ECONOPLATE E0B
SWIMMING POOL
PACKAGED
PLATE HEAT EXCHANGER

INSTALLATION OPERATION & MAINTENANCE DOCUMENTATION

STOKVIS ENERGY SYSTEMS
96R WALTON ROAD
EAST MOLESEY
SURREY
KT8 0DL
TEL: 08707 707 747
FAX: 08707 707 767
E-MAIL:info@stokvisboilers.com
WEBSITE:www.stokvisboilers.com

STOKVIS ECONOPLATE EOB

PACKAGED, SWIMMING POOL, PLATE HEAT EXCHANGER

GENERAL DESCRIPTION.

The Stokvis Econoplate E0B series of packaged plate heat exchangers are available for a range of duties from 48 kW to 291 kW, when fed with primary water at 82 ^{o}C.
The maximum primary temperature is 110 ^{o}C.

The Econoplate EOB series is designed to heat the pool water when installed on a bypass from the filtration loop. The total volume flow does not need to pass through the unit.

All units are built around an epoxy coated chassis containing the heat exchanger. The heat exchanger itself is constructed from a number of gasketted 316 stainless steel plates (titanium is available for seawater application) which can be readily added to, up to the largest model. This enables the capacity of an existing unit to be increased.

The E0B unit is fitted with a digital thermostat which controls the primary pump in an on/off mode, as and when a heat demand is registered by the temperature sensor fitted in the return from the pool. In addition the control unit has adjustable maximum and minimum alarm temperatures which give a common volt free alarm signal for connection to a BMS.

The primary circuit is factory fitted with a matched primary pump, a high flow non return valve and isolating valves. The whole package is fully assembled, wired and tested for ease of installation, leaving only the on site connection of the primary and secondary connections and the electrical supply. A 230 V output terminal is available when there is no heat demand this can be used to signal a motorised valve.

PERFORMANCE GUIDE FOR EOB RANGE

MODEL	EOB5	EOB7	EOB9	EOB11	EOB13	EOB15	EOB17	EOB19	EOB21	EOB23	EOB25
OUTPUT IN kW	48	80	109	137	164	188	211	233	253	274	291
PRIMARY FLOW RATE l/s	0.77	1.06	1.28	1.47	1.64	1.77	1.87	1.98	2.07	2.17	2.22
POOL FLOW RATE l/s	0.45	0.67	0.89	1.1	1.33	1.54	1.75	1.96	2.16	2.36	2.55

THE POOL SIDE PRESSURE DROP IS 20 kPa AT THE FLOW RATE LISTED ABOVE.
PERFORMANCE FIGURES ARE BASED ON A PRIMARY TEMPERATURE OF 82 ˚C.
MAXIMUM SECONDARYTEMPERATURE IS 60˚C AT THE SECONDARY FLOW RATE LISTED ABOVE.

TECHNICAL SPECIFICATION E0B RANGE.

- Chassis Plate : epoxy coated steel 25 mm thick
- Front Plate : epoxy coated steel 20 mm thick
- Heat Exchanger Plate : 316 grade stainless steel (titanium optional)
- Plate Gasket : epdm
- Retaining Bolts : 16mm carbon steel
- Maximum Operating Pressure : 6 bar
- Maximum Primary Temperature : 110 ^{o}C
- Minimum Primary Pump Operating Pressure (82^{o}C) : 2.5mwg
- Primary Connections : 1 1/4" bspf

