



**Econoplate BV Series
Hot Water Service
Packaged Plate Heat Exchangers
with Thermal Stores**

Installation, Operation & Maintenance Manual

STOKVIS ECONOPLATE BV SERIES

GENERAL DESCRIPTION

The Stokvis Econoplate BV series of Brazed Heat Exchanger, Packaged, Hot Water, Thermal Stores are available in a range of outputs from 56kW to 231kW, (based on a primary temperature of 80°C), and 33kW to 152kW (based on primary temperatures of 70°C) coupled to thermal storage vessels with nominal capacities of 300 to 1000 litres. The vessels are manufactured from 316 grade stainless steel, fully insulated with rigid polyurethane foam, all enclosed in a durable P.V.C. zip on cover.

The Plate Heat Exchangers have very high outputs, low water content and low thermal inertia making them ideal for use in systems requiring high outputs, fast recovery with varying heat loads. The thermal store allows for those high peaks which occur at various times, without the need for increased boiler capacity.

The Thermal Store and Heat exchanger kits are all suitable for unvented systems however a suitable set of unvented kit equipment is required to do so. This is available as an option.

All units are designed to operate up to a maximum primary operating temperature of 90°C and up to a maximum primary pressure of 8 barG.

For larger applications a number of units may be installed in parallel.

All of the Econoplate BV units consist of a brazed plate heat exchanger “kit” which is site assembled by others onto a stainless steel thermal storage vessel. To complement this there are 3 different controls packages available.

Model M - Mechanical, thermostatic, 2 port, control valve with inbuilt secondary sensor, secondary pump and secondary flow setting valve.

Model E - Electrically operated, 2 port control valve (24Volt, 0-10V signal), ½” BSPF connection for sensor (sensor not included), secondary pump and secondary flow setting valve. No controls are included with this package.

Model EE - Electrically operated, 2 port control valve (230V), Econotrol™ temperature controller, secondary temperature sensor, primary pump, secondary pump and secondary flow setting valve.

There are full descriptions of each of these later in the manual.

The Thermal Stores are designed to accept a backup immersion heater if required, an adaptor flange for the Lateral Hole is available to do so which will accept a 2 1/4” threaded immersion heater, kW ratings and further details available on request.

TECHNICAL SPECIFICATION

-Thermal Storage Vessel	: AISI 316 grade stainless steel
-Storage Vessel Insulation	: Rigid Polyurethane foam C.F.C. free
-Storage Vessel Jacket	: Durable P.V.C.
-Heat Exchanger.	: Copper brazed/Stainless steel
-Heat Exchanger Insulation Cover	: Expanded polyurethane/Polystyrene 475K
-Secondary Pipework	: LG2/brass/copper
-Maximum Pressure	: Primary & Secondary 8 bar
-Maximum Primary Temperature	: 90°C

Dependent upon model the following apply:

-Primary pumps (Model EE only- see table below)	: UPS2 25-80 or UPS2 32-80, 230V
-Secondary pumps	: UP 20-45N or UPS 25-55N or UPS 32-55N, 230V
-2 port control valve (Model M)	: 1” or 1½” BSP(F)
-2 port control valve (Model E & EE)	: 1” or 1 ¼” BSP(F)
-Secondary flow setting valve	: ¾”, 1” or 1 ¼” BSP(F)
-Heat exchanger HWS circuit Safety Valve	: ¾” 8bar

Thermal Storage Vessel Dimensions (Excluding heat exchanger kit)

-300 litre vessel : 287 l volume, 1685 mm high, 620 mm diameter.

-500 litre vessel : 480 l volume, 1690 mm high, 770 mm diameter.

-800 litre vessel : 792 l volume, 1840 mm high, 950 mm diameter.

-1000litre vessel: 990 l volume, 2250 mm high, 950 mm diameter.

Add 230mm for the heat exchanger kit for Models M & E and 280mm for Model EE.

A clearance of at least 250mm should be allowed around the assembled unit for access and maintenance. If an immersion heater is to be fitted then the clearance in front of the Thermal Store Control Panel and Lateral Hole should be increased to match the diameter of the vessel.

Thermal Storage Vessel Connections

-Cold water feed: 300/500/800/1000litre : 2"BSP(M)

-Hot water service flow: 300/500/800/1000litre : 2"BSP(M)

-Hot water service return: 300/500/800/1000litre : 1 1/2"BSP(M)

-Vessel drain connection 300/500litre : 1" BSP(M)

-Vessel drain connection 800/1000litre : 1 1/4" BSP(M)

-For all other vessel connections please refer to the drawing included later in this document

N.B. Models M & E are not supplied with a primary pump, correct selection of this pump is important to ensure the duty is achieved. In addition, if a fixed flow pump is used (as opposed to a variable speed) an additional bypass or differential control valve will be required. See below for primary flow rate and pressure drop figures.

ECONOPLATE BV MODEL M	VALVE SIZE(INLET)	PRIMARY FLOW RATE l/s	PRIMARY OUTLET	PRIMARY PRESSURE DROP (kPa)
BV10/10	25mm	0.56	25mm	77
BV10/20	25mm	1.02	25mm	81
BV10/30	25mm	1.22	25mm	79
BV10/40	40mm	1.40	25mm	59
BV10/50	40mm	1.49	25mm	57

ECONOPLATE BV MODEL E	VALVE SIZE (INLET)	PRIMARY FLOW RATE l/s	PRIMARY OUTLET	PRIMARY PRESSURE DROP (kPa)
BV10/10	25mm	0.56	25mm	72
BV10/20	25mm	1.02	25mm	63
BV10/30	25mm	1.22	25mm	53
BV10/40	32mm	1.40	25mm	40
BV10/50	32mm	1.49	25mm	37

ECONOPLATE BV MODEL EE	VALVE SIZE(OUTLET)	PRIMARY FLOW RATE l/s	PRIMARY PUMP MODEL (INLET)	PRIMARY PRESSURE DROP (kPa)
BV10/10	25mm	0.56	UPS2 25-80	72
BV10/20	25mm	1.02	UPS2 25-80	63
BV10/30	25mm	1.22	UPS2 25-80	53
BV10/40	32mm	1.40	UPS2 32-80	40
BV10/50	32mm	1.49	UPS2 32-80	37

CONTROLS PACKAGES

All standard thermal stores as listed earlier come with a control panel incorporating an ON/OFF switch and green “Power” lamp, enable thermostat and manual reset high limit thermostat, amber “Ready” lamp and temperature gauge.

Model M : Mechanical, thermostatic, 2 port, control valve with in-built secondary sensor, secondary pump, secondary flow setting valve, and all secondary pipework required to install the kit on to the thermal store. The secondary circuit pipework includes isolating valves and unions for easy connection to the thermal store. The primary pump/primary flow is to be supplied by the customer from the heat source circuit.

Model E : Electrically operated, 2 port control valve (24volt, 0-10v signal), ½” BSPF connection for sensor (sensor not included), secondary pump, secondary flow setting valve, and all secondary pipework required to install the kit on to the thermal store. The secondary circuit pipework includes isolating valves and unions for easy connection to the thermal store. The primary pump and control system is not included. External temperature controls are required to operate the control valve to regulate the temperatures from the heat exchanger.

Model EE : Electrically operated, 2 port control valve (230V), Econotrol™ controller, secondary temperature sensor, primary pump, secondary pump, interconnecting wiring, secondary flow setting valve, all secondary pipework required to install the kit on to the thermal store. The secondary circuit pipework includes isolating valves and unions for easy connection to the store.

The primary inlet is to be connected to the primary pump and the return to the 2 port valve, both using the unions provided. The primary pump included has a “spare head allowance” of at least 6 kPa for external pipework losses.

The Econotrol™ is an Electronic PID temperature controller with the following features.
: 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.

: Safety extra low voltage circuit for Thermal Store Enable Thermostat.

: Adjustable high limit and low limit temperature alarms, temp. alarm lamp, common volt free temp. alarm and selectable high temp. lockout modes. (*low temperature alarm disabled in this application*)

: Functional indication of: pump enabled, valve opening or closing.

: LCD Digital display of day and time, and secondary flow temperature and any faults

: Full menu driven interrogation of parameters and operating modes.

: 500mA control fuse, 10A output fuse

Full Model designations are made up in the following way:

BV10/ = Heat exchanger type: Brazed, type 10.

.../?? = Size of heat exchanger (number of plates).

.../..???? = Nominal capacity of thermal storage vessel in litres.

