Cathelco HEM

Yacht Systems Product Portfolio

- Seawater pipework anti-fouling
- ICCP hull corrosion protection
- HEM desalinators and water treatment
- Cathelco reverse osmosis desalinators
- Ballast water treatment systems

Protection against marine growth in pipework

Blockages in seawater pipework systems can be time consuming and expensive to remove. With an exceptionally wide range of control panels and anodes, the Cathelco system gives complete and continuous protection to yachts of any size.

The investment in the system is rapidly recovered through savings in maintenance costs. Beyond this, there is the reassurance that your yacht is reliably protected, now and into the future.

As world leaders in electrolytic anti-fouling systems, Cathelco can provide expert advice concerning your specific installation and you are supported through an international network of agent/installers.

Nano System

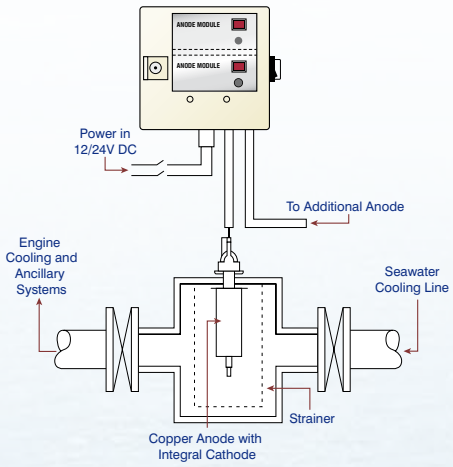
The Nano system is the latest step in miniaturisation, enabling the control panel and anodes to be easily and economically fitted in areas where space is limited.

Systems are custom-made for their applications to provide anti-fouling only or a combination of anti-fouling and corrosion suppression. A variety of anode types are available to fit within the smallest strainers, including anodes with integral cathodes for plastic strainers.

Easy to install and economically priced, the Nano System brings peace of mind to owners of luxury yachts from just 20ft upwards.

- Ultra compact system to protect against bio-fouling in seawater pipework.
- Suppresses corrosion in pipework (in dual purpose systems).
- Requires minimum attention from crew.
- Can be powered from yacht's battery supply – 12V to 24V d.c.
- Copper anodes used to protect steel, stainless steel or copper alloy strainers and pipework against bio-fouling.
- Copper anodes with integral cathodes to protect plastic strainers and pipework.

Anode with integral cathode in Vetus strainer.



Cover Photographs: Top - Serene, Peter Seyfferth. Below - Hemisphere, Jeff Brown.

Micro & Mini Systems

The Micro system eliminates blockages in seawater engine cooling systems caused by barnacles and mussels and has been designed for larger luxury yachts with a number of seawater inlets.

The system is based on the electrolytic principle and creates copper ions giving a dosage of just 2 parts per billion which prevent barnacles and mussels from settling and growing in seawater lines. Its effectiveness has been proved on some of the largest luxury yachts in the world over a period of more than 30 years.

Systems can be supplied solely for anti-fouling or as dual purpose units combining anti-fouling and corrosion suppression features.

- Prevents pipework bio-fouling by barnacles and mussels.
- Suppresses corrosion in pipework (in dual purpose systems).
- Requires minimum attention from crew.
- Easy and economical to install at newbuilding or retrofit.
- Can be powered from the yacht's battery supply (12V to 24V d.c.) or 220V/110V single phase.
- Copper anodes - used to protect pipework against bio-fouling.
- Aluminium anodes - provide corrosion suppression in steel pipework.
- Ferrous anodes - provide corrosion suppression in cupro-nickel pipework.
- Nylon mounting sleeves to fit easily into steel or plastic strainer lids.

Pico anode (3355)

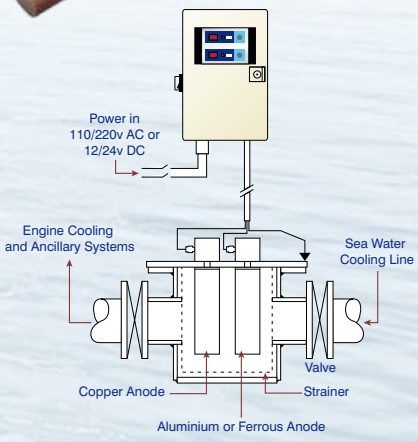
Nano anode with an integral cathode (2525)

Nano anode (2755)

