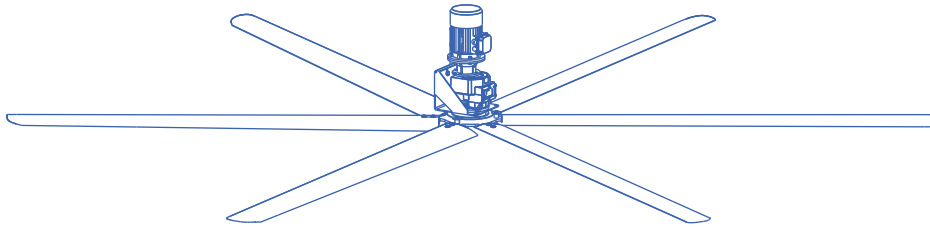




## LARGE AIR DESTRATIFICATION AND MOVEMENT SYSTEMS



The PionAir Destratifiers /Fans range consists of 5 models with blade diameters of 3000, 4000, 5000, 6000 and 7000 mm that can be equipped with either Asynchronous or Brushless motors.

The Large Diameters characterizing our Solutions and the unique patented air foil and the Blades allow the generation of a range of **Air Flow Rates of between 12.000 m<sup>3</sup>/h and 529.000m<sup>3</sup>/h** and then, thanks to the fully automated management, to adapt easily in the various thermal/environmental situations to be dealt with and solved.

**Solving issues, Reliability, Yield, Comfort, Energy Saving:** these are the main reasons that lead us to design and produce our HVLS fans and our customers to choose them.



Technological  
Innovation in  
**ENERGY  
SAVING AN  
ENVIRONMENT  
AL WELL-BEING**

“ Moving massive masses of air  
at a low speed at extremely  
low costs ”

**Quality for Pionair  
means proposing the  
use of the best product  
for every single purpose  
within the framework of  
a common and  
harmonious solution  
between Individual  
Well-being and Global  
Energy Saving.**

*Mission*

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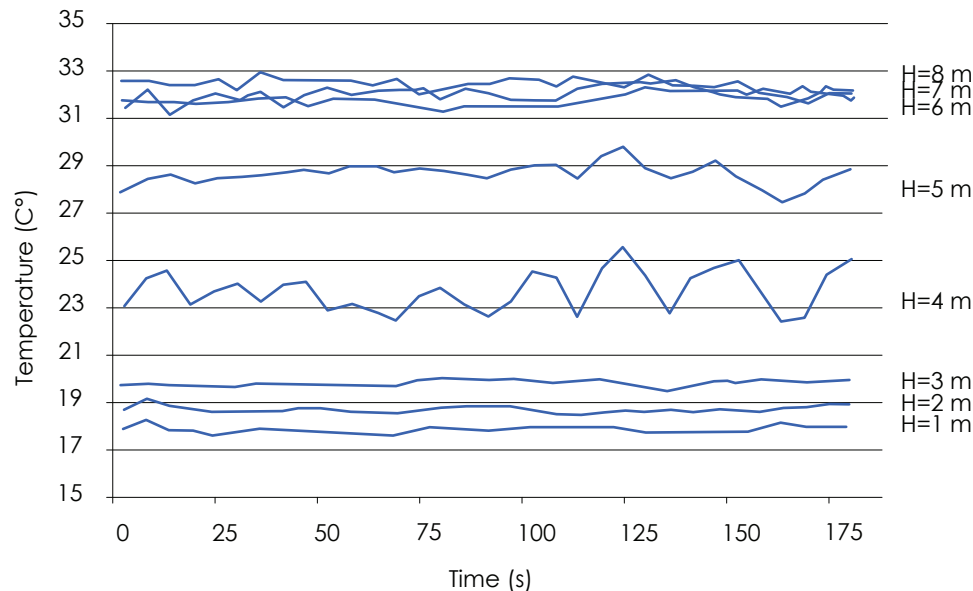
**PIONAIR**  
Destratificators - Ventilators