.../..../? = Model type: Mechanical (**M**), Electrical (**E**), Electrical c/w Econotrol™(**EE**)

e.g. A 30 plate brazed heat exchanger with mechanical, thermostatic control valve on a 500 litre nominal capacity vessel would be designated **BV10/30/500/M**

e.g. A 50 plate brazed heat exchanger with electrical control valve c/w Econotrol™ on a 1000 litre nominal capacity vessel would be designated **B10/50/1000/EE**

PERFORMANCE GUIDE FOR ECONOPLATE BV RANGE (PRIMARY TEMPERATURE 80°C , COLD FEED 10°C)

ECONOPLATE BV MODEL

	BV10/10/300	BV10/20/300	BV10/30/300	BV10/40/300	BV10/50/300
CONTINUOUS OUTPUT AT 60°C litre/min	17.4	35.4	47.4	59.4	66
PEAK OUTPUT litre/10min	432	612	732	852	918
PEAK OUTPUT litre/60min	1302	2382	3102	3822	4218
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	56	123	166	205	231
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	17 Mins	8 Mins	6 Mins	5 Mins	5 Mins

	BV10/10/500	BV10/20/500	BV10/30/500	BV10/40/500	BV10/50/500
CONTINUOUS OUTPUT AT 60°C litre/min	17.4	35.4	47.4	59.4	66
PEAK OUTPUT litre/10min	606	786	906	1026	1092
PEAK OUTPUT litre/60min	1476	2556	3276	3996	4392
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	56	123	166	205	231
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	28 Mins	14 Mins	10 Mins	8 Mins	8 Mins

	BV10/10/800	BV10/20/800	BV10/30/800	BV10/40/800	BV10/50/800
CONTINUOUS OUTPUT AT 60°C litre/min	17.4	35.4	47.4	59.4	66
PEAK OUTPUT litre/10min	887	1067	1187	1307	1373
PEAK OUTPUT litre/60min	1757	2837	3557	4277	4673
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	56	123	166	205	231
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	46 Mins	22 Mins	17 Mins	13 Mins	12 Mins

	BV10/10/1000	BV10/20/1000	BV10/30/1000	BV10/40/1000	BV10/50/1000
CONTINUOUS OUTPUT AT 60°C litre/min	17.4	35.4	47.4	59.4	66
PEAK OUTPUT litre/10min	1065	1245	1365	1485	1551
PEAK OUTPUT litre/60min	1935	3015	3735	4455	4851
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	56	123	166	205	231
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	57 mins	28 Mins	21 Mins	17 Mins	15 Mins

PERFORMANCE GUIDE FOR ECONOPLATE BV RANGE (PRIMARY TEMPERATURE 70°C . COLD FEED 10°C)

ECONOPLATE BV MODEL

	BV10/10/300	BV10/20/300	BV10/30/300	BV10/40/300	BV10/50/300
CONTINUOUS OUTPUT AT 60°C litre/min	9.6	22.2	30.6	38.4	43.8
PEAK OUTPUT litre/10min	354	480	564	642	696
PEAK OUTPUT litre/60min	834	1590	2094	2562	2886
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	33	77	107	133	152
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	30 Mins	13 Mins	9 Mins	7 Mins	7 Mins

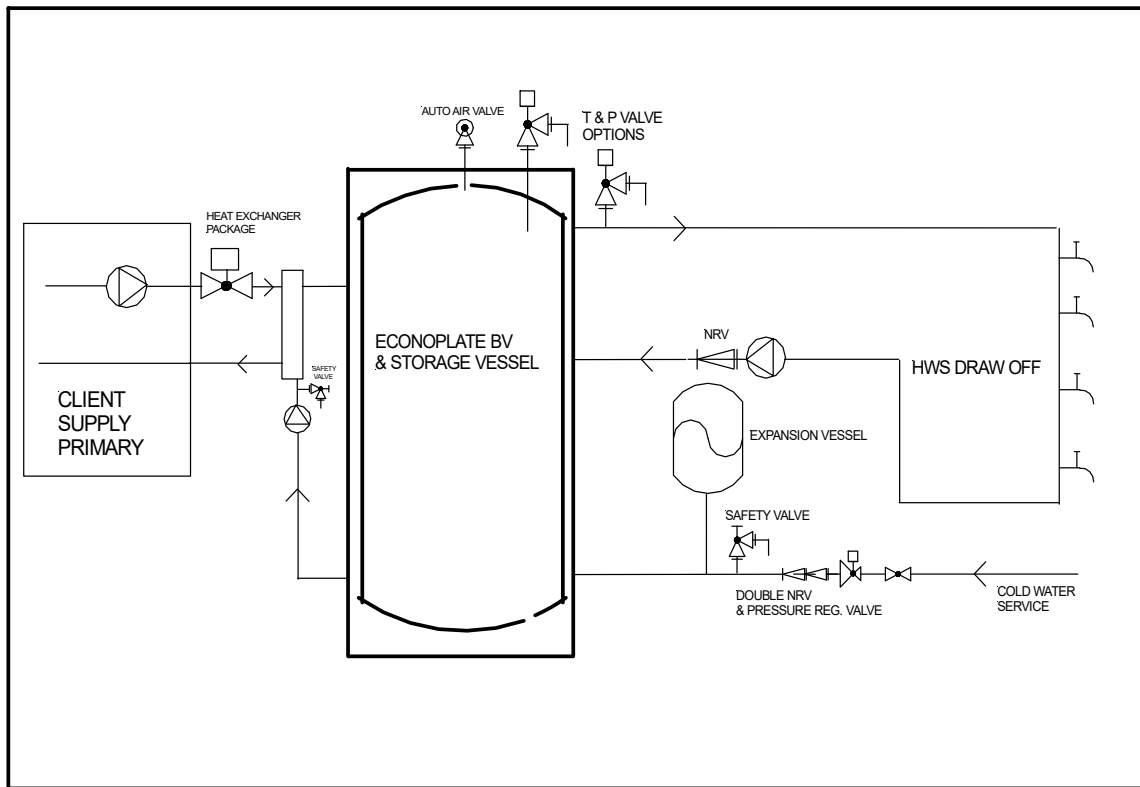
	BV10/10/500	BV10/20/500	BV10/30/500	BV10/40/500	BV10/50/500
CONTINUOUS OUTPUT AT 60°C litre/min	9.6	22.2	30.6	38.4	43.8
PEAK OUTPUT litre/10min	528	654	738	816	870
PEAK OUTPUT litre/60min	1008	1764	2268	2736	3060
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	33	77	107	133	152
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	50 Mins	22 Mins	16 Mins	13 Mins	11 Mins

	BV10/10/800	BV10/20/800	BV10/30/800	BV10/40/800	BV10/50/800
CONTINUOUS OUTPUT AT 60°C litre/min	9.6	22.2	30.6	38.4	43.8
PEAK OUTPUT litre/10min	809	935	1019	1097	1151
PEAK OUTPUT litre/60min	1289	2045	2549	3017	3341
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	33	77	107	133	152
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	83 Mins	36 Mins	26 Mins	21 Mins	18 Mins

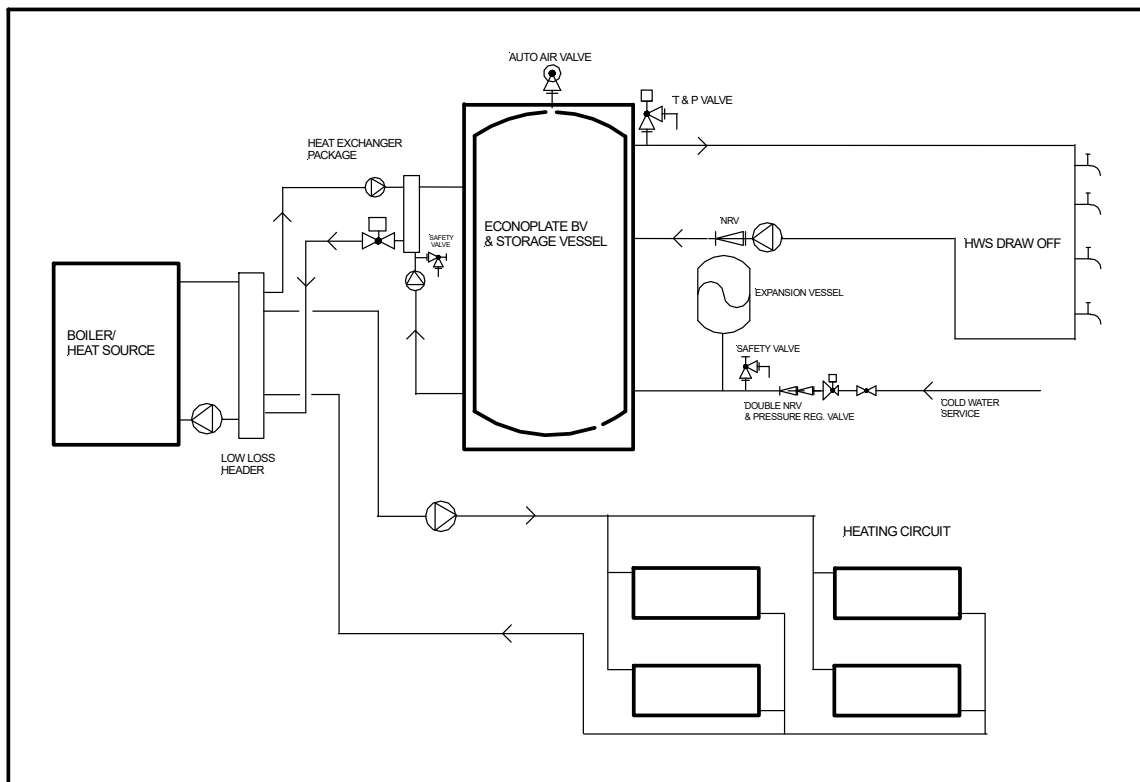
	BV10/10/1000	BV10/20/1000	BV10/30/1000	BV10/40/1000	BV10/50/1000
CONTINUOUS OUTPUT AT 60°C litre/min	9.6	22.2	30.6	38.4	43.8
PEAK OUTPUT litre/10min	987	1113	1197	1275	1329
PEAK OUTPUT litre/60min	1467	2223	2727	3195	3519
PRIMARY FLOW RATE litre/sec	0.56	1.02	1.22	1.40	1.49
HEAT LOAD REQUIRED kW	33	77	107	133	152
APPROX VESSEL RECOVERY TIME (Assuming no hot water draw off)	103 mins	45 Mins	32 Mins	26 Mins	23 Mins

