



**Econoplate i2 Series
Hot Water Service
Packaged Plate Heat Exchangers
i2A/i2B/i2C**

**Installation, Operation & Maintenance
Documentation**

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General Description:

The Stokvis Econoplate i2 series of packaged plate heat exchangers are available in 3 ranges covering a total of some 40+ units with outputs ranging from 51kW up to 1120kW (when fed with primary water at 80°C, secondary temperatures 10-60°C).

The i2 series units are designed, where necessary, to operate up to a maximum primary side temperature of 110°C (see Installation – Primary), and to provide hot water in conjunction with a buffer vessel, up to their maximum rated output. Econoplate units can be coupled to multiple buffer vessels for even greater outputs.

All units are built around an epoxy coated chassis containing the heat exchanger. This heat exchanger is made up of a number of gasketed stainless steel plates which form the channels for primary and secondary water to flow through. Plates can be readily added to the heat exchanger, up to the chassis limit, 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 hot water loads. The primary and secondary water both make a single pass across the heat exchanger, in opposing directions, enabling required heat exchange to take place and low primary returns to be achieved.

The i2 series units are supplied with fast acting 2-Port motorized control valves fitted to the primary circuit. This valve is modulated by a purpose built PID controller which senses the secondary water temperature and modulates the valve in response. The integral primary pump responds accordingly to the reduced flow requirement by modulating its own speed. The pump has been sized with an additional allowance of at least 6 kPa to overcome external pipework losses. Systems which utilise an existing primary feed pump, to a unit, require an additional low loss header to be sited before the heat exchanger.

A secondary transfer pump is required for semi-instantaneous hot water service usage, this can be provided as part of the Econoplate (+1T units).

In addition to the PID controller, the control panel on the i2 series plate heat exchanger contains: indicator lamps for valve opening/closing, P1/P2 primary pump enabled and high/low temperature alarm, a 500mA control fuse, a 10A output fuse, Duplex pump duty share (if fitted), volt free common temperature alarm terminals, high temperature lockout and a safety extra low voltage (SELV) external interlock circuit. In addition, volt free pump fault is available on all Magna3 pumps. 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 pumps have, as standard, fault indication which is displayed locally on the pump’s display screen (and on the Econotrol). Units with Duplex (twin-head) primary pump include duty share facility and auto-changeover on pump fault as standard.

All Econoplate units are fully assembled and factory wired for ease of installation, leaving only the electrical supply and primary and secondary water circuits to be connected on site.

Technical Specification – Econoplate i2A:

Chassis Components	Rear Chassis Plate (Stationary):	Epoxy coated steel 25mm thick
	Front Chassis Plate (Moveable):	Epoxy coated steel 20mm thick
	Heat Transfer Plate:	316 grade stainless steel
	Gaskets:	EPDM
	Retaining Bolts:	16mm carbon steel
Operating Criteria	Maximum Primary Side Temperature:	110°C
	Maximum Primary Side Pressure:	10.0bar
	Maximum Secondary Side Pressure:	6.0bar
Connections	Primary Side Water Connections (standard):	Inlet - Cast Iron, DN40, PN10 Outlet - 1½" BSPF
	Secondary Inlet Connection (Cold Water Feed):	Bronze 1½" BSPF
	Secondary Outlet Connection (Hot Water Service Flow):	Bronze 1½" BSPF
Primary Components	Primary Pump (c/w Volt Free Trip Terminals):	MAGNA3 40-80F (1-phase) (or MAGNA3 D 40-80F on Duplex units)
	Primary Control Valve:	2-Port, DZR Brass, DN40
	Primary Control Valve Actuator:	230V, modulating, motor open/close
Control Panel	Control Panel (standard): <ul style="list-style-type: none"> • ABS enclosure. • Electronic PID temperature controller. • 7-day time clock control of 2 temperature settings or 1 temperature and night "off", per day. • Safety extra low voltage (SELV) circuit for external "clock" control of 2 temperatures of operation or 1 temperature set point and "off". • Safety extra low voltage (SELV) circuit for an external interlock. • Adjustable high limit and low limit temperature alarms, temperature alarm lamp, common volt free temperature alarm and selectable high temperature lockout modes. • Functional indication of: primary pump enable (P1 or P2) and valve open/closing. • LCD digital display of day and time, secondary flow temperature and any faults. • Pump mode selection including Duplex primary pump duty share and auto-changeover on pump fault (if fitted). • Full menu driven interrogation of parameters and operating modes. • 500mA control fuse, 10A output fuse. 	

Optional Extras:

• Duplex (Twin-Head) Primary Pump: (c/w Duty Share and Auto-changeover on Pump Fault as standard)	MAGNA3 D 40-80F (1-phase)
• HWS Secondary Transfer Pump (+1T) (dependent on model):	UP 20-45N, UPS 25-55N, UPS 32-55N, UPS 32-80N or UPS 32-100N (all 1-phase)
• Additional Primary Shut Off Kit: Valve Actuator c/w Additional High Limit Thermostat	2-Port, DZR Cast Brass Body, RP 1½", PN40 230V, motor open/spring close 230V, manual reset, IP54
• Additional High Limit Thermostat Only:	230V, manual reset, IP54
• Primary Control Valve Actuator Positional Indication:	<ul style="list-style-type: none"> • Auxiliary Changeover Contacts Only • Potentiometer Only (1 or 2 kΩ) • Auxiliary Changeover Contacts and Potentiometer (1 or 2 kΩ)
• ISO Flexible Thermal Insulation Jacket.	
• Additional Metal Cover to suit ISO Flexible Thermal Insulation Jacket.	

Dimensions and Weight (excluding options):

Dimensions - Length x Width x Height:	710 x 480 x 1110 mm
Weight (maximum):	150kg

Performance - for full details see "Performance Guide" overleaf:

From 14.4 to 121.2 litres per minute of hot water at 60°C. (based on a primary supply temperature of 80°C and a cold feed temperature of 10°C)

Performance & Selection Guide – Econoplate i2A – 70°C Primary:

Primary Supply Temperature = 70°C, Secondary Temperatures = 10-60°C

		i2A 6	i2A 8	i2A 10	i2A 12	i2A 14	i2A 16	i2A 18	i2A 20	i2A 22	i2A 24	i2A 26
Heat Load Required / Max. Duty	kW	50	79	109	133	157	180	201	222	240	259	276
Secondary Flow Rate at 60°C	ℓ/s	0.24	0.38	0.51	0.64	0.75	0.86	0.96	1.06	1.15	1.24	1.32
	m³/h	0.9	1.4	1.8	2.3	2.7	3.1	3.5	3.8	4.1	4.5	4.8
Secondary Pressure Drop at Peak Output	kPa	20	22	23	23	22	22	21	20	20	19	19
Primary Flow Rate at 70°C	ℓ/s	0.73	0.96	1.22	1.39	1.56	1.72	1.86	2.00	2.10	2.23	2.30
	m³/h	2.6	3.5	4.4	5.0	5.6	6.2	6.7	7.2	7.6	8.0	8.3
Primary Min. Head Available	kPa	6	6	6	6	6	6	6	6	6	6	6
Primary Return Temp. at Peak Output	°C	54	51	48	47	46	45	45	44	43	43	42

	i2A 6	i2A 8	i2A 10	i2A 12	i2A 14	i2A 16	i2A 18	i2A 20	i2A 22	i2A 24	i2A 26
"Tourist Hotel" by No. of Rooms	3	6	9	12	15	19	22	26	29	32	36
"Luxury Hotel" by No. of Rooms	-	4	6	8	11	13	15	18	20	23	25
Number of "Standard Flats"	2	5	8	12	16	21	25	31	37	43	49
Number of "Luxury Flats"	-	3	5	7	10	14	18	22	25	29	33
Hospital or Nursing Home by No. of Rooms	-	5	9	13	19	26	33	40	47	55	62
Leisure Centre or Sports Stadium by No. of Showers	-	-	-	-	-	6	7	9	10	13	15

