CI/SfB (56.4)

STOKVIS
ENERGY SYSTEMS

STOKVIS ECONOPLATE

The "C" SERIES RANGE of ECONOPLATE PACKAGED PLATE HEAT EXCHANGERS

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ECONOPLATES

With the Government requiring the Industry to stay on course for a big shift to Condensing Boilers in April 2005 (SEDBUK grade A,B) plus the Building Regulations Part L upgrade in Jan 2006, it follows that designers need to ensure that return temperatures are low enough to realise the increase in efficiency given by the condensing process.

In order to lower the boiler return temperatures the following factors need to be considered and incorporated

1) Lower Boiler Flow Temperatures
2) Larger Temperature differential across the system, e.g. Flow 70 °C Return 50 °C giving a differential of 20.

Whilst the above points are fairly obvious, and already designed into weather compensated systems, under-floor heating systems, LST radiator systems and so on, there is an extremely important area, where both low flow temperatures and a larger temperature differential, can be incorporated to maximise on the Condensing Boiler efficiency and overall system efficiency - namely Hot Water Service generation. Stokvis proposes that this can be best achieved with the Packaged Plate Heat Exchanger.

Since 1985, Stokvis have been the market leader in packaged plate heat exchangers and are now proud to be first to launch their STOKVIS ECONPLATE “C” SERIES Packaged Plate Heat Exchangers to be used in combination with condensing boilers.

Specifically designed to operate with lower primary temperatures provided by condensing boilers the “C” series Econoplates are available in three ranges - a total of some 50 units - outputs up to 742 KW.

The units operate with a primary flow temperatures of 70 °C and achieve return temperatures of around the mid 40’s °C.

Therefore the “C” series contribute well to the efficiency of condensing boilers, and indeed, marry extremely well with the STOKVIS ECONOFLAME range of fully modulating, premix ,gas fired, condensing boilers.

In addition to the above the “C” series also incorporate the many long standing benefits of the Stokvis Packaged Plate Heat Exchanger, some of which are detailed below:

1. Low water content – not losing heat to the plant room causing excessive boiler firing

2. Fully modulating control valve – giving close control on heat input minimizing boiler firing and providing accurate control of HWS temperature

3. Plate Exchanger – more efficient than coils and not subject to costly insurance checks and easy to expand duty with additional plates.

4. Water Temperature raised from 10C to 60C in a split second – no legionella potential

5. Compact size – amazing output to size ratio -no wasted space - helps keep plant room small.

6. Complete Package – easy to install and service Minimum on site installation and down time.

The Econoplate “C” series units are designed to provide hot water instantaneously, without the need for storage, up to their maximum rated output. Where necessary they can be coupled to a buffer vessel for even greater outputs.

All of the units are built around an epoxy coated chassis containing the heat exchanger. This heat exchanger is constructed from a number of gasketed stainless steel plates which can be readily added to, enabling the output capacity of an existing unit to be increased if required.

Plate Heat Exchangers have low water content and low thermal inertia making them ideal for use in systems with varying heat loads.

The Econoplate “C” series units are supplied with fast acting 3 port motorised control valves fitted to the primary circuit. This valve is modulated by a purpose built PID controller which senses the secondary water temperature and opens or closes the valve in response.

The primary water is constantly circulated around the unit by an integral pump which has been matched to the heat exchanger, with an allowance of 6 kPa for pipe work losses also included.

Systems which utilise an existing primary feed pump, when connected to a unit with its 3 port valve, require an additional bypass.

For instantaneous hot water service usage a secondary hot water service return pump and non-return valve can be supplied, fitted and wired to the unit as an option.

