operating correctly and that good circulation exists - feel the temperature of the return pipe, if it is cool then there is no circulation.

2. Check that a non-return valve is fitted on the HWS return and that it is not letting by and so allowing the cold feed to pass up the HWS return - feel for a cool return pipe.

3. Check that the motorised valve is opening and closing in response to changes in demand - raise and lower the set point on the controller or open and close some hot water taps and observe the valve. Also check that the linkage between the valve and motor is secure.

4. Check that the motorised valve is responding by moving in the correct direction, up is open down is closed - test as above. If incorrect electrically isolate the Econoplate and reverse the + and - valve motor connections on the p.c.b. reinstate the electrical supply and check again.

5. Check that the temperature sensor is not scaled - isolate the secondary side of the unit and remove the sensor, clean as appropriate. If heavily scaled the Plate Heat Exchanger will probably be similarly affected strip and clean as necessary. (see maintenance procedure).

NO HOT WATER AT OUTLETS

1. Check the electrical supply to the unit-reinstate if necessary.

2. Check for the LCD display on the control panel - if not on check/replace 500mA control fuse - check control panel isolator switch is in the ON position.
3. If the 500mA fuse blows again, set the Econoplate to give temporary hot water as detailed below and replace the printed circuit board as soon as possible.

TEMPORARY OPERATION TO PROVIDE HOT WATER IN THE EVENT OF COMPONENT FAILURE IS ACHIEVED AS FOLLOWS:

a. Open the motorised valve fully by hand.
b. Ensure that there is an electrical supply to a primary pump and link the start/stop terminals for that pump if not already made.
c. Reduce the boiler flow temperature to a maximum of 65°C to prevent excess secondary temperatures.
d. Check that the high temperature alarm is set to automatic - refer to “Controller Settings” for procedure.

4. If there is an LCD display but no apparent outputs to pumps etc. check the 10A output fuse on the p.c.b. If it is blown, make electrical checks on all pumps and valves fitted to the unit, repair, replace or isolate faulty item and replace 10A fuse.

5. Check that the motorised valve is operating - place in manual operation and move the valve through its travel to check for seizure, strip and clean or replace as required.

6. Check that the linkage is secure and not loose on the shaft. - adjust with the motor at the ends of its travel (as indicated on the actuator) Up is fully closed the shaft should go tight for 6 seconds then the motor stops. Down is fully open, the shaft should remain loose.

7. Check that the valve motor is operating - raise and lower the set point on the controller and observe. - If the motor does not work, perform the procedure above for the temporary hot water supply.

8. Check that the primary pump is operating - check that there is a start signal to the pump, replace pump head or switch permanently to standby pump if available.
NO WATER FROM HIGHEST OUTLET

1. The resistance through the heat exchanger exceeds the static head/pressure of the cold feed.

If water flow has deteriorated from when originally installed strip and clean the Heat Exchanger as per the maintenance procedure, if scaled up also clean the temperature probe.

If new, investigate the effect of turning off HWS recirculation pumps, where they are installed on the HWS return. If it improves water flow try operating the pump on a lower speed or reinstall it on the HWS flow, perhaps with a bypass and non-return valve if the Econoplate flow exceeds the maximum flow of the pump.

LEAKING FROM THE PLATE HEAT EXCHANGER

1. Check that the Heat Exchanger is bolted up fully - measure the space occupied by the plates, next to each bolt. The gap between the chassis and clamping plate should be between 3 and 3.1mm per plate for G30 plates and it should be evenly spaced across the whole assembly. Relieve the pressure on primary and secondary side and tightened down to the correct figure. If the unit still leaks the affected plates should be replace.

2. Check that the maximum operating pressure has not been exceeded at any time.
E3A PARTS LIST.

Description
Econotrol 2100 controller including enclosure
Enclosure Fibox cardmaster II 21/18-0
‘E’ Series Temperature Sensor 1/8” BSP 65mm
3 port valve Sauter type BXE 040 F300
Sauter actuator type AVR32W30-F001
E3A100 Primary Pump Motor UPS40-80 1 Phase
E3A100(cv120) Primary Pump TP40-60/2 1 Phase
E3A300 Primary Pump Motor UPS40-120/2 1 Phase
E3A300 Primary Pump Terminal Box 96405865
E3A Secondary recirculating Pump UP20-45N 1 Phase
E3A Secondary transfer Pump UPS32-55B 1 Phase
E3A Secondary transfer Pump UPS32-80B 1 Phase
Non-return valve Watts EC270020160 ¾”
Drain cock ½” male
Through frame liner 43mm
Guide pins M16 x 200mm
Guide pins M16 x 330mm
M16 bolts x 130mm
M16 bolts x 180mm
M16 bolts x 200mm
M16 bolts x 250mm
M16 bolts x 300mm

HEAT EXCHANGER PLATES

E3A G30H EPDM End Blanking Plate
E3A G30H EPDM Intermediate Plate
E3A G30H EPDM 4 Hole First Plate
E3A G30L EPDM End Blanking Plate
E3A G30L EPDM Intermediate Plate
E3A G30L EPDM 4 Hole First Plate
ECONOTROL 2100
CONTROLLER
INSTRUCTIONS.
ECONOTROL 2100

GENERAL SPECIFICATION.