Anode with plastic sleeve

Anode with steel sleeve

Dual purpose anode

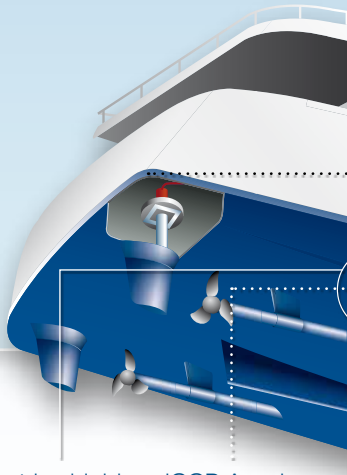


Hull corrosion protection

Cathelco provide reliable and technologically advanced solutions to problems of hull corrosion using impressed current cathodic protection (ICCP) systems.

With lightweight, flush mounted anodes, the systems achieve optimum efficiency without detracting from the smooth lines of the craft – minimising drag and safeguarding the overall appearance.

The Minitek system has been specifically designed to protect steel hulls, whilst Alutek incorporates special controlling and monitoring electrodes to provide precisely controlled corrosion protection for aluminium hulls at an economical cost.



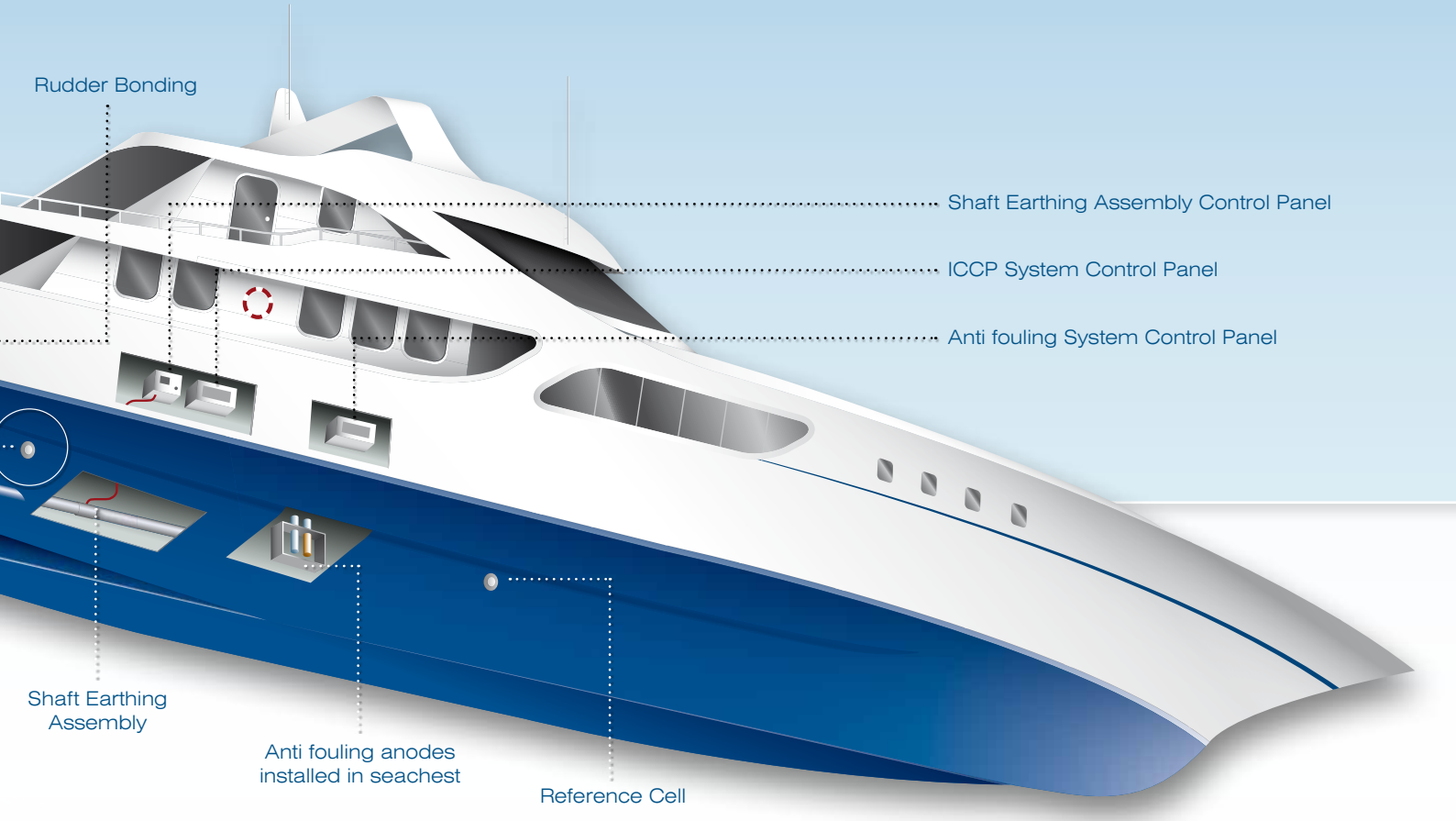
Minitek – for steel hulls

The Minitek system uses the latest technology to protect steel hulled yachts against corrosion. This is achieved by a compact control panel and an arrangement of anodes and reference cells which are flush mounted on the hull – so there is nothing to interrupt the smooth profile or cause additional drag.

The current to the anodes is constantly monitored and adjusted to provide the 'optimum' level of protection at all times. This is far superior to the performance of sacrificial anodes where the amount of protection cannot be easily verified and may be insufficient to prevent corrosion.

- Anode life 15 years – unlike sacrificial anodes.
- Reduced weight in comparison with sacrificial anodes.
- Flush mounted anodes to ensure smooth hull profile.
- No maintenance required.
- Self diagnostic system.
- Operates from 230V a.c. electrical supply.
- Control panel measures only 600mm x 600mm x 210mm.

Length approx	Sacrificial Anodes	ICCP System	Weight Advantage
25m	186 kg	40.5 kg	145.5 kg
45m	465 kg	52 kg	413 kg
60m	926 kg	85 kg	841 kg



Alutek – for aluminium hulls

Aluminium is generally regarded as a stable material which does not corrode easily. However, when used in conjunction with other metals such as bronze propellers and steel components, serious problems of hull corrosion can arise.

The Alutek system uses the latest technology to eliminate corrosion on aluminium hulls. Unlike traditional sacrificial anode systems, it utilises flush mounted, lightweight anodes and advanced monitoring systems to provide the optimum level of protection.

So there is nothing to detract from the smooth lines of your yacht or reduce its speed.