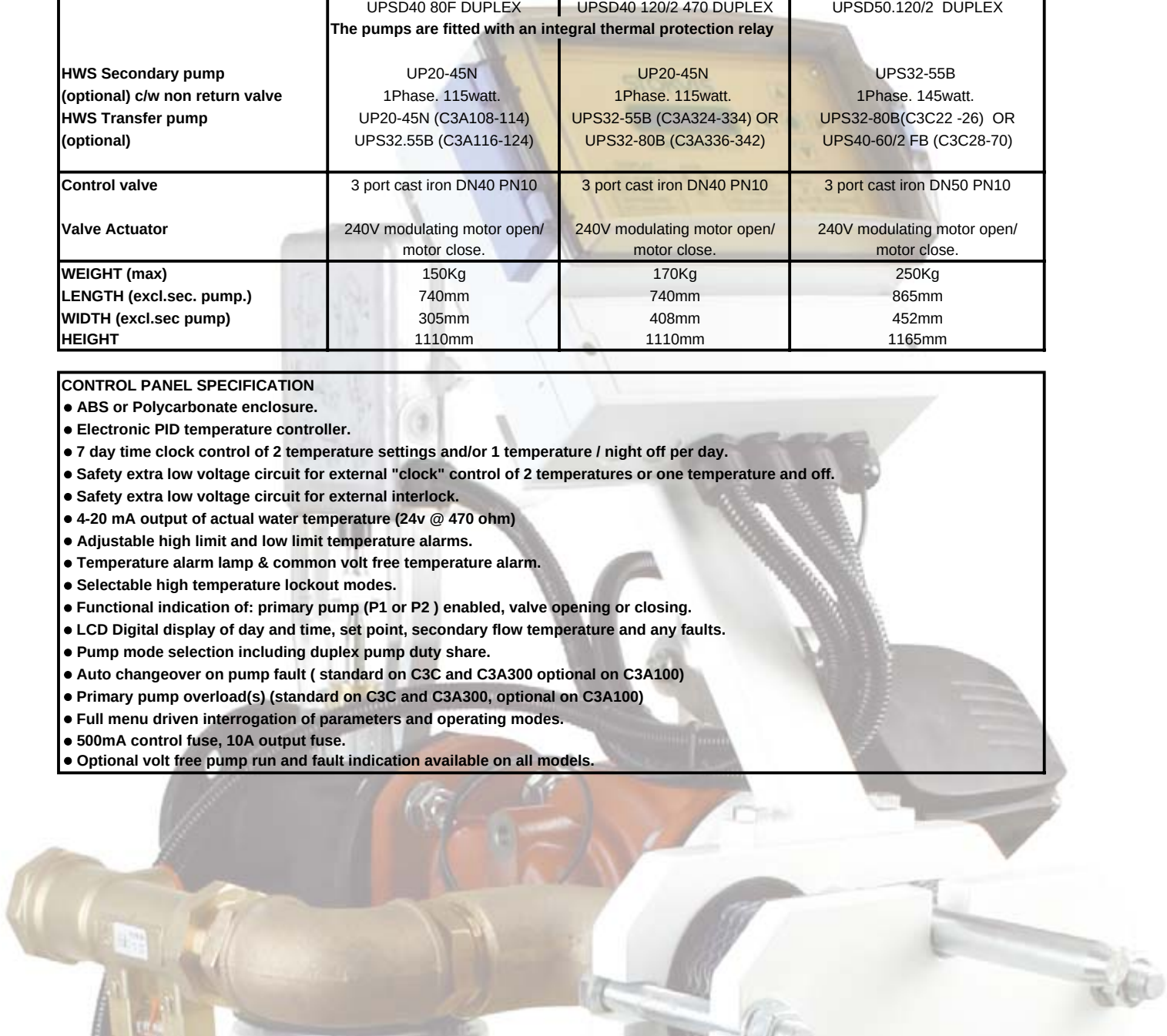
For semi-instantaneous hot water usage the transfer pump can be provided to pump water from the storage vessel to the Econoplate.

TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION	C3A100	C3A300	C3C
Chassis plate	epoxy coated steel 25mm	epoxy coated steel 25mm	epoxy coated steel 25mm
Front plate	epoxy coated steel 20mm	epoxy coated steel 20mm	epoxy coated steel 25mm
Heat exchanger plate	316 grade stainless steel	316 grade stainless steel	316 grade stainless steel
Plate gasket	EPDM	EPDM	EPDM
Retaining bolts	16mm carbon steel	16mm carbon steel	20mm carbon steel
Maximum Primary operating pressure :-	10 bar	10 bar	10 bar
Maximum Primary operating temperature:-	110 º C	120 º C	120 º C
Maximum Secondary operating pressure :-	6 bar	6bar	6 bar
CONNECTIONS			
Cold water feed	Bronze 11/2 " BSPF	2"BSPF	2"BSPF
Hot water service flow	Bronze 11/2 " BSPF	2"BSPF	2"BSPF
Hot water service return	Bronze. 1" (3/4" BSPF when HWS sec pump fitted)	Bronze. 1" (3/4" BSPF when HWS sec pump fitted)	Bronze11/4" BSPM (1 1/4 BSPF when HWS sec pump fitted)
Primary flow and return	INLET cast iron DN40PN10 OUTLET 1 1/2" BSPM	INLET cast iron DN40PN10 OUTLET 1 1/2" BSPM	INLET cast iron DN50 PN10 OUTLET 2" BSPM
Primary pump	UPS40.80F 1Phase. 250watt UPSD40 80F DUPLEX	UPS40 120/2 1Phase. 470watt UPSD40 120/2 470 DUPLEX	UPS50.120/2 1 or 3 Phase.760watt. UPSD50.120/2 DUPLEX
	The pumps are fitted with an integral thermal protection relay		
HWS Secondary pump (optional) c/w non return valve	UP20-45N 1Phase. 115watt.	UP20-45N 1Phase. 115watt.	UPS32-55B 1Phase. 145watt.
HWS Transfer pump (optional)	UP20-45N (C3A108-114) UPS32.55B (C3A116-124)	UPS32-55B (C3A324-334) OR UPS32-80B (C3A336-342)	UPS32-80B(C3C22 -26) OR UPS40-60/2 FB (C3C28-70)
Control valve	3 port cast iron DN40 PN10	3 port cast iron DN40 PN10	3 port cast iron DN50 PN10
Valve Actuator	240V modulating motor open/ motor close.	240V modulating motor open/ motor close.	240V modulating motor open/ motor close.
WEIGHT (max)	150Kg	170Kg	250Kg
LENGTH (excl.sec. pump.)	740mm	740mm	865mm
WIDTH (excl.sec pump)	305mm	408mm	452mm
HEIGHT	1110mm	1110mm	1165mm