INSTALLATION SCHEMATICS

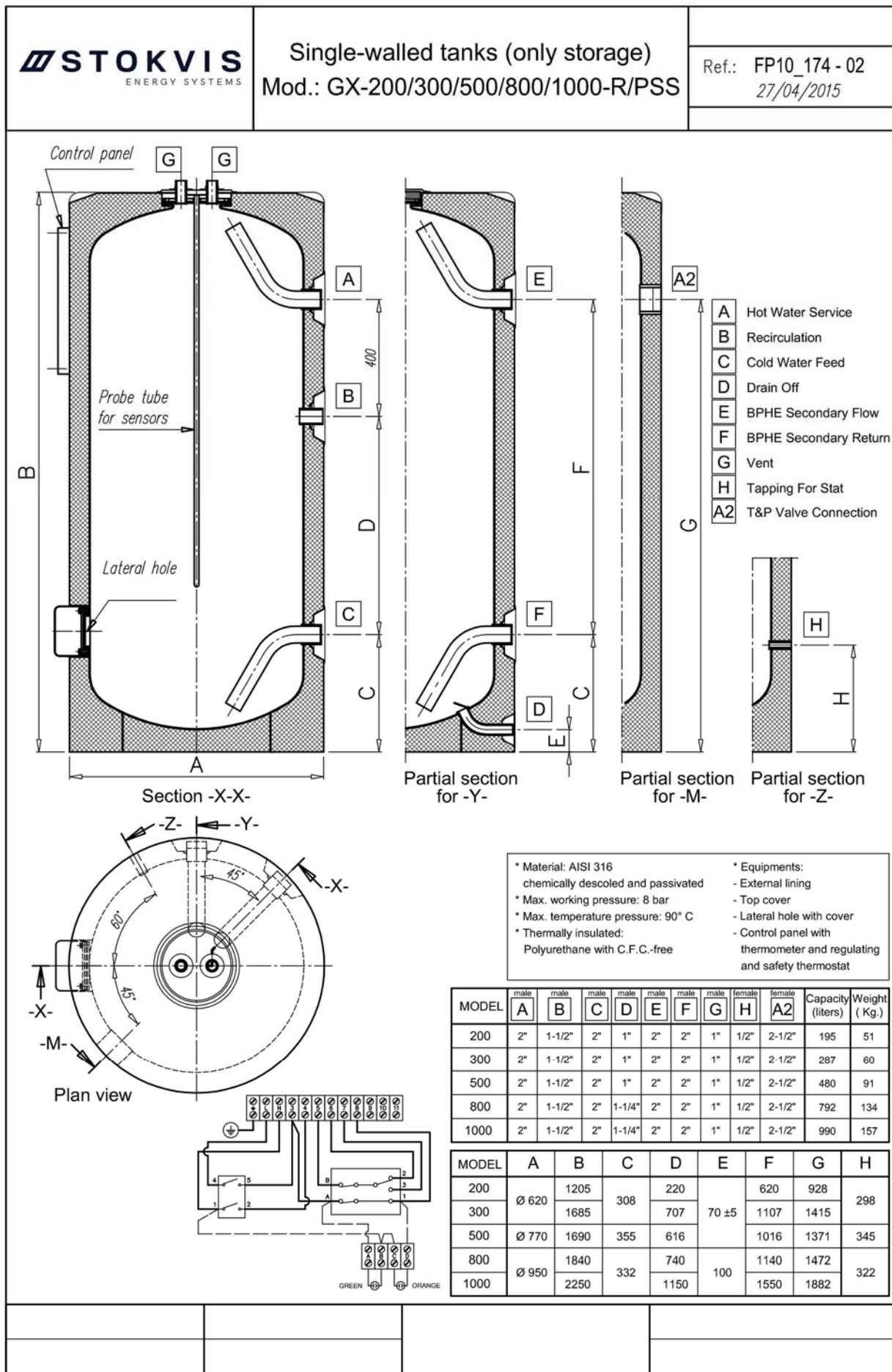
Typical Schematic of an Econoplate BV, Models M or E with Unvented Cold Feed.



Typical Schematic of Econoplate BV Model EE on a Combined Heating & Hot Water System with Unvented Cold Feed.



THERMAL STORE/VESSEL FULL DIMENSIONAL DATA



Inspection Opening
DN90 or
Immersion Htr Boss
2 1/4" or 2 1/2" BSP(F)

MODEL E & M CONNECTION SCHEDULE

A2 = T & P VALVE 2 1/2" BSP(F)

A = HWS 2" BSP(M)

B = RECIRC 1 1/2" BSP(M)

C = CWF 2" BSP(M)

D = DRAIN OFF (300-500) 1" BSP(M)
DRAIN OFF (800-1000) 1 1/4" BSP(M)

E = BPHE SEC FLOW 2" BSP(M)

F = BPHE SEC RETURN 2" BSP(M)

G = VENT 1" BSP(M)

H = TAPPING 1/2" BSP(F)

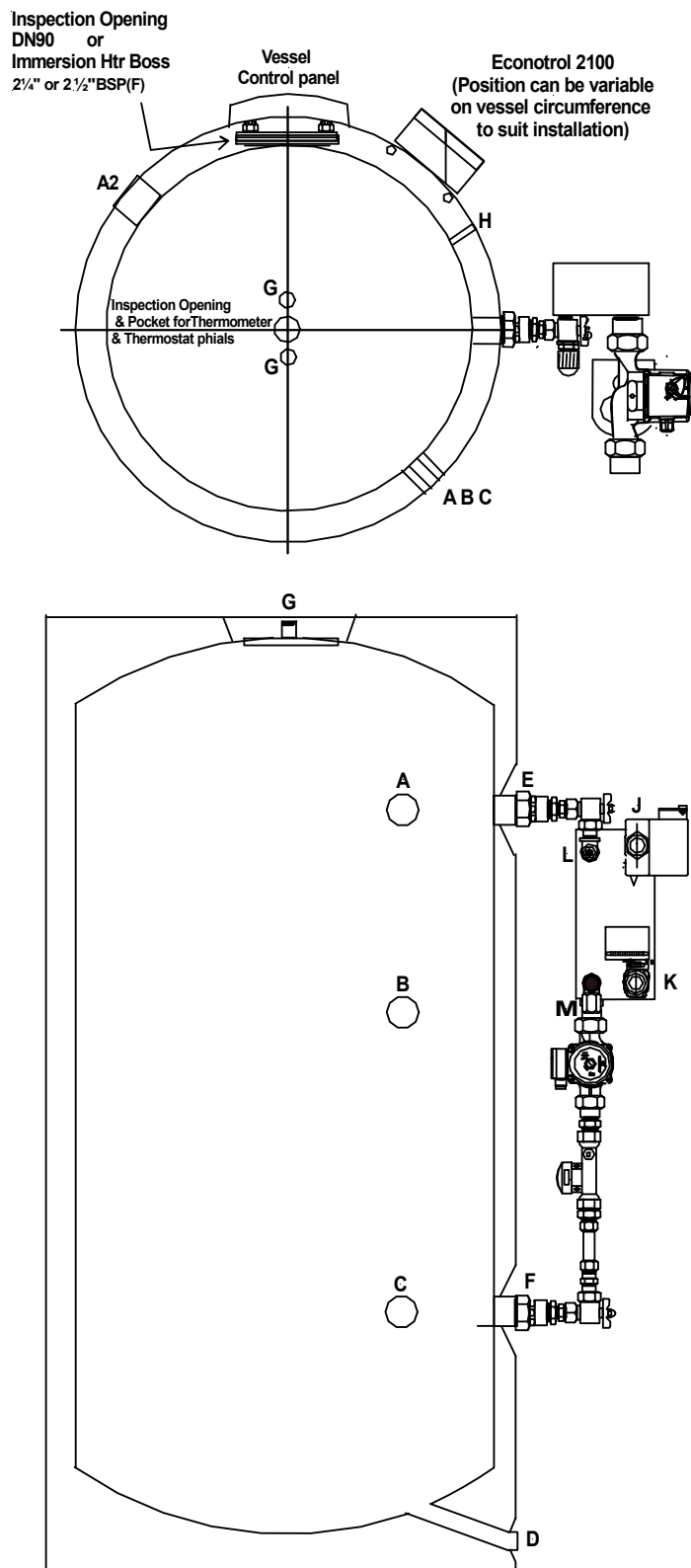
J = PRIMARY FLOW 1" BSP(F)
(BV10/10 - BV10/20 - BV10/30)
PRIMARY FLOW 1 1/4" BSP(F)
(BV10/40 - BV10/50)

K = PRIMARY RETURN 1" BSP(F)
BV10/10 - BV10/20-BV10/30)
PRIMARY RETURN 1 1/4" BSP(F)
(BV10/40 - BV10/50)

L = 1/2" BSP(F) CONNECTION FOR CLIENT
SENSOR POCKET (MODEL E) or
POCKET FOR VALVE SENSOR
(MODEL M)

M = SAFETY VALVE DISCHARGE 1" BSP(F)

CONNECTION DETAILS MODEL EE



MODEL EE CONNECTION SCHEDULE

A2 = T & P VALVE 2 1/2" BSP(F)

A = HWS 2" BSP(M)

B = RECIRC 1 1/2" BSP(M)

C = CWF 2" BSP(M)

D = DRAIN OFF (300-500) 1" BSP(M)
DRAIN OFF (800-1000) 1 1/4" BSP(M)

E = BPHE SEC FLOW 2" BSP(M)

F = BPHE SEC RETURN 2" BSP(M)

G = VENT 1" BSP(M)

H = TAPPING 1/2" BSP(F)

J = PRIMARY FLOW 1" BSP(F)
(BV10/10 - BV10/20 - BV10/30)
PRIMARY FLOW 1 1/4" BSP(F)
(BV10/40 - BV10/50)

K = PRIMARY RETURN 1" BSP(F)
(BV10/10 - BV10/20 - BV10/30)
PRIMARY RETURN 1 1/4" BSP(F)
(BV10/40 - BV10/50)

L = SENSOR Stud coupling

M = SAFETY VALVE DISCHARGE 1" BSP(F)

OPERATION

The control panel fitted to the thermal store incorporates an enable thermostat and a manual reset high limit thermostat. The enable thermostat is used to bring the Econoplate package online, either by starting the secondary transfer pump or enabling the Econotrol™ which in turn starts the pumps.

