

# HEM Hydrophore System

HEM have built a reputation for the effectiveness and reliability of their desalinators and water treatment systems over a period of several decades. Their simple, rugged designs enable users to stay operational under emergency conditions, whilst the components used ensure worldwide spares availability.

## Design Philosophy

HEM's range of hydrophore systems continue this legacy and incorporate state-of-the-art variable frequency drives to provide responsive and smooth water pressure regulation. This avoids any water hammer effects and greatly reduces the size of pressure reservoirs.

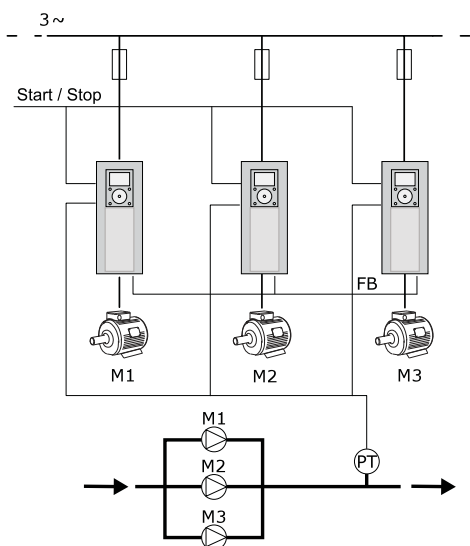
The design philosophy of the HEM Hydrophore Systems focuses on the criteria of robust specifications, operational redundancy, ease of installation and ease of operation.

## Robust Specifications

HEM Hydrophore systems consist of one, two or three independent pumps, each with its dedicated variable frequency drive and pressure transmitter. Multi-pump systems are rated to handle 60-70% of the peak demand at the design pressure with one pump out of operation. An automatic pump rotation scheme ensures even usage of all pumps, ensuring long system life.

The hydraulic assembly and all wetted pump parts are entirely made of 316 stainless steel. Reliable multi-stage pumps with corrosion-resistant bearing sleeves are standard supply. When the pumps are installed in situations where high suction heights have to be overcome, liquid-ring pumps are used.

The variable frequency drives are specifically designed for water pumping applications.



## Operational Redundancy

HEM Hydrophore systems are designed with several levels of redundancy to ensure continued operation even if several components fail.

Each pump in the system has its own dedicated variable frequency drive and its own pressure sensor so that it can operate independently should any or all of the other pumps in the system stop operating. All Frequency Drives are programmed in such a way that each one can take over the controlling function should one or more controllers fail. This means that there is no central point of failure and the system is completely automatic with no intervention in case of pump/VFD failure.

In normal operation the controlling pump regulates its speed to maintain the system pressure. If it cannot cope with the demand, it keeps running at maximum speed and automatically starts the next pump, which now becomes the controlling pump, which in turn starts the next available pump if the demand is still not met. The reverse happens when the demand falls.

Lastly, in the unlikely event of all frequency controllers failing, a pump can be operated by bypassing its associated frequency controller and operating in an emergency mode using the mechanical pressure gauge provided.

The integrated firmware in each VFD provides additional functions for pump protection, such as no-flow detection, low-speed detection and dry-pump condition.

## Ease of installation

HEM Hydrophore Systems are designed with the space constraints of yachts in mind. System components have been selected for their compactness and the design is modular so that customisation to available space is simple. Inlet and Outlet manifold design permits left or right-side connections. A small priming pump is incorporated in the skid to facilitate priming of pumps at first start-up or whenever priming has been lost.

The systems can be supplied as stand-alone units or in knocked-down version for ease and versatility of installation.

## Ease of operation

The ergonomic displays on each VFD together with the simple menu and navigation systems make commissioning very easy. Monitoring the operational status of the equipment is simplified by large-size displays showing pump frequency and system pressure, plus other parameters. The Operator Display contains a flash-memory to store system parameters. Combined with its quick-release mechanism, this permits the easy uploading and downloading of controller parameters between each VFD.

The systems are designed for “switch on and forget” operation. After initial commissioning and system tuning to distribution system specifics, no adjustments or maintenance are required, apart from occasional checks for hydraulic leaks, pump seals and bearings.

## Wide range of systems

The following table shows some of HEM’s standard configurations, one of which should suit your particular application. HEM, will, however, custom-design any system to meet your specifications.



Model	System Capacity	No of Pumps	Approximate Skid Dimensions WxDxH (mm)
HYDRO2-MXVL25/206-I	2 x 3.5 m <sup>3</sup> /hr @ 4 bar	2	600x700x800
	2 x 2.6 m <sup>3</sup> /hr @ 5 bar		
	2 x 1.5 m <sup>3</sup> /hr @ 6 bar		
HYDRO2-MXVL32/406-I	2 x 6.1 m <sup>3</sup> /hr @ 4 bar	2	600x700x800
	2 x 4.8 m <sup>3</sup> /hr @ 5 bar		
	2 x 3.0 m <sup>3</sup> /hr @ 6 bar		
HYDRO2-MXH/803-I	2 x 11.0 m <sup>3</sup> /hr @ 2 bar	2	700x700x800
	2 x 6.2 m <sup>3</sup> /hr @ 3 bar		
HYDRO3-MXVL40/806-V	3 x 11.5 m <sup>3</sup> /hr @ 4 bar	3	910x1110x1850
	3 x 10.0 m <sup>3</sup> /hr @ 5 bar		
	3 x 8.0 m <sup>3</sup> /hr @ 6 bar		
HYDRO3-MXVL50/1606-V	3 x 21 m <sup>3</sup> /hr @ 6 bar	3	1070x1800x1240
	3 x 19 m <sup>3</sup> /hr @ 7 bar		
	3 x 16 m <sup>3</sup> /hr @ 8 bar		