- Flush mounted anodes keep the hull streamlined.
- Reduced weight in comparison with sacrificial anodes.
- Automatic system – constantly monitors and adjusts output.
- Operates from 230V or 115V a.c. electrical supply.
- Monitoring electrodes – measure the electrical potential near the di-electric shield.
- Controlling electrodes - measure the electrical potential at a remote point on the hull.
- Shield sensors – detect changes in resistance at the coated aluminium/seawater interface.
- Lower yard installation costs than recessed sacrificial anodes.

Length approx	Sacrificial Anodes	ICCP System	Weight Advantage
25m	80 kg	52 kg	28 kg
45m	200 kg	52 kg	148 kg
60m	400 kg	52 kg	348 kg
95m	600 kg	52 kg	548 kg

Desalinators and water treatment systems

HEM were acquired by Cathelco in 2015, bringing together two of the best known names in water treatment systems for superyachts.

The HEM range of reverse osmosis desalinators covers all requirements from compact, cost effective units for smaller yachts to the largest ultra-rugged duplex units, capable of high sustained output under continuous operation, where reliability is essential.

Since no water is 100% pure and always contains contaminants from natural or man-made sources, HEM also produces a variety of water treatment systems encompassing filtration, sterilisation and water softening.

HEM Series 20 desalinators – 1,900 to 4,800 litres/day
HEM Series 25 desalinators – 3,400 to 6,000 litres/day

The HEM Series 20 system is designed for small yachts where space is very limited. It is compact, but accessible for routine servicing and allows for fast, simple installation. The HEM Series 25 model is a compact, heavy duty unit fitted with a slow running HP pump driven by a 2.2kW motor.

- Available in frames or modular form for flexible installation.
- Brine and product water flow meters.
- Automatic shutdown by system under/over pressure.
- Controls include hour meter, thermal protection for LP/HP pumps, remote alarm connections, digital permeate quality indicator.
- Automatic salinity control and 'dump' feature.

HEM Series 30 desalinators – 2 x 9,000 to 15,000 litres/day
HEM Series 30 duplex desalinators – 2 x 9,000 to 2 x 15,000 litres/day
HEM Series 38 duplex desalinators – 2 x 21,000 litres/day

The modular version of the HEM Series 30 desalinator does not take up much more space than the Series 25 model, but gives up to three times the output using 4" membranes.

