BOWMAN®

REG NO FM 38224
BS EN ISO 9001-2008

SWIMMING POOL HEAT EXCHANGERS

For use with Boilers, Solar Panels & Heat Pumps

Installation, Operation & Maintenance Guide

Foreword

Dear Customer,

Congratulations on the purchase of your new high quality "Swimming Pool Heat Exchanger".

BOWMAN® has been manufacturing high quality "Swimming Pool Heat Exchangers" for over 60 years.

Your **BOWMAN**® Stockist/dealer will be happy to provide you with advice and practical assistance.

Please read these instructions fully and carefully.

Keep the "Installation, Operation & Maintenance Guide" for all future reference to ensure the long lasting performance from your new "Swimming Pool Heat Exchanger".

Copies of other Country Installation & Maintenance manuals from: -

French 

German 

Italian 

Spanish  http://www.ejbowman.co.uk/downloads.htm

Polish 

Russian 

Chinese 

Installation, Operation & Maintenance Guide

Contents

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1 Safety

1.1 Hazards When Handling the Heat Exchanger

BOWMAN® "Swimming Pool Heat Exchangers" are constructed with current practice and recognised safety rules. Hazards may still arise from operation, such as:

- Injury of the operator or
- Third parties or
- Damage to the heat exchanger or
- Damage to property and equipment

Any person involved with the installation, commissioning, operation, maintenance or repair of the heat exchanger must be:

- Physically and mentally capable of performing such work
- Be appropriately qualified.
- Comply completely with the installation instructions

The heat exchanger must only be used for its intended use.

In the event of breakdowns which may compromise safety, a qualified plumber must always be contacted.

1.2 Safety Instructions

The following symbols are used in these operating instructions:

This symbol indicates an **immediate danger** to health.
Failure to comply with this instruction may result in severe injury.

This symbol indicates a **possible danger** to health.
Failure to comply with this instruction may result in severe injury.

This symbol indicates a **possible risk** to health.
Failure to comply with this instruction may result in injury or damage to property.

This symbol indicates important information about correct handling of the equipment
Failure to comply with this instruction may cause damage to the heat exchanger and/or its surroundings.

1.3 Approved Use

BOWMAN® "Swimming Pool Heat Exchangers" are only approved for heating or cooling pools with boiler water, solar and heat pump installation.

Any other use unless specified by **BOWMAN**® is not approved. **BOWMAN**® declines all liability for damage associated or arising from such use.

The maximum permissible operating pressure must not exceed:

Heating/Cooling (primary side)	:	6 bar max.
Pool Water (secondary side)	:	6 bar max.

The maximum permissible operating temperature must not exceed:

Heating/Cooling (primary side)	:	120 Deg.C
Pool Water (secondary side)	:	100 Deg.C

1.4 Potential Hazards

The heat exchanger may be damaged or leak if the maximum permissible operating pressure is exceeded.

Connections on the heating water side of the heat exchanger may reach temperatures as high as 120 Deg.C.

The heat exchanger may heat up to the flow temperature of the heating water if there is no pool water flowing through the heat exchanger. Any connected plastic pipe work may be exposed to inadmissible temperature and suffer damage.

1.5 Safety Measures at Installation Site

The heat exchanger is recommended to be installed in frost free premises.

Ensure the maximum permissible operating pressure on the primary or secondary side of the heat exchanger is not exceeded. The heat exchanger or surrounding equipment may be damaged.

While the pool is in operation, weekly inspection of the heat exchanger and its connections should be maintained for leaks and externally visible damage.

2 Installation

2.1 Transport / Storage

The heat exchanger must be fully drained down prior to transportation. Once drained and fully dry, the heat exchanger must only be stored indoors within a non aggressive atmosphere.

