# ABBI-AEROTECH

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Well thought-out, sustainable, climate solutions keep your cows and profits healthy!



### Realthy Cattle form the basis for healthy farm profits

As a dairy farmer, you want the best for your animals. In addition to giving them the care and attention they need, you provide optimal rations and unlimited access to fresh water while also looking for the best genetic makeup for your livestock.

In short: everything you do is geared towards keeping your cattle

Laws and regulations around animal welfare, phosphate, and ammonia emissions have been putting your business to the test for many years. And recently, a new challenge has been added to the list: climate change. With an increase in temperatures and the your livestock.zeer reëel gevaar voor uw vee.

#### The dangers of heat stress

and 18°C. Climate change is responsible for increasingly lengthy periods of extremely hot weather. High-yielding animals, such as dairy cows, suffer more frequently from heat stress. This leads to disruptions in their bodily functions, resulting in a decrease in animal welfare and a deterioration in animal health. Heat stress can be recognised by:

- Reduced feed intake
- Reduced milk production and content
- Increased bulk tank milk somatic cell count
- Fertility problems
- Increased risk of infection and disease

#### The right ventilation solution

Heat stress can be mitigated with a state-of-the-art ventilation system in your dairy barn. Numerous factors determine the right ventilation solution for your situation, including:

- Type of barn
- Air flow in and out of the barn
- Animal group
- Position/aspect
- Possible systems already in use
- Specific climatological circumstances

Together with our specialised dealers, we are here to help you determine the right solution for combatting heat stress to keep than just placing a fan somewhere. We will be happy to provide you with information about the possibilities on page 4.



Visible signs of heat stress

Invisible signs of heat stress

Recent studies have shown that as the milk yield per cow increases, so does their sensitivity to heat stress; this can start at temperatures as low as 22°C.

The THI-index (air temperature linked to relative humidity) is a good indicator of heat stress. THI values below 68 show no discernible negative effects on dairy cow milk production, health, and reproduction.

### Problems caused by heat stress (THI $\geq$ 68)



# Ventilation solutions to combat heat stress

"Abbi-Aerotech, the company that invented cross ventilation in dairy barns!"

#### **Cross ventilation**

Abbi-Aerotech could well be considered the inventor of the cross-ventilation system. We introduced this system in 2015, and today we see that this concept is increasingly being applied across the globe.

This is no surprise to us! Cross ventilation is the only system that cools your cows whilst supporting and improving the natural ventilation in your barn. This leads to a cooling airflow in the barn which draws fresh air in through the side walls and disperses the heated 'used' barn air through the ridge. The air quality in the barn is significantly improved, which in turn has a highly positive effect on your cattle.

Cross ventilation cools your cows much better than other ventilation systems because the air flows along the length of the animals (in the cubicles and at the feed fence). As a result, the cow's body heat dissipates more quickly and over a larger body surface area. However, there must be enough natural ventilation (through the side walls and the ridge) to allow for sufficient air exchange.

Fans can be mounted on both sides of the barn, provided the ridge vents are large enough. The fans are then placed at regular intervals along the inside of the barn in front of the curtain. The distance between the fans depends on the type of fans used (see page 7). Depending on the barn width, an additional row of fans can be installed.

The fans need to be installed facing downwards at an angle measuring approx. 19 degrees to generate optimal airflow. Under normal circumstances, this angle is reached as soon as the fans are running at full speed.

In practice, about as many fans are needed for cross ventilation as are typically required for longitudinal ventilation. However, mounting the fans is much cheaper, which means lower installation costs. Moreover, you will no longer have additional obstacles hanging in your barn.

#### All this makes cross ventilation the best ventilation system for your barn!



Abbifan & Abbi-Apex

#### Longitudinal ventilation

If you cannot implement cross ventilation (because your barn roof is too low, for instance), or you want to cool your cows by just adding air circulation to your barn, then longitudinal ventilation would be your next option to consider.