## Destratification: laboratory test

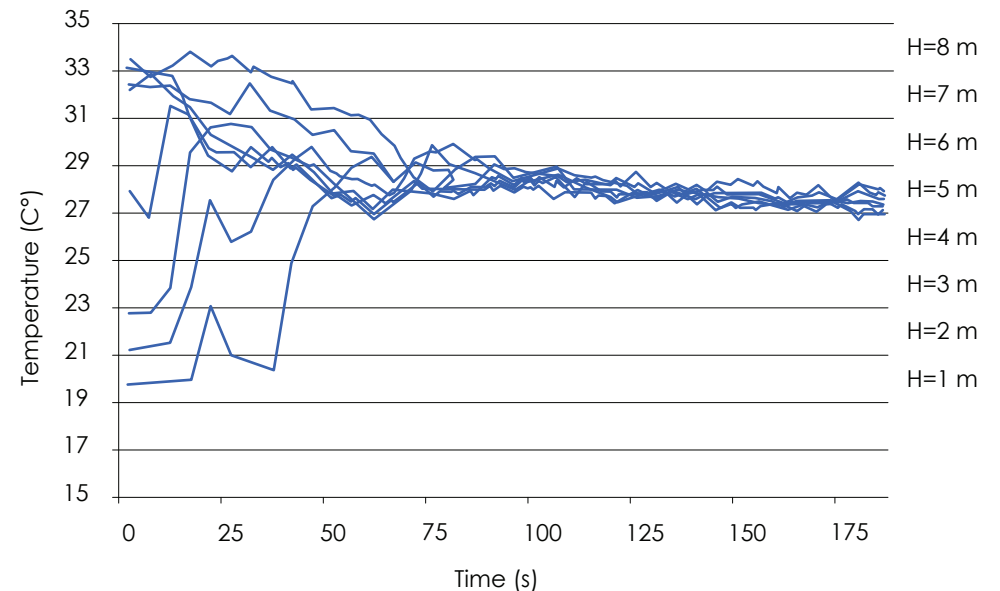
➔ The data below summarize the contents of laboratory tests, carried out and certified by the study group of Dr. Fabio Bozzoli, Parma University Department of Industrial Engineering.

“ The performance of two six-bladed Destrafan 6000 fans manufactured by the Arienti Paul & Co, located in a 1000 square meter mechanical workshop were measured, in order to break up the air stratification promoting a complete mixing of the air. To this end, 8 thermocouples were used that were arranged respectively at 1, 2, 3, 4, 5, 6, 7, 8 meters from the ground.



DESTRAFAN 6000 FANS NOT OPERATING

It can be seen that, in the absence of the fans operating, **a well-defined stratification layer is built up in the industrial shed, characterized by a maximum temperature difference between the upper area and lower area of 14 °C**



DESTRAFAN 6000 FANS OPERATING

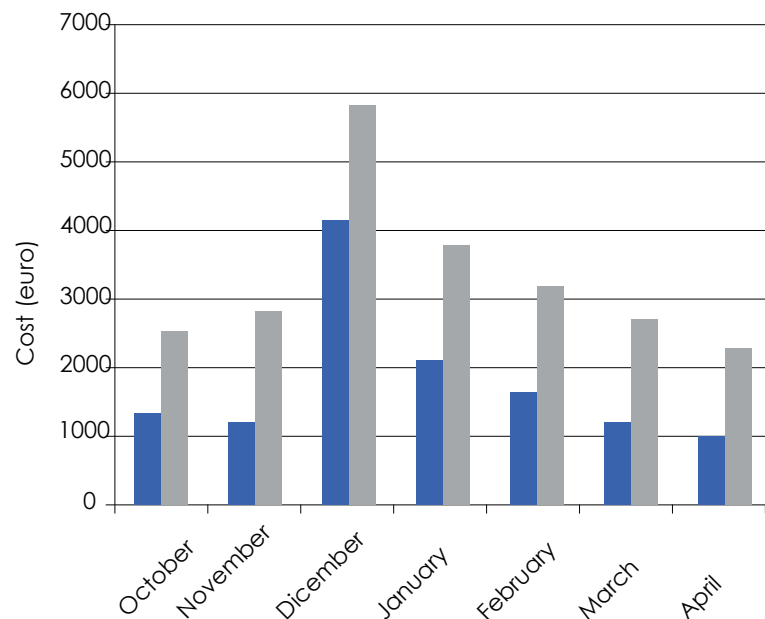
The figure shows **a sudden change at the end of the first minute of measurement: the effect of air remixing becomes significant breaking up the air stratification in a very short time and rendering the temperatures uniform throughout the height of the industrial shed**



## Energy Savings -Thermal Comfort

ARPA Lombardia (Regional Agency for Environmental Protection of Lombardy) data was considered relating to the area of Soncino (CR) (the town where the industrial shed being studied is located) for the year 2014 in order to calculate the savings in terms of energy associated with the use of the Destrafan fans by Arienti & Co. A transmittance of the walls and roof respectively 2W/m<sup>2</sup>K and 3W/m<sup>2</sup>K was considered and a Comfort temperature for the workers of 20 °C ....