-Secondary Connections : 2" bspf

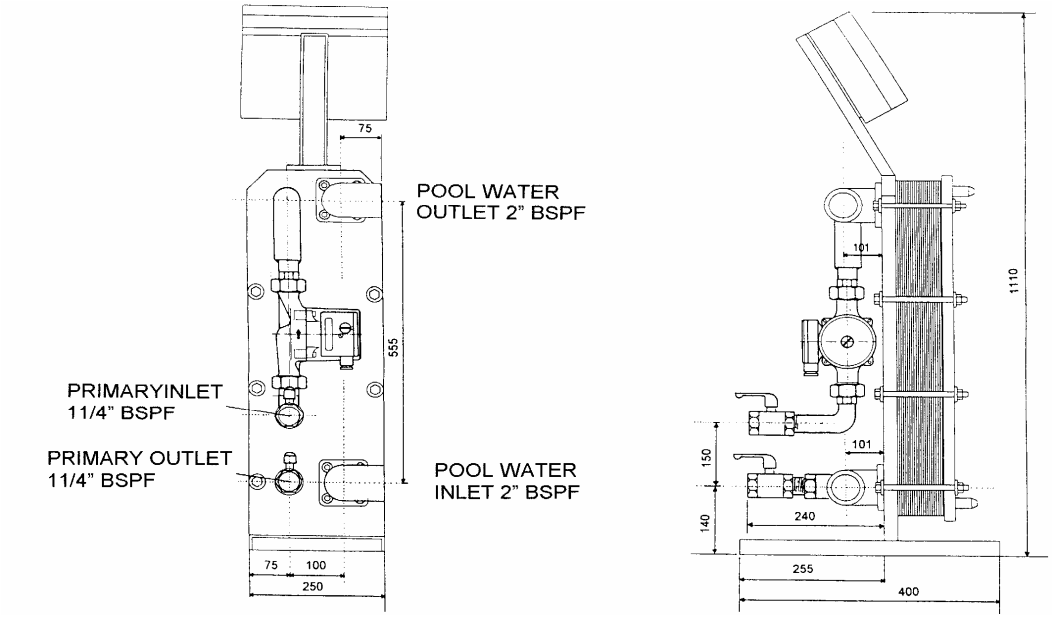
-Primary Pump : UPS32-80 1 phase 250 watt

The pump is fitted with an integral thermal protection relay

- Control Panel : Double Insulated, overall rating IP42
  : Digital thermostat adjustable in 0.1 ^{o}C increments
  : Pump output fused at 4 amp
  : Volt free temperature alarm output
  : Adjustable high & low temperature alarm
  : Adjustable switching differential in 0.1 ^{o}C increments
  : Digital display of pool water temperature & all set points/operational parameters
  : Sensor fault indication
  : Thermistor temperature sensor

Weight	:110kg	Length	:400mm
Height	:1110mm	Width	:250mm

ECONOPLATE EOB DIMENSIONAL DETAILS



INSTALLATION

Primary Circuit

The primary flow into the unit is connected to the top isolating valve, the return into the bottom isolating valve, both on the rear of the unit. The primary fluid is pumped by the integral pump, through the heat exchanger and the integral non-return valve with 6kPa head available to overcome system resistance.

Secondary Circuit (Pool water)

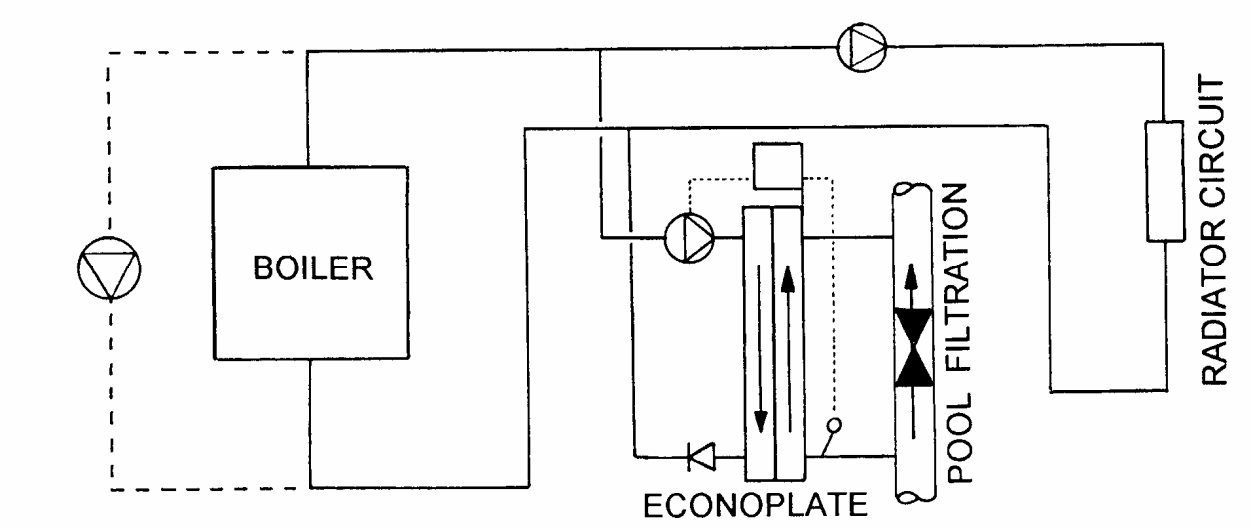
Water from the pool should enter the unit through the bottom right hand bronze elbow. The water is forced through the heat exchanger by the filtration pump; it is heated up and then exits from the top right hand bronze elbow.

