

Shell and Tube Heat Exchangers for

Electric & Hybrid Marine Propulsion



BOWMAN®

100 YEARS OF HEAT TRANSFER TECHNOLOGY

Bowman Shell and Tube Marine Heat Exchangers - the efficient, reliable cooling solution for

Electric and hybrid

Heat generated from electric and hybrid marine propulsion systems can have a direct and adverse effect on the performance of the equipment, if not controlled within pre-set limits.

Partial system shut down during operation and premature component wear and failure are two of the issues caused by excess heat build-up in the propulsion system.

With over 80 years' experience, providing heat exchangers to the marine industry, Bowman has the expertise and products to provide efficient cooling solutions for electric and hybrid propulsion.

Electric Propulsion

Cooling applications include: the battery pack and on board charger (where fitted), AC-DC converter, DC-DC converter, plus the electric drive motor itself.



Hybrid Propulsion

Cooling applications include: the Hybrid Control Unit, the combined Electric Motor/Generator, plus cooling for the engine and lubrication systems (please see our Marine Cooling brochure for more information).

Easy Product Selection

Electric and Hybrid systems are often designed to operate with sea water temperatures of 30°C plus, making selecting the right heat exchanger critical. Whilst the table on page 4 lists typical performance examples at given temperatures and flow rates, this is intended as a general guide only. However, by supplying the following information, we can provide a computer aided product selection, to recommend the most appropriate heat exchanger for your requirements:

Coolant type and concentration

Heat to be dissipated	kW
Required coolant outlet temperature	°C
Coolant flow	l/min
Seawater temperature	°C

Fire Resistant Fluids

For applications where the heat exchanger will be used with fire resistant fluids, the standard nitrile seals can be changed for either Ethylene Propylene or Viton. To specify these seals, please add a suffix to the heat exchanger type number, as follows: EP (for Ethylene Propylene), or VT (for Viton).



propulsion systems



10 reasons why the marine industry specifies Bowman heat exchangers:

Premium quality

UK manufactured, using quality components.

Reliability

Renowned for reliable operation and long life.

Performance

Precision engineered for efficient heat transfer.

Advanced engineering

3D CAD models are available.

Fully floating tube stack

Minimises thermal stress.

Compact design

Easier system integration.

Extensive range

Widest choice of sizes to suit application.

Simple to maintain

Tube stack easily removed for cleaning.

Rapid delivery

Extensive stock holding for fast response.

Product support

Includes technical data, spare parts and global stockists.



Marine Shell and Tube Heat Exchangers

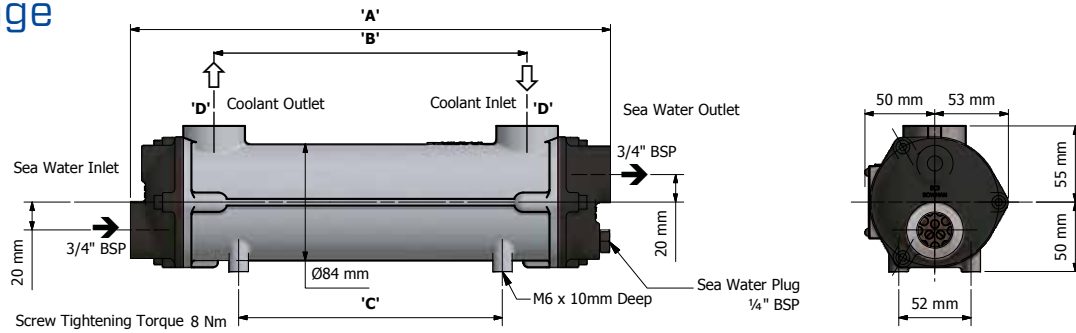
This table is intended to provide a general guide to the typical performance of Bowman marine shell and tube heat exchangers with:

Coolant type: 50/50 water/glycol
Coolant outlet temperature: 40°C
Seawater inlet temperature: 30°C



