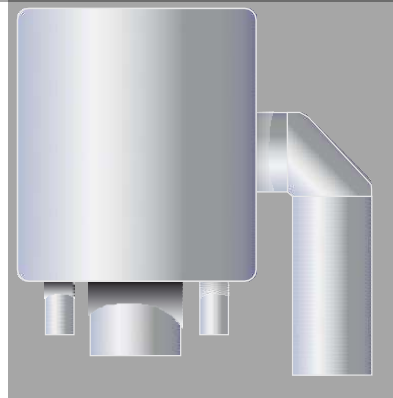
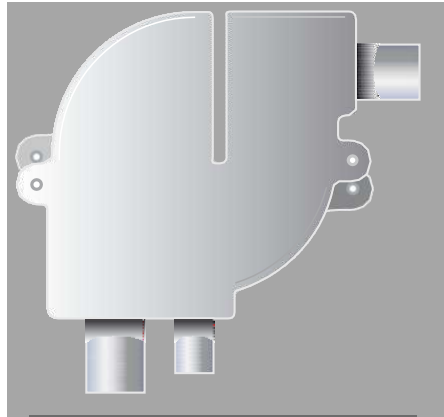




The Science of Silence

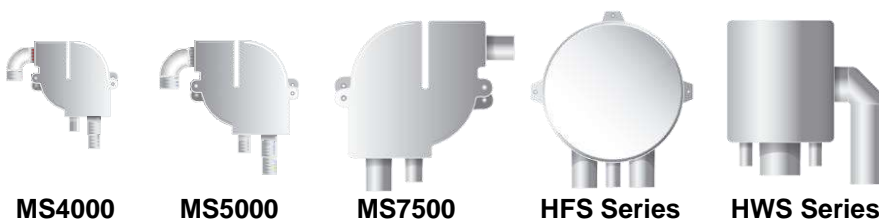


Water Separators Installation & Operating Instructions

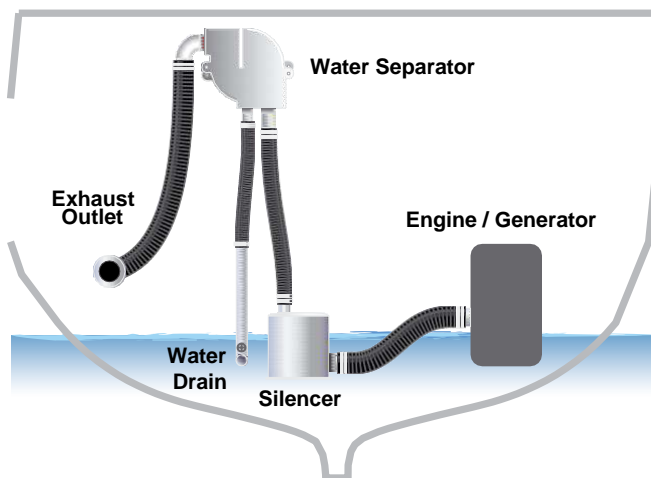
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Water Separators

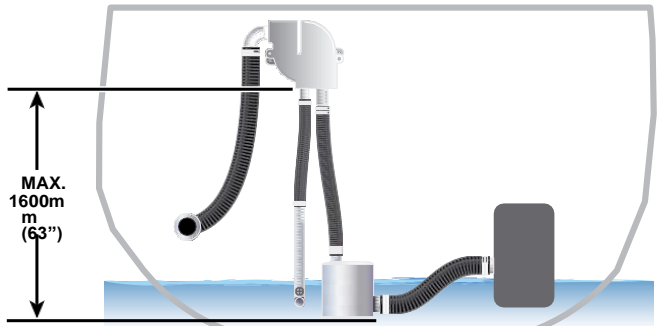
Correct installation is vital to safety and to avoid back-flooding water into the engine or generator. The following information will help achieve correct installation and ensure a long life for the product. Please seek our help and advice if you have any doubts or questions. The installation of a marine exhaust system should be undertaken only by persons experienced in the task.



