



HEM

Leading the way in water treatment



A member of
Cathelco 



Cathelco HEM – Europe’s premier manufacturer of water treatment systems

Combined expertise for product excellence

Cathelco HEM brings together two of the best known names in water treatment systems for superyachts to provide customers with a single source for an unparalleled range of products.



Over a period of 50 years, Cathelco have developed a product portfolio encompassing marine growth prevention systems (MGPS) for seawater pipework, ICCP hull corrosion protection systems and, more recently, a ballast water system specifically designed for luxury yachts. The acquisition of Hydro Electrique Marine (HEM) in 2015, therefore, provided a natural extension to the product range.

HEM have built a strong reputation in the superyacht industry where their name is associated with the supply of desalinators and water treatment systems for many of the most prestigious craft in the world.

Based in Antibes, HEM began producing reverse osmosis desalinators in 1987. Rapidly, establishing a reputation for quality, reliability and customer service, the desalinator range was expanded from 1.5 tonnes to 150 tonnes per day. Beginning in 1995, the company introduced a number of fresh water treatment systems including filtration, sterilisation and water softeners.

Through their combined expertise and resources, Cathelco HEM are now Europe’s premier manufacturer of water treatment systems, able to design and supply an integrated package of products based on quality and cost effectiveness.



Cathelco HEM – the single source solution to water treatment systems on superyachts.



HEM Series 20 Desalinators

Capacities: 1,900 to 4,800 litres/day

The HEM Series 20 system is designed for small yachts where space is very limited. The system is available as a monobloc unit enclosed in an aluminium frame. This is compact without being inaccessible for routine service, and allows for fast, simple installation.

It can also be supplied in modular form, as seven smaller modules with a completely preplumbed and electrically preconnected main panel for flexible installation.

To reduce the space requirements a small HP pump has been chosen which runs at 1450 rpm and is directly coupled to a 4 pole motor.

- Available in frame or modular form.
- 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.



Model	Weight (kg)	Litres/day	Litres/hour
HEM 20/500	60	1900	82
HEM 20/900	66	3400	140
HEM 20/1300	72	4800	200

HEM Series 25 Desalinators

Capacities: 3,400 to 6,000 litres/day

The HEM Series 25 system is designed for medium sized yachts where a heavy duty unit is required, but one which is compact. Over the years, these units have supplied millions of tons of water for yachts all over the world.

The system is available in modular or frame configurations to suit the available space.

The slow running HP pump (700 rpm) is driven by a large 2.2 kW motor, making the system larger and heavier than the lightweight 20 Series.

- Available in frame or modular form.
- 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.
- Optional extras: prefilter system, sandfilter, semi-automatic flushing, UV steriliser.



Model	Weight (kg)	Litres/day	Litres/hour
HEM 25/900	110	3400	140
HEM 25/1300	115	4800	200
HEM 25/1600	120	6000	250

HEM Series 30 desalinators

Capacities: 9,000 to 15,000 litres/day

This system was designed to fit the gap between the Series 25 and 40 units, where a higher production than the series 25 is required, but space for the Series 40 is not available.

The HEM Series 30 uses the 4 inch membrane which gives flows of 375/540/625 litres/hour for the three different models. The framed unit is very compact, whilst still providing unusually good access to all system parts for servicing.

The modular unit does not take up much more space than the Series 25, but gives up to three times the output. A sand filter is strongly recommended if space is available, as the system has a high feedwater flow.

The Series 30 can only be used with a 3 phase power supply.

- Available in frame or modular form.
- 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.
- Optional extras: prefilter system, sandfilter, semi-automatic flushing, UV steriliser.



Model	Weight (kg)	Litres/day	Litres/hour
HEM 30F/2400	205	9000	375
HEM 30F/3400	220	13000	540
HEM 30F/4000	235	15000	625

HEM Series 30 Duplex desalinators

Capacities: 2 x 9,000 to 2 x 15,000 litres/day

The HEM 30 Duplex system is designed to combine two complete RO systems including the sand filters, rehardening filters and membrane cleaning system in one single frame.

