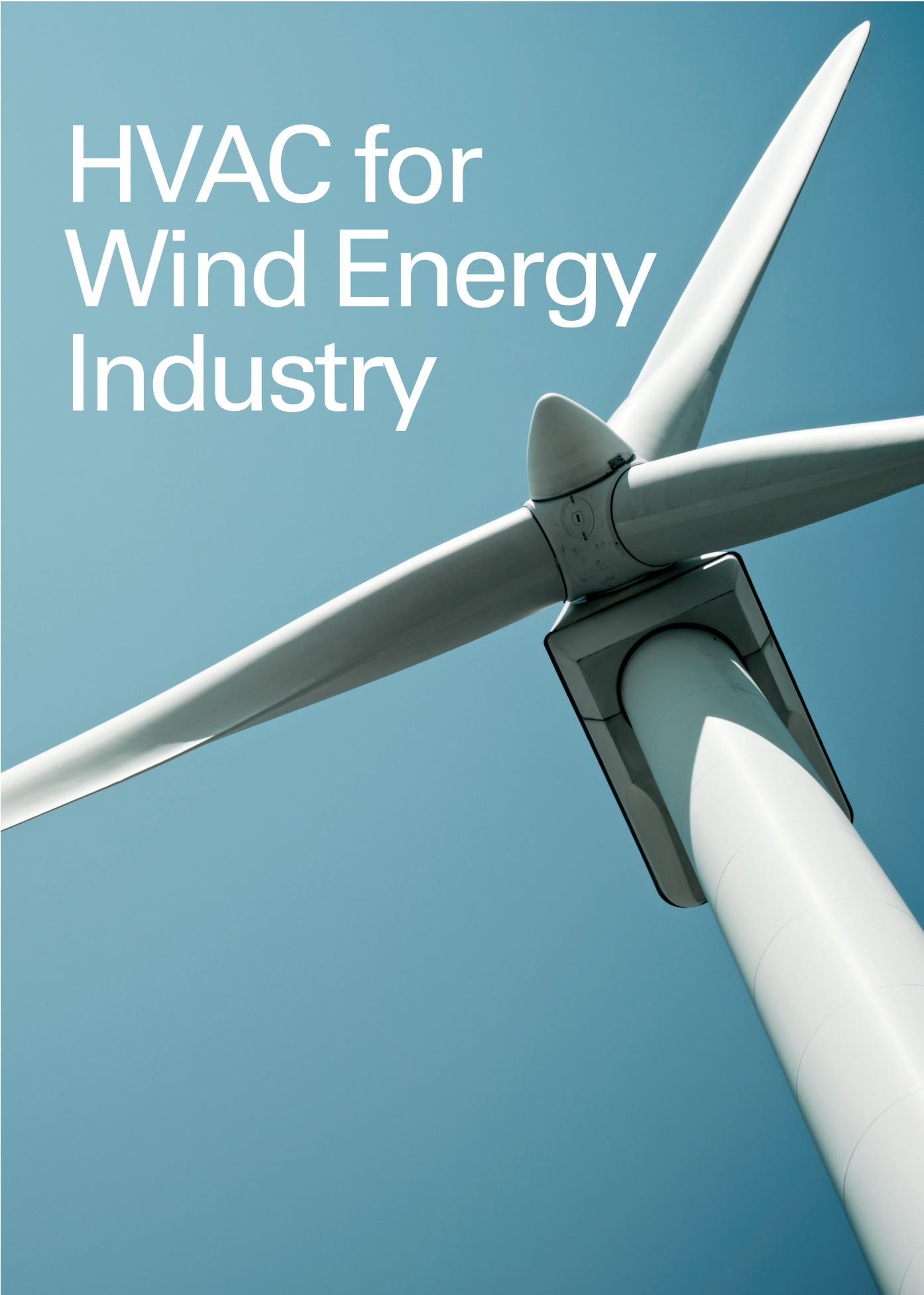


# HVAC for Wind Energy Industry





# At your service

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Halton Marine HVAC products  
for windturbines and offshore  
substations



## Products for demanding conditions

Energy is a necessity. It drives our lives, world and our economy. Halton Marine, one of the leading suppliers of marine HVAC, manufactures high-quality, sustainable and low-maintenance ventilation solutions for wind turbines and substations.

Designing and selecting equipment should always be done according to the operation environment. Halton Marine products are specifically designed for demanding conditions. In addition to multiple wind turbine, windfarm and substation projects, the company has delivered products for over 200 oil & gas projects, over 150 major cruise ships and over 100 naval vessels.