Notes:

- This selection guide uses diversity factors; actual site requirements should always be checked. For simultaneous operation of outlets calculate separately.
- "Tourist Hotel" assumes a room with one shower and one wash hand basin.
- "Luxury Hotel" assumes a room with one bath or one shower and one wash hand basin.
- "Standard Flats" are classed as having one sink, one wash hand basin and one shower.
- "Luxury Flats" are classed as having one sink, two wash hand basins and one bath.
- Standard fittings are assumed in all cases.
- For applications, kW duties, temperatures and pressure drops not listed, please contact Stokvis for an alternative sizing/selection.

Performance & Selection Guide – Econoplate i2A – 80°C Primary:

Primary Supply Temperature = 80°C, Secondary Temperatures = 10-60°C

		i2A 5	i2A 7	i2A 9	i2A 11	i2A 13	i2A 15	i2A 17	i2A 19	i2A 21	i2A 23	i2A 25	i2A 27	i2A 29
Heat Load Required / Max. Duty	kW	51	91	132	167	208	241	272	301	330	354	380	397	416
Secondary Flow Rate at 60°C	ℓ/s	0.24	0.44	0.63	0.80	0.99	1.15	1.30	1.44	1.58	1.69	1.82	1.90	1.99
	m³/h	0.9	1.6	2.3	2.9	3.6	4.1	4.7	5.2	5.7	6.1	6.6	6.8	7.2
Secondary Pressure Drop at Peak Output	kPa	21	28	32	33	35	35	35	35	35	34	33	31	29
Primary Flow Rate at 80°C	ℓ/s	0.48	0.71	0.96	1.14	1.38	1.56	1.72	1.85	1.99	2.10	2.21	2.26	2.33
	m³/h	1.7	2.6	3.5	4.1	5.0	5.6	6.2	6.7	7.2	7.6	8.0	8.1	8.4
Primary Min. Head Available	kPa	6	6	6	6	6	6	6	6	6	6	6	6	6
Primary Return Temp. at Peak Output	°C	55	50	47	45	44	43	43	42	41	40	39	38	37

	i2A 5	i2A 7	i2A 9	i2A 11	i2A 13	i2A 15	i2A 17	i2A 19	i2A 21	i2A 23	i2A 25	i2A 27	i2A 29
"Tourist Hotel" by No. of Rooms	4	7	12	17	23	30	35	40	46	53	59	63	68
"Luxury Hotel" by No. of Rooms	-	5	8	12	16	21	24	28	31	35	39	42	45
Number of "Standard Flats"	2	6	11	18	27	37	48	59	71	80	92	98	107
Number of "Luxury Flats"	-	4	7	12	19	26	32	39	48	54	61	66	73
Hospital or Nursing Home by No. of Rooms	-	7	13	21	35	48	61	73	85	97	108	116	128
Leisure Centre or Sports Stadium by No. of Showers	-	-	-	5	7	11	14	18	21	26	30	32	35

Notes:

- This selection guide uses diversity factors; actual site requirements should always be checked. For simultaneous operation of outlets calculate separately.
- "Tourist Hotel" assumes a room with one shower and one wash hand basin.
- "Luxury Hotel" assumes a room with one bath or one shower and one wash hand basin.
- "Standard Flats" are classed as having one sink, one wash hand basin and one shower.
- "Luxury Flats" are classed as having one sink, two wash hand basins and one bath.
- Standard fittings are assumed in all cases.
- For applications, kW duties, temperatures and pressure drops not listed, please contact Stokvis for an alternative sizing/selection.

Technical Specification – Econoplate i2B:

Chassis Components	Rear Chassis Plate (Stationary):	Epoxy coated steel 25mm thick
	Front Chassis Plate (Moveable):	Epoxy coated steel 20mm thick
	Heat Transfer Plate:	316 grade stainless steel
	Gaskets:	EPDM
	Retaining Bolts:	16mm carbon steel
Operating Criteria	Maximum Primary Side Temperature:	110°C
	Maximum Primary Side Pressure:	10.0bar
	Maximum Secondary Side Pressure:	6.0bar
Connections	Primary Side Water Connections (standard):	Inlet - Cast Iron, DN40, PN10 Outlet - 1½" BSPF
	Secondary Inlet Connection (Cold Water Feed):	Bronze 2" BSPF
	Secondary Outlet Connection (Hot Water Service Flow):	Bronze 2" BSPF
Primary Components	Primary Pump (c/w Volt Free Trip Terminals):	MAGNA3 40-120F (1-phase) (or MAGNA3 D 40-120F on Duplex units)
	Primary Control Valve:	2-Port, DZR Brass, DN40
	Primary Control Valve Actuator:	230V, modulating, motor open/close
Control Panel	Control Panel (standard): <ul style="list-style-type: none"> • ABS enclosure. • Electronic PID temperature controller. • 7-day time clock control of 2 temperature settings or 1 temperature and night "off", per day. • Safety extra low voltage (SELV) circuit for external "clock" control of 2 temperatures of operation or 1 temperature set point and "off". • Safety extra low voltage (SELV) circuit for an external interlock. • Adjustable high limit and low limit temperature alarms, temperature alarm lamp, common volt free temperature alarm and selectable high temperature lockout modes. • Functional indication of: primary pump enable (P1 or P2) and valve open/closing. • LCD digital display of day and time, secondary flow temperature and any faults. • Pump mode selection including Duplex primary pump duty share and auto-changeover on pump fault (if fitted). • Full menu driven interrogation of parameters and operating modes. • 500mA control fuse, 10A output fuse. 	

Optional Extras:

• Duplex (Twin-Head) Primary Pump: (c/w Duty Share and Auto-changeover on Pump Fault as standard)	MAGNA3 D 40-120F (1-phase)
• HWS Secondary Transfer Pump (+1T) (dependent on model):	UPS 32-80N, UPS 32-100N or MAGNA3 40-80FN (all 1-phase)
• Additional Primary Shut Off Kit: Valve Actuator c/w Additional High Limit Thermostat	2-Port, DZR Cast Brass Body, RP 1½", PN40 230V, motor open/spring close 230V, manual reset, IP54
• Additional High Limit Thermostat Only:	230V, manual reset, IP54
• Primary Control Valve Actuator Positional Indication:	<ul style="list-style-type: none"> • Auxiliary Changeover Contacts Only • Potentiometer Only (1 or 2 kΩ) • Auxiliary Changeover Contacts and Potentiometer (1 or 2 kΩ)
• ISO Flexible Thermal Insulation Jacket.	
• Additional Metal Cover to suit ISO Flexible Thermal Insulation Jacket.	