Here, fans are mounted behind each other along the barn's length. In contrast to the cross-ventilation concept, fresh air is not actively drawn into the barn.

Tests have shown that for longitudinal ventilation, the best results are achieved when the fans are placed both over the walkway along the feed fence and the cubicles themselves. As with cross ventilation, the ideal airflow is achieved when the fans run at full speed. The air speed and the fan's throw determine the distance between the fans in the barn.



### **Investment benefits**

and horticultural sectors. Their aim is to improve energy efficiency and savings in the primary production facilities within these sectors. National governments encourage businesses to invest in ces through direct financial or tax benefits.

misting systems, or entire systems fall mainly under these nati-

Contact your local dealer and discover which investment benefits may apply to your situation.

#### **Downward ventilation**

Abbi ceiling fans are characterised by extensive air displacement at low rotational speeds. The fan exerts vertical airflow, 'pressing' the air down, as it were. The moment the vertical airflow reaches the floor, the air bounces off the floor surface, generating horizontal airflow in all directions (360°). However, the airflow is affected by any obstacles in the barn, such as cattle, barn layout elements, and walls.

In contrast to Abbifans, the air speed in the direct surroundings of the cattle is much lower and therefore, the cooling effect is less. A side-effect is that the fans will partially press down the warmed-up, rising barn air.

The fan is mounted at the height of 4 to approx. 6.5 metres above the floor for optimal operation. The effective reach of the fan is approximately 1 to 1.5 times the fan's diameter in all directions when measured from the centre of the rotor. The maximum interval between ceiling fans should therefore be 3x the fan's diameter. The rotor's low rotational speed makes the ceiling fan highly suitable for cooling areas such as group housing/straw-bedded pens, sick pens, and calving pens.



#### **Tube ventilation**

Calves (and young goats) have very little body fat and produce little warmth, making them more susceptible to cold airflows. Abbi Aerotech's tube ventilation system is designed to provide optimal ventilation while preventing downdraughts (draughts caused by the displacement of indoor air).

The fresh outside air is drawn into the air tube through a fan built into the wall and then dispersed via overpressure through holes in the tube. The specially designed and precisely calculated holes ensure an even distribution of air across the barn, so your animals receive fresh air through a barely discernible airflow! This considerably improves the air quality in the barn and decreases the risk of lung infections or diarrhoea.



#### Misting

Besides cooling the barn using Abbi fans, additional cooling is possible through water. This involves either adding moisture to the air or to the cows themselves.

Abbi high-pressure misting systems add moisture to the air above the cows, not the cows themselves. The atomised water droplets evaporate immediately, cooling the ambient temperature, which in turn allows the cows to release their body heat.

Each fan (Abbifan and Appi-Apex) is mounted with a misting bracket with several nozzles (sprinklers). A high-pressure pump supplies water at 60-70 bar to the nozzles. The water droplets form a fine mist, which evaporates into the air. The evaporation process takes the heat out of the air. Depending on the barn's humidity levels, this method can achieve a cooling effect of up to 3 to 5 degrees in the air temperature!

The air humidity levels and other settings need to be regulated through the controller. This works perfectly with the unique misting program which comes with the highly user-friendly Abbi DCC-Touch Climate Controller.



#### Soaking

In contrast to misting, during soaking, water is applied directly to the cows instead of the surrounding air. The system showers the cows with coarse droplets; fans then blow air over the cows' bodies to cool them further. The water on their skin evaporates, providing a cooling effect.

In most cases, a water pipe is installed near the feed fence and/or over the waiting area or when they return from the milking parlour. The water pipe is mounted with nozzles which then spray water under low pressure at 1.2 bar over the backs of the cows at an angle of 180° and 360°, respectively. A spraying pattern with a jet of max. 2.40 metres is optimal to prevent the cubicles from getting wet.

Our DCC-Touch Climate Controller comes with a unique Abbi soaking module, making it the ideal controller for this system!