The costs related to heating in the presence or absence of Destrafan fans are as follows



■ Cost Fan on  
■ Cost Fan off



**11.000 €**  
of annual savings on  
heating costs

”

The Pionair Systems base their operation on the recovery of the hot air that being lighter than cold air, tends to rise and to accumulate unnecessarily in the upper part of the structures. Putting the stagnant hot air back into circulation, by pushing it forcibly downwards, makes it possible to gain great **Environmental and Energy Advantages, consequently Savings.**

Dr. Ing. Fabio Bozzoli

*Fabio Bozzoli*

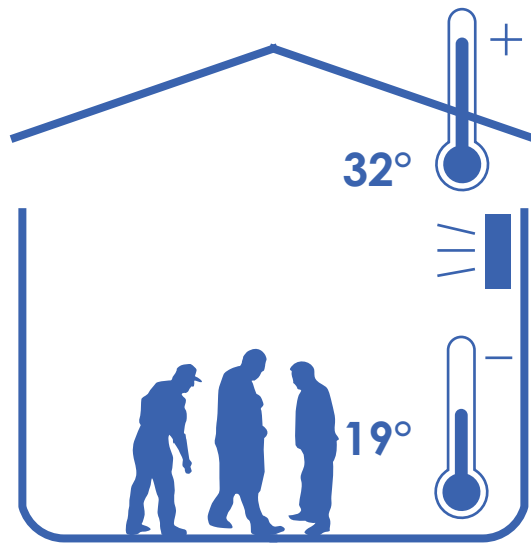


Parma ,18 February 2015

Mr. Luca Cattani

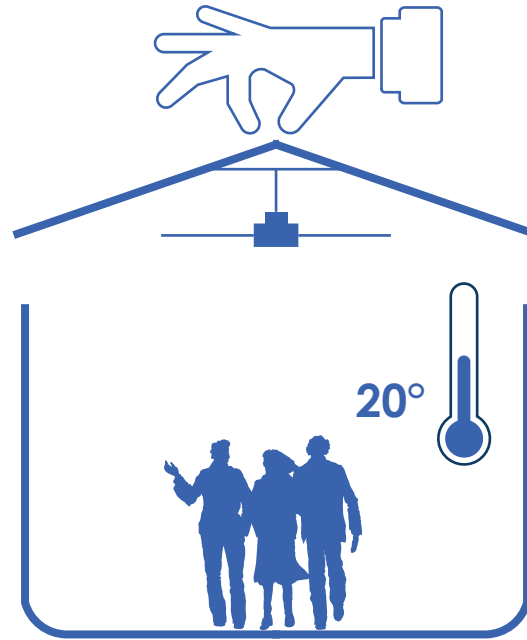
*Luca Cattani*

## Winter Destratification



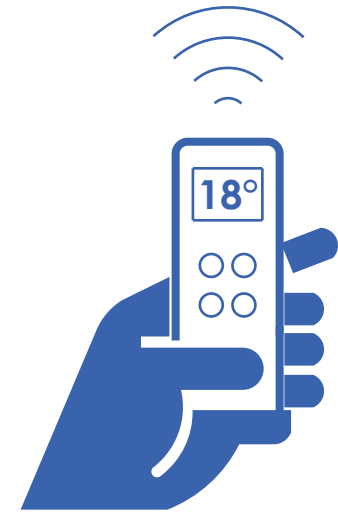
### WITHOUT DESTRAFAN

The hot air produced by the heating systems inevitably rises upwards, stratifying below the ceiling and dispersing slowly outward, **making the high costs incurred by companies to heat the rooms absolutely not very effective and cost-efficient.** The higher the building structure and the more its insulation is deficient, the greater the waste of energy and money is: every meter in height corresponds to an average temperature increase of one degree Celsius.



### WITH DESTRAFAN FANS

The range of solutions for Pionair Destratification has been specifically engineered to eliminate the stratification of the Air and to Render the Temperature Uniform, in all of the large environments in which it operates. Taking advantage of the generous air column, moved by large blades with a unique and patented profile, the vertically-oriented rebalancing of the temperature as well as heat redistribution uniformly in all parts of the environment are achieved and **moisture formation is prevented** also in the most remote areas of the structure.



