

Energy-Efficient Ventilation for Pig Production



Energy-Efficient Ventilation

Ventilation is a must when it comes to creating a healthy livestock house environment and providing optimal conditions for the animals. SKOV has been working with climate and production management for more than 40 years and is constantly striving to develop new high-quality systems that ensure animals the best conditions while at the same time keeping energy consumption to a minimum.

Good house climate depends on many factors, including a supply of fresh air into the building and that the air enters in the most suitable way. It is equally important to get the stale air out of the building. Exhaust units and fans are required to be able to draw air out of the house; these are regulated by means of a climate computer that works according to an exhaust principle.

Low energy consumption without compromise

SKOV operates with two exhaust principles: MultiStep and the more energy-friendly Dynamic MultiStep. What they have in common is that they both significantly reduce energy consump-

tion for ventilation without any negative consequences for the animals in the livestock house. A regulating principle does not achieve this on its own, so SKOV has developed chimneys and fans that are optimally designed to jointly comprise an energy-efficient exhaust unit.



The robust chimney for flexible solutions

In a SKOV ventilation system, air is let out through chimneys or wall fans. SKOV has many years of experience in developing robust and efficient exhaust units.

Aerodynamic and effective

The aerodynamic chimney was developed for maximum air output at low energy consumption levels. SKOV delivers ventilation solutions for animal production worldwide, and therefore we

give effort to the fact that our solutions be usable under all climatic conditions. The chimney is particularly robust under all weather conditions and has a very long service life.

Customised for your building

SKOV's chimneys can be used on virtually any type of livestock house and can be adjusted to fit individual buildings with respect to roof pitch, type and placement. The placement of chimneys on the

building can vary, depending on custom and regulations in the given country. On many markets, such as in Denmark, the building style has always been to place the chimney on the roof, either on the side of the roof or on the ridge of the roof. In other parts of the world, exhaust is mounted on the side of the buildings. The chimney works with whatever placement is required.

Dynamic Air - high well-being and low heating costs

Heavy winds have always been the number one enemy of minimum ventilation. Strong winds make it difficult to maintain sufficient and constant minimum ventilation. This is why SKOV has developed Dynamic Air, a system for continuous measurement of air output in exhaust units, which ensures improved minimum ventilation and reduced heat consumption for the grower.

The Dynamic Air sensor is a manometer measuring the pressure difference between the livestock house and the exhaust unit. This information is combined with other data in the computer, and with this as a basis the computer calculates the airflow through the chimney.

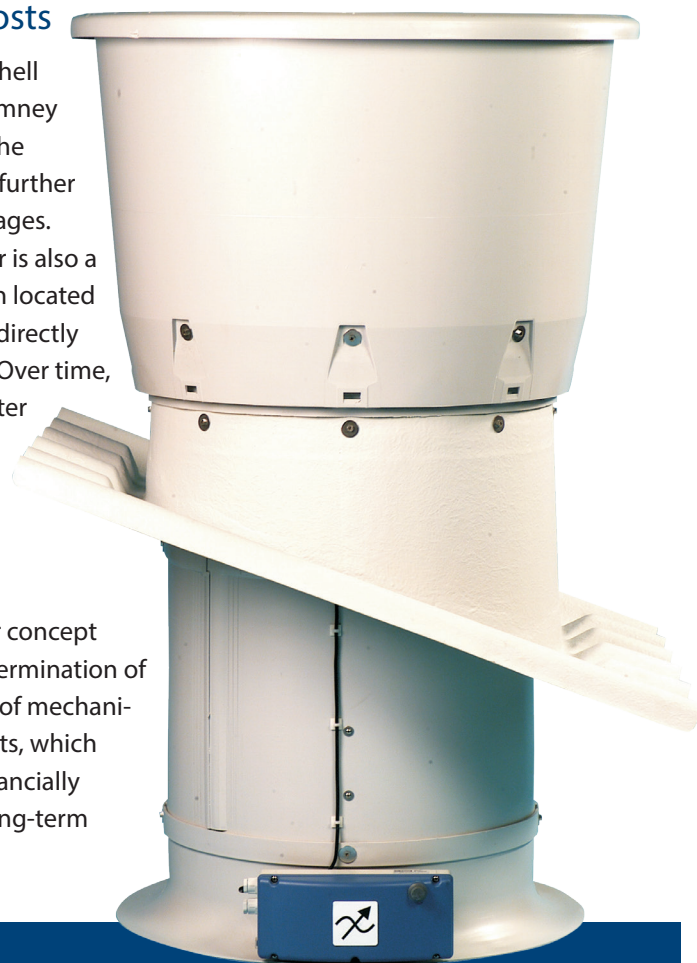
The Dynamic Air measurements constantly make allowances for any pressure drop that may occur because the exhaust unit is exposed to too great wind impacts, and therefore the fan can be adjusted closer to the actual need.