This circuit will be piped up as a bypass off the main filtration loop with a valve in the loop between the Econoplate flow & return to divert the flow. Only a small percentage of the total volume needs to be heated up by the Econoplate.

The design flow rate is achieved when the pressure drop across the heat exchanger is 20kPa which gives an outlet temperature of no more than 60˚C

.

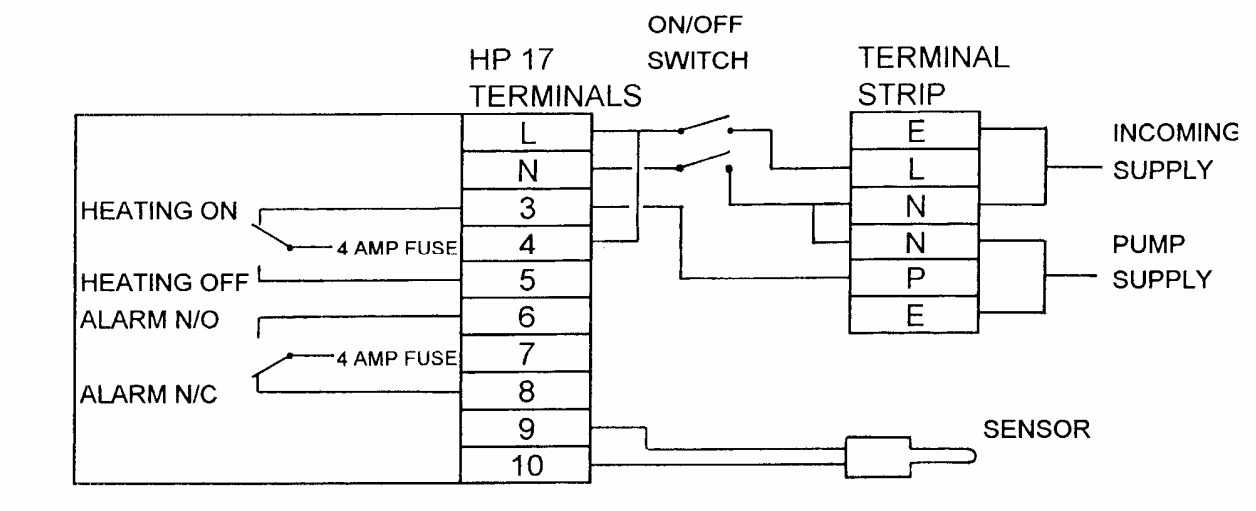
TYPICAL INSTALLATION OF ECONOPLATE EOB UNIT



ELECTRICAL DETAILS

Supply: 230V, 50Hz, 1 Amp f.l.c., fuse at 4 Amp
The pump is fitted with internal motor protection by either thermal overload or impedance protection.

ELECTRICAL WIRING



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.

OPERATION

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

Once this is complete the unit can be switched on. The Econoplate controller should now be set up as described in the Controller Instructions to suit the particular requirements of the client.

The secondary flow rate should be set by adjustment the bypass such that a pressure drop of 20kPa is introduced, this will then ensure that the design flow rate passes through the unit.

