



AIR INTAKE SOLUTIONS THAT PROTECTS FROM MIST & WATER

INOVANE[®]

Water

INERTIAL VANE
SEPARATION

Air Intake Filtration

THE PROBLEM

Your equipment is under constant attack by a wide range of airborne contaminants, many of them invisible to the human eye. Once inside a compressor or blower, they corrode and erode internals and foul up processes. 7 Way air intake systems reduce energy costs and protect your compression equipment from unnecessary downtime. Clean intake air is therefore one of the most effective ways to save energy and control escalating maintenance costs.

7 WAY SOLUTIONS

Perhaps, you are not sure how to best protect your investment. Count on 7 Way to do more than just sell you a filter. 7 Way will carefully evaluate your specific need, situation and possibilities at your site. We will then recommend the most effective combination of filter design and element efficiency to save you money.

SYSTEMS

7 Way design and manufactures air InoVane® modules with capacities from 0,5 m³/s to 50 m³/s and all with adapted connections. Custom engineered air intake systems are available for applications with higher flow rates, requiring acid gas removal, and to adapt to hostile environments - to name a few.



Helping Your Equipment Breathe Easy

Contaminants at the intake of compressors, blowers and turbines dramatically affect the cost of supplying compressed air. Inefficient intake filtration permits contaminants to corrode, erode and foul internals.

7 Way air intake filters will deliver optimum performance, energy savings and protection to gain long component service life

7 WAY manufactures custom designed systems that are both cost-effective and offer the necessary level of protection for your equipment.

The InoVane® systems separate and remove water, salt & dust from intake air before it can inflict internal damage to expensive rotating machines as: Gas Turbines, Diesel/Gas Motors, Compressors and blower systems. Dimensions can easily be adapted for the specific application and could also be designed for fitting onto any static air intake and standardized HVAC aggregate, and will considerably extend the lifetime for filters. The unit is very effective and is easily integrated and fitted in front of any intake.

The InoVane® systems work best in extremely wet environments where contaminant loading is a problem for conventional air-intake filtration.

The InoVane® is a highly effective inertial separator, - superb for a wide range of applications.

Description

The InoVane® units are heavy duty self-cleaning modules, equipped with inertial separators for both low and high velocities from 1 to 8 m/s.

Modules in strong corrosion-free construction means that the InoVane® Water can be installed in hostile environments.

Typical applications include:

Air inlets in all types of industrial, public and commercial buildings

Weather protection for air intakes to rotating machines as:

Gas Turbines, Diesel/Gas Motors, Compressors
Blower systems and Generators

Droplet separators, for air conditioning and ventilation systems in heavy industrial conditions.

THE MODULE

The 7 Way InoVane® Water Vertical Multi Vane louvre, which is the heart of the system, is a compact mechanical separator which can be used independently or in combination with secondary filter elements in a variety of air filtration systems.

It is designed to conquer tough water contaminants, providing clean, smooth air flow in a range of applications and conditions. The self-draining feature makes it ideal for locations where heavy contaminant of water loading is a problem for conventional air-intake filtration.

The strong corrosion resistant construction means the Modules may be installed in hostile environments. In addition, (based upon the choice of materials) gives a wide ambient temperature variations – maintaining stability and operational integrity from - 40°C to + 200°C.

REDUCING WATER

By greatly reducing water from secondary filter elements in a system, the InoVane® modules provides long-term economies by lowering the pressure drop of an air-intake system. Used alone, it removes 100% of water droplets 12 microns and larger from an air stream.

Material

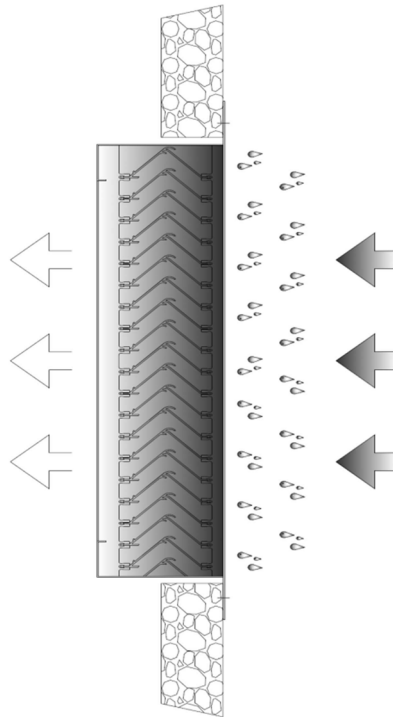
Unit enclosure / Casing:

Galvanized steel
Stainless steel
Marine aluminium.

InoVane® Water profiles:

High Density PP
Stainless steel
Marine Aluminium

Operating Principle



Description

The InoVane® Water unit is a heavy duty self-draining weather protection, equipped with Vertical Multi Vane modules of Inertial separators. Combined with static filters the modules will filtrate both dry and wet contaminants. Modules are made in strong corrosion-free design and Construction.