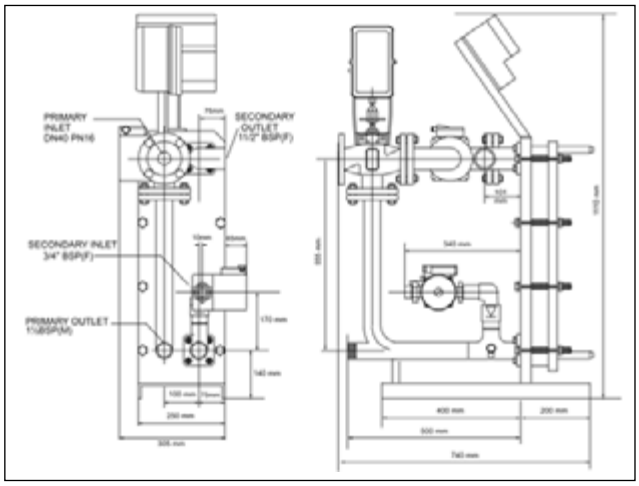
CONTROL PANEL SPECIFICATION

- **ABS or 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.**
- **4-20 mA output of actual water temperature (24v @ 470 ohm)**
- **Adjustable high limit and low limit temperature alarms.**
- **Temperature alarm lamp & common volt free temperature alarm.**
- **Selectable high temperature lockout modes.**
- **Functional indication of: primary pump (P1 or P2) enabled, valve opening or closing.**
- **LCD Digital display of day and time, set point, secondary flow temperature and any faults.**
- **Pump mode selection including duplex pump duty share.**
- **Auto changeover on pump fault (standard on C3C and C3A300 optional on C3A100)**
- **Primary pump overload(s) (standard on C3C and C3A300, optional on C3A100)**
- **Full menu driven interrogation of parameters and operating modes.**
- **500mA control fuse, 10A output fuse.**
- **Optional volt free pump run and fault indication available on all models.**

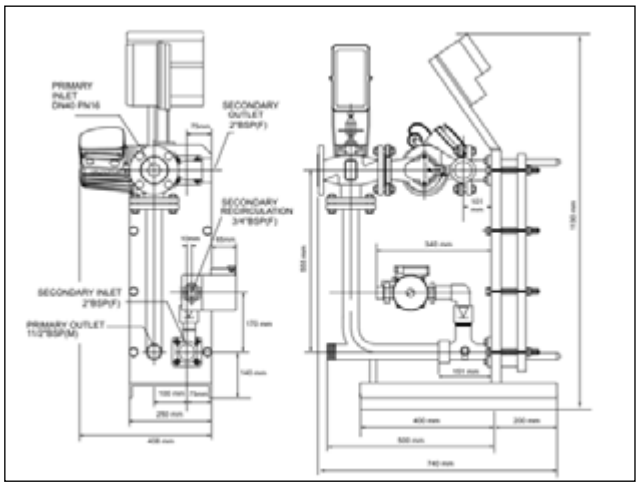


Instantaneous Mechanical Details:

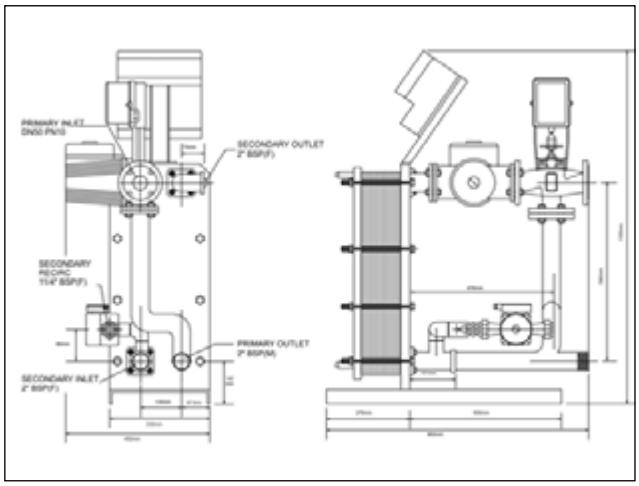
C3A100+1R incorporating recirc pump.



C3A300+1R incorporating recirc pump.

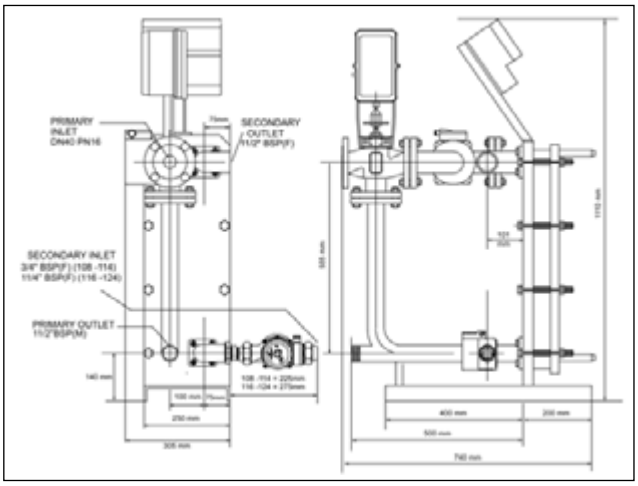


C3C3+1R incorporating recirc pump.