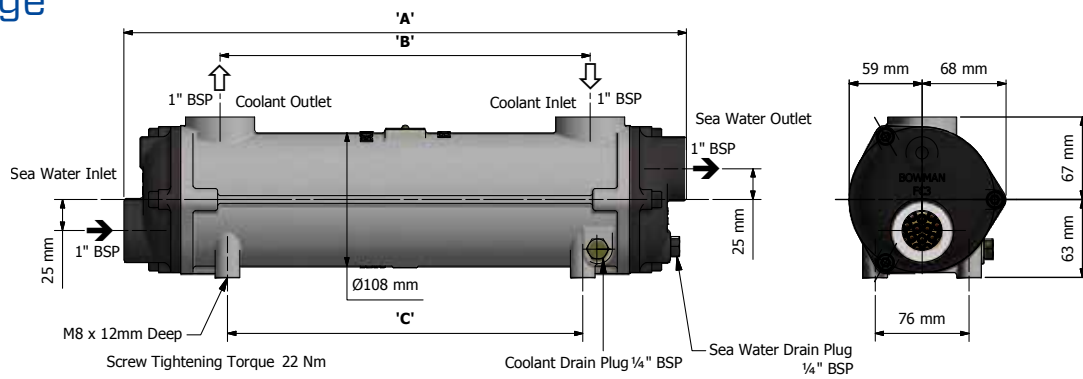
Type	Heat Dissipated	Coolant Flow	Sea Water Flow	Internal Coolant Volume	Internal Sea Water Volume
	kW	l/min	l/min	Litre	Litre
EC 80-3875-1	3	40	40	0.26	0.31
EC100-3875-2	7	50	50	0.49	0.44
EC120-3875-3	11	50	50	0.74	0.57
EC140-3875-4	15	50	50	0.97	0.71
EC160-3875-5	19	50	50	1.30	0.91
FC 80-3876-1	11	80	80	0.75	0.65
FC100-3876-2	16	80	80	1.10	0.84
FC120-3876-3	22	80	80	1.50	1.06
FC140-3876-4	29	80	80	2.00	1.35
FC160-3876-5	37	80	80	2.60	1.68
FG 80-3877-1	24	120	120	1.64	1.26
FG100-3877-2	32	120	120	2.40	1.56
FG120-3877-3	43	120	120	3.00	1.96
FG140-3877-4	53	120	120	3.90	2.42
FG160-3877-5	65	120	120	5.00	2.97
GL140-3878-2	50	200	200	3.60	3.10
GL180-3878-3	66	200	200	4.80	3.80
GL240-3878-4	82	200	200	6.30	4.60
GL320-3878-5	100	200	200	8.00	5.50
GL400-3878-6	121	200	200	10.00	6.60
GL480-3878-7	136	200	200	12.20	7.70
GK190-3879-3	98	300	300	7.00	6.30
GK250-3879-4	125	300	300	9.00	7.50
GK320-3879-5	153	300	300	11.60	9.00
GK400-3879-6	181	300	300	14.60	10.60
GK480-3879-7	206	300	300	17.40	12.30
GK600-3879-8	238	300	300	22.10	14.70
JK190-3881-3	121	400	400	9.70	8.80
JK250-3881-4	157	400	400	12.50	10.40
JK320-3881-5	195	400	400	16.10	12.50
JK400-3881-6	233	400	400	20.30	14.70
JK480-3881-7	267	400	400	24.20	17.10
JK600-3881-8	306	400	400	30.70	20.40
PK190-3880-3	117	650	650	13.60	16.00
PK250-3880-4	238	650	650	17.70	18.60
PK320-3880-5	303	650	650	22.60	21.80
PK400-3880-6	367	650	650	28.50	25.30
PK480-3880-7	424	650	650	34.00	29.00
PK600-3880-8	501	650	650	42.50	34.40
RK400-5882-6	524	900	900	43.40	37.90
RK600-5882-8	701	900	900	65.20	50.10