Dimensions and Weight (excluding options):

Dimensions - Length x Width x Height:	710 x 480 x 1110 mm
Weight (maximum):	170kg

Performance - for full details see "Performance Guide" overleaf:

From 103.2 to 181.2 litres per minute of hot water at 60°C. (based on a primary supply temperature of 80°C and a cold feed temperature of 10°C)
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Performance & Selection Guide – Econoplate i2B – 70°C Primary:

Primary Supply Temperature = 70°C, Secondary Temperatures = 10-60°C

		i2B 24	i2B 26	i2B 28	i2B 30	i2B 32	i2B 34	i2B 36	i2B 38	i2B 40	i2B 42	i2B 44	i2B 46
Heat Load Required / Max. Duty	kW	287	308	325	339	356	372	389	402	415	430	441	452
Secondary Flow Rate at 60°C	ℓ/s	1.37	1.47	1.56	1.62	1.70	1.78	1.86	1.92	1.99	2.06	2.11	2.16
	m³/h	4.9	5.3	5.6	5.8	6.1	6.4	6.7	6.9	7.2	7.4	7.6	7.8
Secondary Pressure Drop at Peak Output	kPa	22	22	21	20	20	19	19	18	18	17	17	17
Primary Flow Rate at 70°C	ℓ/s	2.62	2.76	2.84	2.90	2.99	3.10	3.20	3.25	3.28	3.36	3.40	3.45
	m³/h	9.4	9.9	10.2	10.4	10.8	11.2	11.5	11.7	11.8	12.1	12.2	12.4
Primary Min. Head Available	kPa	6	6	6	6	6	6	6	6	6	6	6	6
Primary Return Temp. at Peak Output	°C	44	44	43	42	42	42	41	41	40	40	39	39

	i2B 24	i2B 26	i2B 28	i2B 30	i2B 32	i2B 34	i2B 36	i2B 38	i2B 40	i2B 42	i2B 44	i2B 46
"Tourist Hotel" by No. of Rooms	38	42	46	49	54	57	61	64	68	71	74	76
"Luxury Hotel" by No. of Rooms	26	29	31	33	36	38	41	43	45	48	51	52
Number of "Standard Flats"	54	62	69	74	82	89	95	101	107	114	119	123
Number of "Luxury Flats"	36	41	47	50	55	59	64	68	73	77	82	86
Hospital or Nursing Home by No. of Rooms	67	76	83	90	98	105	112	121	128	136	144	152
Leisure Centre or Sports Stadium by No. of Showers	16	19	21	23	26	29	31	33	35	37	39	40

Notes:

- This selection guide uses diversity factors; actual site requirements should always be checked. For simultaneous operation of outlets calculate separately.
- "Tourist Hotel" assumes a room with one shower and one wash hand basin.
- "Luxury Hotel" assumes a room with one bath or one shower and one wash hand basin.
- "Standard Flats" are classed as having one sink, one wash hand basin and one shower.
- "Luxury Flats" are classed as having one sink, two wash hand basins and one bath.
- Standard fittings are assumed in all cases.
- For applications, kW duties, temperatures and pressure drops not listed, please contact Stokvis for an alternative sizing/selection.

Performance & Selection Guide – Econoplate i2B – 80°C Primary:

Primary Supply Temperature = 80°C, Secondary Temperatures = 10-60°C

		i2B 21	i2B 23	i2B 25	i2B 27	i2B 29	i2B 31	i2B 33	i2B 35	i2B 37	i2B 39	i2B 41	i2B 43	i2B 45
Heat Load Required / Max. Duty	kW	360	395	430	456	478	502	523	542	563	581	600	619	632
Secondary Flow Rate at 60°C	ℓ/s	1.72	1.89	2.06	2.18	2.29	2.40	2.50	2.59	2.70	2.78	2.87	2.96	3.02
	m³/h	6.2	6.8	7.4	7.8	8.2	8.6	9.0	9.3	9.7	10.0	10.3	10.7	10.9
Secondary Pressure Drop at Peak Output	kPa	40	40	40	39	38	36	35	34	33	32	31	30	30
Primary Flow Rate at 80°C	ℓ/s	2.28	2.47	2.67	2.77	2.85	2.95	3.05	3.10	3.17	3.23	3.30	3.39	3.42
	m³/h	8.2	8.9	9.6	10.0	10.3	10.6	11.0	11.2	11.4	11.6	11.9	12.2	12.3
Primary Min. Head Available	kPa	6	6	6	6	6	6	6	6	6	6	6	6	6
Primary Return Temp. at Peak Output	°C	43	42	42	41	40	40	39	39	38	38	37	37	36

	i2B 21	i2B 23	i2B 25	i2B 27	i2B 29	i2B 31	i2B 33	i2B 35	i2B 37	i2B 39	i2B 41	i2B 43	i2B 45
"Tourist Hotel" by No. of Rooms	55	62	71	77	82	90	97	103	108	113	120	126	130
"Luxury Hotel" by No. of Rooms	36	42	48	53	57	61	65	69	73	76	80	85	88
Number of "Standard Flats"	85	98	114	125	135	149	161	171	182	190	201	212	220
Number of "Luxury Flats"	56	65	77	88	95	107	116	123	133	139	146	155	160
Hospital or Nursing Home by No. of Rooms	100	115	136	155	168	185	198	210	226	239	251	264	272
Leisure Centre or Sports Stadium by No. of Showers	27	32	37	41	45	50	55	58	62	65	70	75	77

Notes:

- This selection guide uses diversity factors; actual site requirements should always be checked. For simultaneous operation of outlets calculate separately.
- "Tourist Hotel" assumes a room with one shower and one wash hand basin.
- "Luxury Hotel" assumes a room with one bath or one shower and one wash hand basin.
- "Standard Flats" are classed as having one sink, one wash hand basin and one shower.
- "Luxury Flats" are classed as having one sink, two wash hand basins and one bath.
- Standard fittings are assumed in all cases.
- For applications, kW duties, temperatures and pressure drops not listed, please contact Stokvis for an alternative sizing/selection.

Technical Specification – Econoplate i2C:

Chassis Components	Rear Chassis Plate (Stationary):	Epoxy coated steel 25mm thick
	Front Chassis Plate (Moveable):	Epoxy coated steel 25mm thick
	Heat Transfer Plate:	316 grade stainless steel
	Gaskets:	EPDM
	Retaining Bolts:	20mm carbon steel
Operating Criteria	Maximum Primary Side Temperature:	110°C
	Maximum Primary Side Pressure:	10.0bar
	Maximum Secondary Side Pressure:	6.0bar
Connections	Primary Side Water Connections (standard):	Inlet - Cast Iron, DN50, PN10 Outlet - 2" BSPF
	Secondary Inlet Connection (Cold Water Feed):	Bronze 2" BSPF
	Secondary Outlet Connection (Hot Water Service Flow):	Bronze 2" BSPF
Primary Components	Primary Pump (c/w Volt Free Trip Terminals):	MAGNA3 50-120F (1-phase) (or MAGNA3 D 50-120F on Duplex units)
	Primary Control Valve:	2-Port, DZR Brass, DN50
	Primary Control Valve Actuator:	230V, modulating, motor open/close
Control Panel	Control Panel (standard): <ul style="list-style-type: none"> • ABS enclosure. • Electronic PID temperature controller. • 7-day time clock control of 2 temperature settings or 1 temperature and night "off", per day. • Safety extra low voltage (SELV) circuit for external "clock" control of 2 temperatures of operation or 1 temperature set point and "off". • Safety extra low voltage (SELV) circuit for an external interlock. • Adjustable high limit and low limit temperature alarms, temperature alarm lamp, common volt free temperature alarm and selectable high temperature lockout modes. • Functional indication of: primary pump enable (P1 or P2) and valve open/closing. • LCD digital display of day and time, secondary flow temperature and any faults. • Pump mode selection including Duplex primary pump duty share and auto-changeover on pump fault (if fitted). • Full menu driven interrogation of parameters and operating modes. • 500mA control fuse, 10A output fuse. 	

