

GE
Energy

AltairVega™

Filtration System



Marine Protection

Introduction

The AltairVega™ filtration system has been protecting marine gas turbines around the world for nearly 40 years. The three-stage system delivers high levels of performance against sea spray, salt aerosols, particulate and 'green seas'.

Flexible filtration

The AltairVega system uses the well proven vane/coalescer/vane approach to deliver superior levels of protection to marine turbines. The system's low inlet pressure loss ensures optimum turbine efficiency, and with exceptional small-droplet removal capability, excellent water-handling capacity. A wide range of filter/coalescer options enables the system to be 'tuned' to suit specific environments and operating conditions.

Designed for the marine environment

Airborne salt can cause serious blade damage and in extreme cases can lead to turbine failure. GE Energy's unique SRS Technology™ removes both wet and dry salt particulate from the system and helps prolong turbine life.



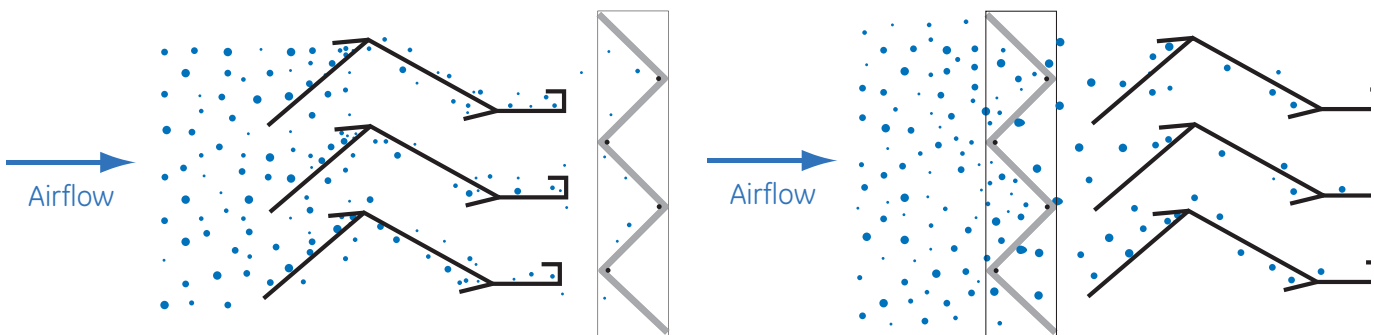
The system is constructed using corrosion-resistant stainless steel or aluminum alloy, and has been successfully shock-tested against a number of national military standards.

Diesel Engine Inlets and HVAC applications

In addition to the three-stage gas turbine system, the AltairVega unit is available in single- and two-stage designs to suit other requirements.

The single-stage vane separator provides high performance bulk water removal from airstreams. The aerodynamically-optimized vane profile ensures extremely low pressure loss, and is ideal to provide protection for HVAC installations on marine vessels.

The two-stage system uses a vane separator and filter coalescer to remove both airborne water and sea spray from air inlets. This system gives high performance protection for applications such as diesel engine air inlets. There are two options:



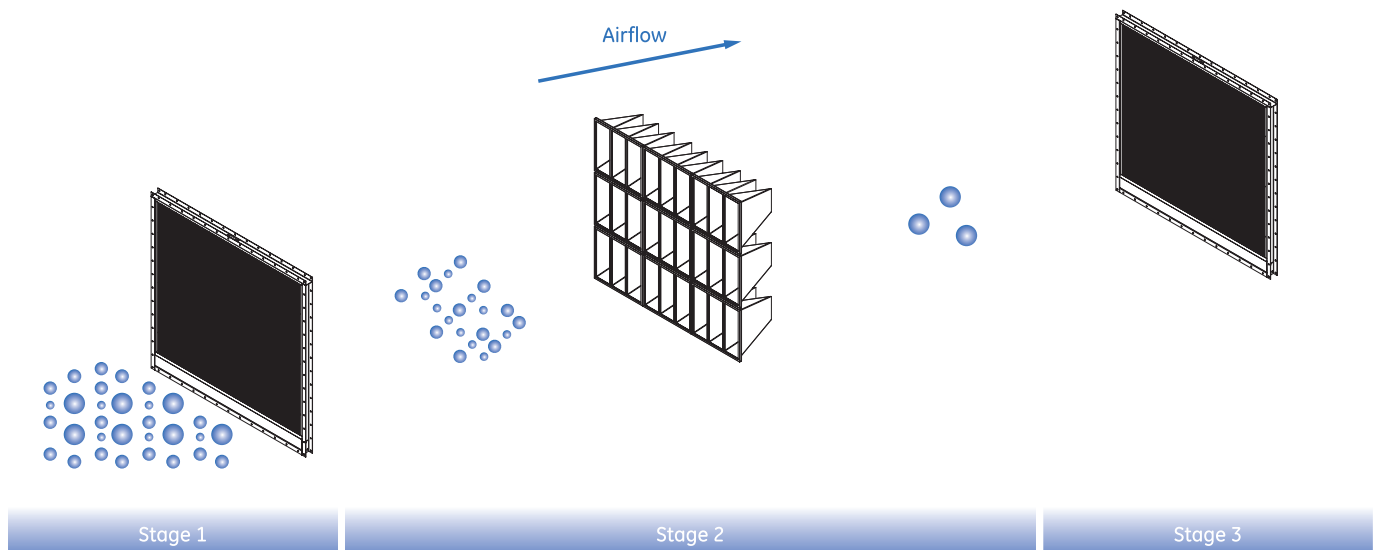
i) Vane separator/filter coalescer - In this configuration, bulk water and coarse droplets are removed by the separator and any fine droplets that pass through are coalesced by the filter and drain away under gravity. It is suitable for environments where there may be surges of bulk water. This option operates at velocities up to 880 FPM (4.5 m/s).