### RESULT

Setting the thermostat at 18° C to H of man in a 7meter-high industrial shed, without destratification **the heating system** produces and consumes up to have even more than 25 ° C in areas close to the ceiling. Destratification instead **produces and consumes only that is necessary to maintain uniformity of 18 ° C throughout the structure.**

- ✓ Immediate reduction of the Energy Requirements, and the resulting Financial outlay, by more than 30%
- ✓ Reduction of environmental Relative Humidity by more than 20%
- ✓ Elimination of the Condensation Phenomenon
- ✓ General reduction of plant systems and structures maintenance as well as wear and tear
- ✓ Improvement of wellbeing that is perceived in the workplace
- ✓ Increase in the Comfort, Safety and Productivity of the Labour Force

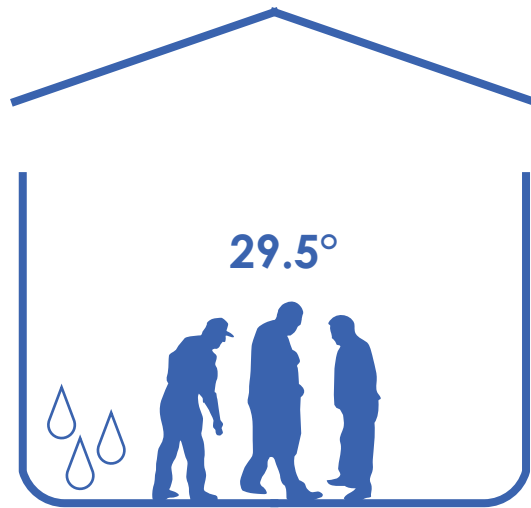
*Winter Efficiency*

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**PIONAIR**  
Destratificators -Fans

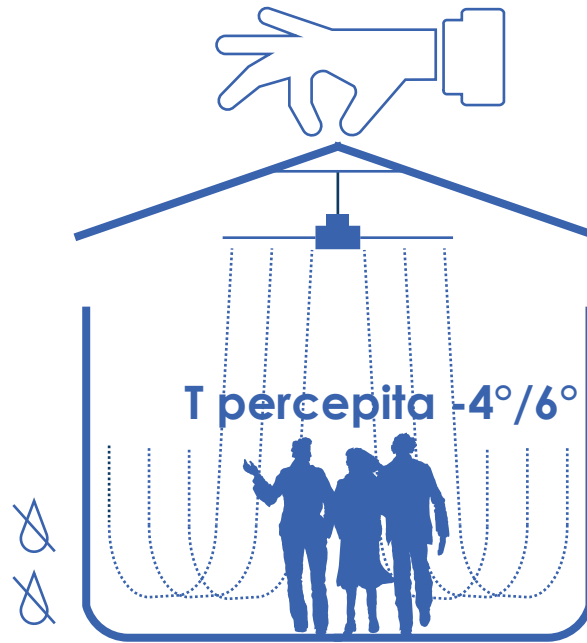


## Summer destratification



### WITHOUT DESTRAFAN

During the **hot summer period**, the particular conformation of the industrial buildings and commercial areas **causes the progressive stratification downward**, which is very rich in air humidity, the stratification that **frequently generates interior microclimates where the perceived temperatures can reach much higher values than those humanly acceptable**. These conditions of extreme discomfort make both safety as well as the yield of the operators deeply uncertain.



### WITH DESTRAFAN

**The ambient temperature does not change but the decrease of the relative humidity, together with the ventilation coming from Destrafan fans, produces a clear cool feeling on the skin due to an easier natural perspiration induced by the ventilation.** In fact, in the presence of even a minimum air velocity, the perception of heat is on average lowered by 4 C° to 6 C° compared to that measured.



### COMBINED USE

**Even in Environments equipped with active Conditioning Systems the use of the Destrafan solutions emerges as externally cost-efficient** in as much as the combination of Traditional conditioning, dehumidifying effect and perfect Shuffling of various thermal layers, allows a cost-efficient management system, with obvious energy savings due to the possibility to set the switching on of the Conditioning to higher Ts.