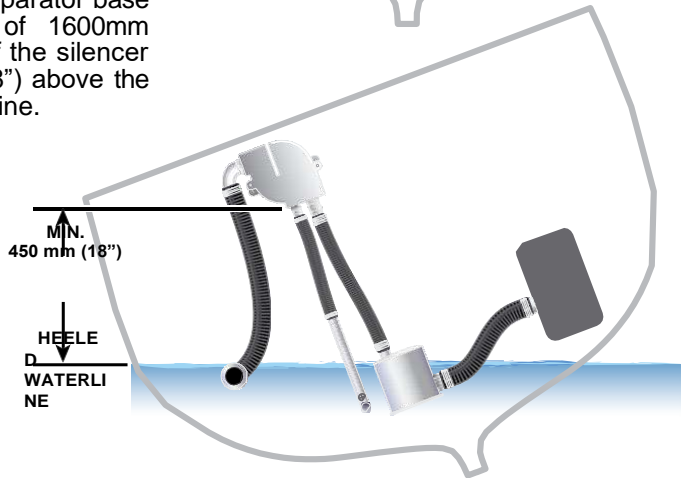
General Arrangement



This general arrangement shows exhaust gases and water entering the water trap silencer, which is at a lower level than the exhaust outlet on the engine (see silencer fitting instructions for further details), and then rising to the Water Separator. The separator needs to be positioned above the lift silencer and there must be a vertical rise of at least 450mm (18") between the two. It is better to position the water separator vertically above the lift silencer, but it will perform satisfactorily if it is within 500mm of the vertical position provided there is a rise of 450mm. There must be no sharp bends on the hose from the lift silencer to the separator. The separator must also be positioned 450mm above the fully loaded, heeled waterline of the vessel.



As a general rule the separator base must be a maximum of 1600mm (63") above the base of the silencer and at least 450mm (18") above the maximum heeled waterline.



Maximum Water Flow Rates and Exhaust Sizes

Halyard separators are designed to be used with the following cooling water flow rates:

| Separator Model | Drain Size | Max. Cooling Water Flow Rate |
|-----------------|------------|------------------------------|
| MS4000 | 38mm | 18 litres per minute |
| MS5000 | 38mm | 42 litres per minute |
| MS7500 | 50mm | 60 litres per minute |
| HFS | 50mm | 65 litres per minute |
| HWS | 2 x 50mm | 225 litres per minute |

Raw water flow rates are the maximum at which efficient separation will take place. These will vary with exhaust gas flow and are not fixed numbers. It may be possible to exceed these flow rates with a slight reduction in the volume of water separated. Please check at technical@halyard.eu.com or +44 (0)1722 710922 for details.

Hose Connections

Inlets and outlets on water separators are provided as follows:

MS4000 Series

- Inlet and outlet provided at 40mm

MS5000 Series

- Cut inlet to suit hose diameter. 5000 series is available with 45mm, 50mm, 60mm and 63.5mm. Outlet is 50mm in all cases

MS7000 Series

- Inlet and outlet provided for 75mm hose

Hose Types and Clamps

The separator must only be used with marine diesel exhaust hose, preferably with Lloyds Type Approval mark. The hose must be double clamped using high torque exhaust hose clamps, as conventional hose clamps may not have sufficient to compress reinforced marine grade exhaust hose. Clamps should be tightened with care remembering that there is a danger of crushing the plastic spigot inside the hose.

**Halyard manufacture
an extensive range
of hoses**

**Specifications and prices available from
technical@halyard.eu.com or +44 (0)1722
710922**



Flow

The MS4000, MS5000 and MS7500 MUST have gas flow in through the large spigot on the bottom, and flow out through the spigot higher up at the side. To change from the left hand outlet to right hand outlet, simply mount the unit the other way around. Water drains from the 38mm spigot underneath on the MS4000 and MS5000 models (50mm o.d. water drain on the MS7500).

The HFS Series inlet and outlet are reversible. Either of the large tubes can be used for gas flow in or gas flow out. The centre outlet, normally 63.5mm, provides the drain.

The HWS Series must be installed with the angled side connection as the gas inlet and the large bottom spigot as the gas outlet shown here. Two drains of 50mm are normally provided in the position shown. (Depending on version).



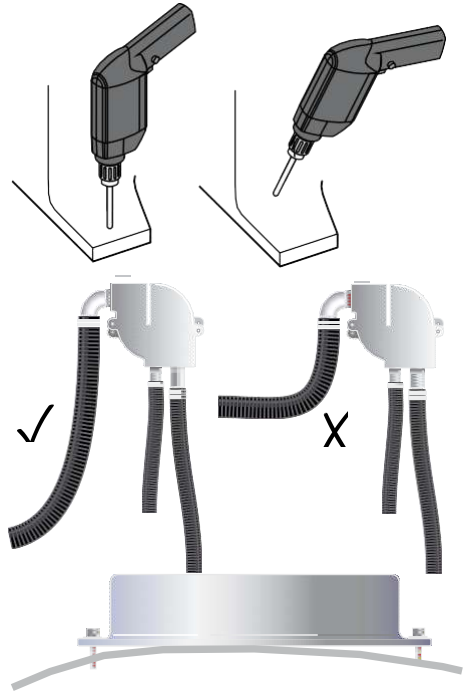
Any separators not using the part numbers starting MS, HFS or HWS may have purpose built layouts. Please check at technical@halyard.eu.com or +44 (0)1722 710922 for details.