The HEM Series 30 duplex desalinators are designed to combine two complete RO systems including the sand filters, rehardening filters and membrane cleaning system in one frame.

Moving up in capacity, the HEM Series 38 duplex unit is designed to be compact and provide good accessibility for all components. This is combined with excellent reliability and a degree of redundancy within the system as a safety measure. All the necessary pre-filtration and post treatment equipment is incorporated on the same frame.

HEM Series 80 Duplex – 2 x 30 to 50m³/day
HEM Series 80 Simplex - 1 x 60-100m³/day

These systems are suitable for very large yachts, commercial ships and cruise vessels in frame or skid mounted versions.

Several variations of the design are available depending on the working conditions and intended purpose for the product water. Any standard system can be adapted to your exact requirements. Features include:-

- Automatic pressure build-up and slow pressure drop during start/stop sequences.
- Connections for automatic start/stop from remote location or from level switches in storage tank.
- Indication light on control panel showing system status, on/off for pumps, fault indication, alarm lights, etc.
- Over pressure relief valves for product and brine pumps.
- Automatic over/under pressure shut down and alarm.

HEM Pure R.O.

These units are specially designed to produce demineralised water which can be used as technical water, most frequently for washing down the hulls of yachts, especially if they are of a dark colour.

This saves a lot of manpower and time when it comes to the hull washdown, since the demineralised water leaves no streaks or traces.

The unit produces up to 2m³/hr (32 ltr/min) at a maximum salinity of 25 ppm TDS.

HEM Water softeners – Types K50 & K60
HEM Water softeners – Type 9500/1350 re-circulation/high flow

The main benefit of installing a water softener on a yacht is to reduce the risk of calcium build-up in water heaters, heat exchangers, piping and hydrophore tanks. The removal of hardness caused by calcium and magnesium is achieved through the exchange of sodium ions.

This new generation HEM 'Recirculation' Softener (Type 9500/1350) allows you to fill your fresh water tank at any flow rate, without having to worry about your water softener capacity.

- Ion exchange prevents the production of corrosive, mineral-hungry soft water.
- On demand operation – automatically adjusts to actual water usage.
- Continuous supply – twin bottle design enables water to be supplied, even during regeneration.
- Counter current regeneration reduces salt and water usage.
- Hydraulically powered – does not require electrical connections.

HEM Freshwater Skids

Type FWS 1300 – 10m³/h
Type FWS 1400 – 15m³/h

The HEM freshwater treatment skids Type 1300 and 1400 are compact, self contained units providing two water treatment processes. Pre-filtration is followed by an active charcoal filter with an automatic programmable backwash valve.

Type FWS 3300 – 10m³/h
Type FWS 3400 – 15m³/h

The FWS 3300 and 3400 combine three treatment processes within one self contained and very compact skid. The first two processes are pre-filtration and the active charcoal filter. In addition, there is a silver ions steriliser, type SIS20A. This injects small quantities of silver ions into the freshwater tanks to ensure that the water is fresh and free from contamination.

Type FWS 8300 - 30m³/h
Type FWS 10400 - 40m³/h

These high capacity units have all of the same features as the FWS 3300 and 3400 models, except that they have a UV steriliser and/or a silver ions steriliser mounted within the frame.

HEM Hydrophore Systems

This new electronically controlled hydrophore system incorporates state-of-the-art frequency drives, pumps and control technology to provide responsive and reliable water distribution for yachts.

The use of variable frequency drives ensures smooth water pressure regulation, avoids any water hammer effects and greatly reduces the size of pressure reservoirs. Automatic rotation of lead pumps ensures even wear. In addition, several levels of redundancy ensure continuous system operation in the case of individual component failure.

- Minimal space requirements.
- Easy installation – two hydraulic couplings and one electrical connection.
- Reliable multi-stage pumps with corrosion resistant bearing sleeves.
- System supplied as stand-alone or modular form for ease of installation.
- Duplex systems have master and slave pumps – either can take over the master function, if necessary.
- Each variable frequency drive has a dedicated redundant pressure transducer circuit for emergency purposes.

Hydrophores can be produced with large capacities in conjunction with water treatment systems mounted on a space saving combined skid.

Cathelco desalinators

Reliable technology – easy operation

To complement the HEM range, Cathelco produce a series of reverse osmosis desalinators suitable for smaller yachts and pleasure craft.