EC Range



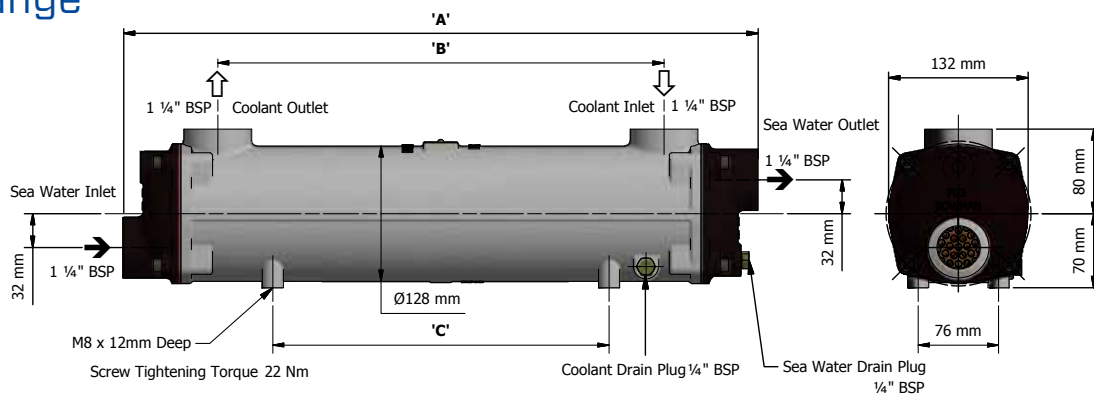
Type	Weight	A	B	C	D
	kg	mm	mm	mm	BSP
EC 80-3875-1	2.4	174	60	60	1/2"
EC 100-3875-2	3.2	260	140	104	3/4"
EC 120-38775-3	3.8	346	226	190	3/4"
EC 140-3875-4	4.8	444	324	288	3/4"
EC 160-3875-5	5.7	572	452	416	3/4"

FC Range



Type	Weight	A	B	C
	kg	mm	mm	mm
FC 80-3876-1	5.5	272	116	104
FC 100-3876-2	6.3	358	202	190
FC 120-3876-3	7.3	456	300	288
FC 140-3876-4	9.4	584	428	288
FC 160-3876-5	11.0	730	574	434

FG Range



Type	Weight	A	B	C
	kg	mm	mm	mm
FG 80-3877-1	8.5	374	196	92
FG 100-3877-2	10.0	472	294	190
FG 120-3877-3	12.0	600	422	318
FG 140-3877-4	14.5	746	568	464
FG 160-3877-5	17.5	924	746	642

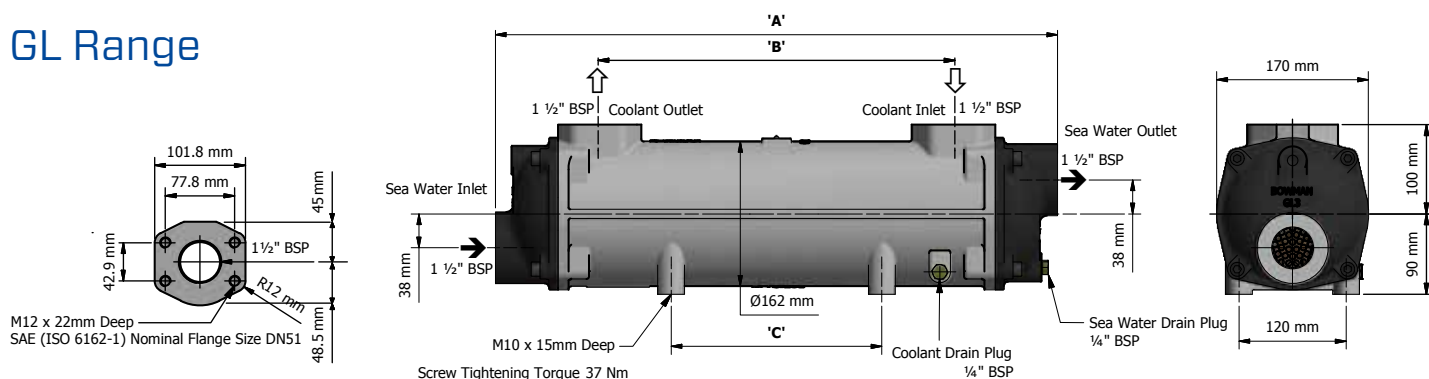
Maximum working coolant pressure
Maximum working sea water pressure

20 bar.
16 bar.