SIZING GUIDE

TABLE OF kW OUTPUT FOR AN INDOOR POOL, TEMPERATURE RISE OF 20^{o}C

POOL VOLUME m^3	HEAT UP PERIOD(HOURS)					
	12	24	36	48	60	72
10	19.5	9.8	6.5	4.9	3.9	3.3
20	39.0	19.5	13.0	9.8	7.8	6.5
30	58.5	29.3	19.5	14.6	11.7	9.8
40	78.0	39.0	26.0	19.5	15.6	13.0
50	97.5	48.8	32.5	24.4	19.5	16.3
75	146.3	73.1	48.8	36.6	29.3	24.4
100	195.0	97.5	65.0	48.8	39.0	32.5
125	243.8	121.9	81.3	60.9	48.8	40.6
150	292.5	146.3	97.5	73.1	58.5	48.8
175	341.3	170.6	113.8	85.3	68.3	56.9
200	390.0	195.0	130.0	97.5	78.0	65.0
300	585.0	292.5	195.0	146.3	117.0	97.5
400	780.0	390.0	260.0	195.0	156.0	130.0
500	975.0	487.5	325.0	243.8	195.0	162.5
600	1170.0	585.0	390.0	292.5	234.0	195.0
700	1365.0	682.5	455.0	341.3	273.0	227.5
800	1560.0	780.0	520.0	390.0	312.0	260.0
900	1755.0	877.5	585.0	438.8	351.0	292.5
1000	1950.0	975.0	650.0	487.5	390.0	325.0

TABLE OF kW OUTPUT FOR AN INDOOR POOL, TEMPERATURE RISE OF 15^{o}C

POOL VOLUME m^3	HEAT UP PERIOD(HOURS)					
	12	24	36	48	60	72
10	14.6	7.3	4.9	3.7	2.9	2.4
20	29.3	14.6	9.8	7.3	5.9	4.9
30	43.9	21.9	14.6	11.0	8.8	7.3
40	58.5	29.3	19.5	14.6	11.7	9.8
50	73.1	36.6	24.4	18.3	14.6	12.2
75	109.7	54.8	36.6	27.4	21.9	18.3
100	146.3	73.1	48.8	36.6	29.3	24.4
125	182.8	91.4	60.9	45.7	36.6	30.5
150	219.4	109.7	73.1	54.8	43.9	36.6
175	255.9	128.0	85.3	64.0	51.2	42.7
200	292.5	146.3	97.5	73.1	58.5	48.8
300	438.8	219.4	146.3	109.7	87.8	73.1
400	585.0	292.5	195.0	146.3	117.0	97.5
500	731.3	365.6	243.8	182.8	146.3	121.9
600	877.5	438.8	292.5	219.4	175.5	146.3
700	1023.8	511.9	341.3	255.9	204.8	170.6
800	1170.0	585.0	390.0	292.5	234.0	195.0
900	1316.3	658.1	438.8	329.1	263.3	219.4
1000	1462.5	731.3	487.5	365.6	292.5	243.8

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 services for many years.

Any clogging, due to a regulation, fault may be detected as follows:-

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

A small temperature drop between the inlet and outlet of the primary circuit (under 10°C for the smallest unit and under 30°C for the largest, 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 followed by secondary, and allow the temperature to fall below 40°C.
- Reduce the pressure by opening the vents.
- Drain both primary and secondary
- 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. Care should be taken to keep the plates in order. A plate pack consists of a 4 hole plate with gaskets round all 4 ports, this sits next to the fixed chassis plate with the gasket facing the chassis, next are a number of intermediate plates with the gaskets around just 2 ports. The last plate is a blank plate. You will notice that the chevron pattern alternates, facing up then down across the whole assembly and alternate ports have gaskets around them.

- Carefully clean the plates (do not use a metallic device). Use a nylon brush with water. Nitric acid may be used, dilute 10% acid to 90% water, then thoroughly rinse with clean fresh water.

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 3.1mm per plate and should be measure 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.

ECONOPLATE EOB
HP17 CONTROLLER

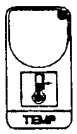
INSTALLATION &
OPERATION
DOCUMENTATION

STOKVIS ENERGY SYSTEMS
96R WALTON ROAD
EAST MOLESEY
SURREY
KT8 0DL
TEL: 08707 707 747
FAX: 08707 707 767
E-MAIL:info@stokvisboilers.com
WEBSITE:www.stokvisboilers.com

E0BHP17 JULY 00

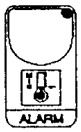
CONTROLLER TYPE HP17

MAIN SETTING (Run Mode)

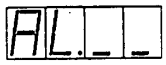


TEMPERATURE SETTING
Press TEMP SET (key lamp flashes): the following message will be displayed alternating with the set temperature value.

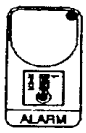
Press + or - to modify, press TEMP SET to escape.