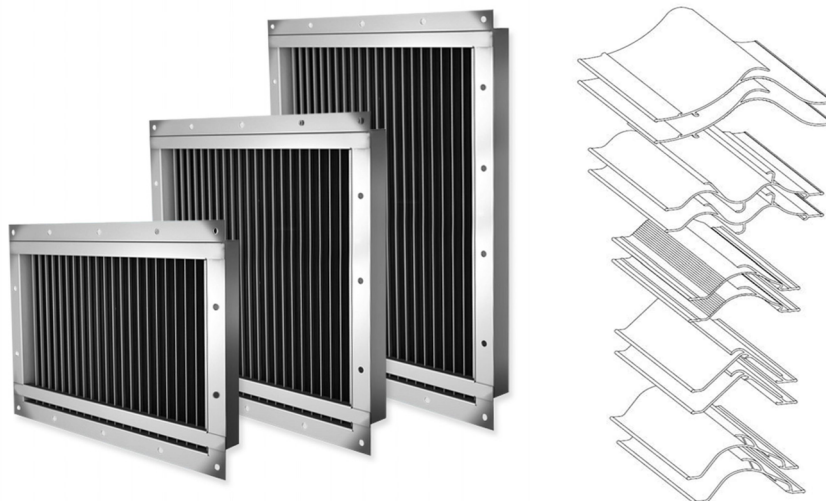
The InoVane® Water profile is extruded of rugged, high-density polypropylene alternative marine grade aluminum. Stainless steel vanes are manufactured by roll-formed steel.

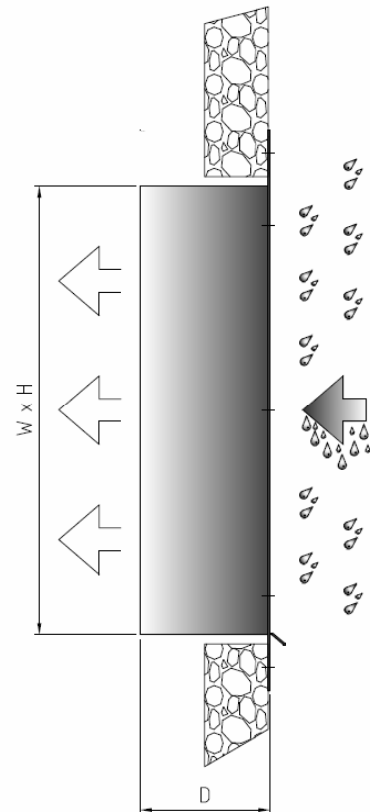
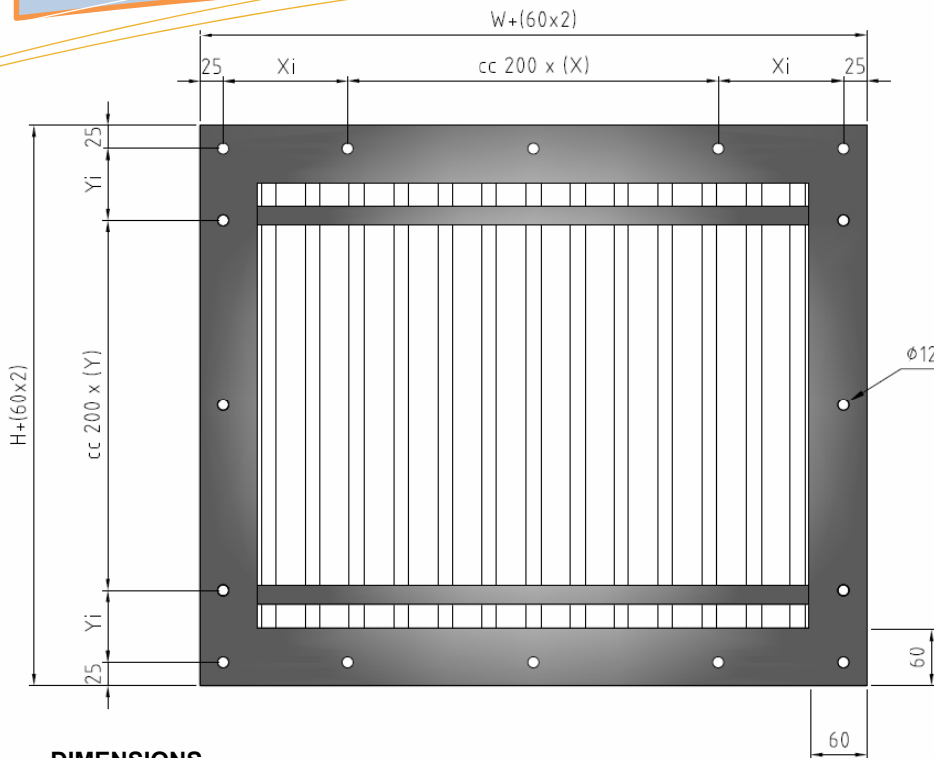
Through Inertial forces, water contaminants are removed from the air stream as it is drawn through the multi directional labyrinths. The separated water drains out from the air stream in a separate drain alternative by the drip strip in the front casing.