2.2 Installation

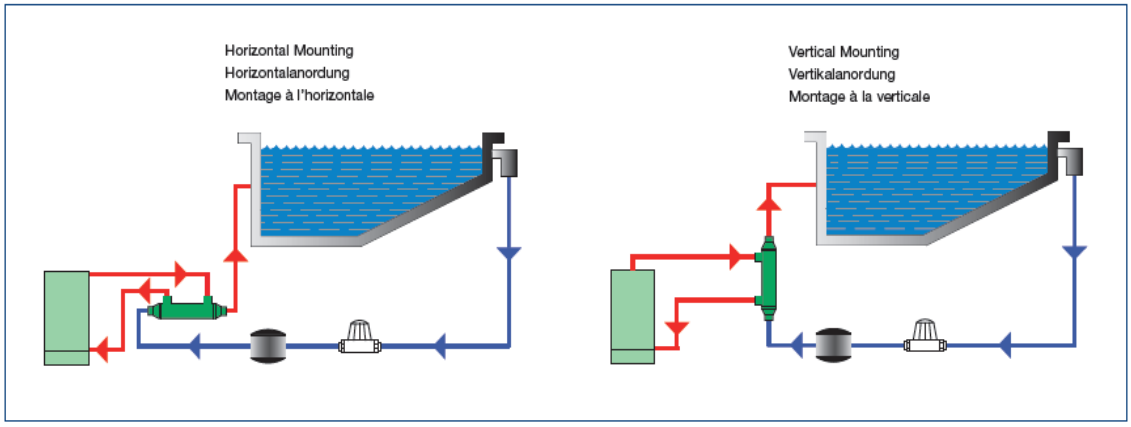
take care

The heat exchanger should only be installed in frost-free, dry premises with a non aggressive atmosphere. Ensure easy access for assembly / disassembly.

2.3 Fitting

take care

Before fitting, check the heat exchanger for visible signs of damage, the heat exchanger can be installed above or below the pool water level, positioned horizontally or vertically within the installation pipe work.



The heat exchanger may be damaged by chemicals. Dosing systems must be fitted downstream from the heat exchanger incorporating a non return valve. If chemicals are used, gases must be prevented from entering the heat exchanger when the filtration system is not in use.

The heat exchanger should always be installed downstream of the pumping and filtration equipment. The boiler / solar water must be pump assisted and the usual precautions taken to prevent air locks. The pool water pump should be controlled by a thermostat in the pool water pipe work before the heat exchanger and set at the required pool temperature.

Under no circumstances should the heat exchanger be used in conjunction with corona discharge type ozone systems. For alternative dosing / disinfection systems not specified within this Installation, Operation & Maintenance Guide please contact our technical department for advice prior to installation of the heat exchanger.

2.4 Connecting the Heat Exchanger

Shut off all drainage valves in the flow and return pipes of the primary and secondary circuits.

Ensure compliance with water quality and maximum permissible pressure requirements.

When fitting the heat exchanger into the pipe work care must be taken to ensure that no debris has been introduced into the primary or secondary circuit of the heat exchanger.

3 Operation

It is essential that the following instructions are followed to prevent corrosion/erosion of the heat exchanger:

a) **BOWMAN**® Stainless Steel heat exchangers should not be used with seawater or salt water pools. (**BOWMAN**® Cupro Nickel or Titanium heat exchangers are available for this application).

b) Always maintain the water pH to within correct levels. The ideal pool pH should be kept within 7.4 to 7.6. On no account should it fall below 7.2 or above 7.8. Checks should be made on a day-to-day basis. Recommend chemical limits for **BOWMAN**® Swimming Pool Heat exchangers are shown below, however local swimming pool water guidelines should be followed for safe bathing.

Material	Cupronickel	Stainless Steel	Titanium
Chemical	Levels	Levels	Levels
Free Chlorine	1.0 - 3.0 ppm	1.0 - 3.0 ppm	15.0 ppm max.
pH	7.2 - 7.8	7.2 - 7.8	6.8 – 8.0
Calcium Hardness	200 - 400 ppm	200 - 1000 ppm	200 - 1000 ppm
Alkalinity	100 - 150 ppm	100 - 150 ppm	100 - 150 ppm
Bromine	2.0 - 4.0 ppm	2.0 - 4.0 ppm	15.0 ppm max.
Chloride	Less than 150 ppm	Less than 350 ppm	Less than 3000 ppm

c) If a by-pass is fitted to the heat exchanger circuit, it is essential that any valves are correctly positioned to allow the recommended pool water flow to pass through the heat exchanger.