This follows the acquisition of Seafresh Desalinators in 2010, a company with a record of more than 2,000 installations over a period of 30 years.

Building on a tradition of engineering expertise combined with high quality components, Cathelco have enhanced and extended the product range.

Through the introduction of the latest control systems the desalinators have greater functionality and are easier to operate. In addition, the overall foot print sizes have been reduced to simplify installation. Beyond this, a wider range of water treatments are now available to customers as optional extras.

Seafresh H2O Series

Capacities: 36 to 276 litres per hr (up to 6.5m^3/day)

Ideal for the requirements of pleasure craft and some luxury yachts, these fully automatic machines incorporate water quality sensing. As the water is produced it is tested electronically and the pure water is passed to a holding tank. Any which does not reach the standard is rejected and passed overboard via automatic divert valves.

All H20 models are available in frames or can be supplied in component form to make the most efficient use of space. The desalinators are most commonly powered by an AC generator, but can also be belt driven from the vessel's engine or powered by the DC battery supply.

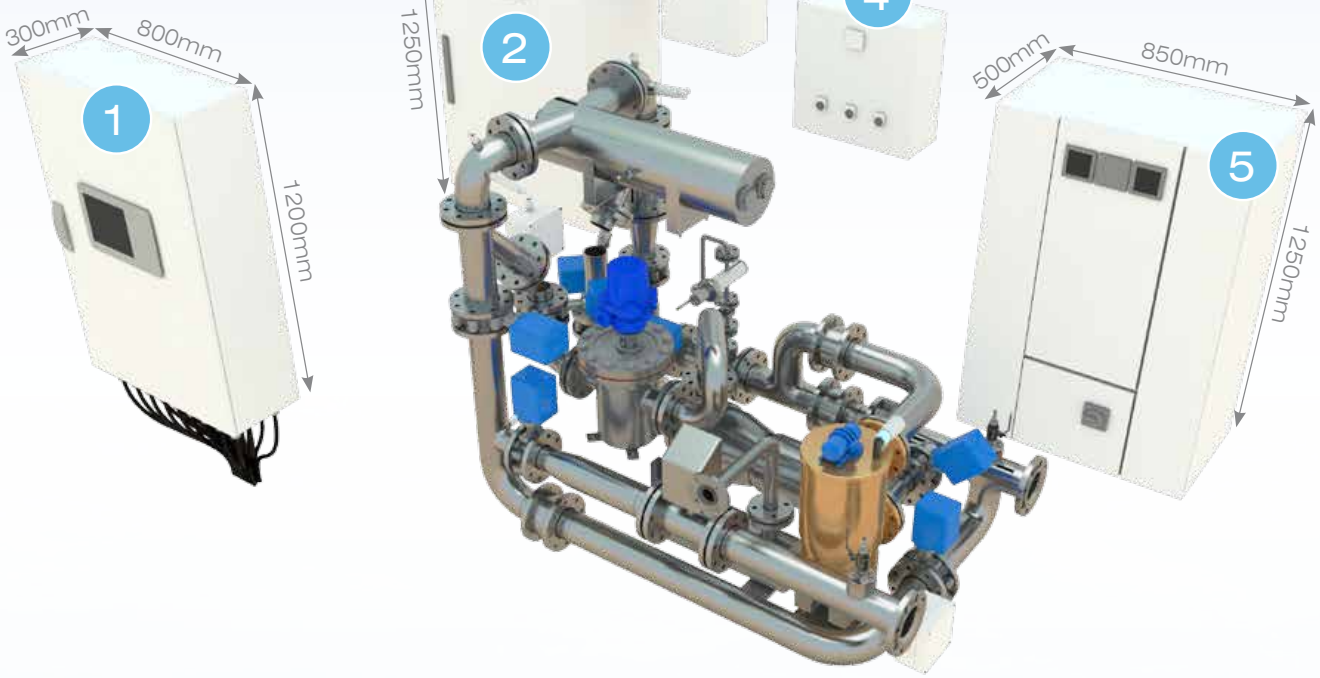
- Easy to install and simple to operate.
- Fully automatic, temperature compensated electronic water quality sensing.
- Available in frame or can be supplied in 'space saving' component form.
- Option of remote control operation.
- Available with additional pre and post treatments.
- Full spares and service kit available.