Please note that due to the nature of water-cooled exhaust systems; under certain atmospheric and load conditions it is possible that some visible steaming may occur.

Attachment

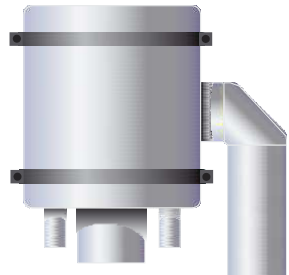
MS4000, MS5000 and MS7500 have mounting tabs allowing them to be mounted facing either right or left. Screws suitable for the type of surface should be used.

HFS Series have a circular flange for the attachment holes, which **MUST NOT** be drilled through the laminate overlay which attached the body to the back plate. Screws suitable for the type of surface should be used, with penny washers to spread the load on the GRP surface. The unit must not be positioned in such a way that the inlet and outlet spigots are strained by hose bent through angles. In this situation fabricated bends must be used and the hose must be bracketed directly to the bulkhead, removing strain from the separator spigots.



All units must be secured to a perfectly flat surface. Any unevenness on the surface will lead to the mounting tabs being strained, potentially causing damage and fracturing the unit.

HWS Series is designed to be supported on a frame or with strapping around the body.



Gas Exit

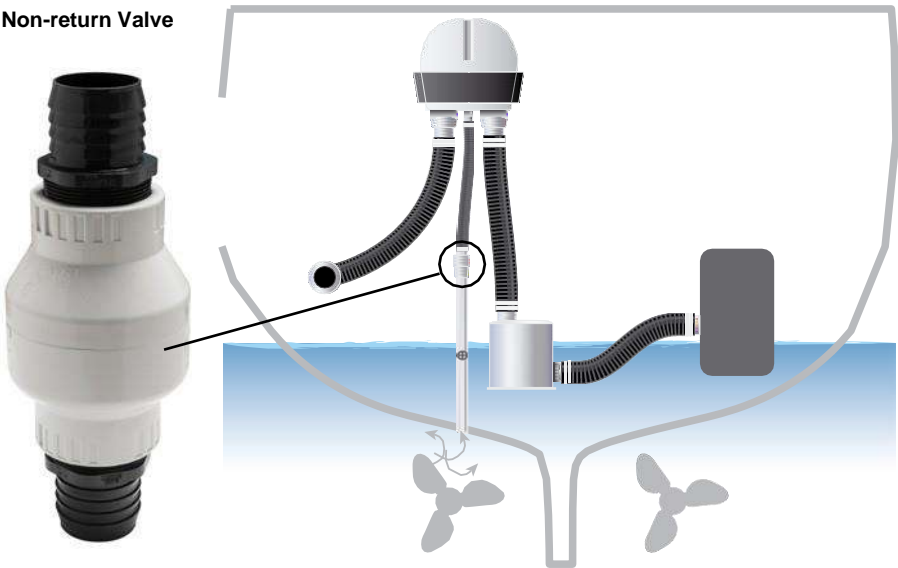
The gas exit hose should be run off aft from the separator unit to the exit at least 50mm above the heeled waterline. The hose can run up and down but must never run at a higher level than the base of the separator. It must exit the hull at the lower level than the base of the water separator with an average downwards gradient of at least 1 in 10.

The water drain hose must be connected to the 38mm spigot on the MS4000 and MS5000 models. 50mm drain hose is used on the MS7500. The HFS and HWS units are provided with varying drain diameters. The drain hose must be connected to a sea-cock and must be taken through a hull skin fitting not less than 100mm below the waterline. The following **Warning** is vital.

⚠ WARNING

The exit must be positioned in a place where the sea-water will not be forced up the pipe by the motion of the craft moving through the water or by the turbulent water adjacent to a propeller or engine exhaust outlet. You are at particular risk if you position the outlet above or aft of the propeller or engine pod drive such as the Volvo IPS unit, or aft of an underwater outlet for the main engine exhaust. All cause serious turbulence which may force water back up the exhaust. If there is any risk of this, a non-return valve above the fully loaded, heeled waterline of the vessel must be used (contact Halyard for details).

Non-return Valve



Care and Maintenance

The separator needs no maintenance beyond an occasional wipe with a soapy cloth. Solvents must not be used. There are no parts requiring service within any of the separators covered by these instructions.

Halyard Specialist Silencers – Non-standard installations

Halyard manufactures a whole range of specialist silencers and separators as well as a range of noise control materials, flexible couplings and engine mounts. The separator range is designed for use in straightforward generator and propulsion engine installations with exhaust systems up to 150mm diameter.



Pleasure Craft

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Superyacht

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The Science of Silence

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