The Econotrol 2100 is a purpose designed PID regulator which controls temperature via a motorised modulating valve as well as operating a number of primary and secondary pumps, as can be fitted to the various Econoplate units.

In addition to the PID control it also contains all functional indicator lamps, a control fuse, an output fuse, duplex pump duty share (if fitted), high and low temperature alarm indication, common volt free temperature alarm terminals, and high temperature lockout, extra low voltage external interlock circuit with indication, 4-20 mA flow temperature indication, a 7 day time clock for either 2 temperatures of operation or a single temperature and night off, per day. Alternatively the extra low voltage “external time clock” circuit can be used for operation at 2 temperatures or for single temperature and off.

If primary pump overloads are included, overload trip indication is available on the panel. On duplex units with overloads, auto changeover on primary pump fault is also possible.

ECONOTROL 2100 - FACIA LAYOUT.
**ECONOTROL 2100 - DISPLAY.**

The current SET POINT is always displayed, to view any one of the other display options press either the ↑ or ↓ key to move from one to the other DISPLAY options:

- DAY of the week & TIME, (24 hour clock).

- Secondary water flow TEMPERATURE, in °C

- EXTERNAL INTERLOCK, shown only if an external interlock has been connected and activated.

- HIGH TEMPERATURE ALARM, shown only if the alarm temperature has been exceeded (factory set at 10°C above the higher set point).

- LOW TEMPERATURE ALARM, shown only if the alarm temperature has been exceeded (factory set at 20°C below the current set point).

- PUMP OVERLOAD TRIP, shown only if a primary pump, P1 or P2, overload has tripped, only available on units fitted with contactor overloads, with auxiliary contacts.

**ECONOTROL 2100 - FUNCTION.**

The FUNCTION options are accessed by pressing either the 3 or 8 key. To move from one option to the next press either the ↑ or ↓ key. To view the current status of an option press the * key. To change the current status press either the ↑ or ↓ key. To enter/select this change press the * key. To return to the DISPLAY press 3 or 4 key.

- The DAY<FROM>NIGHT function is used to change from one mode of operation to the other, e.g. if you were running in night mode and the unit was off, if you wanted hot water as you had during the day, by using this function you can swap over from the night setting to the day setting. When the unit next operates in the day mode the unit will revert back to normal operation.

- The HIGH TEMPERATURE RESET only operates if a high temperature lockout has occurred, using it restarts the unit and resets the external volt free temperature alarm.

- The RESTORE DEFAULTS option is used to return to the factory values for all settings. A further “Are You Sure” prompt appears on the display prior to this function being actioned.
ECONOTROL 2100 - SETTINGS.

The SETTINGS are used to set all of the parameters which have an influence on the way in which the controller will work, there are default values for all of these parameters, which are given in SUMMARY OF OPERATION. The SETTINGS options are accessed from FUNCTION by pressing and holding either the 3 or 4 key for 5 seconds then releasing.

To view the current status of a setting press the * key.

To select a particular parameter within a particular setting press the * key (the parameter will now flash).

To change the current value of a parameter press the # key.

To move to the next parameter press the 3 key.

To enter this change press the * key (the parameter stops flashing).

To move to the next setting press the 3 or 4 key.

To return to FUNCTION then DISPLAY press the 3 or 4 key twice.

- TIME, this includes the current day of the week, time, in hours, minutes and seconds, based on a 24 hour clock.

- CLOCK, the unit can run on its internal clock or it can be controlled from an external source, (default setting is internal clock).

- DAILY DAY, TIME & TEMPERATURE, this is used, for each day of the week to set the start time for the day operation and the temperature. The temperature range is from 01°C to 99°C, alternatively OFF can be selected.

- DAILY NIGHT, TIME & TEMPERATURE, this is used for each day of the week, to set the start time for the night operation and the temperature. The temperature range is from 01°C to 99°C, alternatively OFF can be selected.

- EXTERNAL CLOCK DAY, TEMPERATURE, this is used to set the temperature for the day operation when controlled by an external source. The temperature range is from 01°C to 99°C, alternatively OFF can be selected.

- EXTERNAL CLOCK NIGHT, TEMPERATURE, this is used to set the temperature for the night operation when controlled by an external source. The temperature range is from 01°C to 99°C, alternatively OFF can be selected.

HIGH TEMPERATURE ALARM, this is used to set the temperature difference above the higher set point at which an alarm mode occurs. The temperature difference is from 01°C to 99°C, alternatively OFF can be selected.

LOW TEMPERATURE ALARM, this is used to set the temperature difference below the current set point at which an alarm mode occurs. The temperature difference is from 01°C to 99°C, alternatively OFF can be selected.
PROPORTIONAL BAND, a high proportional band will produce slow response but no overshoot, the set point may never be reached, a low proportional band will produce a fast response but a big temperature overshoot and prolonged oscillations in temperature may occur.