- ✓ Immediate control of the high summer temperatures
- ✓ Net reduction of the relative humidity
- ✓ Regular distribution of the renewed air
- ✓ Reduction of installation costs and cooling management
- ✓ Maximizing and Enhancement of traditional Conditioning Systems
- ✓ Increased Comfort, Safety and Productivity of the Workforce

*Summer Efficiency*

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**PIONAIR**

Destratificators - Fans



# Range of Products










The range of Pionair Destratifiers/Coolers is wide and effective and is the result of our long experience as builders of stand alone HVLS Ventilation Systems. Engineered and built to provide maximum performance, they have allowed us to become a leading company in the sector, not only thanks to its innovative technical features that characterize them individually, but also for the utmost attention paid to their proper insertion and sizing within more complex systems. It is in this way that our actual experience as developers of solutions is demonstrated: the Destrafan fans immediately become a critical component for the effectiveness and performance of any existing plant or in the design stage. **The Pionair Destratifiers can boast a MTBF (mean interval of time before failure) that is among the highest in the market and require extremely low maintenance.** Our production includes different models and each of them is designed and sized to perform specific functions in all those environments where correct positioning on the ceiling of the Destrafan fans is possible.

## “ DESTRAFAN: WHEREVER THERE IS A NEED TO DESTRATIFY AND VENTILATE AREAS THAT ARE CLOSED OR UNDERGOING PROLONGED STOPPAGES ”

### DESTRAFAN 3000












**SMALL SPACES: School Facilities, Offices Open Space, Meeting Halls, etc.** Installable with the Blades placed at a distance from the ground as low as 3.7 meters, the Destrafan3000 is the solution that is designed to manage "small" and usually very crowded spaces that, in addition to a perfect thermo-climatic management, need an excellent and continuous replacement of air

	Diameter of the blades	3.00 m
	Number of blades	5
	Useful surface diameter	12.00 m
	<b>Useful covered surface</b>	<b>113,00 m²</b>
	<b>Maximum fan flow rate</b>	<b>37.407 m³/h</b>
	Rated/input power*	0.25/0.19 kW
	Minimum distance from the grounds	3.70 m
	Minimum distance from the ceiling	0.50 m
	Overall weight DF	33 kg

### DESTRAFAN 4000



**MEDIUM / SMALL SPACES: Show Rooms, Lofts, Restaurants, Dairy/Cheese processing centres etc.** Slightly bigger spaces and rotors at least 4.0 meters in height, these are the conditions of use suggested for the Destrafan4000. With this version you can solve environmental problems similar to those of the previous model in larger spaces but also to begin to address the small Processing and Packaging Industry.

	Diameter of the blades	4.00 m
	Number of blades	5
	Useful surface diameter	16.00 m
	<b>Useful covered surface</b>	<b>201,00 m²</b>
	<b>Maximum fan flow rate</b>	<b>96.810 m³/h</b>
	Rated/input power*	0.55/0.42 kW
	Minimum distance from the grounds	4.00 m
	Minimum distance from the ceiling	0.50 m
	Overall weight DF	68 kg

## DESTRAFAN 5000



**AVERAGE SPACES:** Fitness centers, Large Sized Hotels, Banquet halls, Gardens, Green Houses etc. The Useful Area covered starts to become important, and, always with Blades placed at least 4.0m in height, the Destrafan5000 is the natural solution for meeting venues and/or those for friendly gatherings that are even larger than the previous ones and for all those working applications where, in addition to temperature, mould and excess moisture management also plays a vital role for the success of the activity.

	Diameter of the blades	5.00 m
	Number of blades	6
	Useful surface diameter	20.00 m
	<b>Useful covered surface</b>	<b>314,00 m<sup>2</sup></b>
	<b>Maximum fan flow rate</b>	<b>237.505 m<sup>3</sup>/h</b>
	Rated/input power*	0.75/0.54 kW
	Minimum distance from the grounds	4.00 m
	Minimum distance from the ceiling	0.80 m
	Overall weight DF	75 kg

## DESTRAFAN 6000



**LARGE SPACES:** Industrial buildings, Manufacturing Factories, Hypermarkets, Trade and Convention Halls. The possibility to generate large flows and the broad Area covered by each individual unit makes the Destrafan6000 our real warhorse. There is no activity that takes place under the roof of and/or within buildings with large surfaces, which cannot help but find benefits from the use of this powerful industrial equipment.