H2O Series - capacities

Model	H202	H204	H206	H208	H2012	H2016
Litre/hr std	36	72	104	140	217	276
Tonne/day	0.87	1.72	2.49	3.36	5.20	6.62
U.S.Gallons/hr	9.5	19	27.5	37	57	73
U.S.Gallons/day	228	456	660	888	1368	1752

Modular ballast water treatment systems for retrofits

In retrofit installations space availability is usually a major consideration. The Cathelco BWT system can be supplied in modular form enabling components and control panels to be distributed in available areas.



Paint finish

Control panels supplied in RAL White or any colour specified by the customer.

1 Automation control panel

Controls ballasting/deballasting, C.I.P cleaning and many other functions. Built in data logging ensures compliance with IMO regulations. Provides salt water and fresh water operational modes. Available as stand alone, remote or fully integrated.

2 Lamp control panel

Step-less power control enables output to the lamps to be raised or lowered in small incremental steps, ensuring that power is used economically.

3 C.I.P ball cleaning system control panel

Controls cleaning cycle of C.I.P system. Initiates release and recovery of cleaning balls.

4 Filter control panel

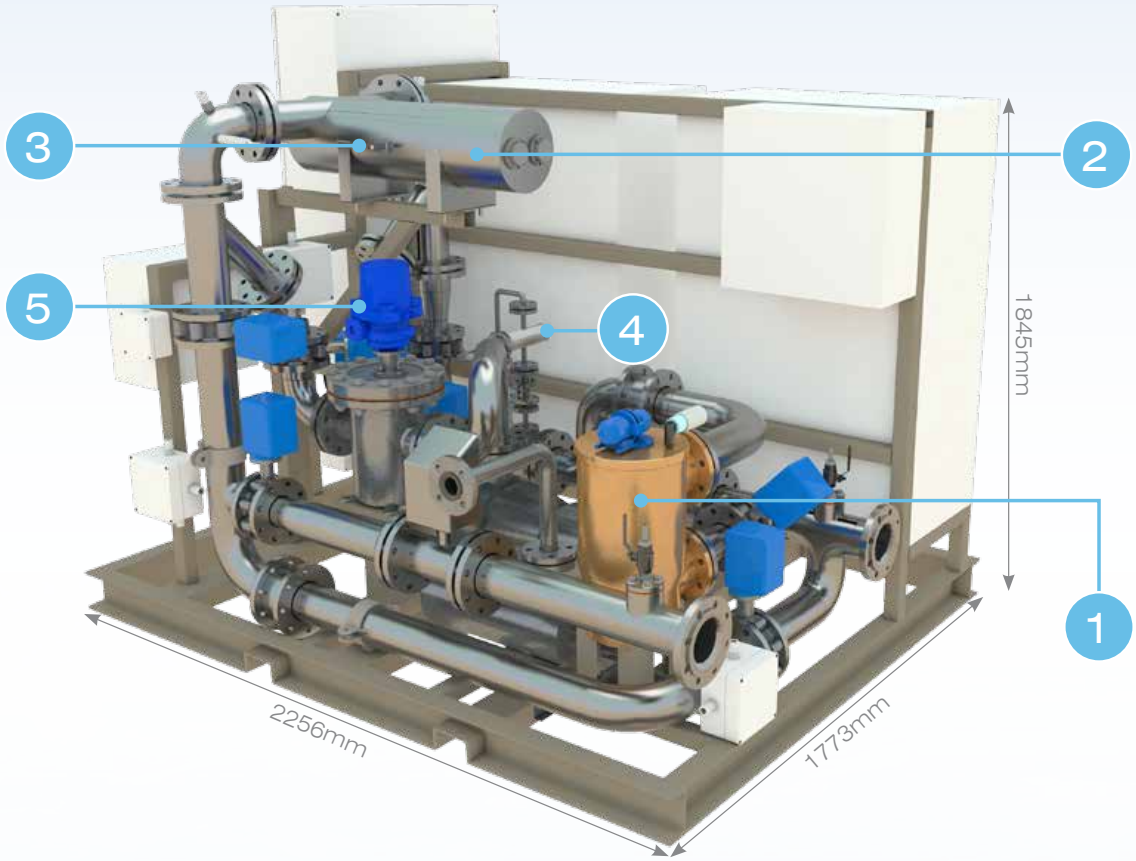
Controls back flushing cycles within filter unit.

5 Mains switchboard

The mains switchboard has a single electrical feed and provides all of the consumable energy for the BWT unit. This simplifies installation and maintenance in comparison with systems which require multiple power lines.