Optional Extras:

• Duplex (Twin-Head) Primary Pump: (c/w Duty Share and Auto-changeover on Pump Fault as standard)	MAGNA3 D 50-120F (1-phase)
• HWS Secondary Transfer Pump (+1T) (dependent on model):	UPS 32-80N, UPS 32-100N, MAGNA3 40-80FN or MAGNA3 40-120FN (all 1-phase)
• Additional Primary Shut Off Kit: Valve Actuator c/w Additional High Limit Thermostat	2-Port, DZR Cast Brass Body, RP 2", PN40 230V, motor open/spring close 230V, manual reset, IP54
• Additional High Limit Thermostat Only:	230V, manual reset, IP54
• Primary Control Valve Actuator Positional Indication:	<ul style="list-style-type: none"> • Auxiliary Changeover Contacts Only • Potentiometer Only (1 or 2 kΩ) • Auxiliary Changeover Contacts and Potentiometer (1 or 2 kΩ)
• ISO Flexible Thermal Insulation Jacket.	
• Additional Metal Cover to suit ISO Flexible Thermal Insulation Jacket.	

Dimensions and Weight (excluding options):

Dimensions - Length x Width x Height:	865 x 537 x 1165 mm
Weight (maximum):	250kg

Performance - for full details see "Performance Guide" overleaf:

From 148.2 to 321.6 litres per minute of hot water at 60°C.
(based on a primary supply temperature of 80°C and a cold feed temperature of 10°C)

Performance & Selection Guide – Econoplate i2C – 70°C Primary:

Primary Supply Temperature = 70°C, Secondary Temperatures = 10-60°C

		i2C 22	i2C 26	i2C 30	i2C 34	i2C 38	i2C 42	i2C 46	i2C 50	i2C 54	i2C 58	i2C 62	i2C 66	i2C 70	i2C 74
Heat Load Required / Max. Duty	kW	350	409	450	493	542	572	603	632	660	688	703	725	745	765
Secondary Flow Rate at 60°C	l/s	1.67	1.96	2.15	2.36	2.59	2.74	2.89	3.02	3.16	3.29	3.36	3.47	3.57	3.66
	m³/h	6.0	7.1	7.7	8.5	9.3	9.9	10.4	10.9	11.4	11.8	12.1	12.5	12.9	13.2
Secondary Pressure Drop at Peak Output	kPa	14	13	12	11	11	10	9	9	9	8	8	8	7	7
Primary Flow Rate at 70°C	l/s	4.00	4.45	4.65	4.89	5.30	5.42	5.50	5.65	5.75	5.90	5.93	6.00	6.05	6.10
	m³/h	14.4	16.0	16.7	17.6	19.1	19.5	19.8	20.3	20.7	21.2	21.3	21.6	21.8	22.0
Primary Min. Head Available	kPa	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Primary Return Temp. at Peak Output	°C	49	48	47	46	46	45	44	44	43	43	42	42	41	40

	i2C 22	i2C 26	i2C 30	i2C 34	i2C 38	i2C 42	i2C 46	i2C 50	i2C 54	i2C 58	i2C 62	i2C 66	i2C 70	i2C 74
"Tourist Hotel" by No. of Rooms	52	66	76	87	103	111	121	130	140	151	156	165	172	180
"Luxury Hotel" by No. of Rooms	34	44	52	60	69	75	81	88	93	99	103	108	111	117
Number of "Standard Flats"	79	104	123	144	171	187	203	220	238	255	265	281	293	307
Number of "Luxury Flats"	53	71	86	103	123	136	147	160	175	188	196	207	215	226
Hospital or Nursing Home by No. of Rooms	95	124	151	179	210	233	253	272	294	314	329	346	361	378
Leisure Centre or Sports Stadium by No. of Showers	25	34	40	48	58	64	71	77	84	91	94	100	104	111

Notes:

- This selection guide uses diversity factors; actual site requirements should always be checked. For simultaneous operation of outlets calculate separately.
- "Tourist Hotel" assumes a room with one shower and one wash hand basin.
- "Luxury Hotel" assumes a room with one bath or one shower and one wash hand basin.
- "Standard Flats" are classed as having one sink, one wash hand basin and one shower.
- "Luxury Flats" are classed as having one sink, two wash hand basins and one bath.
- Standard fittings are assumed in all cases.
- For applications, kW duties, temperatures and pressure drops not listed, please contact Stokvis for an alternative sizing/selection.

Performance & Selection Guide – Econoplate i2C – 80°C Primary:

Primary Supply Temperature = 80°C, Secondary Temperatures = 10-60°C

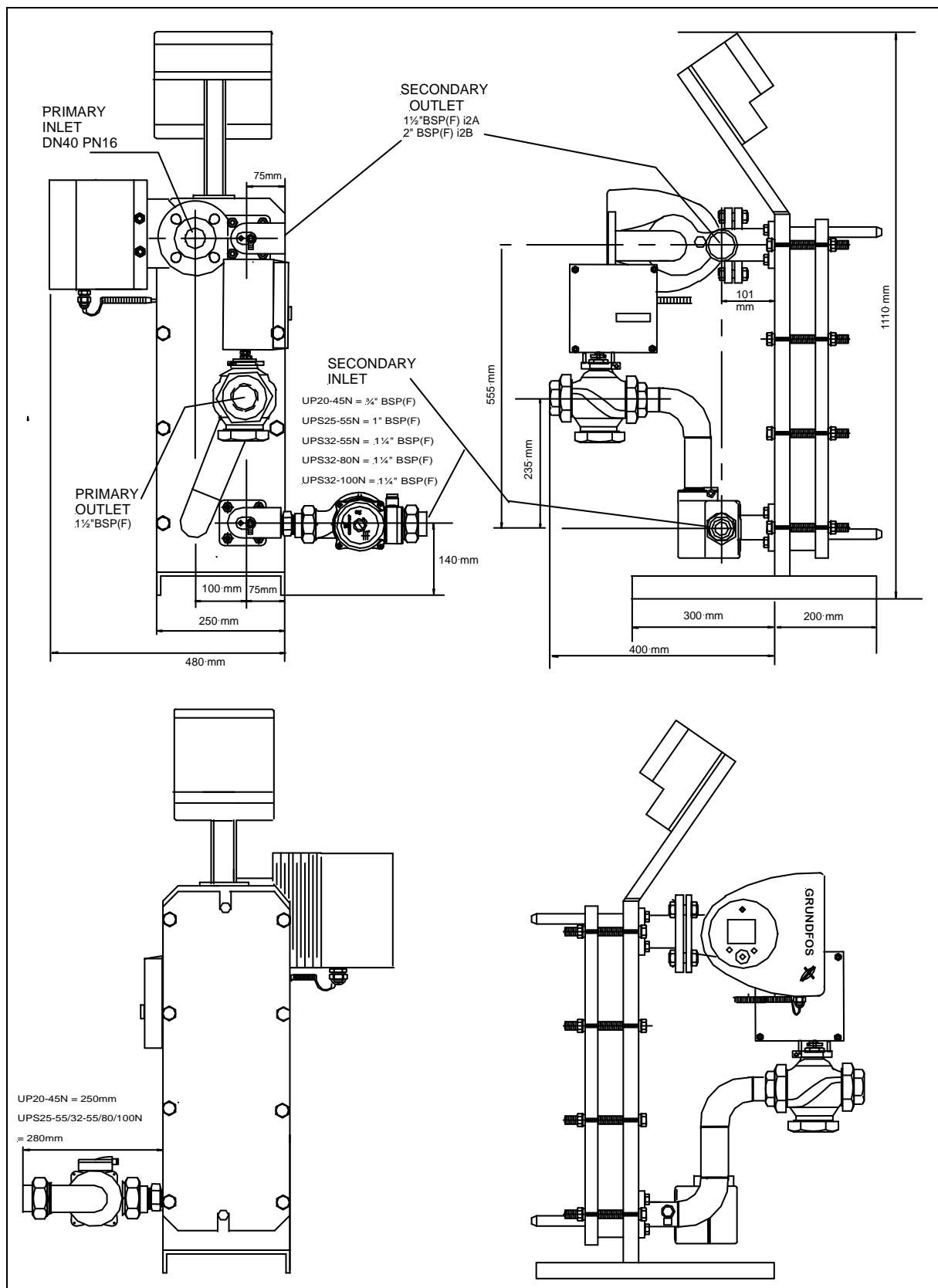
		i2C 22	i2C 26	i2C 30	i2C 34	i2C 38	i2C 42	i2C 46	i2C 50	i2C 54	i2C 58	i2C 62	i2C 66	i2C 70	i2C 74
Heat Load Required / Max. Duty	kW	517	600	678	740	802	849	892	943	988	1015	1045	1078	1099	1120
Secondary Flow Rate at 60°C	l/s	2.47	2.87	3.24	3.54	3.84	4.06	4.27	4.51	4.73	4.86	5.00	5.16	5.26	5.36
	m³/h	8.9	10.3	11.7	12.7	13.8	14.6	15.4	16.2	17.0	17.5	18.0	18.6	18.9	19.3
Secondary Pressure Drop at Peak Output	kPa	23	22	21	20	19	18	17	16	16	15	14	13	12	12
Primary Flow Rate at 80°C	l/s	3.79	4.24	4.65	4.90	5.18	5.35	5.47	5.70	5.86	5.90	6.00	6.10	6.15	6.18
	m³/h	13.6	15.3	16.7	17.6	18.6	19.3	19.7	20.5	21.1	21.2	21.6	22.0	22.1	22.2
Primary Min. Head Available	kPa	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Primary Return Temp. at Peak Output	°C	48	47	46	44	43	42	41	41	40	39	39	38	37	37

	i2C 22	i2C 26	i2C 30	i2C 34	i2C 38	i2C 42	i2C 46	i2C 50	i2C 54	i2C 58	i2C 62	i2C 66	i2C 70	i2C 74
"Tourist Hotel" by No. of Rooms	94	120	147	171	193	212	229	249	269	281	295	312	321	333
"Luxury Hotel" by No. of Rooms	64	80	97	110	127	139	149	161	175	183	191	201	207	215
Number of "Standard Flats"	158	201	248	289	332	367	398	434	469	492	520	552	569	587
Number of "Luxury Flats"	113	146	183	213	245	272	295	325	352	369	390	414	427	441
Hospital or Nursing Home by No. of Rooms	194	251	307	357	405	446	481	522	561	589	620	653	674	691
Leisure Centre or Sports Stadium by No. of Showers	53	70	88	103	121	133	144	160	175	186	197	208	217	225

Notes:

- This selection guide uses diversity factors; actual site requirements should always be checked. For simultaneous operation of outlets calculate separately.
- "Tourist Hotel" assumes a room with one shower and one wash hand basin.
- "Luxury Hotel" assumes a room with one bath or one shower and one wash hand basin.
- "Standard Flats" are classed as having one sink, one wash hand basin and one shower.
- "Luxury Flats" are classed as having one sink, two wash hand basins and one bath.
- Standard fittings are assumed in all cases.
- For applications, kW duties, temperatures and pressure drops not listed, please contact Stokvis for an alternative sizing/selection.

Mechanical Drawing – Econoplate i2A/i2B+1T Semi-Instantaneous
Including UP/UPS Secondary Transfer Pump on Angled Secondary Inlet:



Recommended Minimum Clearances for Maintenance:

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

Installation – Primary:

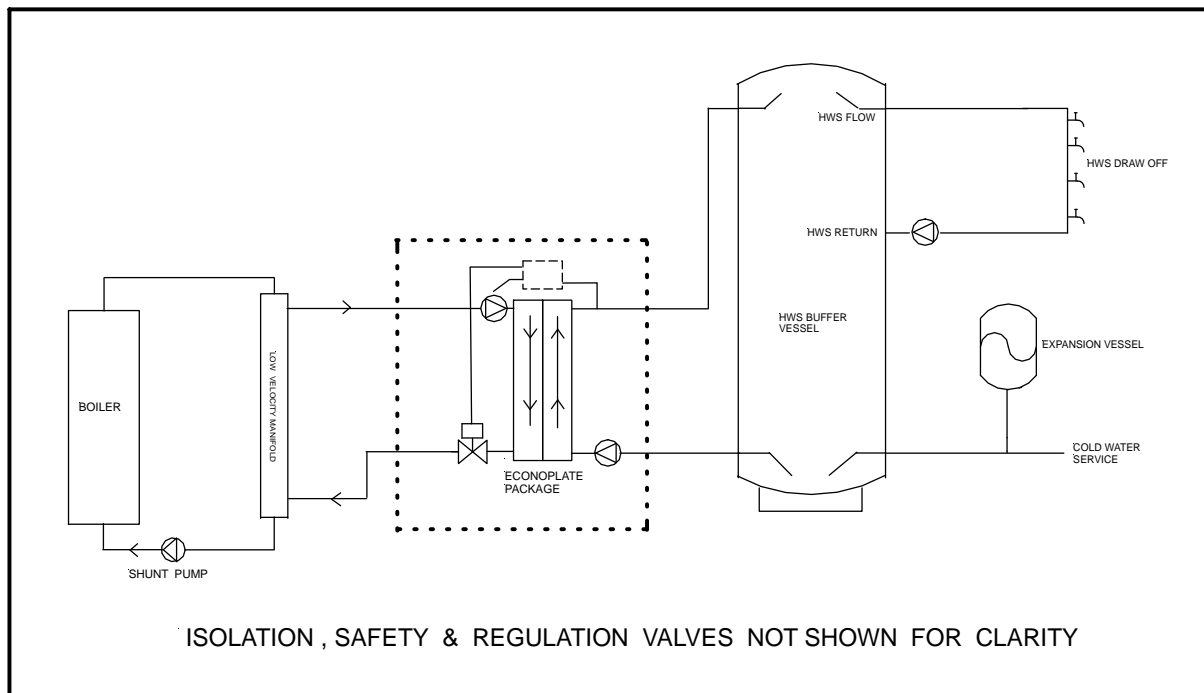
The flow from the primary heat source is connected to the pump flange and the return to the 2-Port valve. Connections should be made using the correct counter flanges/unions, and suitable isolating valves should be installed to enable servicing of the unit after installation.