ii) Filter coalescer/vane separator - This design is suited to damp/humid environments. Fine mist coalesces on the filter and the resulting droplets are captured by the vane separator. Additional weather protection upstream of the filter/coalescers is recommended when using this option. This version is suited to velocities up to 1200 FPM (6 m/s).

Key Benefits

- Exceptional salt removal performance minimizes turbine corrosion
- Increased engine power due to low inlet pressure loss
- Robust construction and shock-resistant design tested to military standards
- Range of filter/coalescer options to match your specific application
- Reduced maintenance time and lower costs with long-life filter designs

SRS Technology™



The ingestion of airborne salt has long been proven to be a major contributing factor in both decreased turbine performance and reduced engine lifetime. The AltairVega system utilizes GE Energy's unique SRS Technology process to protect the turbine from damage. This process, which is the result of nearly 40 years' experience in marine and offshore filtration, removes both solid and liquid contaminants in all weather conditions and at all levels of humidity. Removing the particulate from the system substantially reduces the possibility of salt leaching or becoming re-entrained in the air stream.

SRS Technology is deceptively simple. Three key stages are employed:

Stage 1 is referred to as the 'bulk water removal' stage. The majority of the liquid (rain, sea spray, coarse aerosols)

entering the inlet is removed and drained away using a vane separator.

Stage 2 is the coalescence stage. Fine aerosols that have penetrated Stage 1 are coalesced to form larger droplets that can be easily removed by the third stage. Dust and other solid particulate is also removed. As all marine and offshore pre-filters and high efficiency filters in the range are optimized for coalescence as well as dust filtration, this dual function can be carried out without compromise.

Stage 3 is typically a vane separator or similar, which removes any concentrated saline solution that has passed through Stages 1 and 2. Not only is this entrained liquid captured, but it is removed from the inlet by a manometrically-sealed drainage system.

AltairVega Filter Elements

The AltairVega range of filter elements consists of two cleanable coalescer/filter elements (GT2 & HV850) and the disposable HV600 high efficiency bag filter/coalescer. All three elements offer superior coalescence performance and salt removal capabilities.



Filter Type	Product Name	Performance
High efficiency filter		HV600 Very high efficiency marine coalescer, this bag filter captures over 97% of particles of 1 micron and above while still providing excellent coalescence properties
		HV850 A bag/filter coalescer giving outstanding levels of dust-holding at velocities of up to 1700 FPM (8.5m/s); ideal for cruise ship applications
		GT2 Well-proven coalescer/filter panel that offers low pressure loss, good particulate efficiency, and the ability to reduce salt ingress to well below engine manufacturers' guidelines

Performance Data

	GT2	HV850	HV600
Nominal velocity	1200 FPM 6 m/s	1200 FPM 6 m/s	1000 FPM 5 m/s
System pressure loss at nominal velocity *	2.0 IN WG 50 mmH ₂ O	2.0 IN WG 50 mmH ₂ O	1.9 IN WG 47 mmH ₂ O
Gravimetric efficiency vs ASHRAE	80%	98%	99%
Salt output vs NGTE 30 knot aerosol ** (efficiency)	0.0007 ppm (99.98%)	0.0004 ppm (99.99%)	0.0011 ppm (99.97%)

NOTES

* System includes front and rear stage Marine Vane Separator (MVS)

** 3.6 ppm input

All data are shown for indication purposes and are subject to change without notice. Actual results may vary.

For more information on Altair systems contact your GE Energy sales representative at +44 (0) 1420 541 188 (UK) / +1 502 499 2151 (US), or visit us on the web at ge-energy.com/airquality.

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