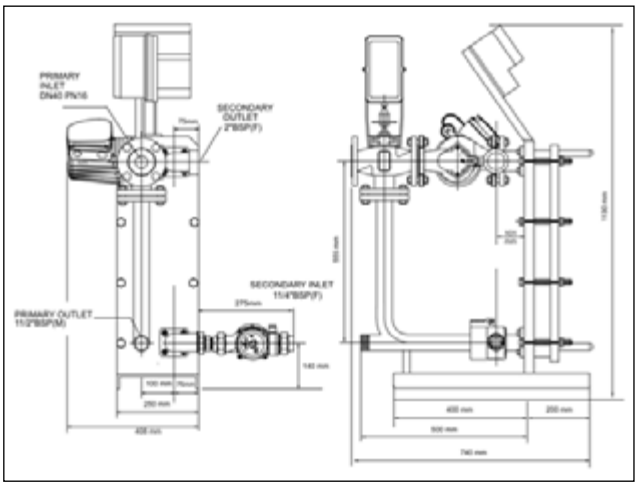


Semi - Instantaneous Mechanical Details:

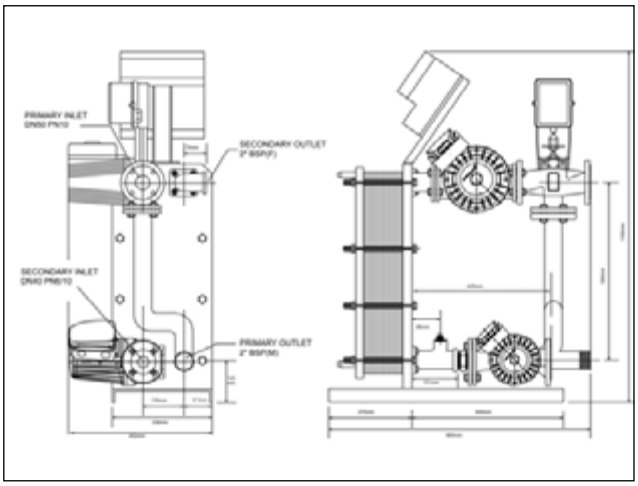
C3A100+1T incorporating angled connections and transfer pump.



C3A300+1T incorporating flow rate setter.



C3C300+1R incorporating transfer pump (UPS40-60/2 FB PUMP).



PERFORMANCE GUIDE FOR C3A100 RANGE(PRIMARY TEMPERATURE 70^{O}C , COLD FEED 10^{O}C)

	ECONOPLATE MODEL								
	C3A108	C3A110	C3A112	C3A114	C3A116	C3A118	C3A120	C3A122	C3A124
SECONDARY FLOW RATE AT 60^{O}C l/min	18	23.8	29.3	34.2	39	43.4	47.4	51.1	54.6
SECONDARY PRESSURE DROP AT PEAK OUTPUT kPa	17	16	16	15	15	15	15	14	14
PRIMARY FLOW RATE l/sec	0.82	0.97	1.11	1.23	1.35	1.45	1.53	1.62	1.70
PRIMARY RETURN TEMPERATURE^{O}C	52	49	48	47	46	45	44	44	43
HEAT LOAD REQUIRED kW	63	83	102	119	136	151	165	178	190
	SELECTION GUIDE FOR C3A100 RANGE								
TOURIST HOTELS BY NUMBER OF ROOMS	4	6	9	12	15	18	20	22	24
LUXURY HOTELS BY NUMBER OF ROOMS	-	4	6	8	10	12	14	16	17
NUMBER OF STANDARD FLATS	3	5	8	11	14	17	20	23	26
NUMBER OF LUXURY FLATS	-	3	5	7	9	11	13	15	17
HOSPITALS & NURSING HOMES BY NUMBER OF ROOMS	-	5	9	12	16	20	25	29	33
SPORTS CENTRES OR STADIUMS BY NUMBER OF SHOWERS	-	-	-	-	-	-	5	6	7
	Available pump head in kPa from optional secondary recirculation pump, at various flow rates								
RECIRCULATION RATE OF 1m^{3}/hr	25	30	32	33	34	35	35	35	36
RECIRCULATION RATE OF 3m^{3}/hr	-	-	-	-	-	-	2	4	4

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.
:Primary return temperature is given at full load.
:The selection guide uses diversity factors . For simultaneous operation of outlets calculate separately.
:For applications not listed or temperatures other than those above , contact Stokvis for a selection.
:Tourist hotels assume a shower and wash hand basin are available in each room.
:Luxury hotels assume a bath or shower and wash hand basin are available in each room.
:Standard flats are classed as having 1 sink, 1 wash hand basin and 1 shower.
:Luxury flats are classified as having 1 sink, 2 wash hand basins, and 1 bath.
:Standard fittings are assumed in all cases.