d) The filter unit should be checked regularly, especially if sand filters are utilised. If sand filters are installed but working incorrectly, fine particles of sand can be allowed to flow around the pool circuit causing erosion of the pipe work, heat exchanger and pump unit.

e) Keep pool free from debris such as leaves, grass cuttings etc. This foreign matter can decay and increase the pH level in the pool.

f) It is essential that the correct amount of chemical dosage is added to the pool. To allow proper dispersion of the dose in the pool water, distribution of the dose should be made to various areas of the pool. Do not dose in one area only, especially local to the pool return as this will create high acidic areas which can cause corrosion/erosion of the pool equipment.

4 Commissioning

Commissioning of the heat exchanger should not be undertaken until such time that this document has been fully read and understood.

The primary and secondary circuits of the heat exchanger must be fully closed prior to commissioning.

Adequate provision should be made to ensure that correct operating/service equipment along with personal protection (PPE) in accordance with current standards/legislation is utilised prior to the commencement of any working.

5 Maintenance / Repair

5.1 Winter Shutdown in Frost Free Areas

When shut down in frost free premises the heat exchanger must be completely full of water and fully purged of air.

5.2 Winter Shutdown in Areas Exposed To Frost

Care should be taken to prevent frost damage from a winter shutdown in premises exposed to frost. We recommend fully draining down the heat exchanger or removing the heat exchanger completely from the installation throughout the duration of the shutdown period.

5.3 General Maintenance

The heat exchanger should require little attention in service, however if cleaning or replacement of the tube stack is necessary the end cover bolts should be tightened to the torque figures below. Note new seals are recommended if the end covers are removed.

Type	Bolt Size	Torque (Nm)	Type	Bolt Size	Torque (Nm)
5113 Series	M6	8	3708-2	M10	37
5114 Series	M8	22	3709-3	M12	54
5115 Series	M8	22	3711-3	M16	95
			3710-3	M16	130

6 Warranty

All BOWMAN® Swimming Pool Heat Exchangers are guaranteed against manufacturing defaults associated with the product for a period of twelve months from the date of invoice. The range of Titanium Heat Exchangers, are provided with an extended 3 year guarantee. Furthermore, the titanium material incorporates a ten year anti-corrosion guarantee against any damage associated from the pool water.

For full warranty terms, please see the **BOWMAN**® Conditions of Sale. A copy of which is available on request or via download from the website.

www.ejbowman.co.uk

7 Specifications for use with boilers...

Type / Typ / Type	Pool capacity / Schwimmbadvolumen / Volume de la piscine		Boiler water flow / Durchfluss Kesselwasser / Débit d'eau de la chaudière		Maximum pool water flow / Maximaler Durchfluss Schwimmbadwasser / Débit d'eau de la piscine maximal		Heat transfer / Wärmeübertragung / Transfert thermique 82°C Boiler water / 82°C Kesselwasser / 82°C Eau de la chaudière		Heat transfer / Wärmeübertragung / Transfert thermique 60°C Boiler water / 60°C Kesselwasser / 60°C Eau de la chaudière	
	m³	gal	m³/h	l/m	m³/h	l/m	kW	BTU	kW	BTU
5113-2 C/S/T*	80	18000	2.4	40	10.2	170	40	135000	22	75000
5113-3 C/S/T*	120	26000	3.6	60	15.0	250	70	240000	40	135000
5114-2 C/S/T*	170	37000	5.4	90	21.0	350	100	340000	55	190000
5115-2 C/S/T*	230	50000	7.2	120	28.8	480	160	545000	92	310000
5114-5 S/T*	240	52000	7.8	130	28.8	480	200	680000	130	440000
5115-5 S/T*	320	70000	9.6	160	39.0	650	300	1000000	170	570000
3708-2 C	400	88000	12.6	210	50.4	840	300	1000000	170	570000
3709-3 C	600	130000	19.2	320	75.0	1250	550	1900000	310	1050000
3711-3 C	910	200000	28.6	475	114.0	1900	780	2650000	440	1500000
3710-3 C	1400	300000	44	730	175.2	2920	1050	3600000	590	2000000