The secondary circuit of the heat exchanger incorporates a transfer pump and flow commissioning valve which ensures water circulates at the pre-set flow rate from the bottom of the thermal store, through the heat exchanger where it is heated and returns it to the store ready for use by the hot water draw offs.

The applicable temperature control system (provided by others on Model E) then senses the secondary water flow temperature from the heat exchanger and modulates the control valve fitted to the primary circuit to maintain a constant secondary outlet temperature to the thermal store.

ELECTRICAL SUPPLY & LOAD

The electrical supply is made in to the Control Panel on the Thermal Store. The panel must be removed to access the terminal strip.

A single phase supply is required in all cases, wired to terminals L, N & E, through a local isolator, all in accordance with current IEE regulations.

Electrical loads vary for different models, this is as a result of the number and type of pumps fitted.

The EE Models also have a motorised valve and controller which have a small power consumption. Therefore add a further 0.2A for Model EE.

-Primary pumps (Model EE only)	: UPS2 25-80, 230V, 1.1A 140 Watt max or : UPS2 32-80, 230V, 1.1A 140 Watt max
-Secondary pumps	: UP 20-45N, 230V, 0.52A, 120 Watt or : UPS 25-55N, 230V, 0.38A, 85 Watt or : UPS 32-55N, 230V, 0.46A, 105 Watt

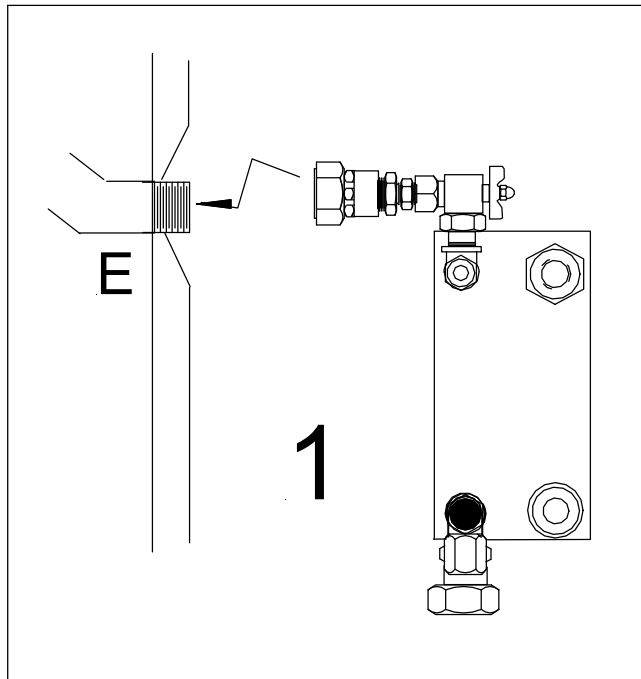
INSTALLATION & ASSEMBLY DETAILS

The heat exchanger package is supplied in kit form comprising of various sub-assemblies and components which are ready for connection to the thermal store. The whole package has been previously pre-assembled, hydraulically tested and then disassembled, at the various union connections, prior to delivery.

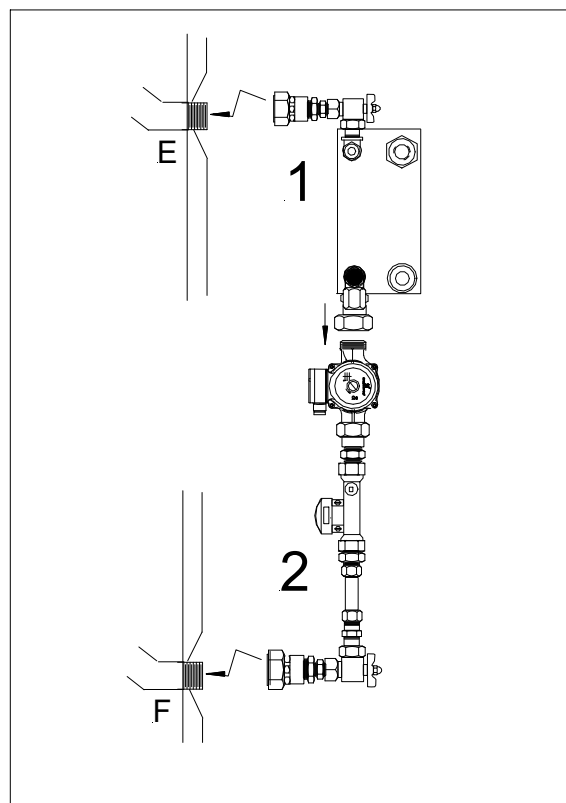
Refer also to the Thermal Store / Vessel drawing for details of the connections.

All Models

Component 1 : The heat exchanger sub-assembly, which incorporates the heat exchanger secondary flow and heat exchanger safety valve, is fitted to connection **E** on the thermal store using the union connection provided. The safety valve outlet should be piped to drain via a tundish.

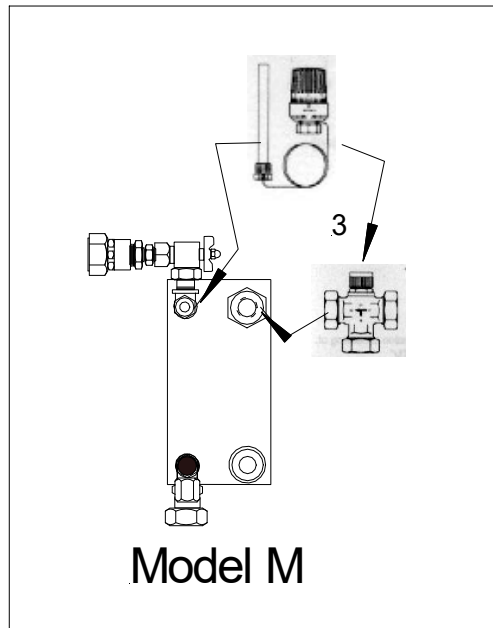


Component 2 : The secondary return sub-assembly, including transfer pump is fitted to connection **F** on the thermal store using the union connection provided and is then connected to the bottom union connection of the heat exchanger assembly. When connected check all pipe and fittings for tightness. The secondary section of the assembly is now complete.



Model M

Component 3 : The mechanical 2 port valve is fitted to the primary flow port (inlet) on the heat exchanger assembly with the union provided. Ensure the valve orientation is correct flow I → II into the heat exchanger. The sensor is fitted into the pocket provided on the heat exchanger secondary flow port.

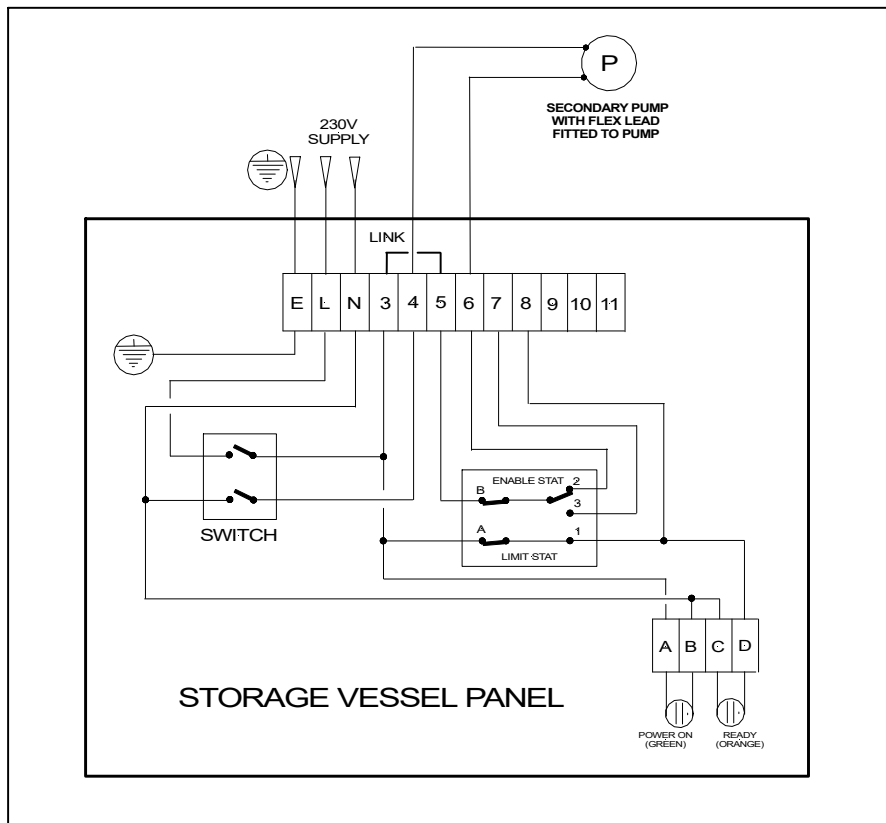


Model M -The incoming supply wiring, should now be made to terminals L, N & E, in the control panel on the thermal store. The control panel requires drilling to suit, in a location as indicated below. In addition the panel should be drilled at this time to suit the PG11/M20 gland provided for the transfer pump cable. The flying lead from the pump should be wired to terminals 7 for the Live and 4 for Neutral. A link must also be added from terminal 3 to terminal 5. All cabling can then be “zip” tied together.