Abbifan, Abbi-Apex & Abbi PV-A



stance between fans for cross ventilation [m]	Minimum side wall height for mounting without a protective grille for cross ventilation [cm]	
7	420	
5	390	

### Abbifan 140-XXP-21 The leading standard in barn ventilation!

The reliable and exceptionally energy-efficient Abbifan 140-XXP-21 features the latest direct-drive motor technology. The fan's propeller is fitted directly onto the new motor's shaft, so slipping no longer occurs. This also means that you no longer have maintenance or wear and tear on parts such as pulleys, bearings, and belt drives.

The compact motor has a built-in converter in a separately protected section of the casing. The fan comes with a 2-plug contact connection (plug and play) for fast and easy installation of power and control cables. The connector plugs are supplied as a standard with two lengths of cable; you only need to provide the central 400V power cable and a 0-10V control cable.

Compact direct-drive DC motor

#### YOUR ADVANTAGES

- Minimal air resistance with aerodynamic orifice panel made from recyclable plastic
- Highly compact DC motor with built-in electronics for precise rotational speed control
- Direct-driven Wave propeller; no slipping
- No maintenance and no wear parts
- Curved Wave propeller blades generate airflow with consistent optimal air speed
- Fully controllable with the Abbi DCC-Touch

**Result:** More air with less energy and at a lower cost!



Aerodynamic orifice panel for perfect airflow

#### PRODUCT SPECIFICATIONS

Notor:	EC DC motor with
	permanent magnet
'oltage*:	400V/3-phase
requency:	50/60Hz
flax. energy consumption:	530W
Current:	1.0A
Electronic converter:	0-10V control signal (EM
Propeller rotational speed:	500rpm
xternal dimensions:	147x38x144cm
itting dimensions:	140x38x140cm
Propeller diameter:	1219mm
Veight:	46kg
nergy efficiency label:	AA+
Sound levels:	58.1dB (Lpa 7m)
	63 1dB (I na 4m)

\* Also available in a 230V/1-phase option

1			
	Throw ler	ngth and thr	ow width
1	Throw length [m]	Air speed [m/sec]	Throw width [m]
1946	3	7.3	2
Sec. 2	6	4.9	5
	12	2.8	10
10	15	2.2	10
	18	1.8	10

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100		Applian	140-AAP-21 energy con	isumption		
1	Ventilation capacity [%]	Control signal [Vdc]	Rotational speed [rpm]	Energy consumption [W]	Current [A]	
~!	100	9.8	500	530	1.0	
-	75	7.5	413	313	0.7	
Pa	50	5.3	315	148	0.4	
11	25	3	214	53	0.2	
to Ale	10	1.6	150	24	0.2	1
1. 9						-

### **Savings**

A proper ventilation system in your barn, complete with energy-efficient, direct-driven fans and full-automatic control, can easily cost you  $\in$ 1,500.00 per fan. That sounds like a lot of money, but this is a one-time expense.

It is not only the investment itself that counts but also the daily costs associated with it. This extremely energy-efficient Abbifan 140-XXP-21 can easily provide savings of anywhere from €200.00 up to €350.00 per fan per year! With an energy consumption of just 0.53kWh at its highest setting as opposed to no less than





"The new Abbifan 140-XXP-21 dairy fan is extremely energy-efficient.

And yes, we're very proud of that!"



#### nergy consumption

1.1kWh by the 'cheaper' fans on the market, this will lead to savings of  $\in$ 313.00<sup>\*</sup> per fan annually. And if we increase the kW/h price by 3 cents, your savings can amount to up to  $\in$ 356.00 per fan each year!

Your return on investment is faster thanks to savings on your daily costs plus the maintenance costs you save on not having to replace bearings, belts, or pulleys.

\* Based on an assumed price of €0.22 per kWh.

# **The ideal solution for barns with low ceilings!**

The Abbi-Apex 36-AXP-21 is designed explicitly for barns with lower ceilings. With this smaller model in the XP family, we can

The highly energy-efficient Abbi-Apex 36-AXP-21 uses only 5W/0.2A at its lowest speed setting (100 rpm)! The fan is equipped with the same direct drive motor and controller technology as the Abbifan 140-XXP-21. The orifice panel and the propeller are also manufactured using the same principles.

offer you a comprehensive range of energy-efficient fans to meet

the ventilation needs of every dairy farm.