...for use with solar panels & heat pumps

Type / Typ / Type	Pool capacity / Schwimmbadvolumen / Volume de la piscine		Boiler water flow / Durchfluss Kesselwasser / Débit d'eau de la chaudière		Maximum pool water flow / Maximaler Durchfluss Schwimmbadwasser / Débit d'eau de la piscine maximal		Heat transfer / Wärmeübertragung / Transfert thermique 82°C Boiler water / 82°C Kesselwasser / 82°C Eau de la chaudière		Heat transfer / Wärmeübertragung / Transfert thermique 60°C Boiler water / 60°C Kesselwasser / 60°C Eau de la chaudière	
	m³	gal	m³/h	l/m	m³/h	l/m	kW	BTU	kW	BTU
5113-2 C/S/T*	80	18000	2.4	40	10.2	170	40	135000	22	75000
5113-3 C/S/T*	120	26000	3.6	60	15.0	250	70	240000	40	135000
5114-2 C/S/T*	170	37000	5.4	90	21.0	350	100	340000	55	190000
5115-2 C/S/T*	230	50000	7.2	120	28.8	480	160	545000	92	310000
5114-5 S/T*	240	52000	7.8	130	28.8	480	200	680000	130	440000
5115-5 S/T*	320	70000	9.6	160	39.0	650	300	1000000	170	570000
3708-2 C	400	88000	12.6	210	50.4	840	300	1000000	170	570000
3709-3 C	600	130000	19.2	320	75.0	1250	550	1900000	310	1050000
3711-3 C	910	200000	28.6	475	114.0	1900	780	2650000	440	1500000
3710-3 C	1400	300000	44	730	175.2	2920	1050	3600000	590	2000000

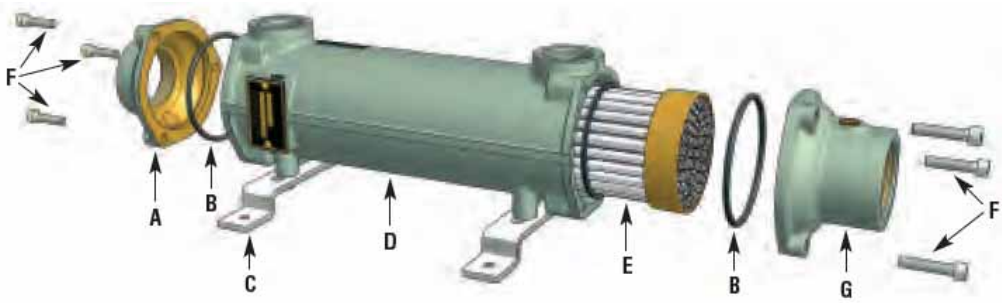
* Add the appropriate suffix indicating tube material when ordering these part numbers (C, S or T).
* Bei der Bestellung dieser Teilenummern den entsprechenden Zusatz zur Angabe des Rohrmaterials hinzufügen (C, S oder T).
* Ajoutez le suffixe approprié indiquant le matériau du tube, lorsque vous commandez ces échangeurs de chaleur (C, S ou T).

C = Cupronickel	C = Kupfernickel	C = Cupronickel
S = Stainless steel	S = Edelstahl	S = Acier inoxydable
T = Titanium	T = Titan	T = Titane