Maximum working coolant temperature

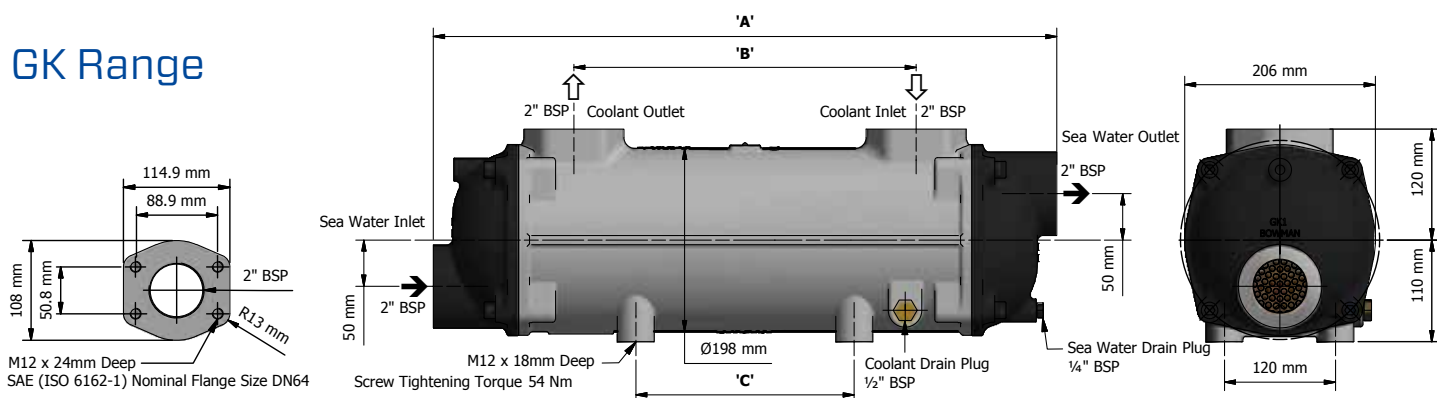
110°C.

GL Range



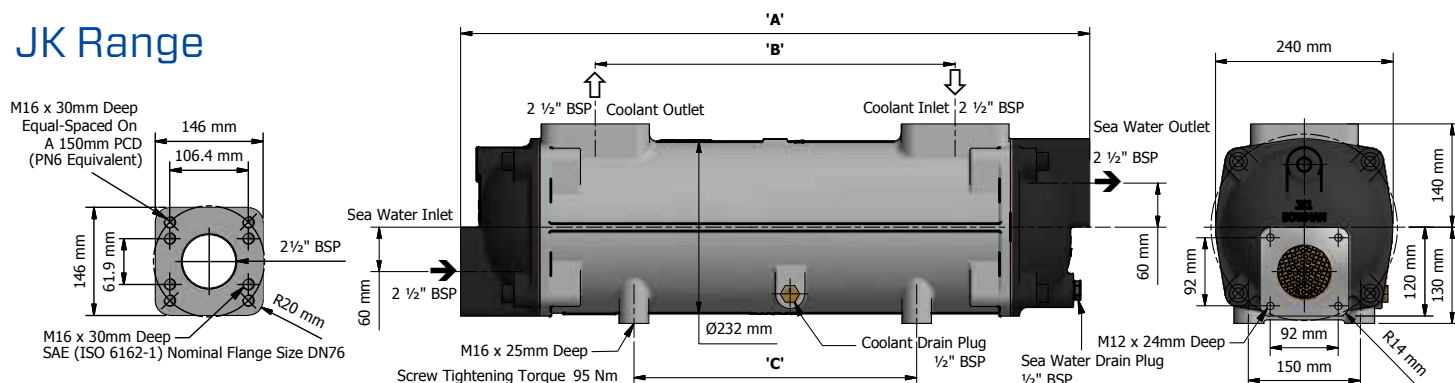
Type	Weight	A	B	C
	kg	mm	mm	mm
GL 140-3878-2	18	502	272	108
GL 180-3878-3	21	630	400	236
GL 240-3878-4	25	776	546	382
GL 320-3878-5	30	954	724	560
GL 400-3878-6	36	1156	926	762
GL 480-3878-7	42	1360	1130	966

GK Range



Type	Weight	A	B	C
	kg	mm	mm	mm
GK 190-3879-3	34	674	370	236
GK 250-3879-4	39	820	516	382
GK 320-3879-5	46	998	694	560
GK 400-3879-6	54	1200	896	762
GK 480-3879-7	62	1404	1100	966
GK 600-3879-8	74	1708	1404	1270