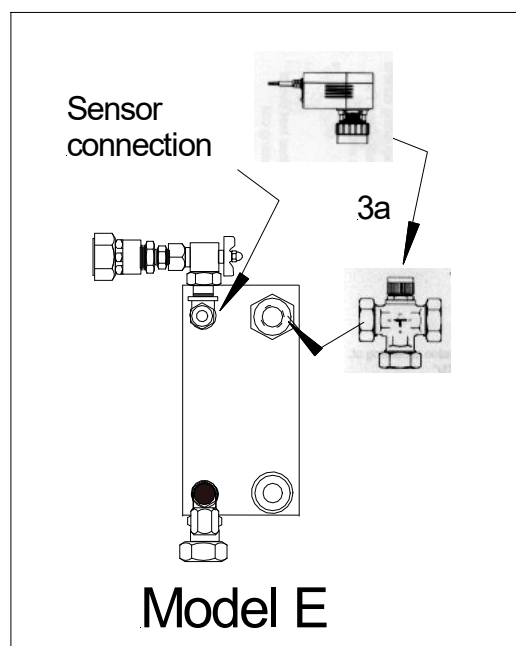
The Econoplate BV is now complete and ready for installation of other services.

Model M Wiring Details

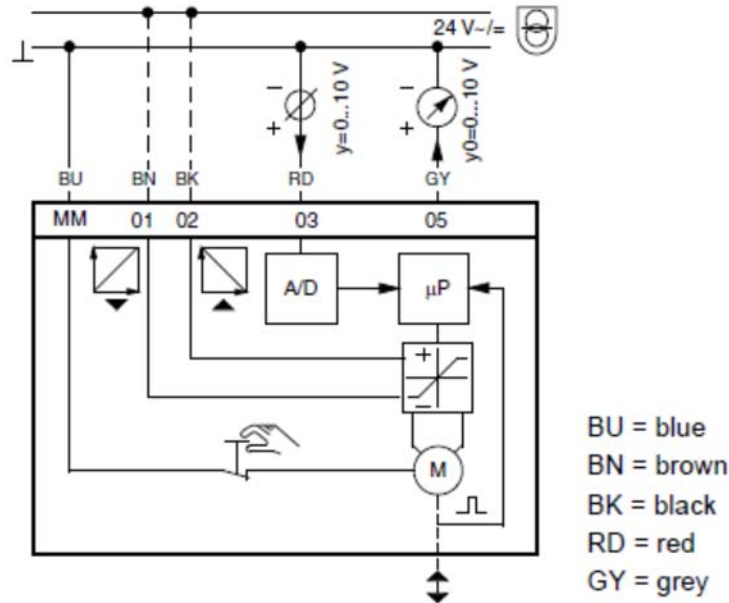


Model E

Component 3a : The 24V electrical 2 port valve is fitted to the primary flow port (inlet) on the heat exchanger assembly with the union provided. Ensure the valve orientation is correct flow A → AB into the heat exchanger. The drive is supplied with a flexible cable for connection to “customer” temperature control equipment. A ½” BSP connection is provided on the heat exchanger secondary flow port for customer secondary temperature sensor.



Actuator Wiring Details for the 2 Port Valve on Model E



The direction of response to the 0-10V control signal is reversible.

Direction of operation 1 (24V on the brown (BN) cable).

When the positioning signal is increased the actuator rod moves out and opens the valve.

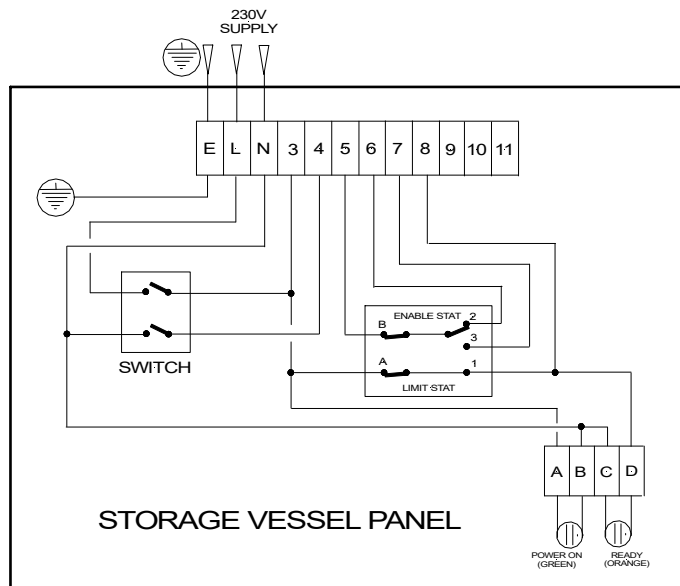
Direction of operation 2 (24V on the black (BK) cable).

When the positioning signal is increased the actuator rod moves in and closed the valve.

There are 3 dip switched in the actuator which are used for setting speed and valve characteristics. When set 1= OFF / 2=OFF / 3=ON the actuator will have a speed of 35 seconds and an =% response characteristic.

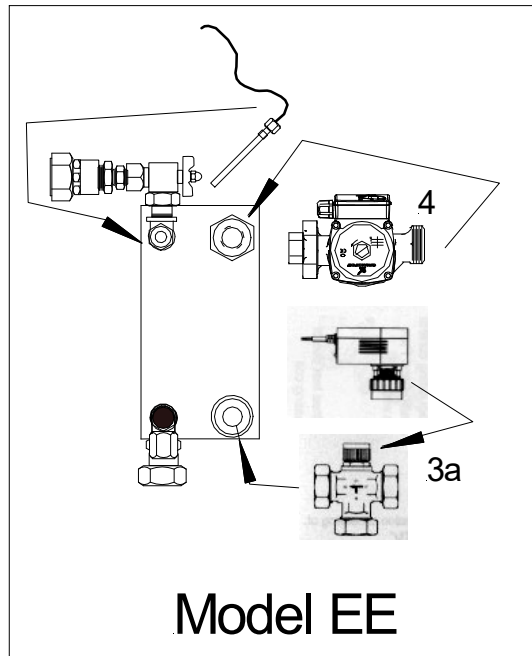
Econoplate BV Thermal Storage Vessel Control Panel.

As supplied the wiring of the panel is as shown and could be used in a similar way to the Model M if required

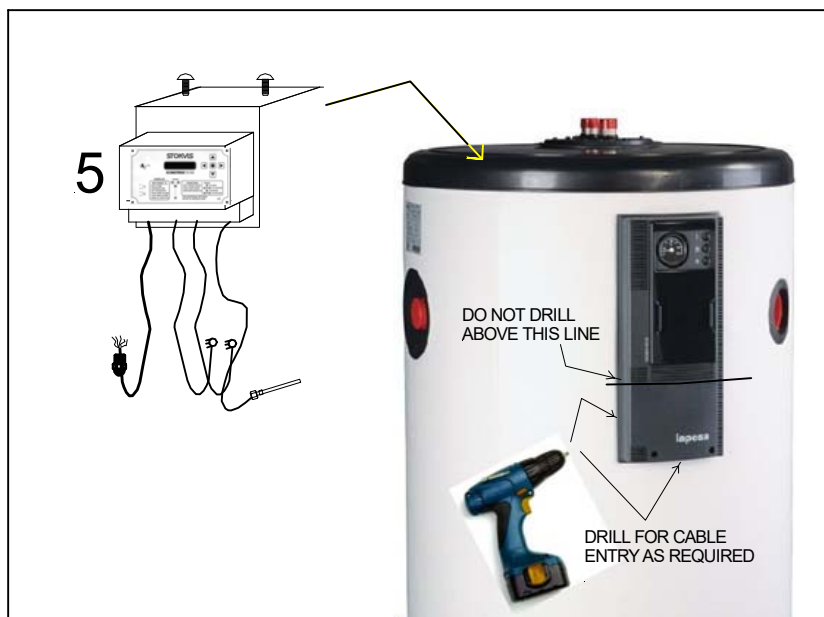


Model EE

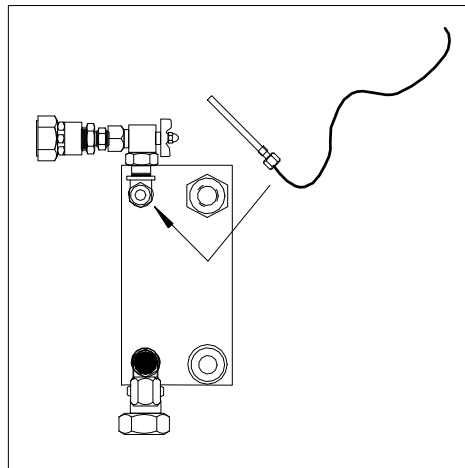
Component 3a & 4 : The 230V, 2 port valve (3a) is fitted to the primary return port on the heat exchanger assembly with the union provided. Ensure the valve orientation is correct flow A → AB away from the heat exchanger. **The primary pump (4)** is fitted to the primary inlet port on the heat exchanger with the union provided ensuring the pump shaft is in the horizontal plane. The flow direction on the pump should be into the heat exchanger.



Component 5 : The Econotrol™ Controller has a pre-mounting bracket which is used to attach it to the top of the thermal store using 2 x self tapping screws. It is provided with pre-wired flying leads, which should be plugged into both the primary and secondary pumps, a 5 core cable for the power and controls connection cable to the control panel of the thermal store and the prewired secondary temperature sensor. A cable gland has also been fitted to the Econotrol™ for entry of the flying lead fitted to the 2 port valve.