The separators are remarkable efficiency and is the culmination of years of engineering design, laboratory developments and field testing.

Best Performance & Efficient Operation

The InoVane® system consist of a range of different vane profiles. More than 95% off all Air Intake Solutions are solved with our low & high velocity profiles. Great efficiency is created by the shapes of these profiles and the adapted distance between profiles.





DIMENSIONS

Width (W): 200-2500 mm

Height (H): 200-2500 mm

Distance: X & Y (To be calculated)

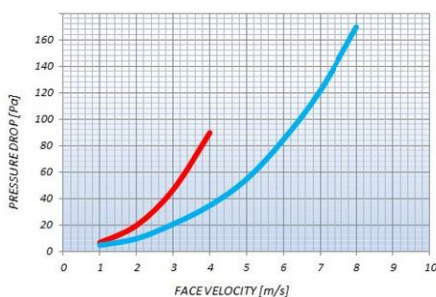
Depth (D): 140 mm (Lv = Low Velocity Vanes)

Depth (D): 210 mm (Hv = High Velocity Vanes)

Distance: Xi & Yi (Max 200 mm)

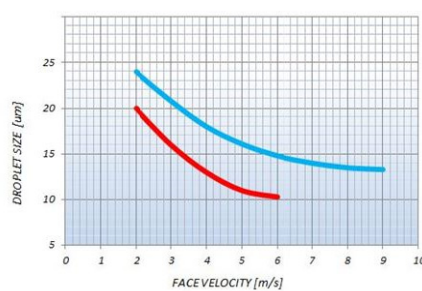
Note: Dimensions for wall opening to be minimum 10 mm wider than W & H.

PERFORMANCE DATA



Pressure Drop vs Air Inlet Air Flow:

Pressure Drop through the InoVane® Water is low due to its airofoil design. Pressure Drop is based upon laminar air flow in the units, other pressure drops caused by shape of aggregates, frames aso is not taken into consideration. This is valid for the system water / Air @ 20°C and 1 bar. Data achieved with uniform load and flow.



Drop Size limit vs Face Velocity:

The InoVane® Water separator has a droplet removal efficiency of 100% for water droplets 12-15 microns and larger. The limitation to drop size means the smallest drop which is completely separated by the system. The limit drop size is measured in microns (0,001 mm = 1/1000 mm). As example a normal human hair is 75-200 μm. Rain drop appr. 200-10,000 μm. Mist appr. 80 - 200 μm.



Sound Power Levels vs Air Inlet Air Flow:

Sound Power Levels is based upon laminar air flow in the units, added noise caused by shape of aggregates, frames a.s.o is not taken into consideration.



Red Curves = Low Velocity Vanes



Blue Curves = High Velocity Vanes

Separation & Collection Mechanisms

Impaction

The mechanism whereby a particle or a droplet cannot avoid hitting a plate surface or one of the fibres / wires or Vanes randomly arrayed in the path of the gas, even though the fast flowing gas tries to 'streamline' past. There is a relationship between the blade design and spacing or diameter of wire and the size of droplet collected.

The range of velocities is broad (1 to 10m/Sec) without affecting efficiency.

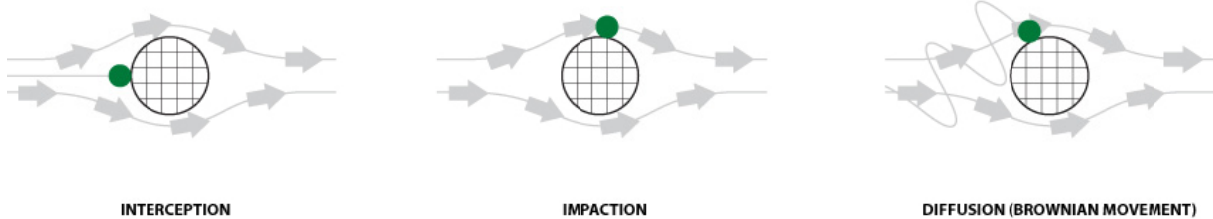
Interception

Collection is achieved by trapping the droplet between two adjacent filaments or fibres. The finer the filaments, the more there can be in a filter with less space between them, which increases the rate of interception of finer mists. At higher velocities interception is a mechanism of coalescence, but at lower velocities it aids collection.

Normal velocity range for Interception is 0.2 to 0.8 m/Sec.

Brownian Diffusion

At low velocities (usually below 0.2 m/Sec but maximum 0.25 m/Sec), as the gas passes horizontally through a bed of very fine fibres, the fine mist particles are bombarded by the gas molecules surrounding them, causing the particles to move in various directions, both towards and away from the fibres. The high number of fibres means, however, that the mist is virtually certain to be collected on the fibres. The smaller the fibre diameter, the finer the mist size that can be collected.



RELATIONS OF PARTICLE SIZES IN REAL WORLD