JK Range



Type	Weight	A	B	C
	kg	mm	mm	mm
JK 190-3881-3	58	704	340	236
JK 250-3881-4	66	850	486	382
JK 320-3881-5	78	1028	664	560
JK 400-3881-6	92	1230	866	762
JK 480-3881-7	105	1434	1070	966
JK 600-3881-8	126	1738	1374	1270

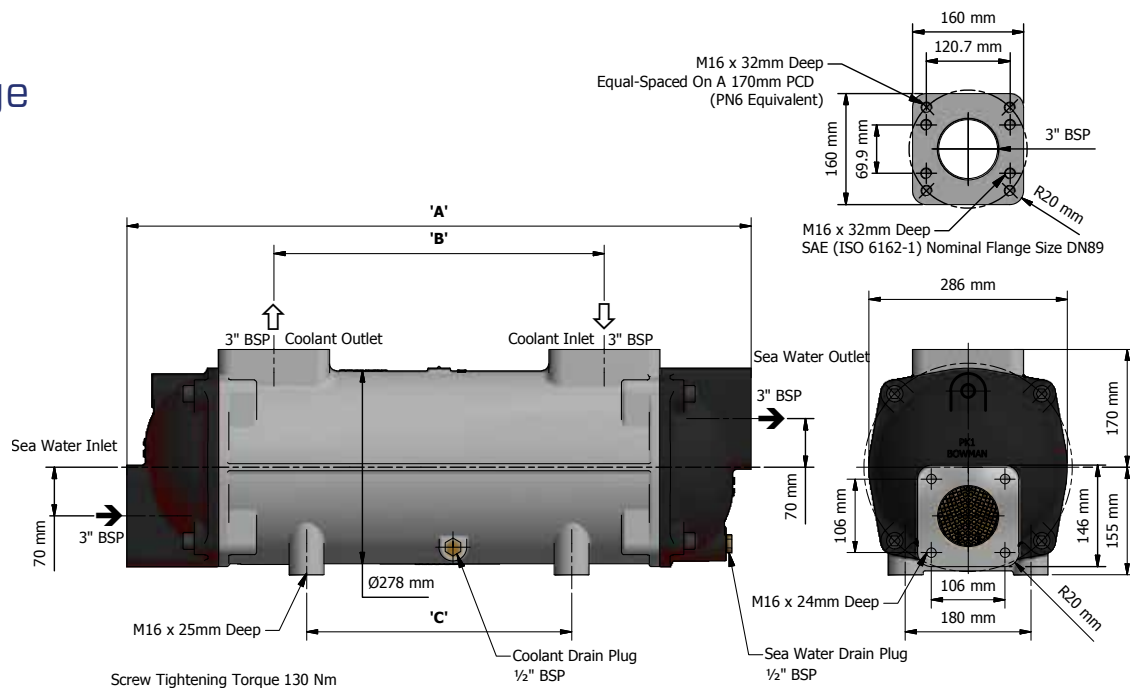
Maximum working coolant pressure
Maximum working sea water pressure

20 bar.
16 bar.