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.

Avoid having additional primary pumps pumping to the Econoplate, unless either a full bore bypass or a low loss header is included across the primary flow and return.

**On unvented systems, where the heat source is capable of raising the temperature over 95°C, a manual reset high limit thermostat set to 90°C can be provided to interrupt the supply of energy to the primary of the heat exchanger. Where a flow can persist, even when the high limit thermostat has switched off the primary pump, an additional spring return primary shut off valve, operated by the same manual reset high limit thermostat set to 90°C, can be provided. This valve will also interrupt the supply of energy if the electrical power supply is interrupted.

Typical Installation of an Econoplate i2 Series Plate Heat Exchanger on a Semi-Instantaneous Hot Water Services Installation with Buffer Vessel Storage:



Installation – Secondary:

Semi-Instantaneous Hot Water Applications:

Semi-Instantaneous hot water generation is 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 type of installation particularly suits applications which have low cold feed pressures, sporadic usage or insufficient boiler power available.

The cold water feed is connected to the bottom of the vessel; the cold feed can still be either from a cold feed storage tank, which can itself be boosted if required, or it can be directly mains fed. The same restrictions/requirements as above apply, with the additional requirement of Temperature & Pressure protection (T&P Valve(s)).

The Econoplate can be supplied with an optional secondary transfer pump (+1T) which draws water from the bottom of the vessel at the design flow rate of the unit. This water enters the Econoplate through the lower bronze connection and is heated to the desired temperature. It is then pumped from the top bronze connection into a top connection on the vessel. The flow rate should be set using the speed control on the pump, or, if a more accurate method is required, a flow setting device can be supplied or a double regulating valve could be incorporated in the pipework. In many cases a simple lockshield valve may suffice. 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.

N.B. Isolating valves should be fitted to all circuits.

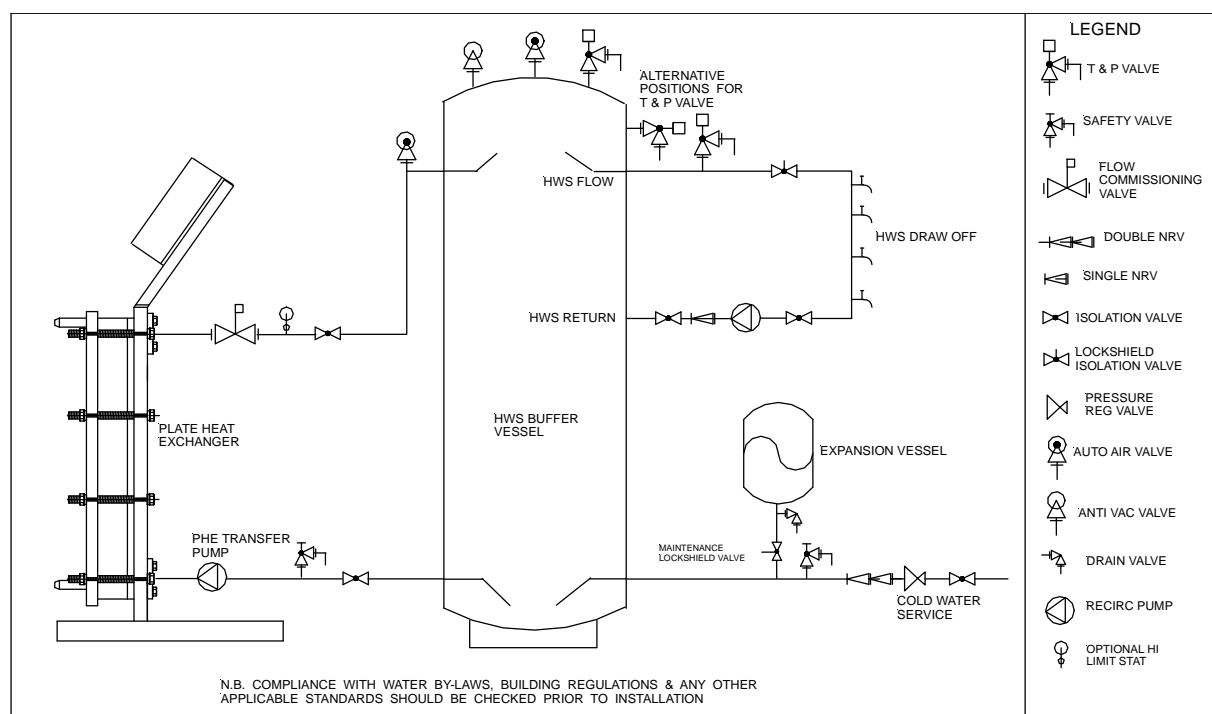
Other Applications:

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

Recommended Minimum Clearances for Maintenance:

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

Secondary Schematic – Semi-Instantaneous System with Mains/Boosted Cold Feed Connection and Buffer Vessel Storage:



Electrical Details:

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. The electrical supply connection is made via a 3 pin plug on the side of the control panel. It will accept flexible cable up to 10mm with individual cores up to 1.5mm. A PG11 x M16 Adaptaflex conduit gland is also provided.

Full Load Current:

Econoplate i2A+0R	(230V, 1-phase):	= 1.40A (MAGNA3 40-80F)
Econoplate i2B+0R	(230V, 1-phase):	= 2.15A (MAGNA3 40-120F)
Econoplate i2C+0R	(230V, 1-phase):	= 2.57A (MAGNA3 50-120F)

Note: above figures are applicable for both single and twin-head primary pump models.

When a secondary HWS transfer pump (+1T) has been opted for, the corresponding amperage below must be added to the above figure for **total** full-load current:

UP 20-45N	(230V, 1-phase):	+ 0.52A, 120W
UPS 25-55N	(230V, 1-phase):	+ 0.38A, 85W
UPS 32-55N	(230V, 1-phase):	+ 0.46A, 105W
UPS 32-80N	(230V, 1-phase):	+ 0.98A, 220W
UPS 32-100N	(230V, 1-phase):	+ 1.52A, 345W
MAGNA3 40-80FN	(230V, 1-phase):	+ 1.20A, 265W
MAGNA3 40-120FN	(230V, 1-phase):	+ 1.95A, 440W

External Connections:

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 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).

MAGNA3 Pump Fault Indication:

Volt free changeover contacts from pump relay 1 (wire free from the factory).
Screened cable should be used.

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.

WARNING

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

Commissioning & Operation:

Prior to switching the Econoplate on it must be ensured that the unit is filled with water and that all pipework, Duplex primary pumps and fixed speed secondary pumps have been vented.

Once this is complete and the unit is on, the Econoplate Controller should be set up as described in the Econotrol 2100 Controller Instruction Manual (see later) to suit the particular requirements of the client.

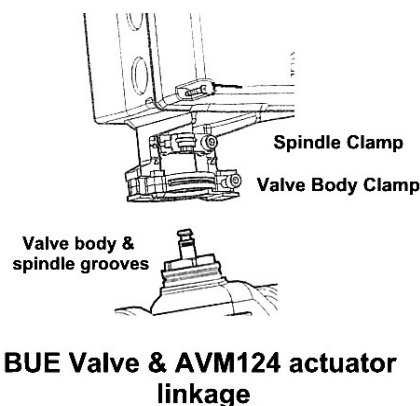
MAGNA3 pumps have been set for optimum operation and should not require adjustment. The status and settings can be viewed on the pump display. The flow rate should be checked in the status menu with the valve open and closed and compared with the design flow rate for the heat exchanger supplied. In all cases the pump run current or energy consumption should be recorded. Primary pump fault is indicated on the pump display screen and on the Econotrol LCD display. On Duplex twin-head primary pump units, duty share facility and auto-changeover on primary pump fault are included as standard. In addition, these functions should be checked.