Ballast water treatment systems for new builds

The Cathelco BWT system is based on a combination of filtration and UV technology. It has been specifically designed for luxury yachts with a very compact filter, shorter UV chamber and very small overall footprint. Its capacity has been tailored to the needs of yachts and it is ideally suited to treat flow rates in the range of 30-80 cubic metres per hour.



1 Filter unit

The Filtrex ACB filter has been specifically selected for its very compact size - less than half the size of filters used on commercial vessels. It has a filter mesh size of 40 microns and incorporates automatic back flushing.

2 UV chambers

These are designed as twin chambers with two lamps. The manifolds make the ballast water flow in a helix, maximising the surface area which is exposed to UV irradiation. The chamber is 832mm in length making it one of the smallest on the market.

3 UV intensity meters

UV intensity meters are mounted on the edge of the UV chambers and measure the amount of light received during irradiation. If the amount of UV light falls below a prescribed level the automation control unit indicates that a cleaning cycle is required or that lamp renewal is necessary.

4 UVT sensor

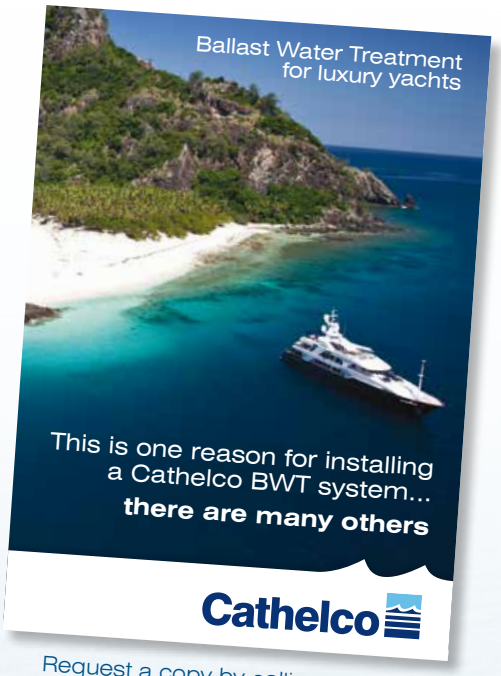
The UVT sensor measures UV light transmittance through a sea water sample taken before it reaches the chamber. The sensor operates in conjunction with UV intensity meters in a feed-back loop ensuring that the correct dosage is being achieved.

5 C.I.P ball cleaning system

Specialised foam balls gently polish the quartz sleeves (surrounding the UV lamps) to remove residue. They also clean the interior of the chamber increasing reflectiveness and mitigating corrosion.

Request or download these brochures for more information

Request a copy by calling us or download from www.hemwater.com



Request a copy by calling us or download from www.cathelco.com

Worldwide Service Network

Our worldwide network of sales and service centres can provide immediate advice and assistance on the complete range of Cathelco HEM products. Agent's contact details are available on our websites: **www.cathelco.com** and **www.hemwater.com**

Corrosion consultancy for yachts

Cathelco have wide experience of investigating corrosion problems on luxury yachts. Surveys can focus on any of the following areas:-

- Pipework systems
- Hull corrosion – steel and aluminium
- Corrosion related to exhaust systems
- Corrosion related to paint coating flaws

Using their expertise, Cathelco's corrosion engineers will seek to establish the cause of the problem by looking at material selection and a variety of other factors which may have contributed to corrosion. Where appropriate they will recommend solutions which may involve the provision of additional anodes or other types of remedial action.

Cathelco HEM References

Abeking & Rasmussen	Devonport Yachts	Oceanco
Alloy Yachts	De Vries	Overmarine
Alblasserdam Y.B.	Ferretti	Pendennis
Alstom Marine	Hakvoort	Perini
Amels Holland	HDW	Proteksan
Astilleros Tarrob	Heesen	Royal Huisman
Azimut	Holland Jachtbouw	Royal Van Lent
Barcos Deportivos	Jongert	SE-RI-GI
Benetti	Kingship Marine	South Wind Shipyards
Bloemsma & Van Breemen	Kusch Yacht Agentur GmbH	Sunseeker
Blohm & Voss	Lurssen Yachts	Trinity Yachts
Christensen Shipyards	Moonen	Thyssen Krupp
Danish Yachts	Nautor Swan	Vitters
Delta Marine	Oceanfast	

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