Maximum working coolant temperature

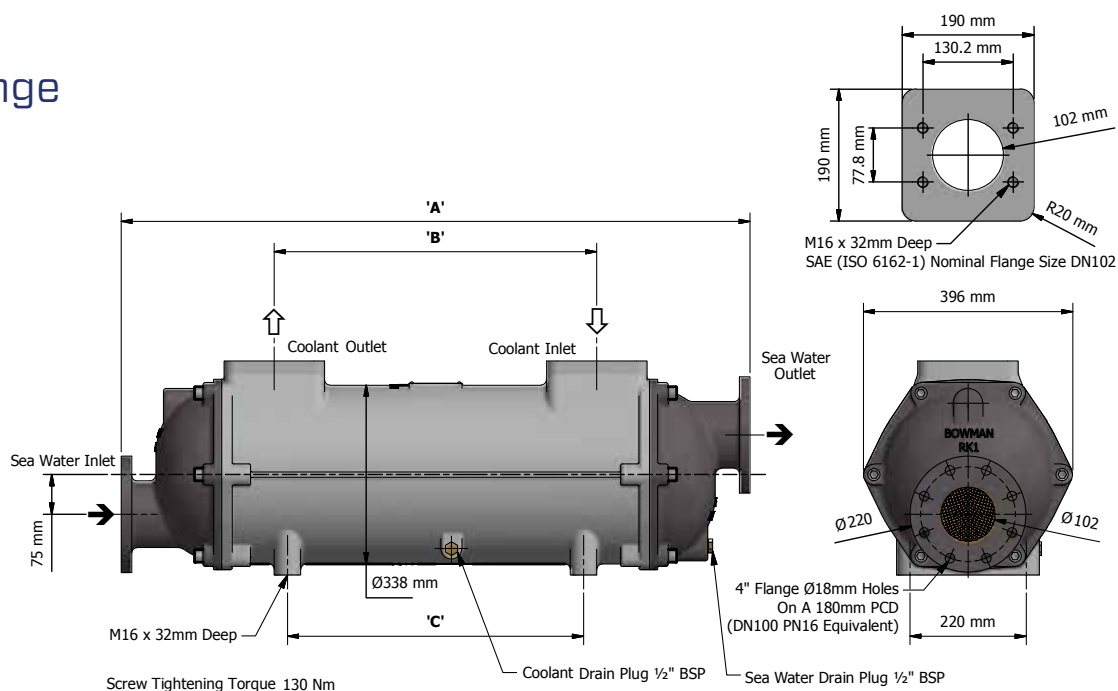
110°C.

PK Range



Type	Weight	A	B	C
	kg	mm	mm	mm
PK 190-3880-3	81	754	330	236
PK 250-3880-4	94	900	476	382
PK 320-3880-5	110	1078	654	560
PK 400-3880-6	125	1280	856	762
PK 480-3880-7	140	1484	1060	966
PK 600-3880-8	158	1788	1364	1270

RK Range



Type	Weight	A	B	C
	kg	mm	mm	mm
RK 400-5882-6	186	1392	812	762
RK 600-5882-8	246	1900	1320	1270

Maximum working coolant pressure
Maximum working sea water pressure

20 bar.
16 bar.

Maximum working coolant temperature

110°C.

A world of applications

Bowman heat exchangers can be found cooling marine propulsion, transmission, plus electric and hydraulic control systems throughout the world. Renowned for their excellent heat transfer performance and long operational life, even in the most difficult conditions, here are just a few examples of Bowman marine heat exchangers in action:



Electric & Hybrid cooling

This 'leading edge' manufacturer, who specifies Bowman heat exchangers for cooling its larger (100 kW plus) propulsion products, is just one of a number of companies at the forefront of electric and hybrid marine development, that rely on Bowman cooling for their propulsion systems.



Transmission Cooling

Thousands of work boats and leisure craft rely on Bowman gearbox oil coolers for safe, reliable operation of the vessels power transmission. Bowman oil coolers deliver efficient cooling for the lubrication and transmission systems, ensuring the oil is kept within the required temperature range.



Marine Deck Machinery

Designed to combine extended service life with minimal running costs, this hydraulic propulsion system replaces conventional marine gearboxes to provide smooth, quiet operation for inland commercial charter boats. Proven over thousands of hours, Bowman oil cooler technology is at the heart of the system.



Roll Reduction Systems

A pioneer in the development of advanced marine stabiliser technology and roll reduction systems, this leading manufacturer uses Bowman heat exchangers in their hydraulic power packs to ensure the fluid power required to articulate the stabiliser fins is always kept at the required temperature.



All Bowman marine heat exchangers are produced to the highest quality in our UK manufacturing facility. With 100 years' experience producing efficient heat transfer solutions, you can have complete confidence when you specify Bowman marine heat exchangers.

EJ Bowman (Birmingham) Ltd

Chester Street, Birmingham B6 4AP, UK

Tel: +44 (0) 121 359 5401

Fax: +44 (0) 121 359 7495

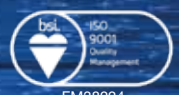
Email: info@ejbowman.co.uk

www.ejbowman.co.uk

BOWMAN®

100 YEARS OF HEAT TRANSFER TECHNOLOGY

All material contained in this brochure is the intellectual property of EJ Bowman (Birmingham) Ltd. It is protected under copyright and may not be reproduced without prior written consent of the company. EJ Bowman (Birmingham) Ltd, reserve the right to change specifications without prior notice.



FM38224