	Diameter of the blades	6.00 m
	Number of blades	6
	Useful surface diameter	24.00 m
	<b>Useful covered surface</b>	<b>452,00 m<sup>2</sup></b>
	<b>Maximum fan flow rate</b>	<b>342.002 m<sup>3</sup>/h</b>
	Rated/input power*	0.75/0.6 kW
	Minimum distance from the grounds	5.00 m
	Minimum distance from the ceiling	1.00 m
	Overall weight DF	85 kg

## DESTRAFAN 7000



**VERY LARGE Spaces:** Industries, Storage Sites, Shopping Malls, Sports Halls, Airports, Railway Stations etc. It is the "top of the line" product and is obviously the one providing the greatest performance both as regards the Air Flow as well as for the Useful Surface covered. Despite moving up to 529,240 m<sup>3</sup>/h of air, the amazing quietness of the solution allows its use in both industrial settings and as well as in locations which are typically where people come to meet and enjoy themselves.

	Diameter of the blades	7.00 m
	Number of blades	6
	Useful surface diameter	28.00 m
	<b>Useful covered surface</b>	<b>615,00 m<sup>2</sup></b>
	<b>Maximum fan flow rate</b>	<b>529.240 m<sup>3</sup>/h</b>
	Rated/input power*	1.1/0.83 kW
	Minimum distance from the grounds	6.00 m
	Minimum distance from the ceiling	1.00 m
	Overall weight DF	95 kg

\*Consumption data related to Destrafan fans equipped with the ABB Three-phase Asynchronous Motor of the M3AA-IE12-IP55-CLF family, the versions with proprietary Brushless motors are certified for lower power consumption between 25 and 30%.

# Evolution of Products

For other cases where we are faced with outdoor installations, extremely weak or valuable ceilings, or where a particular airflow direction is needed, new categories of products have been studied and created.

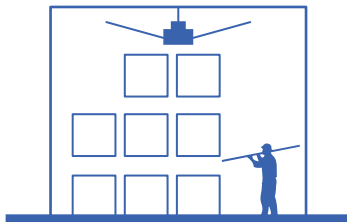
## “ DESTRAFAN UP: EVERYWHERE THERE IS A NEED TO VENTILATE OPEN ENVIRONMENTS OR THOSE OF SMALL/MEDIUM PLACEMENT ”

UP

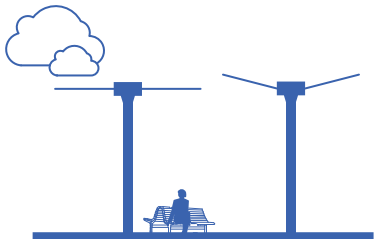


Thanks to the ingenious and revolutionary idea of **tilting the blades a few degrees upwards**, this solution makes it possible to also obliquely direct the air flow towards the most lateral zones to the machine's rotation axis, thus ensuring a wider useful movement surface (+ 50% compared to the corresponding Destrafan versions) and a highly refreshing continuous direct flow. Destrafan UP is mostly intended for the Outdoor Areas of Bars, Hotels and Restaurants, regardless of whether it involves venues where people stop or food distribution, to Amusement Parks, to cool the waiting areas before accessing the various activities / attractions, the museums, the Tensile Exhibition Structures or Sports Buildings.

The Destrafan UP, in indoor areas, also makes it possible to solve problems related to the presence of high shelves, machinery or, more generally, to the vertical air flow obstructions produced by "standard" Destrafans. As a matter of fact, the inclination of the airflow ensures a more correct and uniform movement and air destratification also in the limit cases described above.



FLOWER

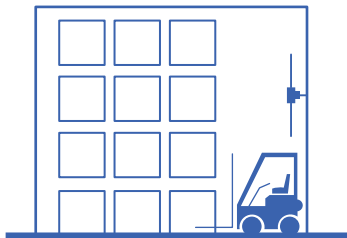


## “ FLOWER: EVEN WITHOUT THE CEILING ”

A solution that **makes both Destrafan as well as Destrafan UP fans self-supporting**, making it possible to enjoy the benefits of Pionair solutions also in open-air venues or with outdoor ceilings. **Destratification and ventilation with the same effectiveness of the ceiling versions but without the need of the same.**

## “ TOR: EVEN WITHOUT ANY ROOM ”

TOR



If there is just not enough space in height between any shelving and/or equipment in environments, **Tor represents the solution designed to directly ventilate lanes, tools and/or personnel at work.** Silent, easy to handle and solid, it is fit for all aeration, drying and ventilation applications, which may be required in the manufacturing and processing companies, and in all cases where, a powerful, easily directable air flow, is required for the correct carrying out of the activities.