Capacities range from 2 x 9 m³/day, 2 x 13 m³/day and 2 x 15m³/day, according to whether the unit has two, three or four membranes.

The compact system is ideal for newbuilds where it will considerably lower the installation cost as the yard will only have to connect the pipes and power supply.

- Available in frame or modular form.
- 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.
- Optional extras: 4-20 mA outputs for remote monitoring, semi-automatic flushing.



Model	Weight (kg)	Litres/day	Litres/hour
HEM 30F/2400	750	9000	375
HEM 30F/3200	770	13000	540
HEM 30F/4000	790	15000	625

HEM Series 38 Duplex desalinators

Capacities: 2 x 21,000 litres/day

The HEM series 38 Duplex desalination system 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.

The Duplex unit consists of two identical and independent R.O. units mounted on a common frame. All the necessary prefiltration and post-treatment equipment is incorporated on the same frame.

- Epoxy coated stainless steel frames, mounted on stainless steel 'silent' blocks.
- Rotary high pressure pumps made from stainless steel and water lubricated. Low maintenance – only need to be serviced after 8,000 hours.
- Automatic pressure build-up and slow pressure drop during the start and stop sequences, enables the desalinator to be controlled remotely.
- The product water output can be automatically controlled according to the salinity of the feedwater to avoid damaging the membranes, for example, when navigating past a river mouth.
- All of the main control components including LP & HP switches, 3 way product diverter valves, salinity sensors and flow sensors are easily accessible from the front of the unit for easy maintenance and repair purposes.
- Only two 8 inch membranes are used per machine, giving a total output of 2 x 21,000 litres/day. This simplifies changing membranes since there are only half the number of pressure vessels in comparison with systems using 4 inch vessels.
- The complete front panel can flip forward on two support brackets giving easy access to the membranes, if access from the sides is a problem.



HEM Series 60 Duplex

Capacities: 2 x 30 m³/day



Moving up in capacity, the HEM Series 60 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.

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 Series 80 Duplex

Capacities: 2 x 30 to 50 m³/day



With standard capacities of 2 x 30 to 50 m³/day from seawater, the HEM Series 80 is suitable for very large yachts, commercial ships and cruise vessels in frame/skid mounted versions.

Where the system is used for land based water supply, it is often installed in a refurbished 20 or 40ft container which enables the unit to be safely transported and housed on site.

Several variations of 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.

- Digital feed water/ product water flow meters.
- Stainless steel glycerine filled pressure gauges monitoring all prefiltration stages, HP in/out membranes, product pressure, etc.
- Automatic pressure build-up and slow pressure drop during start and stop sequences.
- Connections for automatic start/stop from remote location or from level switches in storage tank.
- Indication light on control panel of 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.
- Feedwater thermometer operating hour meter.
- Incorporated cleaning/storage system.
- Optional extras: anti-scalant dosing system, pretreatment adapted to feedwater conditions.



Model	m ³ /day	Litres/hour
HEM 80/30	2 x 30	2 x 1250
HEM 80/40	2 x 40	2 x 1670
HEM 80/50	2 x 50	2 x 2090

HEM Series 80 Simplex

Capacities: 1 x 60-100 m³/day



With standard capacities of 60 to 100 m³/day from seawater, the HEM Series 80 is suitable for very large yachts, commercial ships and cruise vessels in frame/skid mounted versions.

Model	m ³ /day	Litres/hour
HEM 80/60	60	2500
HEM 80/80	80	3340
HEM 80/100	100	4180



HEM Pure R.O. 30/60

Capacity: 25-36 m³/day (17-25 ltr min) at maximum salinity of 25 ppm TDS

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 hull washdown, since the demineralised water leaves no streaks or traces.