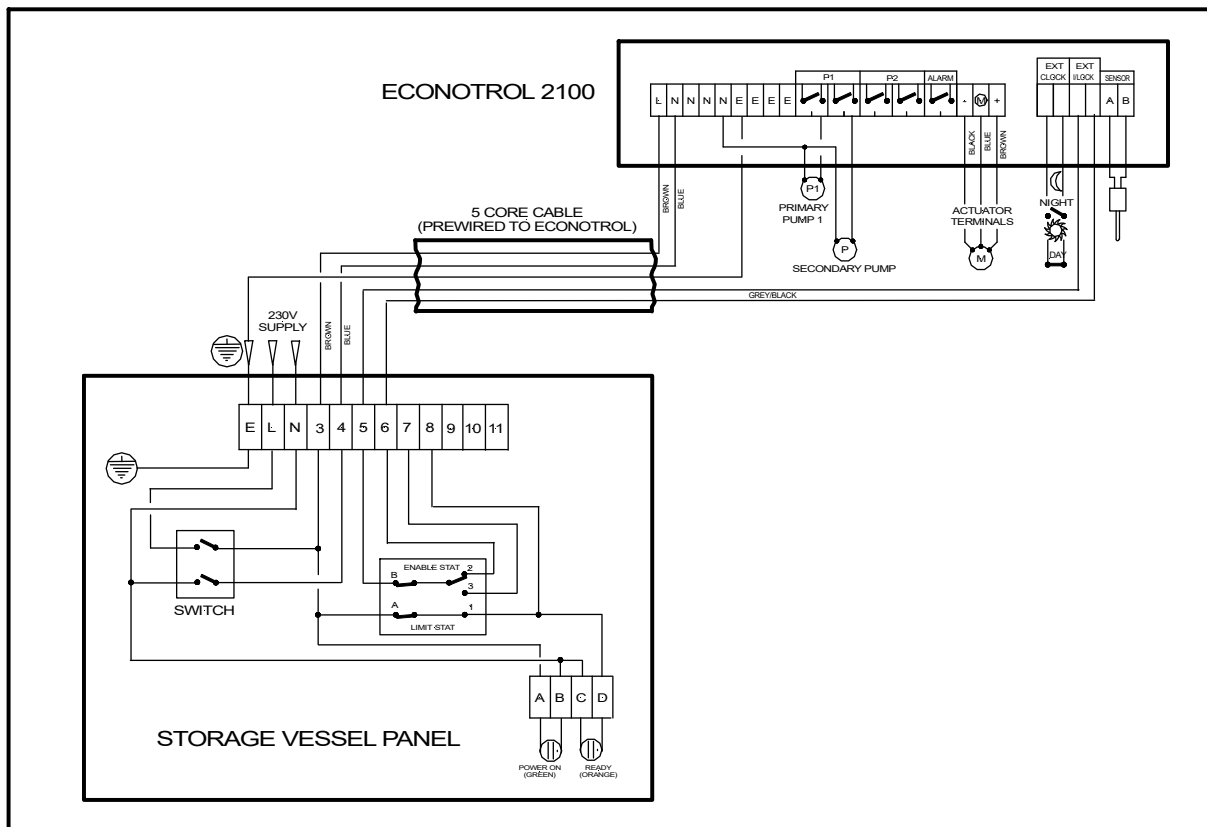
The PT100 sensor should now be fitted into the stud coupling located on the secondary flow from the heat exchanger, taking care not to over tighten against the olive.



With the Econotrol™ now mounted on the thermal store connect the 2 port control valve actuator wiring as detailed below.

The incoming supply wiring, should now be made to terminals L, N & E, in the control panel on the thermal store. The control panel requires drilling to suit, in a location as indicated above. In addition the 5 core cable from the Econotrol™ needs to be wired as below, this is for the supply and enable wiring to the Econotrol™. Drill to suit the PG11/M20 gland provided, again in the location indicated above.

Model EE Wiring Details



The Econoplate BV is now complete and ready for installation of other services.

COMMISSIONING

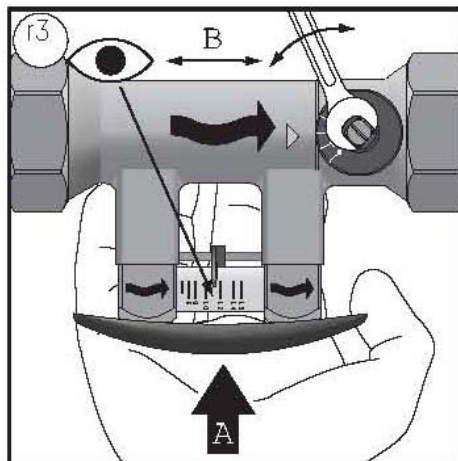
The Thermal Store Control Panel incorporates a combined thermostat for the enable (adjustable) and manual reset high limit thermostat (preset to 90°C).

The enable thermostat should be adjusted and set to the SWITCH ON temperature for hot water generation. There is a spring clip on the rear of the dial which can be used to restrict the setting of this thermostat if required (see below).



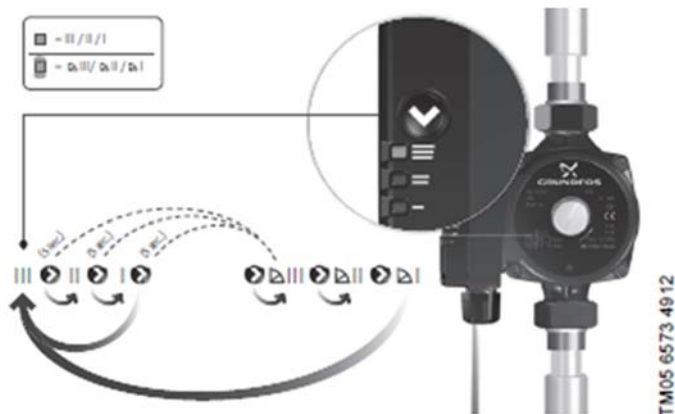
The Thermostatic Control Valve/ Econotrol™ should be set to give the desired secondary domestic hot water temperature set point - this should be set 5K above the setting of the buffer vessel enable thermostat.

The secondary flow rate around the heat exchanger and buffer/thermal store should be set on the Taconova Setter Valve as indicated.



The figure in the Performance Guide under Continuous Output is the flow rate that should be set, for the Econoplate BV model supplied.

The primary pump on the EE models should be set to Proportional Pressure III. When in Proportional Pressure mode the green light flashes ON/OFF next to the selected speed I, II or III. (In Fixed Speed mode it is ON, solid green light). All settings are accessed by pressing the arrow button and appear in sequence as pictured. To change to proportional pressure, from fixed speed, hold the button for 5 seconds.

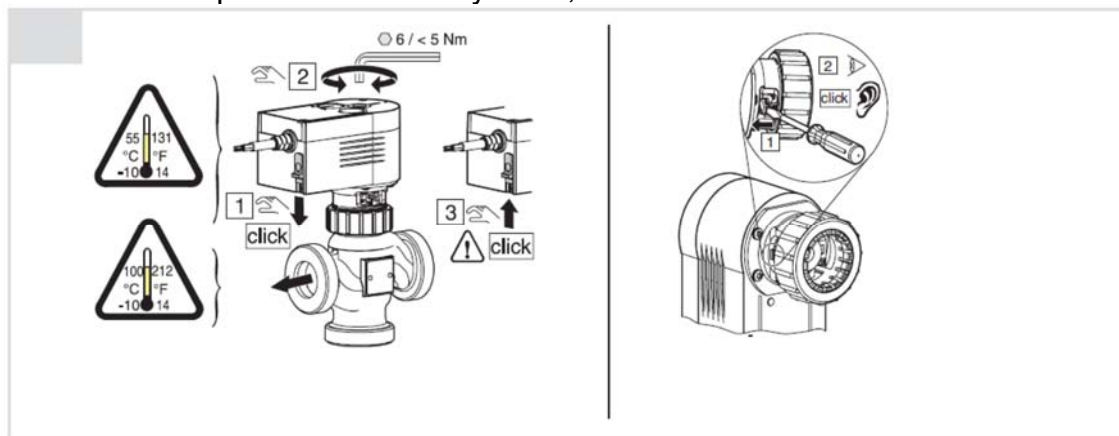


Primary flow rates should be set, on units without primary pumps (Models M & E) to the figure shown in the Technical Specification section of this document.

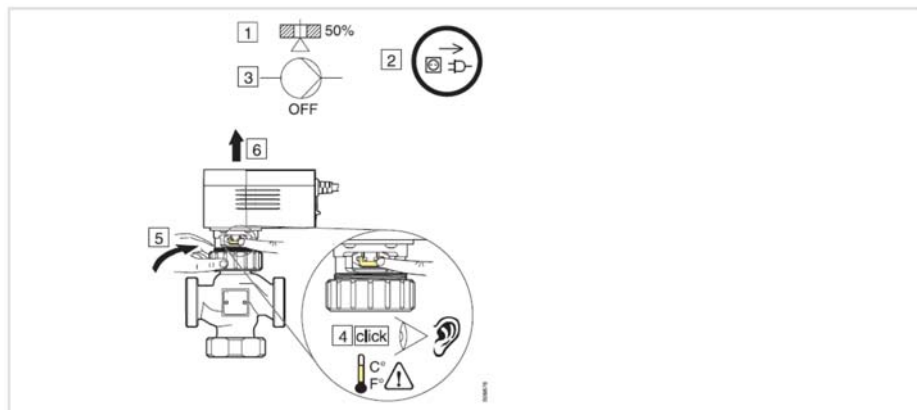
For Model EE, the Econotrol™ manual should be referred to for set up however the default settings will provide hot water from the heat exchanger at 60°C, 24/7. The only setting which MUST be changed is the Low Alarm which should be set to the correct differential to equal a 10°C setting, e.g. Set the Low alarm to 50 when the set point temperature is 60°C.