# Automated Control and

**Pionair destratifiers are controlled by a Modular Control Unit (APS), based on the Proprietary Programming Software, which guarantees both the Automated management as well as the full Scalability in the time of the installation.**

The APS, in the Plus version, can be upgraded with flexibility at any time, by means of plug-in I/O units, for functional purposes (e.g. humidity sensors, air quality and/or speed, etc.) and / or communication (e.g. modules for Remote Assistance, Fault Prediction, Correct Functioning Control etc).

**The APS makes it possible to automate the operation of the machines and makes them active and only when the environment being served has a real need.** The Destrafan fans start up "spontaneously" when the **two control sensors**, one placed at the top of the building to be destratified and the other at a height of about one meter from the ground, detect a pre-set  $\Delta T$  between the temperatures perceived by the two probes. **In other words, the system will start only and only if there is the actual need to destratify**, by modulating the speed of rotation and the tripping time as a function of the received data. **This proprietary technology**, together with the extreme speed of achieving the perfect blending of the air, **can further reduce the electrical power consumption even if they are already very low, of the same destratification system.**



## APS

- 3 inch Backlit display
- Manual/Automatic Management
- Summer/Winter Operating Modality
- Dual Temperature Sensor Management
- Expandability up to 4 I / O modules
- Intuitive Control Software



## APS Plus

- 4 inch Display Touch Screen
- Manual / Automatic Management
- Summer / Winter Operation Modality
- Dual Temperature Sensor Management
- **Relative Humidity Control module with automatic adjustment to the perceived temperature (THI)**
- Possibility of Direct Connection to the Repeater Panels and/or Cellular phones
- Possibility of Customization of Functionalities
- Ample Expandability I/O Modules
- Intuitive Control Software

# Movement

For the motorization of the Destrafan fans, PionAir uses two different technologies: Asynchronous Three -Phase and Brushless.

**ASYNCHRONOUS TRI-PHASE MOTOR:** considered among the most reliable electrical machines, it has performed its function for many years with very few maintenance interventions and can be adapted to different performances, according to the particular needs and different applications



- Low cost
- Readily available from distributors throughout the world
- Low Maintenance
- Versatility of use
- Maintenance and service by third parties



- Slightly Noisiness
- Need to adjust setting
- Major possibility of wear compared to the Brushless motors



**In cases where it is decided a priori uniquely for the Ventilation mission** (prevalently a rotation with a high number of turns), **in the event in which it might be possibly necessary to disengage from the manufacturer for assistance of the same, in the event in which the immediate cost of the component is predominant as its purchase motivation and where there are no particular needs that motivate the purchase of a Brushless Destrafan.**

**BRUSHLESS MOTOR:** it is a Direct Current electrical motor with a permanent-magnet rotor and the rotating magnetic field stator. This entails a lower mechanical resistance thus reducing the possible periodic maintenance, with an evident energy saving



- Greater expectations for the motor's lifespan
- No physical and electromagnetic noise
- Compact size
- Versatility in speed management during use
- Less consumption than the equivalent asynchronous motor



- Increased cost of the motor itself
- Additional cost for the drive unit
- Limited availability at the manufacturer's



**Whenever there is the need to routinely move from a low number of rotations to a high number (both for Destratification as well as Ventilation), whenever the absolute quietness of the machine is required, whenever you need the motor component to be compact and minimally invasive and when you intend to evaluate the investment in the medium/long term and not immediately.**

Due to the high quality of the selected motor, to the particular shape of the patented blades and a careful study of friction, we can safely say that **Pionair Systems in their Asynchronous version consume similarly to or less than most of the fans equipped with brushless motors on the market.** In this way, in addition to ensuring that our rotating machines have a greater competitiveness, we can ensure the opportunity to offer assistance to them in a simple and accurate manner, in every country of the world. **Regarding the Brushless solutions, in addition to ensuring silent and reliable motors that consume very little, we are proposing them, certain to be offering the market an innovative and reliable product as well as with an indisputable energy efficiency.**

## The importance of the environmental

“

The temperature in working areas must be adequate for human beings during working hours, bearing in mind the working methods being applied and the physical demands placed on the workers

”