HEM PURO 30/60	Softened shore water as feed	R.O. water as feed
Feed water flow to membranes	30-37 lpm	28-35 lpm
Permeate flow	17-23 lpm	18-25 lpm
Recovery rate	60 – 65%	75 – 80%
Operating range	5-35 deg C	
Feedwater pressure	2 – 4 bar	
Operating pressure range	16 – 17 bar (feed water dependent)	
Permeate nominal quality	10 ppm TDS	
Permeate max TDS	50 ppm TDS	
HP pump motor	Shaft power: 3Kw 400V - 50 Hz – 3 phases 6.6A	
Feed water	Supplied by ship's hydrophore system	



Custom made Pure R.O units

HEM also designs and manufactures smaller custom units, producing around 2 lpm, for specific applications, for example helicopter turbine washdowns. These can be fitted with small integrated hydrophore systems and/or technical water tanks.

Where space is an issue, very small modular units with a frame size of 440mm (w) x 260mm (d) x 480mm (h) can be designed, with membranes remotely mounted.

Please contact HEM to discuss your specific requirements.

HEM Water Softeners

Types K50 & K60

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 prevents the production of mineral-hungry water which can be detrimental to health and equipment.

The HEM K50 and K60 have in-built water meters which enable them to operate 'on demand' based on actual water usage. Therefore, the regeneration cycle takes place automatically, as and when required, without interruption or inconvenience.

The twin tank design of the water softeners means that when one tank needs to regenerate, service automatically switches to the other tank, ensuring a continuous 24 hour supply. The water softeners are hydraulically powered, not electrically. Consequently, there is no wiring to connect, buttons to push or timers to set – it runs itself.

- 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.



Type 9500/1350 Recirculation/High Flow

This new generation HEM 'Recirculation' Softener allows you to fill your fresh water tank at any flow rate, without having to worry about your water softener capacity. Until recently, the standard procedure has been to fit the softener in the bunker line.

These softeners were able to handle a limited flow and were meant to 'trickle feed' the tanks over a whole day. With these limitations in mind, HEM has developed a system that measures the water volume that is actually on board via the bunker line and then treats this water once it is in the fresh water tank(s) through a recirculation period for each amount.

- Allows softening of fast bunker feeds.
- Operating capacity of 8.4 m³/h (2100 US gallons/h)
- Peak capacity of 11.2 m³/h (2800 US gallons/h)
- Duplex bottle design allows for regeneration without disruption of softening.

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.

Prefiltration (5 micron) is carried out within a stainless steel filter housing containing 7 x 20 inch filter cartridges.

There is also an active charcoal filter with an automatic programmable backwash valve. Regular backwashing ensures minimum back pressure and prevents the filter media from compacting.

Both filters are housed within a single frame. Depending upon the model, the pipework can be either PVC or 316 stainless steel 1.5" with flanged, straub or threaded interfaces for ease of connection to the shipyard's piping.

All internal piping, pressure gauges and valves are pre-installed and tested by HEM prior to delivery.



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, 5 micron pre-filtration and the active charcoal filter, are the same as those described above.

In addition, there is a silver ions steriliser, type SIS B40. This injects small quantities of silver ions into the freshwater tanks in controlled dosages, directly proportional to the volume of water entering the tanks. A silver level of 0.08 ppm will maintain the water in the tanks fresh and free from contamination.



Type FWS 8300 – 30 m³/h

Type FWS 10400 – 40 m³/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.

HEM hydrophore systems always consist of a minimum of two independent pumps, each with its dedicated variable frequency drive. Each pump is rated to be able to handle 70-80% of the peak demand at the design pressure. This means that the system will operate comfortably with only one pump running for most daily usage, the second pump being used as an assist pump in peak periods.