Type approvals from the major classification societies and worldwide references are a solid proof about the product quality. As a reliable manufacturer Halton Marine has also certifications like ISO 9001, ISO 14001, OHSAS 18001 and ATEX. Halton Marine is also qualified by FPAL and the Achilles Joint Qualification System, for suppliers to the Oil & Gas industry.

## Scope of supply

- Fire and gas dampers
- Non-return and pressure relief dampers
- Shut-off, balancing and gas dampers
- Grilles and diffusers
- Droplet separators
- Outdoor louvres

Windpower is one of the cleanest and most environmentally friendly energy sources in the world today. Using wind as an energy source offers many benefits for ecosystems and health, in addition to being an excellent option for reducing emissions rapidly and cost-effectively.

## References of wind energy projects utilizing Halton Marine products

- Baltic2
- Borwin2
- Borwin3
- Butendiek
- Dolphin Alpha
- Dolwin Beta
- Gemini
- Helwin Alpha
- Helwin Beta
- Sylwin Alpha
- Cpipec Binhai wind power plant
- Merkur
- Horns Rev 3
- Hunterston HVDC
- Gwent y Mor
- Borwin3
- Walney 3 and 4
- Race Bank 1



# Dampers for substations

Reliable and robust products for offshore installations

Halton Marine has supplied its dampers for more than 200 major oil & gas projects, over 150 major cruise ships and over 100 naval vessels worldwide.



## Fire dampers

Halton Marine fire dampers are MED certified and conform to leading classification societies worldwide. **The Halton FDB2** is most widely sold marine fire and gas damper in the world. The damper is typically installed to prevent the spread of fire, smoke and gas between fire zones.



Photo for illustration purposes courtesy of Statoil / Alan O'Neill

## Airflow dampers

Halton Marine shut-off and airflow control dampers are installed in the ventilation ducts where the dampers are used to control and balance the supply of fresh air. When necessary, dampers can be used to shut-off the ventilation ducts (possible emergency situation).

As a result of good airflow management, temperatures and air pressures are maintained at the required level.

Halton BLD non-return dampers prevent backflow and can be used e.g. in multi fan systems to prevent backflow through non-operating fan. BRD pressure relief dampers regulate over pressure and vent excess pressure in designated areas.

## Did you know?

Halton has tested FDB2, UTG and BRD dampers in demanding cold conditions. The test results show that the dampers operated normally for the full duration of the test and kept their performance level after the test.

# Droplet separators

## In adverse conditions...

**Even the calmest weather conditions contain salty spray particles that must be removed to protect e.g. ventilation systems, air handling units, diesel engines, marine gas turbines, wind turbines and components inside nacelles. The high-efficient droplet separator results in maintenance, repair and replacement cost savings.**



PROVEN  
RESULTS

### Droplet separators

Halton DSH droplet separators are designed for demanding applications where reliability, easy installation and special design play an important role.

Separator vanes are designed to restrict the passage of moisture, salt spray and rain water e.g. into HVAC systems or engine room intakes. Unique form of separator vanes enables high efficiency separation.

Halton DSH is used in a wide range of applications, where there are differences in wind speed and direction, levels of local turbulence, rate and droplet size, distribution of rainfall and surface water flow from the surrounding structure. DSH has been tested according to the EN13030 performance test for louvers subjected to simulated rain. The tests were made at the VTT Technical Research Centre of Finland, where the droplet separator reached A-Class results.







### External louvres

When droplet separation is not needed, an external louver is effective in preventing objects entering into the ductwork. Louvre can be also used in air intakes.

### For cold conditions

Halton DSA high-efficiency droplet separators with heated vanes keep intakes clear during critical weather conditions.

A solution for continuous operation during extreme conditions such as real arctic fog conditions is also available.