The electronic converter also comes with a 2-plug contact connection (plug and play) for fast and easy installation of the supplied power and control cables.



- Minimal air resistance with aerodynamic orifice panel made from recyclable plastic
- Highly compact DC motor with built-in electronics
- for precise rotational speed control
- Direct-driven propeller; no slipping
- No maintenance and no wear parts
- Curved propeller blades generate consistent airflow
- Fully controllable with the Abbi DCC-Touch



Throw length and throw width			
Throw length [m]	Air speed [m/sec]	Throw width [m]	
3	4.8	1.5	
6	3.2	3	
12	1.9	7	
15	1.2	7	

#### **PRODUCT SPECIFICATIONS**

lotor:	EC DC motor with
	permanent magnet
oltage:	400V/3-phase
requency:	50/60Hz
lax. energy consumption:	391W
lax. current:	0.8A
ectronic converter:	0-10V control signal (EMC)
ropeller rotational speed.:	max. 580rpm
xternal dimensions:	112x39.5x112cm
tting dimensions:	103x39.5x103cm
ropeller diameter:	900mm
/eight:	26kg
nergy efficiency label:	AA+

Abbifan 140-XXP-21 energy consumption				
Ventilation capacity [%]	Control signal [Vdc]	Rotational speed [rpm]	Energy consumption [W]	Current [A]
100	9.8	580	391	0.8
75	7.5	475	224	0.5
50	5.3	360	109	0.3
25	3.0	238	38	0.2
10	1.6	163	19	0.2

### Abbi PV-A Gelling fans

Abbi PV-A Ceiling fans come equipped with a direct-drive, permanent-magnet motor. The rotor is fitted directly onto the motor's shaft, so additional transmissions are no longer needed. This leads to far less energy loss and ensures slipping is a thing of the past!

The aluminium rotor blades are designed to create a downward airflow.

The connections and controls are the same as those used for the Abbifan and the Abbi-Apex fans. As this modern drive technology makes the use of frequency controllers completely redundant, other electronic systems in your barn, such as cow recognition systems and DECT telephony are not disrupted in any way by the Abbi fans!

The fans come with safety suspension cables. The rotor blades are secured by a reinforced rotor blade hub.



Specially formed rotor blade for downward airflow

#### YOUR ADVANTAGES

- Extremely energy-efficient due to the latest direct drive motor technology and minimal air resistance
- DC motor with built-in electronics for precise rotational speed control
- Direct-drive motor, so no slipping
- Always a suitable type for your barn
- Enormous capacity thanks to extra wide rotor blades
- Almost silent due to low rotational speed
- Fully controllable with the Abbi DCC-Touch

Other specifications per type	PV2500-A	PV3000-A
Rotor diameter [mm]	2,500	3,000
Energy consumption at max. setting [W]	792	834
Current [A]	2	2.23
Rotational speed at max. setting [rpm]	210	160
Sound level [dB(A)]	60	60
Weight [kg]	82.5	86
Capacity* [m³/h]	210,000	310,000
Max. distance between fans in the barn [m]	7,5	9

\* Measured at 4.5 metres above floor level





#### **PRODUCT SPECIFICATIONS**

#### Motor:

Voltage: Frequency: Electronic converter:

Number of rotor blades: Mounting height: Safety: EC DC motor with permanent magnet 400V/3-phase 50/60Hz 0-10V control signal (EMC) 5 (aluminium) 4 - 6.5m Suspension cables and reinforced rotor blade hub

PV4000-A	PV5000-A	PV6000-A	PV7000-A
4,000	5,000	6,000	7,000
840	806	946	793
2.15	2	2.4	2.1
100	80	66	50
55	45	45	45
94	113	132	140
370,000	530,000	670,000	890,000
12	15	18	21

## Appi DCC-Touch

The easy-to-use Abbi DCC-Touch is the newest generation of climate controllers that comprehensively regulates and optimises the climate conditions in your barn. DCC-Touch boasts many convenient features, such as a touchscreen and a perfect combination of various functions.