OTHER OPERATIONS.

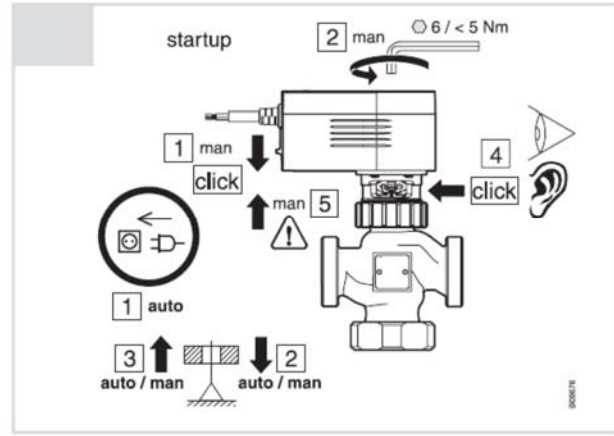
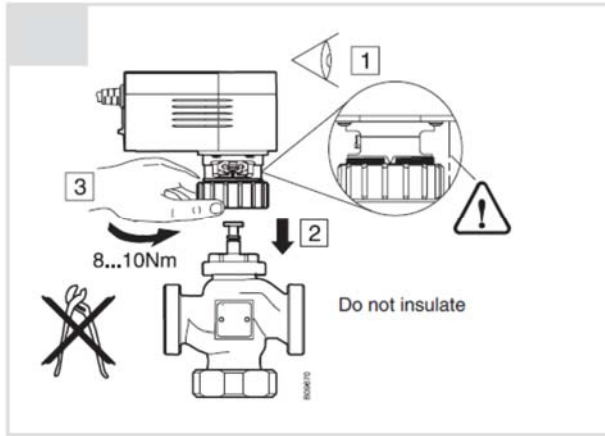
If required the AVM105 actuator on Model EE models can be put into manual mode and the valve opened or closed by hand, as below.



When replacing the actuator the following procedure should be followed.
To remove:



To fit:



Fault finding

1.No green light on buffer vessel control panel

Check power supply to buffer vessel panel

Check on/off switch

Check wiring

2.No orange light on buffer vessel control panel

Check/reset buffer vessel high limit thermostat.

Check wiring to and from the high limit thermostat

3.Econotrol display is blank (model EE)

Check for a green light on buffer vessel panel

Check power at the Econotrol

Check display screen is plugged in correctly to the back board

Check internal 500mA fuse in Econotrol

4.Econotrol displays OFF even when hot water required

Check external enable circuit – link out Ext/Clock terminals

Check Econotrol time & temperature program in Settings

5.Econotrol displays Ext I/lock

Check setting of the buffer vessel thermostat, EXT I/lock means the thermostat is currently open circuit holding the unit off.

Check wiring of the thermostat

6.Valve not modulating

Check 2 port valve is free to open & close

Check control signal to valve actuator (model E & EE)

Check thermostatic head (model M) is on and set, check the sensing element is in place (model M)

Check if external pumps are over pumping or lack of low loss header on units with integral primary pump – turn off external pump – power down the complete BV unit then back on again and observe operation

7.Secondary pump not running

Check for green & orange light on buffer vessel panel
Check buffer vessel panel thermostat setting and operation
Check buffer vessel panel high limit thermostat
Check Econotrol display is showing a suitable set point not OFF or Ext I/Lock when scrolling down

8.Primary Pump not running (only for EE models)

Check if pump is seized
Check power at the pump
Check 1-5 above

9.Buffer vessel temperature stays low

Check 1-8 above
Check primary temperature is correct
Check primary flow rate / primary pump setting - flashing green light on III
Check for air locks, blocked strainers etc
Check secondary pump / flow using the Taconova
Check 2 port valve is opening
Check for blockage of the heat exchanger e.g scale or boiler sludge

10.Running out of hot water at certain times

Check primary temperature is correct
Check primary flow rate / primary pump setting - flashing green light on III
Check secondary pump / flow using the Taconova
Check 2 port valve is opening
Check for air locks, blocked strainers etc
Check for blockage of the heat exchanger e.g scale or boiler sludge

11.Water too hot

Check buffer vessel thermostat setting
Check BMS control signal to valve (model E)
Check Econotrol setting and signal to valve (model EE)
Check Thermostatic head setting and operation (model M)
Check 6. above



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Econotrol 2100 Controller

Operation Manual

Contents

Page 3	General Specification & Fascia Layout
Page 4	Display Menu
Page 4	Function Menu
Page 5 & 6	Settings Menu
Page 7	External Connections
Page 8	Summary of Display Menu, Function Menu & Settings Menu

General Specification:

The Econotrol 2100 is a purpose designed PID regulator which controls temperature via a motorized 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 regulation, the controller includes:

- Valve opening/closing and P1/P2 primary pump running functional indicator lamps.
- A 500mA control fuse and a 10A output fuse.
- Duplex twin-head pump duty share (if fitted).
- High/low temperature alarm indication.
- Volt free common temperature alarm terminals.
- High temperature lockout.
- A safety extra low voltage (SELV) external interlock circuit for connection of an external safety device or switched circuit.
- A safety extra low voltage (SELV) external time clock circuit for connection of BMS time control.

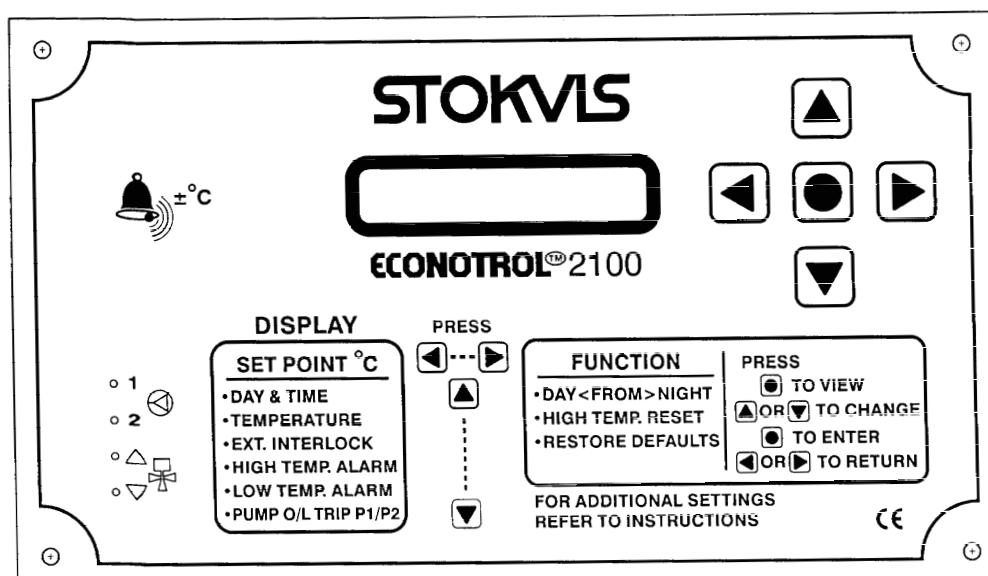
Time control can be by: either the internal inbuilt 7 day time clock for either 2 temperatures of operation or a single temperature set point and night “off” per day, or externally using the safety extra low voltage (SELV) external clock circuit for either 2 temperatures of operation or a single temperature set point and “off”.

Primary pump fault indication/overload trip is displayed on the Econotrol for units fitted with Magna3 variable speed pump(s) and UPS fixed speed pump(s) only when fitted with contactor and overload.

Duplex twin-head primary pump duty share facility is included as standard.

Duplex twin-head primary pump auto-changeover on pump fault is included as standard for units fitted with Magna3 D variable speed pumps, and for units fitted with UPSD fixed speed pumps only when fitted with contactor and overload.

Fascia Layout:



Display Menu:

Default Display:

The current **SET POINT** (°C) and **DAY & TIME** (24 hour clock, 7 day week) are displayed; to view any one of the other display menu options below press either the ▲ or ▼ key to move from one to the other.

Display Menu Options:

- **TEMPERATURE** – measured secondary water flow temperature (°C).
- **EXT INTERLOCK** – shown only if the External Interlock circuit is open.
- **HIGH ALARM** – shown only if the high temperature alarm setting has been exceeded (factory set at 10°C above the higher set point).
- **LOW ALARM** – shown only if the low temperature alarm setting has been exceeded (factory set at 20°C below the current set point).
- **P1 O/L or P2 O/L (Pump Fault)** – shown only if a primary pump, P1 or P2, overload has tripped (available on Magna3 variable speed pump(s) and UPS fixed speed pump(s) only when fitted with contactor and overload).

Function Menu:

Access:

The FUNCTION options are accessed from the default SET POINT display menu by pressing either the ◀ or ▶ key once.

Navigation:

- To move from one function option to the next press either the ▲ or ▼ key.
- To view the current status of a function 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 default SET POINT display menu press the ◀ or ▶ key.

Function Menu Options:

- **DAY<FROM>NIGHT** – this 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.
- **HIGH TEMP RESET** – only operates if a high temperature lockout has occurred; using it restarts the unit and resets the external volt free temperature alarm.
- **RESTORE DEFAULTS** – 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.