On all units, the motorized valve should be checked for correct connection and travel by simulating a load / no load situation.

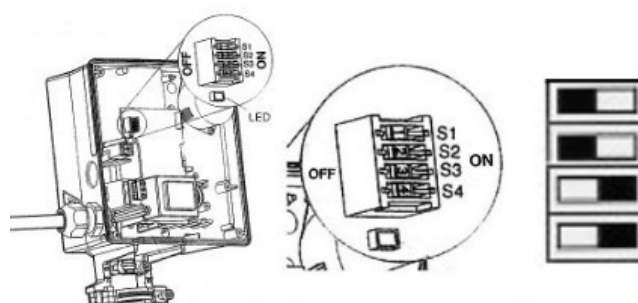
Units are fitted with a Sauter VUN valve with an AVM124F130 actuator.

To check the correct connection of valve and actuator proceed as follows:

The AVM124 actuator is connected to the valve body and spindle by two clamps which are secured with hexagon head screws. The upper clamp (drive spindle) can be released and the spindle can be checked for up and down movement by hand without removing the bottom clamp (valve body). Once the valve spindle movement is checked, ensure that both clamps are refitted correctly in the location grooves on the spindle and valve body and are not loose.



The AVM124 actuator has automatic self-adjusting valve spindle travel. AVM124 actuators also have a switch coding for valve speed inside the actuator cover, which can be seen through the clear lid, and these should be set as below:



There is also a single green LED just below the switch block which gives indication of the following functions of the actuator:

Quick intermittent flashing	Initialization procedure
Illumination when being driven	Actuator moving to set point
Short flashing with longer delay between flashing	Set point reached
Longer flashing with shorter delay between flashing	Too much force detected (possible valve seized)
Rapid flashing	Actuator in manual mode

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.

A large temperature drop between inlet and outlet of the primary circuit, but lack of hot water indicates a lack of primary flow, possibly due to an external blockage. Any internal 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 20°C at full load) indicates the exchanger is clogged.
- A lack of water at the design temperature on the secondary circuit.

A plate pack consists of a first/start plate, a number of intermediate plates and a blank/end plate:

i2A/i2B (GCP-009 Plates – Parallel Units):

- First/Start Plate (4 gasketed holes): Fitted against the fixed rear frame chassis plate with the chevron pattern facing upwards and the gasket facing towards the fixed rear frame chassis plate.
- Intermediate Plates: The chevron pattern, stamped on the plates, must alternate downwards on the 1st intermediate plate, upwards on the 2nd intermediate plate and so on, with the gasket facing towards the fixed rear frame chassis plate.
- Blank/End Plate (no holes): The chevron pattern will be in the opposite direction to the final intermediate plate, with the gasket facing towards the fixed rear frame chassis plate. The moveable chassis plate sits against this end plate.
Note: For odd number plate packs, the blank/end plate will be chevron pattern facing upwards.

i2C (GLD-013 Plates – Diagonal/Cross Flow Units):

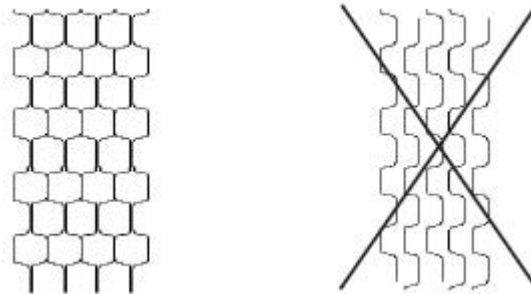
- First/Start Plate (4 gasketed holes): Fitted against the fixed rear frame chassis plate with the chevron pattern facing upwards and the ½ thickness gasket facing towards the fixed rear frame chassis plate.
- Intermediate Plates: The chevron pattern, stamped on the plates, must alternate downwards on the 1st intermediate plate (left hand), upwards on the 2nd intermediate plate (right hand) and so on, with the full thickness gasket facing towards the fixed rear frame chassis plate.
- Blank/End Plate (no holes): The chevron pattern will be in the opposite direction to the final intermediate plate, with the full thickness gasket facing towards the fixed rear frame chassis plate and the ½ thickness gasket facing towards the moveable chassis plate, which sits against this end plate.
Note: For even number plate packs, the blank/end plate will be chevron pattern facing downwards.

If it is required to clean the plate pack, the below instructions should be followed:

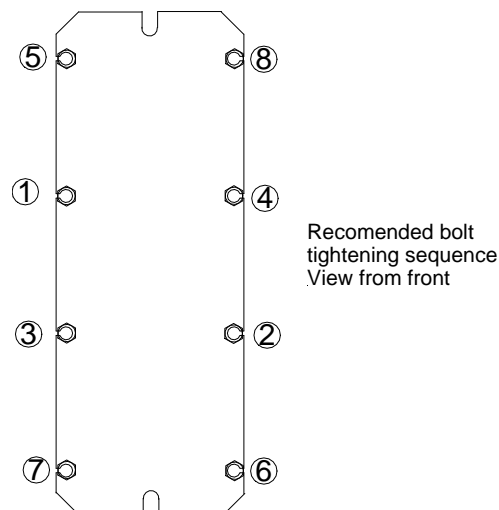
1. Isolate the exchanger, primary side first, allowing the temperature to fall below 40°C and then isolate the secondary side.
2. Reduce the pressure by opening the vents and drain both primary and secondary.
3. Carefully release the securing bolts between the frame and front plate. Slacken the bolts in sequence to reduce stress on individual bolts.
4. Remove the plates one at a time from the unit leaving the last plate in situ against the fixed chassis, unless you have new chassis liners available. If possible, keep the plates in order ready for reassembly. Specific instructions are available on request for all plate types.
5. Carefully clean the plates using a nylon brush and warm water (do not use a metallic device). A proprietary de-scaling agent may be used if necessary. Rinse thoroughly with clean fresh water. Always follow the correct safety procedures when handling chemicals. Reassemble the plates in the same order that they were removed.

The following visual checks can be made to ensure correct assembly:

- A pattern resembling a honeycomb should always be seen:



- The stamped chevron pattern should alternate up and then down from one plate to another.
 - The gasket around the top plate ports should alternate left to right from one plate to another.
6. 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, see below:



The correct tightening figure is checked by measuring the distance between the moveable front chassis plate and the fixed rear chassis plate and should be calculated as follows:

- i2A/i2B:
 - GCP-009 – 3.1mm +/- 0.05mm x the number of plates
- i2C:
 - GLD-013 – 3.4mm per plate x the number of plates

This distance should be measured next to each bolt to ensure even tightening of the plate pack.

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

N.B. Sequences must be noted prior to dismantling, to ensure correct reassembly.