Meanwhile, we have expanded the available options with convenient functions. These new features are another step towards advanced functionality and ease of use!

#### The DCC-Touch Climate controller's new functions include:

#### • Programmable time switch

4 time switches/group/24 hours offer you ample flexibility in setting your cooling options. This is exceptionally convenient:

- · When grazing at set times. This prevents the fans from turning long after the cows have already gone outside. And prevents them from switching back on too late when the animals return to the barn.
- Around milking times. Switch on the fan(s) in the waiting area 30 minutes before milking, for example. This keeps the temperature comfortable and ensures that the cows enter the milking parlour free from flies.

#### • Unique soaking procedure

With many systems, the fans only switch off once the soaking program is switched on. This means the water is sprayed from the nozzles while the fans are still winding down!

Our new intelligent soaking procedure does this differently; it makes the DCC-Touch unique! This feature switches off the fans 30 seconds before soaking starts. By the time the soaking starts, the fans' propellers will have reached a full standstill. This prevents the sprayed water from being dispersed and disrupting the spraying pattern. The fans are automatically switched back on immediately after soaking.

#### • Overview of operating hours in one chart.

With just one overview, a simple chart will show you the number of operating hours and the ventilation percentage capacity per fan group.

#### **PRODUCT SPECIFICATIONS**

Analogue inputs:	3 (2x temperature and 1x humidity)
Analogue outputs:	2 (adjustable groups)
Digital inputs:	1 (wind speed sensor)
Digital outputs:	2 (fan run-stop/misting/ soaking)
Alarm relay:	1
Connection voltage:	110-240Vac-50/60Hz
Output voltage:	24/12Vdc
Dimensions:	204x229x116mm
Protection class:	IP54
Working temperature:	0-45°C

#### **Optional:**

• Sensors for temperature (for an additional group), humidity and wind speed

#### YOUR ADVANTAGES

- Fully automated control of fans, misting, and soaking systems
- Management options available based on the THI
- Control of fans in two separate groups
- Built-in modules for misting and soaking
- Easy operation through a touchscreen with icons
- Easy-to-read real-time values
- Overview of operating hours at a glance
- temperature sensor
- Easy installation



Setup times for desired function



"DCC-Touch is the smart and comprehensive climate controller for your barn."









### Abbi Tube ventilation

Fresh air and a draught-free environment are of vital importance to calves. A disrupted barn climate resulting from a combination of volatilisation, body heat, exhaled air and humidity can be disastrous. This can lead to severe illnesses and impaired growth and development, which later results in lower yields for the dairy cow.

Tube ventilation was explicitly developed to provide fresh air to calves and young cattle in barns. This system draws fresh outside air into the air tube through a fan in the wall. The air is then dispersed through holes in the tube using overpressure. The holes are precisely calculated at Abbi-Aerotech to obtain a comprehensive overview of how the air is distributed and to prevent draughts and downdraughts from forming. The holes and the size of the holes are customised according to the conditions in your barn.

Tube ventilation is also an alternative for supplying fresh air and cooling in dairy barns with low ceilings. In low-ceiling barns or areas, fan placement can sometimes prove too complicated, or the air speed may be too great. For example, this system can provide a great solution in milking parlours.