No mechanical weaknesses

A mechanical fan wheel anemometer is the most commonly used technique for measuring airflow. However, a fan wheel anemometer causes some resistance in the exhaust unit, which reduces the output of the unit. Experi-

ence shows that a fan wheel anemometer lowers chimney performance, and that the performance decreases further when the anemometer ages. A fan wheel anemometer is also a mechanical construction located in a harsh environment directly inside the exhaust unit. Over time, the fan wheel anemometer will measure less accurately because of wear, and in the worst-case scenario, it will break.

Overall, the Dynamic Air concept offers a very precise determination of airflow without any use of mechanical, movable components, which makes it reliable and financially attractive and gives it long-term stability.



- Aerodynamic and optimised in relation to the LPC fan
- Maximum air output at low energy consumption
- Robust under all weather conditions
- Can be adapted to virtually any livestock house
- Available as Ø600 and Ø920 in two colours, and can be supplied with extra accessories such as drip trays and environment module



Effective and energy-efficient solution with LPC fans from SKOV

SKOV has developed a series of energy-efficient fans that are especially suited for ventilation of livestock houses and that are optimised to work with SKOV's ventilation systems and chimneys.

The fans have a high level of pressure stability, and it is therefore less sensitive to wind than, for example, frequency-controlled fans, which are often used as low-energy fans in many livestock houses. The high pressure stability of the fans is very important when using minimum ventilation, where strong wind action can severely affect the air volume and through this animal well-being as well as the heating cost.

Save money and protect the environment

With LPC fans from SKOV the consumption of power is significantly reduced, as far less kWh per unit and year is used. Lower energy consumption has at the same time a major impact on CO₂ emissions. For each LPC fan that is installed, CO₂ emissions are reduced by approx one ton per year.

- Efficient motor - even at lower RPMs
- More pressure stable
- Less sensitive to wind
- Motor, regulating unit and fan blades developed and optimised for SKOV's chimneys
- Low-noise



- Major energy savings
- Optimal climate for animals in the livestock house - also at minimum ventilation
- Less noise in the livestock house
- Short payback period



Two generations of regulation principles to ensure you major energy savings

SKOV has developed two exhaust methods — MultiStep®, launched back in 1997, and Dynamic MultiStep®, introduced to the market in 2009. What they have in common is that both help significantly reduce energy consumption for ventilation with SKOV's LPC fans and chimneys.

What is the difference?

The difference between the two principles is that MultiStep provides continuously variable regulation from 0-100%, while the other fans are connected in groups as needed.

Dynamic MultiStep, which is a further development of the MultiStep concept, is entirely unique. The fans are still connected in groups, but run only up to 50% of their output. Once all the fans in the group are connected, they are all regulated in parallel up to 100% of their output when additional ventilation is required. The advantage is that the fans have a very low level of power consumption at low RPMs, while consumption increases significantly when the fan is running at maximum performance.