PERFORMANCE GUIDE FOR C3A300 RANGE(PRIMARY TEMPERATURE 70^{O}C , COLD FEED 10^{O}C)

	ECONOPLATE MODEL									
	C3A324	C3A326	C3A328	C3A330	C3A332	C3A334	C3A336	C3A338	C3A340	C3A342
SECONDARY FLOW RATE AT 60^{O}C l/min	70.2	74.4	79.8	84	88.2	93	96	99.6	102.6	106.2
SECONDARY PRESSURE DROP AT PEAK OUTPUT kPa	19	18	18	17	17	17	17	17	16	16
PRIMARY FLOW RATE l/sec	2.55	2.66	2.76	2.85	2.95	3.05	3.10	3.17	3.23	3.30
PRIMARY RETURN TEMPERATURE^{O}C	47	46	46	46	45	45	44	44	44	43
HEAT LOAD REQUIRED kW	244	260	278	292	308	323	335	346	357	370
	SELECTION GUIDE FOR C3A300 RANGE									
TOURIST HOTELS BY NUMBER OF ROOMS	30	32	36	39	42	46	48	50	53	56
LUXURY HOTELS BY NUMBER OF ROOMS	21	23	25	27	29	31	32	34	36	38
NUMBER OF STANDARD FLATS	39	44	50	56	62	69	73	77	81	86
NUMBER OF LUXURY FLATS	26	29	34	38	42	46	48	51	54	56
HOSPITALS & NURSING HOMES BY NUMBER OF ROOMS	49	55	63	69	76	83	87	92	96	104
SPORTS CENTRES OR STADIUMS BY NUMBER OF SHOWERS	11	13	15	17	19	21	22	24	26	28
	Available pump head in kPa from optional secondary recirculation pump, at various flow rates									
RECIRCULATION RATE OF 1m^{3}/hr	36	36	36	36	36	36	36	36	36	36
RECIRCULATION RATE OF 3m^{3}/hr	4	6	7	9	9	10	11	12	12	12

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.
:Primary return temperature is given at full load.
:The selection guide uses diversity factors . For simultaneous operation of outlets calculate separately.
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PERFORMANCE GUIDE FOR C3C RANGE(PRIMARY TEMPERATURE 70^{O}C , COLD FEED 10^{O}C)

	ECONOPLATE MODEL												
	C3C22	C3C26	C3C30	C3C34	C3C38	C3C42	C3C46	C3C50	C3C54	C3C58	C3C62	C3C66	C3C70
SECONDARY FLOW RATE AT 60^{O}C l/min	98.4	114.6	127.2	141	151.8	159.6	170.4	179.4	186	194.4	201.6	207	213
SECONDARY PRESSURE DROP AT PEAK OUTPUT kPa	18	17	15	15	14	14	13	13	12	12	12	12	11
PRIMARY FLOW RATE l/sec	3.95	4.35	4.70	5.05	5.25	5.45	5.60	5.79	5.85	6.00	6.10	6.15	6.20
PRIMARY RETURN TEMPERATURE^{O}C	49	48	47	47	46	46	45	44	44	43	42	42	41
HEAT LOAD REQUIRED kW	342	399	442	492	529	555	594	625	648	678	702	720	742
	SELECTION GUIDE FOR C3C RANGE												
TOURIST HOTELS BY NUMBER OF ROOMS	50	64	74	86	99	107	118	130	136	147	156	163	170
LUXURY HOTELS BY NUMBER OF ROOMS	34	42	50	59	66	72	79	86	90	97	102	106	110
NUMBER OF STANDARD FLATS	76	100	120	141	163	178	196	217	230	250	265	276	290
NUMBER OF LUXURY FLATS	50	68	82	100	117	130	144	160	173	184	196	203	214
HOSPITALS & NURSING HOMES BY NUMBER OF ROOMS	92	120	146	176	201	220	246	270	286	310	328	340	357
SPORTS CENTRES OR STADIUMS BY NUMBER OF SHOWERS	24	32	39	47	56	62	69	76	80	88	94	98	104
Available pump head in kPa from optional secondary recirculation pump, at various flow rates													
RECIRCULATION RATE OF 1m^{3}/hr	48	49	49	49	49	49	49	49	49	49	49	49	49
RECIRCULATION RATE OF 3m^{3}/hr	39	40	41	41	42	42	42	42	42	42	42	42	42
RECIRCULATION RATE OF 5m^{3}/hr	22	24	26	28	29	30	31	31	31	32	32	32	32