#### YOUR ADVANTAGES

- Healthier calves, reduced medicine use
- Improved growth and development
- Optimal air distribution without draughts
- Draws fresh, outside air into the barn
- Improved air quality
- No condensation due to fabric air tube with micro-
- Comprehensive, adjustable system
- Functions independently of weather conditions
- Easy and guick installation
- Single or double suspension
- Zippers at every 5 metres of tubing
- Washable at 40°C

#### **PRODUCT SPECIFICATIONS**

Fan type:

Fabric type:

Fabric thickness: Permeability: Tensile load: Fire class:

Variable, depending on the diameter and length of the air tube PMS, 100% polyester with round inlet collar and zipper 0.30mm 22m<sup>3</sup>/h/m<sup>2</sup> bij 50Pa 1830/1020N B-s, d0 in accordance with EN 13501-1+A1:2010

Air tube with pre-calculated hole pattern

### Appi Multi Unit

The Abbi Multi Unit for milking parlours has an integrated fan and draws fresh outside air into the milking parlour. The air can be directed in six different directions for optimal cooling through a unique distribution unit with adjustable valves.

The Multi Unit is usually suspended from a central point in the milking parlour. The air can be aimed directly at the cows or horizontally in all directions. In this case, the effective surface area is 100m<sup>2</sup>. This improves the climate conditions in the milking parlour, cools the cows and chases away flies. The desired air speed can be adjusted with a manual controller.

The Multi Unit is also a great solution in dairy barns with low ceilings or in musty corners of the barn where working with fans is not a suitable option. An example of such a situation might be low-ceilinged parts of an old barn adjacent to a new barn.

#### Extra cooling through misting

For misting (see also page 5), the Multi Unit has a ring with nozzles. The ring is connected to a high-pressure pump to produce very fine droplets. This method can decrease the air temperature by as much as 8°C.

#### Heating

A heating element can also be built into the Multi Unit, creating a frost-free environment in the winter.

#### **Recirculation**

Fresh outside air is usually drawn in through the air duct before being distributed in the milking parlour. You may also choose to recirculate the air, in which case, an additional 50-60cm of mounted duct should be sufficient.



#### YOUR ADVANTAGES

- Fresh air in the milking parlour and the dairy barn
- Keeps the animals and the milker free from flies
- Misting option
- Heating option
- Air recirculation option





#### **PRODUCT SPECIFICATIONS**

Distribution unit:	6 outputs (plastic) with adjustable valves (stainless steel)
Air displacement:	10,400m³/h
Voltage*:	400V/3-phase
Frequency:	50Hz
Max. energy consumption:	570W
Max. current:	1.4A
Propeller rotational speed.:	max. 920rpm
External dimensions:	830x860x535mm
Duct diameter:	63cm
Duct length:	1m (recirculation) or 3m with roof vent and rain cap

\* Also available in a 230V/1-phase option

# Abbi-Aerotech's

#### Abbi-Aerotech B.V. has been developing and producing aerodynamically-shaped, energy-efficient fans specifically for dairy farms for decades. For every animal and barn type, Abbi has the best ventilation solution to prevent heat stress, improve air quality, and promote animal welfare.

Under Eric Bussem's daily supervision, an enthusiastic team designs, develops, produces, and markets the best ventilation concepts and most energy-efficient fans with the latest motor and control technology. The team is a fine combination of agricultural, technical, and commercial experts; people who know everything there is to know about cows, farmers, and ventilation concepts! Eric continues to work in day-to-day operations to keep abreast of the latest developments.

"You know what's going on, and you get an immediate sense of the needs that are out there from the market. Issues, experience, knowledge, and vision from dealers and dairy farmers play a role in forming the basis for innovation and development at Abbi. To maintain flexibility and supply a high-quality, technical product, we do everything in-house and work only with well-known suppliers."

### "Do we want to be the biggest?

### Not that per se, but certainly the best and the most economical!"

In 1990, Eric's father, Aalbert, established the business and bought a license in the United States to produce ventilation systems. He eventually developed, together with a Belgian university, an affordable fan with optimal aerodynamics and recyclable plastic orifice panel. The business consequently invested in large moulds to make the frames in-house. Aalbert is currently involved in the company as a consultant and walking encyclopaedia; he can regularly be found giving ventilation advice to customers on-site.



Do you have any comments, ideas, or questions?

duced in 2007, Abbi-Aerotech has develo-





#### Your Abbi-Aerotech dealer:



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