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

Redundant pump sets

In a duplex system (two independent pump sets), the normal operating mode consists of a master pump and slave pump. The master pump controls the delivery pressure by varying the pump speed continuously according to a pressure feedback signal. The slave pump can be programmed as a fixed-speed assist pump or as a speed controlled pump with a pressure setpoint lower than the master pump. The frequency controllers are programmed in such a way that each one can take over the master function should one controller fail.

Redundant pressure sensors

Each variable frequency drive has a dedicated redundant pressure transducer circuit and can individually control the system in case of emergencies.

- Minimal space requirements.
- Easy installation – two hydraulic couplings and one electrical connection.
- Inlet and outlet manifolds permit left or right connections.
- Hydraulic assembly and all wetted pump parts are made from 316 stainless steel.
- Reliable multi-stage pumps with corrosion resistant bearing sleeves.
- System supplied as stand-alone or modular form for ease of installation.



System	Hydro 227	Hydro 273	Hydro 285	Hydro 365	Hydro 385	Hydro 3168
Number of pumps	2	2	2	3	3	3
System nominal capacity	3.5m ³ /hr @ 7 bar	12m ³ /hr @ 3 bar	14m ³ /hr @ 7 bar	15m ³ /hr @ 5 bar	20m ³ /hr @ 5 bar	40m ³ /hr @ 8 bar
System Power	2.5kW	3.5kW	5.0kW	9.5kW	7.0kW	17kW

Additional water treatment products

Proportional chlorine dosing unit

Consisting of a dosing unit and a flow meter, the HEM chlorine dosing system is used to introduce Hadex into the yacht's water supply. Hadex is a safe and effective chlorine based product which disinfects tanks and pipelines. Completely automatic in operation, the dosing unit comes within a frame or in kit form where space is limited.

- Designed for dosing water with Hadex disinfectant.
- Completely automatic in operation.
- Available in frame or modular form.



Silver ion and copper steriliser Type SI/SCI

This steriliser produces a combination of silver and copper ions which are more effective than silver alone in the disinfection of potable water systems. The ions are produced as the result of electrolysis and fed into the fresh water system. The unit is completely automatic in operation to avoid the risk of over dosing.

- Sterilises water using silver and copper ions.
- Operates via water counter in freshwater pipe to vessel's tank.
- Water containing silver ions is injected into flow at prescribed intervals.
- Simple, safe and effective.

Silver ion steriliser Type SIS B40

Robustly made and economically priced, this silver ion steriliser has a number of features which make it easy to install and use.

- Very compact design with user friendly interface.
- Easy to change/replace electrode.
- Fully automatic proportional dosing.
- Alarm for system failure/low electrode.
- Fail safe valve prevents water entering system due to malfunction.



UV steriliser Type Ultra

Disinfection by means of ultraviolet is a well proven method of killing pathogens and micro-organisms without the use of chemicals. One of the advantages is that it does not impart any smell or taste to the drinking water. The steriliser unit is fitted between the fresh water tank and the water distribution system for the vessel.

- Effective method of killing pathogens and micro-organisms.
- Does not impart any smell or taste to the water.
- Does not involve the use of chemicals.
- Requires minimal attention and maintenance.

HEM ozone generator

Ozone is a powerful oxidation agent used for the purification of air in ventilation systems, pump stations, garbage areas and large rooms with poor air quality. The ozone is produced from ambient air as oxygen passes the corona discharge electrode.

- Compact design for easy installation.
- Automatic in operation.
- Can be supplied with ozone sensors.



Cathelco HEM Hot Water Systems

At peak times, conventional hot water systems may struggle to meet the combined demands of multiple showers, galley and laundry requirements. Now Cathelco HEM have designed a system which 'regenerates' hot water more quickly, reduces limescale and is available as a flexible package which economises on space.

In ordinary hot water systems, the heating elements are in direct contact with the water passing through the system which limits the volume of water which can be heated over a short period of time. Therefore, more cylinders are required to store a higher volume of water in order to meet peak demands.