Settings Menu:

Description:

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 listed below and in the "Summary of Settings Menu" (see later).

Access:

The SETTINGS options are accessed from the default SET POINT display menu by:

- First pressing and releasing the \blacktriangleright key to enter the FUNCTION menu,
- Then pressing **and holding** the \blacktriangleright key for >5 seconds and then releasing.

Navigation:

- To move from one setting to the next press either the \blacktriangle or \blacktriangledown key.
- To view the current value of a setting, press the \bullet key.
- To change the value of a setting press the \bullet key again (a cursor will now flash).
Settings parameters are changed digit by digit:
 - To change the current value of a parameter digit, press the \blacktriangle key.
 - To move to the next parameter digit, press the \blacktriangleright key.
 - To enter this setting value change, press the \bullet key (the cursor will stop flashing).
- To move to the next setting, press the \blacktriangle or \blacktriangledown key.
- To return to the default SET POINT display menu, press the \blacktriangleleft or \blacktriangleright key twice, or leave for 30 seconds.

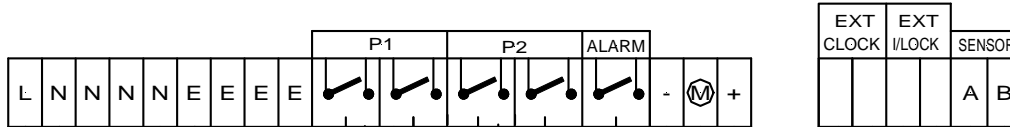
Settings Menu Options:

- **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 time clock (INT) or it can be controlled from an external source (EXT).
(Factory Setting = INT).
- **DAILY DAY, TIME & TEMPERATURE** – this is used, for each day of the week, to set the start time and temperature for the "day" operation when controlled by the internal time clock. The temperature range is from 01°C to 99°C; alternatively "OFF" can be selected.
(Factory Setting = 06:00 : T 60°C).
Note: values only adopted when CLOCK = "INT" (internal time clock control).
- **DAILY NIGHT, TIME & TEMPERATURE** – this is used, for each day of the week, to set the start time and temperature for the "night" operation when controlled by the internal time clock. The temperature range is from 01°C to 99°C; alternatively "OFF" can be selected.
(Factory Setting = 23:30 : T 60°C).
Note: values only adopted when CLOCK = "INT" (internal time clock control).
- **EXT CLOCK DAY, TEMPERATURE** – this is used to set the temperature for the "day" operation when controlled by an external device connected across the external time clock circuit. The temperature range is from 01°C to 99°C; alternatively "OFF" can be selected.
(Factory Setting = T 60°C).
Note: values only adopted when CLOCK = "EXT" (external time clock control).
- **EXT CLOCK NIGHT, TEMPERATURE** – this is used to set the temperature for the "night" operation when controlled by an external device connected across the external time clock circuit. The temperature range is from 01°C to 99°C; alternatively "OFF" can be selected.
(Factory Setting = T OFF).
Note: values only adopted when CLOCK = "EXT" (external time clock control).

- **HIGH 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.
(Factory Setting = T +10°C).
- **LOW 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.
(Factory Setting = T -20°C).
- **PROP (Proportional Band)** – a high proportional band will produce a 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.
(Factory Setting = 25).
- **DIFF (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.
(Factory Setting = 20).
- **PUMP MODE** – this is used to determine which pump output terminal is used. If a single-head primary pump is connected to the P1 terminals then “P1 ON” should be selected. If a single-head primary pump is connected to the P2 terminals then “P2 ON” should be selected. If a duplex twin-head primary pump is fitted, one will be connected to P1 terminals and the other to P2 terminals, “P1/P2” should be selected which will then perform duty share on the 2 pump heads.
(Factory Setting = P1 ON).
- **ALARM** – there are 3 automatic and 1 manual reset high temperature alarm modes:
(Factory Setting = AUT1).
 - **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. Auto reset occurs once the temperature has fallen below the alarm temperature. Subsequent high temperatures cause an almost immediate shut down.
 - **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 the FUNCTION menu and select HIGH TEMP RESET = “YES”.

External Connections:

Econotrol Terminal Detail:



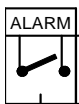
Electrical Supply:

The controller operates with a 230V 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:

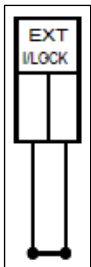
The electronic controller is protected by a 500mA fuse and the main PCB output side is protected by a 10A fuse; both are located on the main PCB.

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 energized. A single pair of volt free (ALARM) terminals, which close on a fault (after a given time), are available for external indication.

External Interlock:



An external safety device or switched circuit can be connected to the Econoplate which will shut the unit down in case of a fault. It is a safety extra low voltage (SELV) circuit; an open circuit should be used to shut the unit down.

External "Clock":

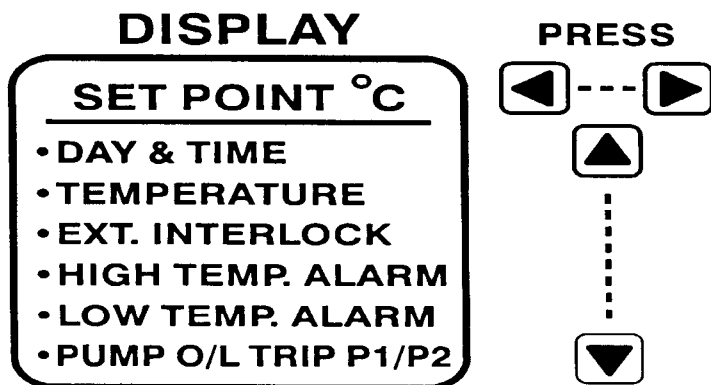


An external device can be connected to switch between 2 temperatures of operation, or to switch between a single set point and "off". A closed contact across this safety extra low voltage (SELV) circuit gives the "day" setting (EXT Clock Day) and an open circuit the "night" setting (EXT Clock Night).

WARNING

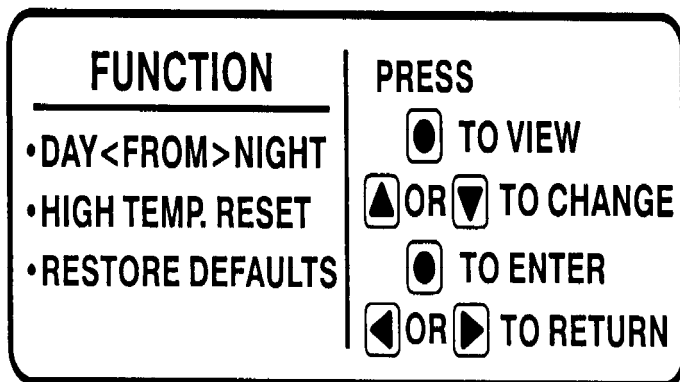
Never run control cables using low voltages with power cables – induced voltages can affect the operation of the controller.

Summary of Display Menu:



Summary of Function Menu:

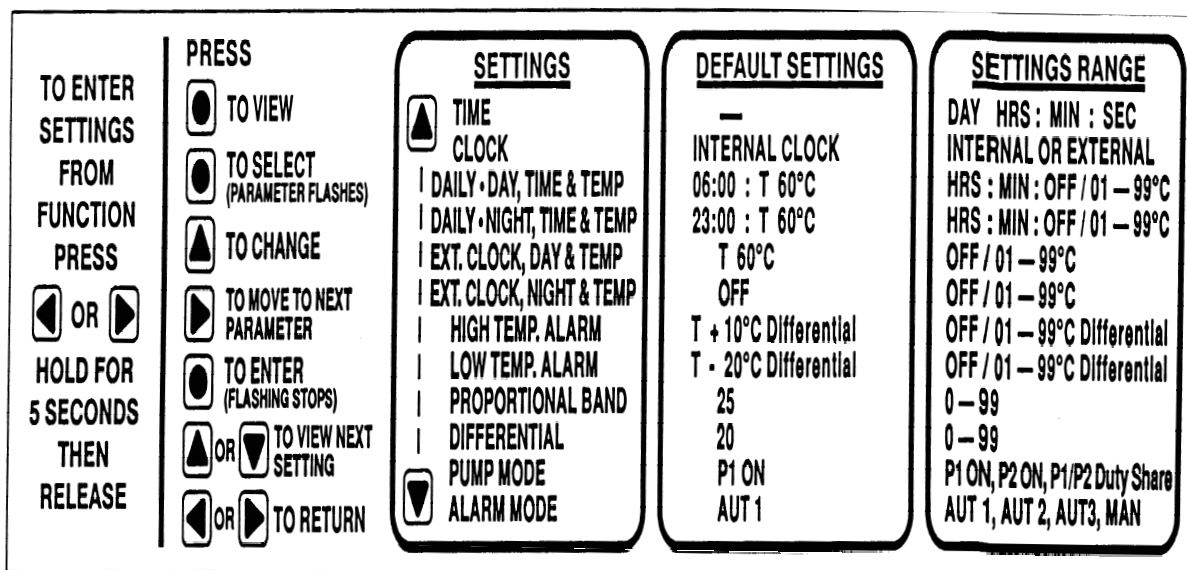
The FUNCTION options are accessed from the default SET POINT display menu by pressing either the ◀ or ▶ key once.



Summary of Settings Menu:

The SETTINGS options are accessed from the default SET POINT display menu by:

- First pressing and releasing the ▶ key to enter the FUNCTION menu,
- Then pressing **and holding** the ▶ key for >5 seconds and then releasing.





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