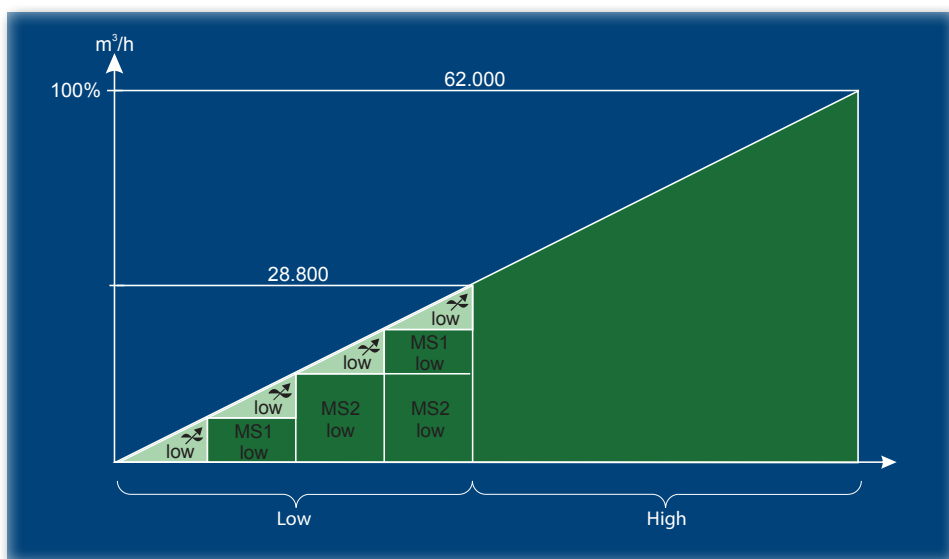
Which solution to choose

Whether to choose MultiStep® or Dynamic MultiStep® depends on several factors - including, for example, climatic conditions, existing ventilation solution and investment profile.

Dynamic MultiStep is the solution that presents the greatest energy savings. In fact, the energy consumption in finisher pig production can be reduced to 6-10 kWh per pen place annually. On the other hand, Dynamic MultiStep is a larger investment than MultiStep; however,

from an economic point of view, it is most advantageous to invest in Dynamic MultiStep in connection with building new livestock houses, carrying out a complete renovation of a ventilation system, or when working with an older system using triac and parallel operation of the exhaust units.

If you already use the MultiStep method you can invest in replacing variable fans with new LPC fans to further increase energy efficiency.



Example of Dynamic MultiStep® with four DA 600 LPC chimneys.

Research Centre for Pig Production tests MultiStep® and Dynamic MultiStep®

The Research Centre for Pig Production (VSP) has studied the yearly energy saving when using low energy fans together with MultiStep® and Dynamic MultiStep®. The study was carried out in two identical and parallel sections in a Danish livestock house unit with 400 finishers in each. After a period of eight months, the energy consumption in the section with Dynamic MultiStep® was **56%** less than in the section with MultiStep®. VSP is about to finish the study, and it can be expected that the total savings will be somewhat lower when including the warm summer months in the study.

Is the climate the same?

The only difference that was noticed in the two sections was a lower noise level in the section that was fitted with Dy-