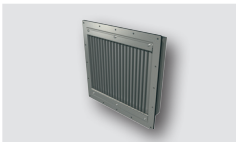
Type	Fire and gas damper	Fire and gas damper	Fire damper	Fire and gas damper
				
Name	FDA A0(A60)	FDB2 A0(A60)	FDL A0(A60)	FDO A0(A60)
Frame	EN 1.4404 or EN 1.4301 or EN 1.4432 galvanized steel or painted steel	EN 1.4404 or EN 1.4301 or EN 1.4432 galvanized steel or painted steel	EN 1.4404 or EN 1.4301 or EN 1.4432 galvanized steel or painted steel	EN 1.4404 or EN 1.4301 or EN 1.4432 galvanized steel or painted steel
Frame thickness	3 or 3-5 mm	3 or 3-5 mm, available as an option up to 10 mm	3 or 3-5 mm, available as an option up to 10 mm	3 - 4 mm
Blades	EN 1.4404 or EN 1.4301 or EN 1.4432 or galvanized steel	EN 1.4404 or EN 1.4301 or EN 1.4432 or galvanized steel	EN 1.4404 or EN 1.4301 or EN 1.4432 or galvanized steel	EN 1.4404 or EN 1.4301 or EN 1.4432 or galvanized steel
Blade gaskets	with thermal expansion and stainless spring steel seals	with thermal expansion and special seals	with thermal expansion seals	special seals
Leakage class according to EN 1751:2014*	up to class 3	up to class 3	class 1	up to class 4
Sizes	from 200x200 to 1200x1600 mm at 1 mm intervals	from 100x100 to 1200x1600 mm at 1 mm intervals	from 100x100 to 1300x1200 at 1 mm intervals	from ø 100 to 500 mm (sizes ø 100 and 125 not available in EN 1.4404)
Circular connection pieces	from 200 to 1250 mm	from 100 to 1250 mm	from 100 to 1250 mm	from ø 100 to 500 mm
Modules possible	yes	yes	case by case	no
Special flanges and drilling patterns available as an option	yes	yes	yes	yes
ATEX as a whole	available as an option	available as an option	available as an option	available as an option
	Dampers with automatic electrical or pneumatic or spring actuated operation systems and fusible link. Please note: painted frame according to various standards available as an option for most of the dampers. Special grades of stainless steel available on request. Visit <a href="http://www.haltonmarine.com">www.haltonmarine.com</a> for fire damper certificates. *) Leakage class depending on size. Details available from Halton Marine.			

Type	Pressure-relief damper	Shut-off, balancing and gas damper	Shut-off, balancing and gas damper	Adjustment and measurement unit
				
Name	BRD	UTG	UTT/UTX	PRA
Frame	EN 1.4404 or EN 1.4301 or EN 1.4432 galvanized steel or painted steel	EN 1.4404 or EN 1.4301 or EN 1.4432 galvanized steel or painted steel	EN 1.4404 or galvanized steel	Casing galvanized steel or EN 1.4404
Frame thickness	3 mm	3 mm (standard) or 5 mm, up to 10 mm as an option	1 mm	Blades galvanized steel, EN 1.4404 or copper.
Blades	EN 1.4404 or EN 1.4301 or EN 1.4432 or galvanized steel	EN 1.4404 or EN 1.4301 or EN 1.4432 or galvanized steel	EN 1.4404 or galvanized steel	Operating mechanism for different sizes ABS & PBT plastic for 100...315, steel for 350...1000 mm
Blade gaskets	special seals	with seals	insulated and with seals	
Leakage class according to EN 1751:2014*	up to class 2	up to class 3	up to class 3	Casing leakage according to EN 1751 Class C
Sizes	from 200x200 to 1200x1400 mm at 1 mm intervals	from 100x100 to 1200x1600 mm at 1 mm intervals	from 100x100 to 2400x2400 mm at 50 mm intervals (special sizes available)	
Circular connection pieces	from 100 to 1250 mm	from 100 to 1250 mm	from 100 to 1250 mm	
Modules possible	yes	yes	yes	Sizes Ø100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000 mm
Special flanges and drilling patterns available as an option	yes	yes	yes	
Operation principle	electrical, pneumatical or manual	electrical, pneumatical or manual	electrical, pneumatical or manual	Operation principle manual
ATEX as a whole	available as an option	available as an option	available as an option	

\*) Leakage class depending on size. Details available from Halton Marine.

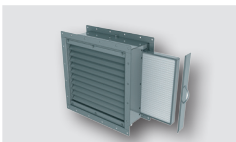
Square multi-nozzle ceiling diffuser JSC	Circular ceiling diffuser TDM, TDM/P	Square ceiling diffuser TBM, TBM/P	Wall diffuser unit TLB	Exhaust valve URH
				
Grilles AWE, AWU	Grilles WSD, WDD	Grille AGC	Grille WTS	Plenum BDR
				

### Droplet separators / DSH



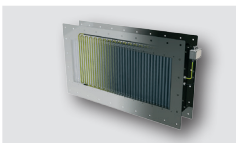
Frame material aluminium EN AW 5754 with a painted finishing (RAL9010 as standard) or EN 1.4404 with a painted finishing as an option. Painting according to various standards available as an option. Construction: droplet separator and frame (single stage), droplet separator, frame and filter (two-stage). Net and mask louvre available as an option. High droplet and moisture efficiency, Class A results (EN 13030:2001), low pressure drop. Tailored sizes and designs according to customers' needs. Possibility to connect in conjunction with Halton Marine dampers.