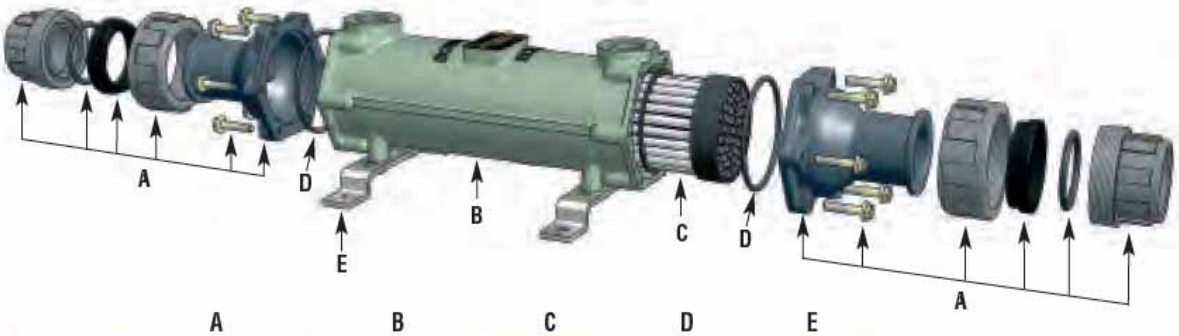
N.B. Stainless steel heat exchangers should not be used on pools fitted with chlorinators or salt water pools.
Anmerkung: Edelstahlwärmetauscher sollten nicht in mit Chlor-Elektrolyse-Anlagen ausgestatteten Schwimmbecken verwendet werden.
Nota: Echangeurs de chaleur en acier inoxydable ne devraient pas être utilisés avec des piscines équipées avec un chlorinateur d'eau salée.

8 Spare Parts List

We always keep a comprehensive stock of spare parts. Please contact our sales department for details.



	A	B	C	D	E	F	G
Type	Plain end cover	"O" Seals	Mounting brackets	Body	Tube stack	End cover screws	Thermostat pocket end cover
3705-3 4495-3	EC033-784GM	AN12NT	4154	EC071-4568-3CI	5088-3TN2P	HS06X30	– EC060-3920NB
3706-2 4496-2	FC033-1176GM	OS46NT	4154	FC010-1200-2CI	5089-2TN2P	HS08X35	– FC033-4760GM
3707-2 4497-2	FG007-2802GM	OS52NT	4154	FG010-1650-2CI	3446-2TN2P	HS08X35	– FG007-4761GM
3708-2	GL037-3140GM	OS63NT	–	GL015-3136-2CI	3447-2TN2B	HS10X40	–
3709-3	GK063-3255GM	OS69NT	–	GK019-2865-3CI	3448-3TN2B	HS12X50	–
3711-3	JK004-3331GM	OS74NT	–	JK019-3332-3CI	3450-3TN2B	HS16X70	–
3710-3	PK004-2926GM	OS81NT	–	PK019-2919-3CI	3449-3TN2B	HS16X70	–



	A	B	C	D	E
Type	End cover assembly	Body	Tube stack	"O" Seals	Mounting brackets
5113-2C 5113-2S 5113-2T	5030	EC070 4568-2CI	5095-2TNP 5095-2STP 5095-2TIP	AN12NT	4154
5113-3C 5113-3S 5113-3T	5030	EC071 4568-3CI	5095-3TNP 5095-3STP 5095-3TIP	AN12NT	4154
5113-5C 5113-5S 5113-5T	5030	EC073 4568-5CI	5095-5TNP 5095-5STP 5095-5TIP	AN12NT	4154
5114-2C 5114-2S 5114-2T	5031	FC070 4668-2CI	5096-2TNP 5096-2STP 5096-2TIP	OS46NT	4154
5114-5S 5114-5T	5031	FC073 4668-5CI	5096-5STP 5096-5TIP	OS46NT	4154

When replacing the tube stack, always fit new seals - 2 off per unit.

* Mounting feet may differ from drawing

Scan the QR Code below to your phone for a direct link to our Swimming Pool webpage: -

Bowman products can also be found in the following industries: -

Hydraulic Cooling

CHP Power Generation

Engine Test House Cooling

Marine Cooling

Fishing Industry Cooling

The product range includes: -

Aquatic Heat Exchangers

Calorifiers

Exhaust Gas Heat Exchangers

Plate Type Heat Exchangers

Shell & Tube Oil Coolers

Stainless Steel Heat Exchangers