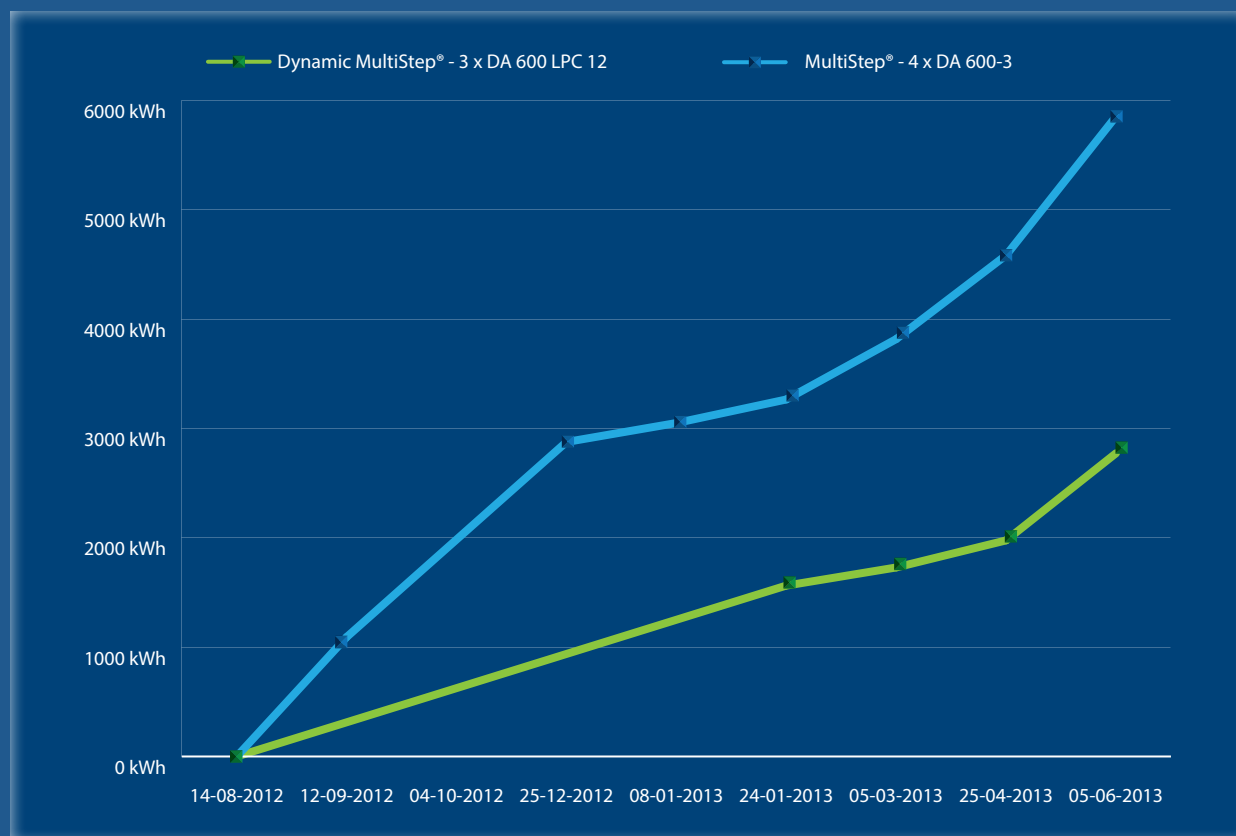
namic Multistep®. The lower noise level is especially beneficial for the working environment in the livestock house.

Not convinced?

If you are planning on replacing existing exhaust units, making building renovation or new build, please contact SKOV and let us find the optimum solution together. Regardless of whether you choose MultiStep® or Dynamic MultiStep®, the animals in the house are ensured a stable and optimal climate, and electricity costs will also be dramatically reduced at the same time.