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.
:Primary return temperature is given at full load.
:The selection guide uses diversity factors . For simultaneous operation of outlets calculate separately.
:For applications not listed or temperatures other than those above , contact Stokvis for a selection.
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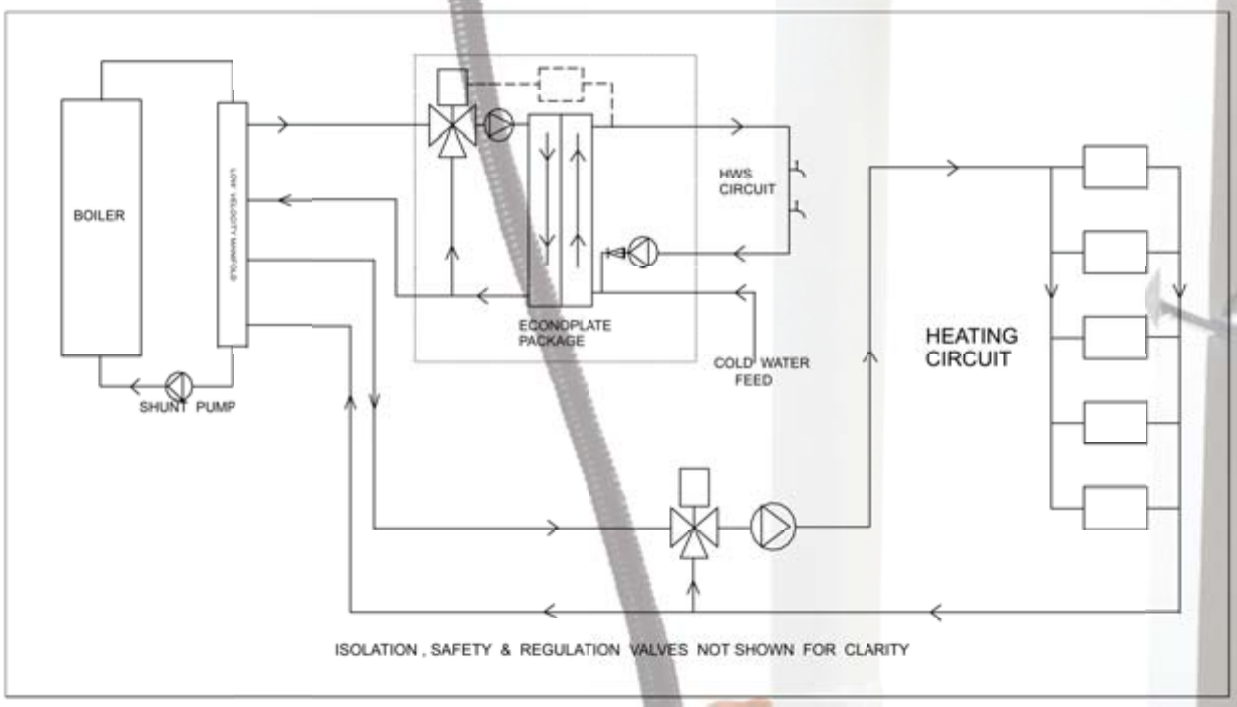
INSTALLATION.

Primary

The primary inlet connection is made into the 3 port valve, whilst the outlet is from the lower BSP threaded connection. Both primary connections should be made using the correct counter flanges and suitable isolating valves, to enable servicing of the unit after installation.

To ensure correct operation, water at the design flow temperature should be available to the plate heat exchanger at all times. This is necessary because the plate heat exchanger itself, under no load conditions, does not flow water through the boiler. Consequently when a demand for hot water occurs the boiler would be unable to respond fast enough to prevent temperatures dropping. The “Typical installation schematic” shows an ideal example.

TYPICAL INSTALLATION OF ECONOPLATE C SERIES PLATE HEAT EXCHANGER ON A COMBINED HEATING AND HOT WATER SYSTEM.



INSTANTANEOUS HOT WATER APPLICATIONS.

When water is being drawn directly from the Econoplate into the distribution system to the taps this is termed instantaneous hot water generation. The cold water feed connection is made into the bottom horizontal bronze connection on the rear of the Econoplate. The cold feed may be either from a cold feed storage tank which can itself be boosted if required. Alternatively the unit may be connected to the mains, a kit of components required by part G3 of the approved document of the Building Regulations 1985 and complying with any Installation Requirements for bylaw compliance, can be provided to complete the package.

The hot water service flow is connected into the top bronze connection, again on the rear of the Econoplate. It can be identified by noting the electrical temperature probe fitted into it. A secondary re-circulation must be maintained at all times either around the installation or locally to the Econoplate. For this purpose, a connection is provided in the bronze cold feed casting, or alternatively if the optional secondary re-circulation pump (complete with non-return valve) is provided, then the connection is made into the pump. Isolating valves should be fitted to all circuits.

SEMI-INSTANTANEOUS HOT WATER APPLICATIONS.

When hot water is drawn from a storage vessel into the distribution system to the taps and the vessel is heated directly by the Econoplate, this is termed semi instantaneous hot water generation. This type of installation particularly suits applications which have low cold feed pressures or insufficient boiler power available.
The cold feed connection is made into the bottom, of the vessel. The cold feed can still be either from a cold feed storage tank which can itself be boosted or it can be mains fed, the same restrictions/requirements as above apply.