The solution developed by Cathelco HEM is to have a cylinder which heats the water 'indirectly' using a tank within a tank. In this way, the inner tank is completely surrounded by a jacket of hot water which raises the temperature of the cold feed very quickly.

The advantage of this heat exchanger system is that the cylinders can be much smaller, whilst producing large volumes of hot water on a continuous basis. As an example, a 263 litre cylinder will continuously deliver over 1,000 litres of hot water per hour.

As a flexible package, the hot water system can be scaled to the requirements of larger yachts by using additional boilers and cylinders in tandem.

Ideally suited to retrofit applications because of relatively small component sizes, the system includes controls, valves and expansion tanks, coupled with all the necessary safety devices for an unvented hot water solution.

Major features

- Skid mounted 'plug and play' or modular design for flexible installation.
- Easily installed during newbuild or retrofit.
- Vertical and horizontal cylinder options.
- Multiple capacity and power rating options.
- Longer life through design and material selection.
- Can be used in conjunction with heat recovery systems.



Modular Units

To make the best use of space in the engine room, the system can be supplied in modular form enabling boilers, cylinders and ancillary equipment to be distributed in available areas. All of the components including the cylinders are designed to pass through standard hatchways to simplify access.



Skid mounted units

For newbuilds and installation on very large superyachts, the system can be supplied on a stainless steel skid with flange connections, significantly reducing the time and labour involved in fitting the system.



Standard scope of supply

- Hot water cylinder, boiler, primary filling loop and inhibitor.
- Expansion tank.
- Unvented kit (stop valve, pressure reducing valve, non-return valve, temperature/pressure reducing valve, temperature/pressure gauges, vented tundish)
- Balancing flow meters.
- Recirculation pump sets.
- Mixing valves.
- All internal plumbing connections.
- Installation/Operation/Maintenance manuals.
- Stainless steel skid with flange connections (or modular)
- Consumer electric junction box.

Safety features

- Combined temperature and pressure relief valves.
- Vented tundish/sight glass.
- Press regulator valve.
- Pipework design, gradually expanding.
- Primary flow: expansion tank, pressure safety valve, water pressure switch, high limit pressure reset switch, circulation pump.
- CE approved equipment to latest regulations.

Capacities and performance

1st hour production and per hour afterwards (litres)

Power Consumption/ Cylinder Configuration	9kW	15kW	22kW	28kW	36kW
1 boiler + 1 x 320 ltr	513 (194)	615 (301)	778 (473)	901 (602)	1064 (774)
2 boiler + 2 x 320 ltr	1026 (388)	1230 (602)	1556 (946)	1802 (1204)	2128 (1548)
3 boiler + 3 x 320 ltr	1539 (582)	1845 (903)	2334 (141)	2703 (1806)	3192 (2322)
1 boiler + 1 x 600 ltr	740 (194)	842 (301)	1006 (473)	1128 (602)	1292 (774)
2 boiler + 2 x 600 ltr	1480 (388)	1684 (602)	2012 (946)	2256 (1204)	2684 (1548)

Based on design criteria: Primary temp 80 degrees C, cold water feed temp 20 degrees C, hot water temp 70 degrees C.

Cathelco

Marine growth prevention
for seawater pipework



Eliminates blockages in seawater pipework caused by the growth of barnacles and mussels. Copper and aluminium anodes installed in seachests or strainers are wired to a control panel. Does not interfere with reverse osmosis systems.

ICCP hull corrosion protection systems



Reliable corrosion protection for steel and aluminium hulls. Uses small hull mounted anodes and reference electrodes connected to a control panel for careful monitoring and optimum protection. Anode life 15 years – considerably longer than sacrificial anodes.

Ballast water treatment



Specifically designed for superyachts with capacities from 34m³/h to 1,200m³/h with IMO and AMS approval. Combines filtration and UV technology to kill micro-organisms and pathogens. Available skid mounted or in modular form for retrofit applications.

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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