**Legislative Decree 81/08**

Heating and hydraulic engineers often found themselves working to meet the specific request of customers to reach an invigorating **Microclimate Wellness**, a request that should not be considered a whim but be held to be of fundamental importance for home and working environments as well as for all places open to the public. Each of us spends about 90% of his time indoors, but what few know is that it is precisely the indoor spaces that are more polluted than outside environment. Our habits, the construction materials and furnishings release VOCs, Volatile Organic Compounds that are extremely harmful to our health. Equally important is preventing the formation of mould and humidity; these are in fact dangerous not only for the well-being of those who live in these environments, but also for buildings and equipment. Excess humidity promotes the formation of condensation and dripping that cause costly equipment failures, the deterioration of the goods in storage and the early wear of the structures of the buildings themselves. Constant and

**+40%**

error work force  
possibility

**-20%**

work force  
productivity

controlled movement of the air in the environment, maintained at a temperature close to that desired, without that excess of humidity so feared by Doctors and technicians, is what you get with the "easy" installation of **Pionair's Automated Destratification Systems, an excellent solution for the protection of Health, Welfare and Productivity of people as well as for the preservation of the Structures and Investments of the world of work.**



Values of incorrect temperature, that are too high or too low, cause a reduced productivity of the workforce by 20% while, a NASA study certifies the increase of the possibility of workmanship error by up to 40%.



# Overview of installations

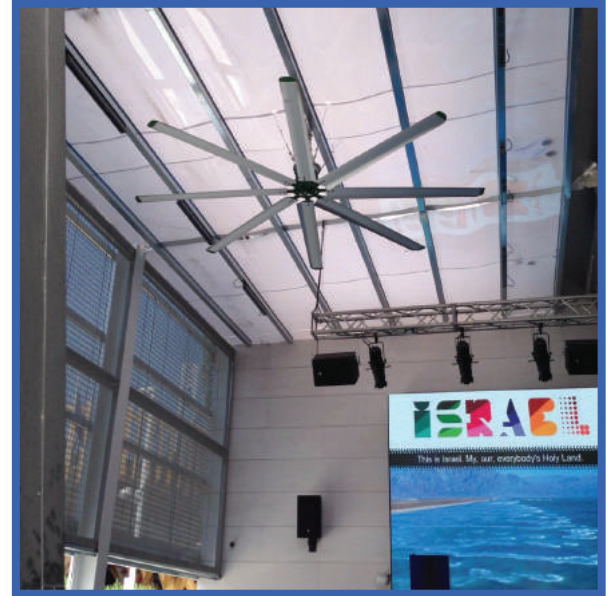
FARM HOLIDAYS



GYM



EXPO



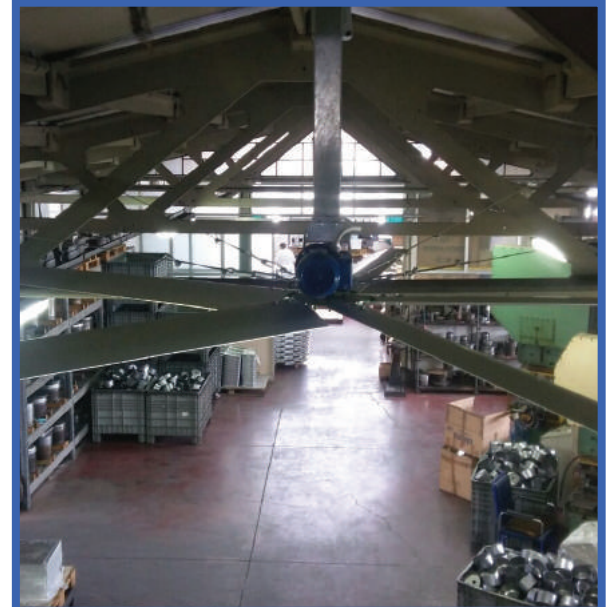
RESTAURANT



OFFICE



WAREHOUSE





# Possible Installations

AIRPORTS



HOTELS




GYMS



SPORTS ARENAS



-  School Structures
-  Offices
-  Meeting Rooms
-  Farm Holidays
-  Pubs
-  Sporting Centres
-  Hot Houses/Gardens
-  Warehouses
-  Offices
-  Sporting
-  Supermarkets
-  Swimming Pools
-  Hotels
-  Airports
-  Railway Stations
-  Cinemas / Theatres
-  Stalls



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