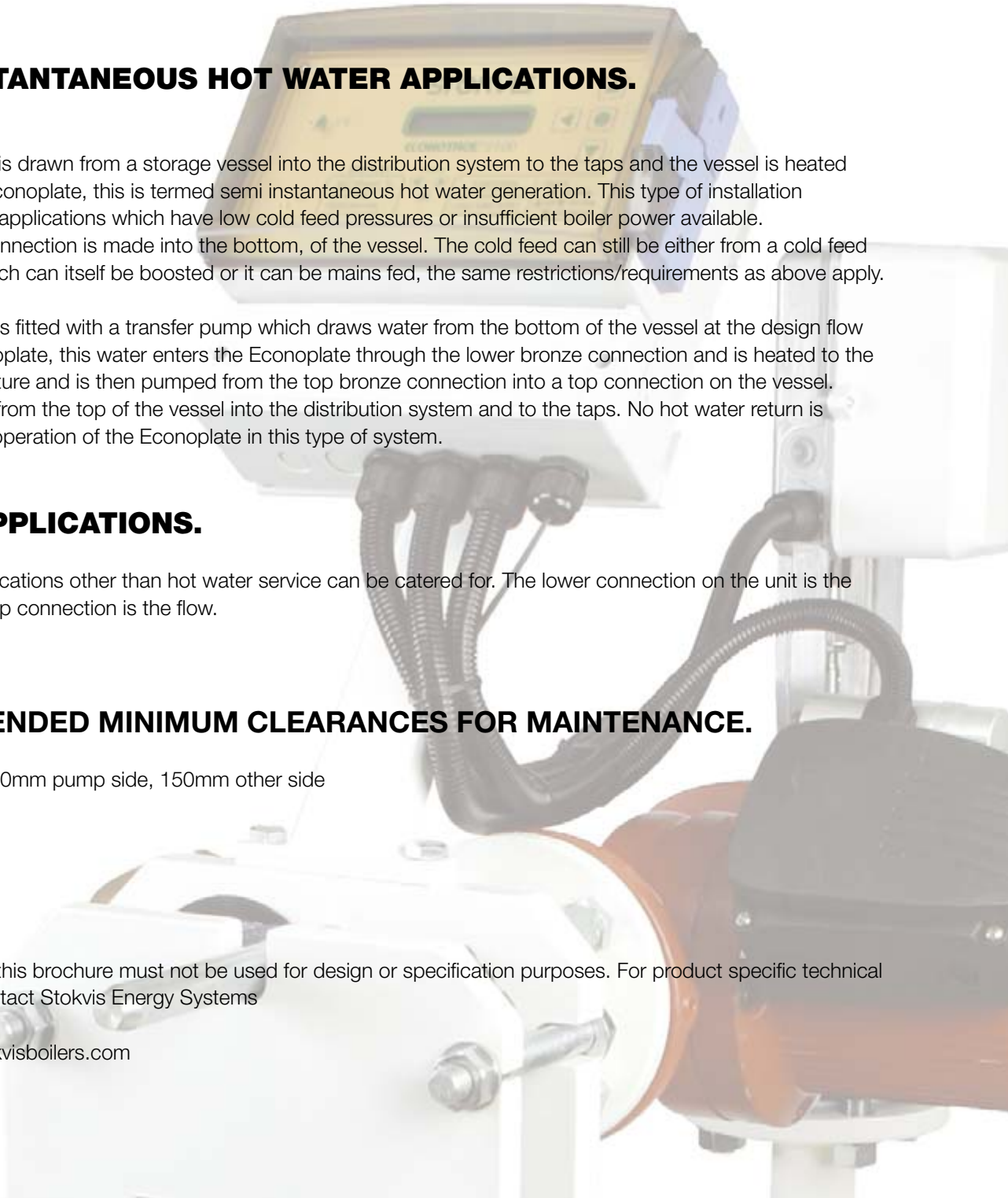
The Econoplate is fitted with a transfer pump which draws water from the bottom of the vessel at the design flow rate of the Econoplate, this water enters the Econoplate through the lower bronze connection and is heated to the desired temperature and is then pumped from the top bronze connection into a top connection on the vessel. Hot water flows from the top of the vessel into the distribution system and to the taps. No hot water return is required for the operation of the Econoplate in this type of system.

OTHER APPLICATIONS.

Many other applications other than hot water service can be catered for. The lower connection on the unit is the return and the top connection is the flow.