MINIMUM ALARM TEMPERATURE
Press ALARM MIN (Key lamp flashes): the following message will be displayed alternating with the set Minimum temperature value.



Press + or - to modify, press MIN ALARM to escape*.



MAXIMUM ALARM TEMPERATURE
Press ALARM MAX (key lamp flashes): the following message will be displayed alternating with the set Maximum temperature value.

Press + or - to modify, press MAX ALARM to escape*.

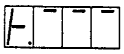
* If alarm option o.ALA=1 (see COSt) the c.AL_ or c.AL-message appears on the display.

If alarm option o.ALA=2 (see COSt) the r.AL_ or r.AL- message appears on the display.

The alarm temperatures cannot be reset in the run mode if either of these alarm modes have been selected.

VIEWING RECORDED TEMPERATURES

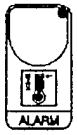
Press **+** and hold
The following will be displayed followed by the Maximum Temperature Recording



Press **-** and hold
The following will be displayed followed by the Minimum
Temperature Recording

Values recorded are memory permanent : for memory clear, keep the **+** key pressed for more than 3 seconds: CLEA message will be composed on the display before clearing.

PRESET PROGRAMS



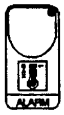
At delivery this processor is pre-programmed with the following (variable) settings. To return to these settings at any time: Power off the processor, press the ALARM MAX key. Keep the key pressed and turn the power on: the boot message will be displayed, (now release the ALARM MAX key).

t.SEt=25.0^0 AL_ _ = 10.0^0 AL- - = 30.0^0
The COSt values are shown in the COSt Programming.

COSt PROGRAMMING (System constants)

These settings refer to the mode of operation of the system and must be made on initial start-up.

Press **-** / **+** together for at least one second. The message C.O.S.t. will be displayed.



Press ALARM MAX repeatedly until the correct message is displayed (see table below). The value and message will be displayed alternately. Press + or - to input a new value and then ALARM to confirm. The next system constant will then appear. You can press ALARM MAX for at least two seconds to escape and return to the Run Mode.

Message.	Set Value	System Constant.	Note
diFF	0.2^0	^{0} Switching Differential	*1)
o.ALA	=0	Alarm setting mode	*2)
C.Al_	0.0^0	^{0} Set temperature minimum alarm	*3)
C.Al-	40.0^0	^{0} Set temperature maximum alarm	*3)
tEnP	=1	Temperature representation (1=^{0}C 2 = ^{0}F)	*4)
Ad.tE	0.0^0	^{0}Input temperature sensor correction (+ or-)	*5)

*1) The switching differential is evenly split either side of the set point

*2) o.ALA=0: Minimum and maximum alarm values user adjustable (see ALARM keys). (FACTORY SETTING).
o.ALA=1: Minimum and maximum alarms as absolute values (see Note *3).
o.ALA+2: Minimum and maximum alarm as a differential setting (see Note *3).

*3) If o.ALA=1:Minimum or maximum absolute alarm values can be set.
If o.ALA=2:Minimum or maximum differential alarm values can be set

*4) :=1 : ^{0}C Temperature range .
:=2 : ^{0}F Temperature range

*5) You can correct the readings on the various sensors (+ or -)

STATUS INDICATION LAMPS

The lights situated at the bottom of the display show the state of the various relays as set out below:

LAMP	State	Relay	Contact
HEAT	Heat On/Pump On	1	3-4
COOL	Heat Off/Pump Off	1	4-5
AL.MIN	Minimum Temperature Alarm On	2	6-7-8
AL.MAX	Maximum Temperature Alarm On	2	6-7-8

INSTALLATION

How to connect the supply to the controller

The electrical supply should be taken from a fused isolator in accordance with current IEE regulations.Connect the supply to the terminal strip L-N-E.

How to connect the sensor.

Connect the sensor provided as shown in the diagram. For remote connections use a standard 0.5 square millimeter two core wire, taking great care over the connections, by insulating and sealing the joints carefully. -0.C.- is displayed when the temperature sensor wiring is open, -S.C.- is displayed when the temperature sensor wiring is short circuit.

How to connect to the alarm contacts

Connect to terminals on the HP17 (contacts up to 4AMP.AC1).