### Droplet separators, DSH optional features



DSH with mask louvre provides aesthetic appearance. Access hatch enables easy access to the filter from the side of the unit. (G4 filter in the picture). F7 and F8 bag filters. The materials of the synthetic fine filters are high-quality and durable, progressive mounted synthetic fibres. The filters can be used in example for air purification of intake air. Filters certified with ISO9001 and ISO14001 quality and environmental standards. The fine filters are also certified by Eurovent (EN779) standard.

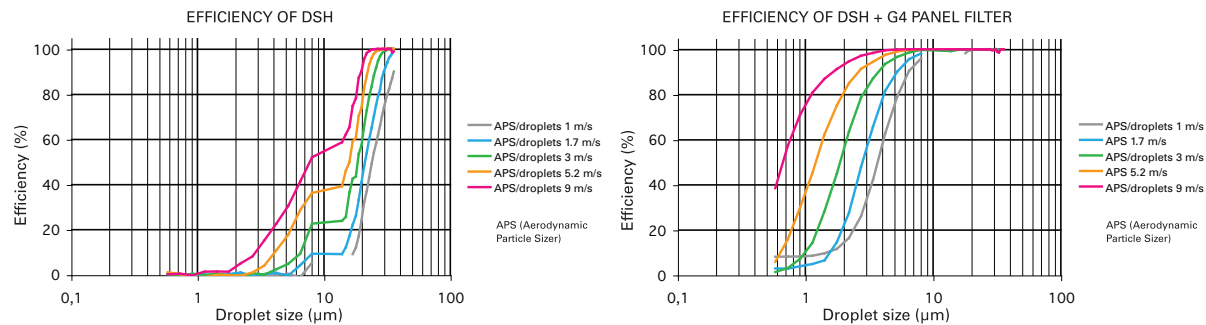
### Droplet separators with heated vanes / DSA



DSA with heated vanes for cold conditions. Frame aluminium EN AW 5754 with a painted finishing (RAL9010 as standard). Painting according to various standards available as an option. Frame also available as EN 1.4404 as an option. Construction: droplet separator with thermal cable and frame. High droplet and moisture efficiency, Class A results (EN 13030:2001), low pressure drop. Tailored sizes and designs according to customers' needs. Possibility to connect in conjunction with Halton Marine dampers.

### PERFORMANCE DATA

Fractional efficiencies of DSH and a combination of droplet separator + G4 panel filter measured at the Independent Research Institute.

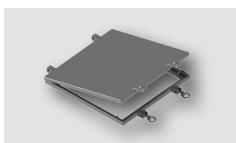


### Outdoor louvres / USM



Sea water resistant aluminium (EN AW 5754) with painted finishing (white RAL9010 as standard colour) or galvanized steel or EN 1.4404. Frame thickness 3 mm as standard, blades 1 mm. For air exhaust or intake. Sizes from 150x150 to 1500x2400 mm at 1 mm intervals. Modular construction for larger sizes available. Non-standard dimensions and flange drilling available as an option. Can be fitted in conjunction with Halton Marine dampers.

### Weather tight hatch / WTH



Weather tight cover to be used with Halton Marine droplet separators and louvres. Material painted or galvanized steel or EN 1.4404.

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# About us

## Halton Marine

Halton Marine, one of the world's leading suppliers of marine HVAC, develops, manufactures and markets reliable, high-quality ventilation solutions specifically designed for shipbuilding, oil & gas, energy and naval applications. Our track record includes deliveries to over 150 major cruise ships, 200 oil & gas projects and 100 naval vessels.

## Halton Group

Halton Group specializes in indoor environment solutions, ranging from public and commercial buildings to foodservice facilities. Founded in Finland in 1969, Halton operates today in over 30 countries around the world, with annual sales of €189 million and over 1350 employees. The company has production facilities in Brazil, Canada, China, France, Finland, Germany, Hungary, Malaysia, United Kingdom and USA.