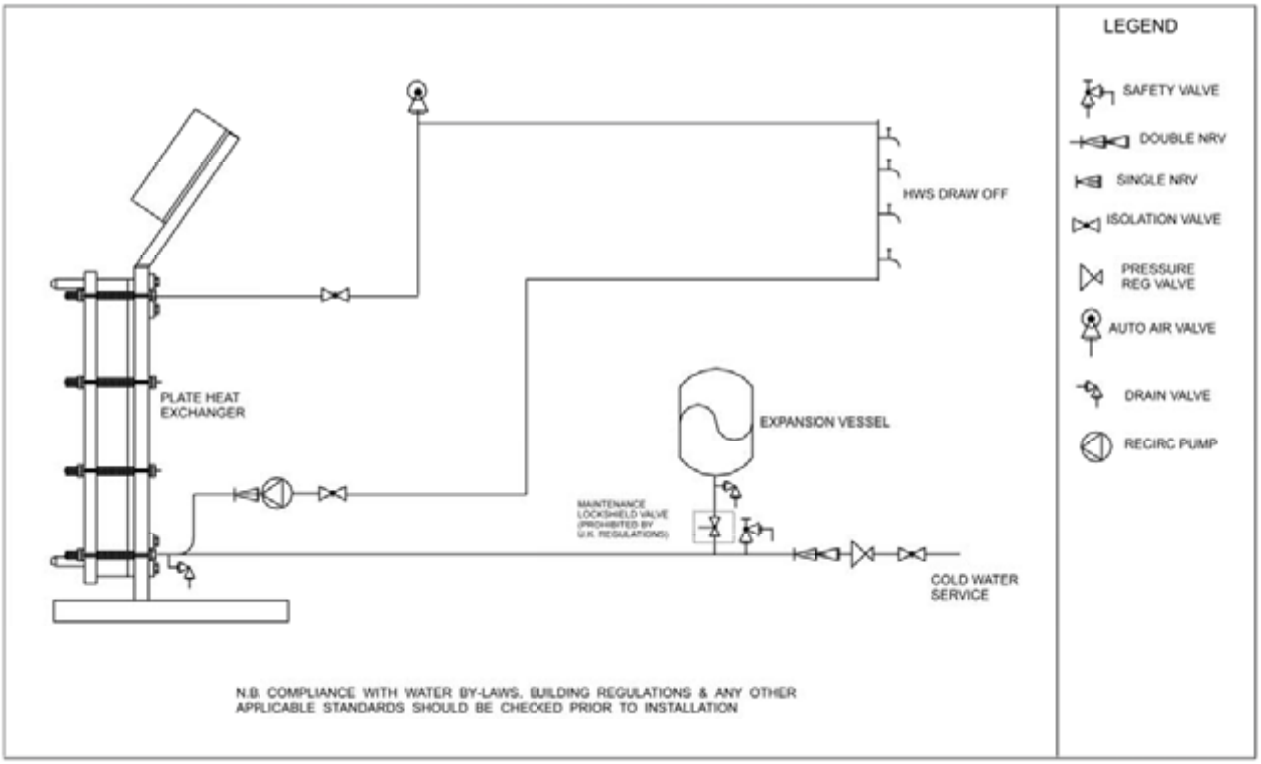
RECOMMENDED MINIMUM CLEARANCES FOR MAINTENANCE.

450mm front, 300mm pump side, 150mm other side

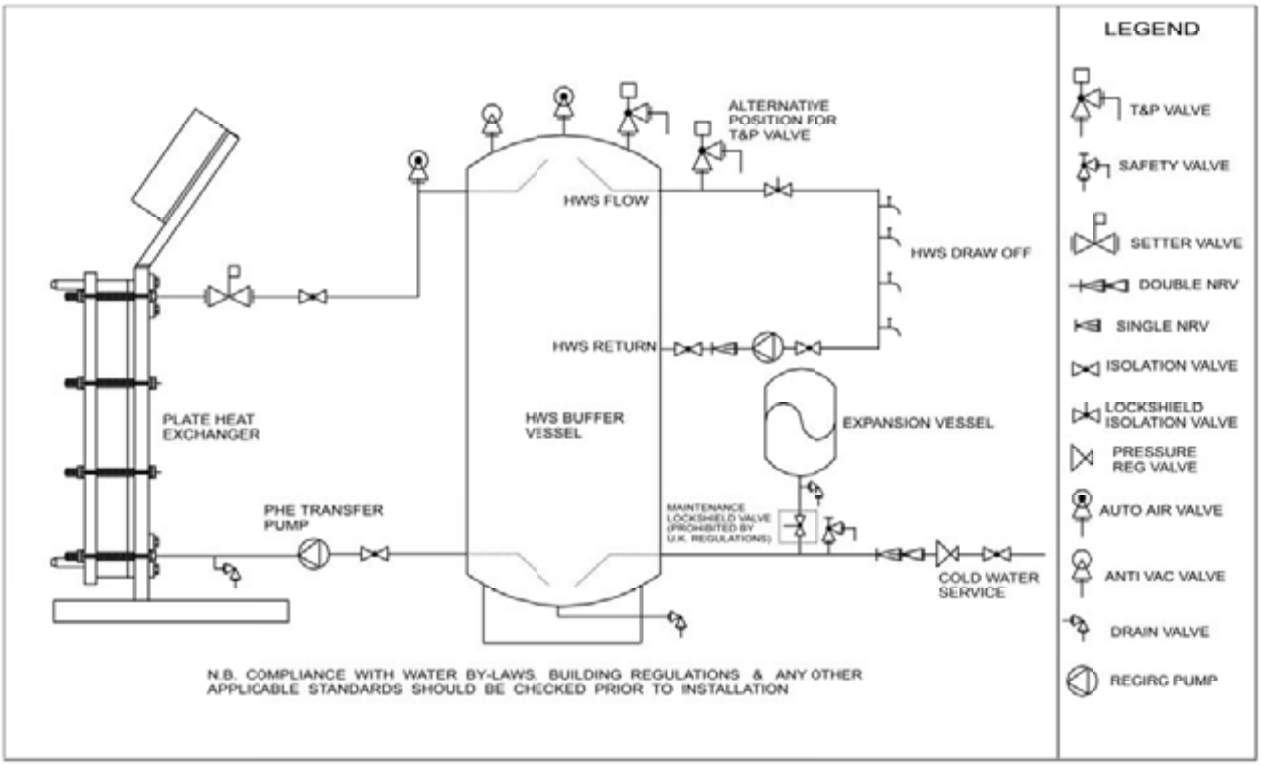


SECONDARY INSTALLATION DETAILS.

Instantaneous Application.



Semi Instantaneous Application.



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