DIFFERENTIAL, this term helps the controller approach the set point more rapidly with less overshoot. The higher the value the more the differential term works, and in theory the better the response, however there is a limit above which the system will respond too quickly to small errors and become unstable.

-PUMP MODE, this is used to determine which pump output is used. If a single primary pump is connected to the P1 terminals then P1 ON should be selected. If a single primary pump is connected to the P2 terminals then P2 ON should be selected. If a twin headed(duplex) pump is fitted, one will be connected to P1 the other to P2, P1/P2 should be selected which will then perform duty share on the 2 pumps.

-ALARM MODE, there are 3 automatic and 1 manual reset high temperature alarm modes.
AUT1 - If the secondary temperature measured is greater than the high temperature alarm value, the LCD indicates this. If this persists, the unit is shut down, all pumps are turned off, and the modulating valve is closed. The common temperature alarm lamp is lit and the common temperature alarm volt free terminals are closed. Auto reset occurs once the temperature has fallen below the alarm temperature.
AUT2 - If the secondary temperature measured is greater than the high temperature alarm value, the LCD indicates this. If this persists, the unit is shut down, all pumps are turned off, and the modulating valve is closed. The common temperature alarm lamp is lit and the common temperature alarm volt free terminals are closed. Subsequent high temperatures cause an almost immediate shut down. Auto reset occurs once the temperature has fallen below the alarm temperature.
AUT3 - If the secondary temperature measured is greater than the high temperature alarm value, the LCD indicates this. If this persists the common temperature alarm lamp is lit and the common temperature alarm volt free terminals are closed, the unit is not shut down. Auto reset occurs once the temperature has fallen below the alarm temperature.
MAN - If the secondary temperature measured is greater than the high temperature alarm value, the LCD indicates this. If this persists, the unit is shut down, all pumps are turned off, and the modulating valve is closed. The common temperature alarm lamp is lit and the common temperature alarm volt free terminals are closed. To reset the alarm, go into FUNCTION and select HIGH TEMP. RESET.
EXTERNAL CONNECTIONS

Electrical Supply.
The controller operates with a 240V supply. An external electrical supply isolator should always be fitted adjacent to the unit. The supply itself should be provided with suitable protection in accordance with current IEE regulations and codes of practice.

Internal Fuse Protection.
The electronic controller is protected by a 500mA fuse and the main p.c.b. output side is protected by a 10A fuse, both are located on the p.c.b.

Common Temperature Alarm.
If either the high or low temperature alarm value is exceeded a relay is energised, closing a pair of volt free terminals for external indication.

External Interlock.
An external safety device can be connected to the Econoplate which will shut the unit down in case of a fault, it is a safety extra low voltage circuit, an open circuit should be used as a fault signal. To reset the fault the power must be turned off and on again.

External “Clock”.
An external device can be connected to switch between 2 temperatures, or to switch between a single set point and off. A closed contact across this safety extra low voltage circuit gives the day setting and an open circuit the night setting.

External Temperature indication.
A 4-20mA output gives an indication of the secondary flow temperature, it is a linear scale, 4mA = 0°C, 20mA = 99°C.
SUMMARY OF DISPLAY & FUNCTION.

**DISPLAY**

SET POINT °C

- DAY & TIME
- TEMPERATURE
- EXT. INTERLOCK
- HIGH TEMP. ALARM
- LOW TEMP. ALARM
- PUMP O/L TRIP P1/P2

**PRESS**

- ▲
- ▼

**FUNCTION**

- DAY<FROM>NIGHT
- HIGH TEMP RESET
- RESTORE DEFAULTS

**PRESS**

- TO VIEW
- OR ▼ TO CHANGE
- OR ▲ TO ENTER
- OR ▼ TO RETURN

SUMMARY OF SETTINGS

<table>
<thead>
<tr>
<th>SETTINGS</th>
<th>DEFAULT SETTINGS</th>
<th>SETTINGS RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME</td>
<td>INTERNAL CLOCK</td>
<td>DAY HRS : MIN : SEC</td>
</tr>
<tr>
<td></td>
<td>06:00 : T 60°C</td>
<td>INTERNAL OR EXTERNAL</td>
</tr>
<tr>
<td></td>
<td>23:00 : T 60°C</td>
<td>HRS : MIN : OFF / 01 — 99°C</td>
</tr>
<tr>
<td></td>
<td>T 60°C</td>
<td>HRS : MIN : OFF / 01 — 99°C</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>OFF / 01 — 99°C</td>
</tr>
<tr>
<td></td>
<td>T + 10°C Differential</td>
<td>OFF / 01 — 99°C Differential</td>
</tr>
<tr>
<td></td>
<td>T + 20°C Differential</td>
<td>0 — 99</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>0 — 99</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>P1 ON</td>
</tr>
<tr>
<td></td>
<td>P1 ON</td>
<td>P1/P2 Duty Shunt</td>
</tr>
<tr>
<td></td>
<td>AUT 1</td>
<td>AUT 1, AUT 2, AUT3, MAN</td>
</tr>
</tbody>
</table>

To enter settings from function press ▼ or ▲ hold for 5 seconds then release.