Energy consumption with MultiStep® and Dynamic MultiStep®

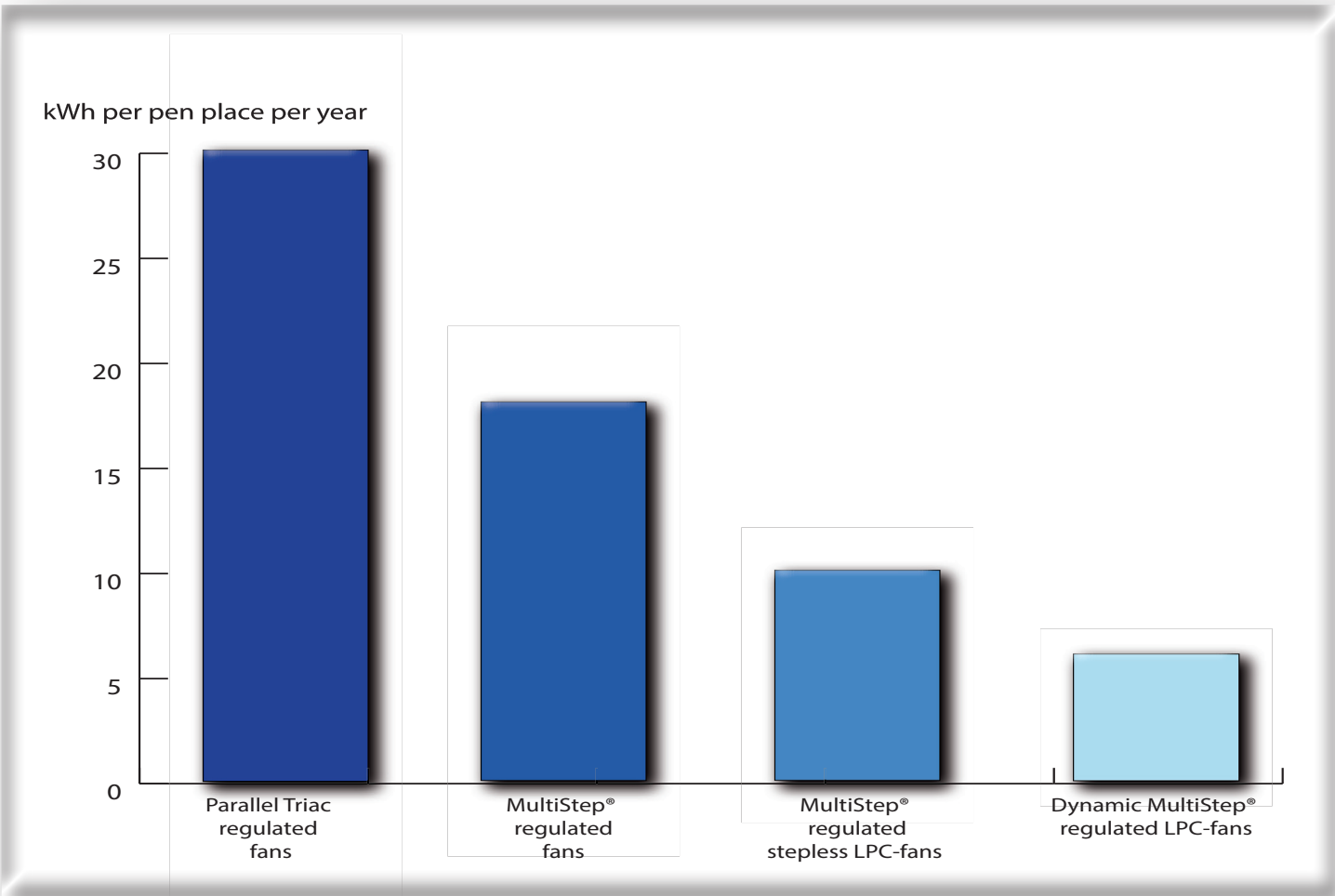


Avoid being deceived by claims of high percentages

The following table/graph shows the historical development of fans, and how they have become increasingly energy-friendly over time. If investments in new exhaust units are planned, it is important to be aware of

the basis for comparison used before selecting a supplier. We often see customers who are promised even higher energy savings than what we offer, but a review of the numbers often reveals that the high savings are achieved by

comparing the proposed system with an outdated triac-regulated unit, which is a misleading basis for calculation.



Which regulating method should you choose?

	Dynamic MultiStep®	MultiStep®
Building a new livestock house	X	
Renovation of existing livestock house		X
Replacement of an older triac system with parallel operation	X	

Not convinced?

The figure to the left shows when it is financially most advantageous to change to either Dynamic MultiStep or MultiStep. Contact SKOV if you are planning to replace existing ventilation units, renovate buildings or carry out new construction - we can find the optimal solution to meet your needs. With MultiStep or Dynamic Multi-Step, the animals in the house are ensured a stable and optimal climate, and electricity costs will also be dramatically reduced at the same time.

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