Fault Finding:

Little or No Hot Water at Outlets:

- Check the external electrical supply to the unit – reinstate if necessary. Check control panel isolator switch is in the ON position.
- Check for the LCD display on the control panel – if not on, check/replace 500mA control fuse.
- If the 500mA fuse blows repeatedly, set the Econoplate to give temporary hot water (see Temporary Operation) and replace the PCB as soon as possible.
- If there is an LCD display but no apparent outputs to pumps etc, check the 10A output fuse on the PCB. If it is blown, make electrical checks on all pumps and valves fitted to the unit. Repair/replace or isolate faulty item and replace fuse.
- Check that the primary pump is operating – check the pump status and operating mode settings either on the pump display or with a Grundfos GO module/app. Check that there is a start signal and/or electrical supply to the pump. Replace pump head or switch permanently to standby pump if available. If a Duplex twin-head MAGNA3 D primary pump is fitted and if both pump heads are at fault, once the fault has been cleared on the pump heads, the Econotrol will need to be powered off and back on to reset.
- Check that the primary supply temperature is correct and that there is nothing in the external pipe work that could restrict flow e.g. faulty pumps, strainers, non-return valves, isolating valves, air locks etc. This would show as a large temperature drop on the primary but with a lack of hot water.
- Check the secondary pump is operating, particularly if the display indicates set-point achieved, but no hot water available.
- Check to ensure correct connection of valve and actuator as described previously in the Operation section.

- Check that the motorized valve is mechanically operating – place in manual operation and move the valve through its travel to check for seizure. Strip and clean or replace as required.
- Check that the valve motor is electrically operating – raise and lower the set point and observe. If the motor does not work, see Temporary Operation.
- Check the ΔT across inlet and outlet of the primary circuit; a small temperature drop (under 20°C at full load) indicates that the heat exchanger is contaminated with debris causing clogging.

Fluctuating Temperatures at Outlets:

- Check that the secondary pump is operating correctly and that good circulation exists – carefully feel the temperature of the return pipe, if it is cool then there is no circulation.
- Check that a non-return valve is fitted on the HWS return; if fitted, check that it is not letting by and so allowing the incoming cold water to enter the HWS distribution system return – carefully feel for a cool return pipe.
- Check that the motorized 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 linkages between the valve and motor are secured.
- Check that the motorized valve is responding by moving in the correct direction – test as above. If incorrect, electrically isolate the Econoplate and reverse the + and - valve motor connections on the PCB. Reinstall the electrical supply and check again.
- 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 is likely to be similarly affected. Strip and clean as necessary (see Maintenance).

Reduced Output:

- A reduced output may be as a result of a blockage of the heat exchanger, as well as any of the above mentioned causes. A small temperature drop across the heat exchanger at full output would confirm. See Maintenance for cleaning.
- A large temperature drop between inlet and outlet of the primary circuit, but a lack of hot water indicates a lack of primary flow, possibly due to an external blockage.

Leaking from the Plate Heat Exchanger:

- Check that the heat exchanger is bolted up fully – measure the space occupied by the plates, next to each bolt. The gap between the rear fixed chassis plate and front moveable plate should be checked (see Maintenance for figures). If incorrect, relieve the pressure on primary and secondary side and tighten to the correct figure. If the unit still leaks, the affected plates should be replaced.
- Check that the maximum operating pressure has not been exceeded at any time.

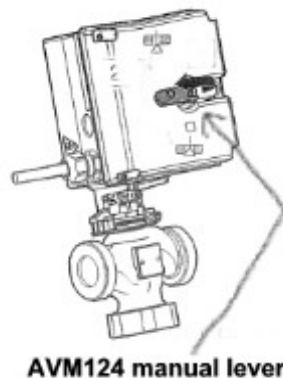
No Hot Water from Highest Outlet:

- 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 (see Maintenance). 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 water flow is improved, 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. Another option could be to install a larger pump on the cold feed connection with the HWS return teed into the cold feed on the suction side of the pump.

Temporary Operation:

TO PROVIDE HOT WATER IN THE EVENT OF COMPONENT FAILURE CAN BE ACHIEVED AS FOLLOWS:

- a) On AVM124 open the 2-Port valve fully by hand using the fold out lever on the outside of the actuator as shown below:



On AVM124 actuators, the single LED will flash off and on rapidly; this indicates manual override is in operation.

N.B. A valve is closed when the valve spindle is uppermost on all types of valve.

- b) Ensure that there is an electrical supply to a primary and secondary pump and link the start/stop terminals for pump(s) if not already made.
- c) Reduce the boiler flow temperature to a maximum of 65°C to prevent excess secondary temperatures.
- d) Set the high temperature alarm to automatic – refer to “Econotrol 2100 Instruction Manual” for procedure (see later).

N.B. If fitted with an additional high temperature primary shut off 2-Port VKR valve and AKF actuator, this will also need to be in the open position. To do this, ensure that the electrical feed from the Econotrol to the limit stat (and subsequently to the AKF actuator) is live or made live. If either the valve/actuator/high limit/auxiliary relay has failed, then manually open the valve (remove drive).

Parts List

Controller & Sensor (All):

ESS8133 – Econotrol 2100 controller exc. Enclosure
ESS6600/1 – E Series Adjustable Temperature Sensor 1/8" BSP PT100

Valve & Actuator:

VUN 040 F300 – 2-Port Valve – Sauter VUN 040 F300 (i2A/i2B)
VUN 050 F200 – 2-Port Valve – Sauter VUN 050 F200 (i2C)
AVM 124 F130 – Actuator – Sauter AVM 124 F130

Heat Transfer Plates & Liners:

GCP009H START – 4-hole First/Start Plate (i2A/i2B)
GCP009H INT – Intermediate Plate (i2A/i2B)
GCP009H BLANK – No-hole Blank/End Plate (i2A/i2B)
ESS4647 – 43mm Through-Frame Chassis Liner (i2A/i2B)
GCP009L INT – Intermediate Plate (low pressure drop) (i2AxxL/i2BxxL)

GL13H START – 4-hole First/Start Plate (i2C & i2CxxL)
GL13H LH – Left-Hand Intermediate Plate (i2C)
GL13H RH – Right-Hand Intermediate Plate i2C)
GL13H BLANK – No-hole Blank/End Plate (i2C & i2CxxL)
ESS8127 – 52mm Through-Frame Chassis Liner (i2C & i2CxxL)
GL13L LH – Left-Hand Intermediate Plate (low pressure drop) (i2CxxL)
GL13L RH – Right-Hand Intermediate Plate (low pressure drop) (i2CxxL)

Primary Pumps:

Primary Pump Simplex i2A – MAGNA3 40-80F (1-phase) (97924268)
Primary Pump Simplex i2B – MAGNA3 40-120F (1-phase) (97924270)
Primary Pump Simplex i2C – MAGNA3 50-120F (1-phase) (97924284)
Primary Pump Duplex i2AxxD – MAGNA3 D 40-80F (1-phase) (97924463)
Primary Pump Duplex i2BxxD – MAGNA3 D 40-120F (1-phase) (97924465)
Primary Pump Duplex i2CxxD – MAGNA3 D 50-120F (1-phase) (97924479)

Optional Secondary Pumps:

Secondary Pump – UP 20-45N (1-phase) (98057222)
Secondary Pump – UPS 25-55N (1-phase) (95906772)
Secondary Pump – UPS 32-55N (1-phase) (95906773)
Secondary Pump – UPS 32-80N (1-phase) (98057247)
Secondary Pump – UPS 32-100N (1-phase) (98057249)
Secondary Pump – MAGNA3 40-80FN (1-phase) (97924349)
Secondary Pump – MAGNA3 40-120FN (1-phase) (97924351)

N.B. UP and UPS Pumps have "commando" type electrical connections.

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