

PF Variable Pitch Axial Fans

Ultra-robust technology for durable, controllable performance



The outstanding aerodynamic performance of Howden PF fans has been developed by listening to customer needs, and proven in the most demanding applications.



Howden Axial Fans is a global centre of excellence for the development, design and engineering of variable pitch axial fans. We have been at the forefront of the technology since the earliest days of its development, and we continue to lead the world in raising energy efficiency, improving reliability and reducing lifetime costs for our customers.

A world-leading supplier of air and gas handling technology of all types, Howden was founded more than 160 years ago and is today an international organisation with bases in 27 countries spread across every continent.



Reduced energy demands bring reduced operating costs and environmental advantages

The Howden PF range of single and two-stage adjustable pitch axial fans provides exceptional energy efficiency across a wide operating range.

By using an integrated hydraulic control system to vary the blade angle while the fan is in normal operation, performance can be instantly matched to changing demands while the fan is running at a constant speed for maximum economy.

Featuring a compact design that offers exceptionally fast, straightforward on-site installation, PF fans are easy to maintain, and offer outstanding economy. They are the optimal choice for induced draught, forced draught, primary air and booster fan for boiler applications up to the highest power ratings.

All Howden PF fans comply fully with the relevant national and international regulations, and we are fully accredited to ISO 9001 quality

management, ISO 14001 environmental management and OHSAS 18001 occupational health and safety standards. Our most important benchmark, however, is customer satisfaction. From the initial contact, agreement of specification, cost and schedule, through delivery installation and commissioning to our dedicated lifetime aftermarket support, we have a track record of exceeding expectations.

Worldwide presence, worldwide service

More than 600 Howden PF fans are already providing reliable, efficient service in applications throughout the world, each one designed to meet a unique set of circumstances and demands.

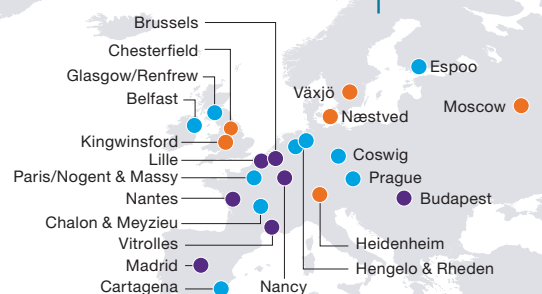
North America

69 installations



Europe

244 installations



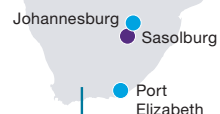
South America

2 installations



Africa

23 installations



Map key

- Sales office
- Site with no manufacturing
- Site with manufacturing

We have supplied high-speed PF fans with a tip speed of 195 metres per second. We have installed fans with impeller diameters up to 4500mm. Some fans are running continually in ambient temperatures of up to 200°C and we have, where necessary, provided the capability of unimpaired operation in temperatures as high as 400°C.

Our job is to provide the fan that delivers the performance you need, and goes on delivering it for decades.

Howden's global presence and wide experience brings enormous benefits. It means that every customer, in every part of the world, has access to state-of-the-art knowledge backed by leading edge research and development. A field engineer in any location has instant access to more than a century of accumulated specialist expertise, and every customer enjoys the reassurance of having responsive local support on hand whenever required.

Secure, ethical supply lines

We also have dedicated teams working throughout the world to keep our supply chain secure and to take advantage of local trading conditions to ensure we can meet all our schedules at the lowest possible cost to our customers. While we ensure that our suppliers meet our demanding quality criteria as well as the highest ethical and environmental standards, we know that a global purchasing capability can bring substantial financial benefits.

Asia

244 installations



Oceania

64 installations

Over 600 installations worldwide



Samisaari coalfired power station, Helsinki, Finland.



Uppsala Combined Heat and Power Plant, Vattenfall AB, Sweden.

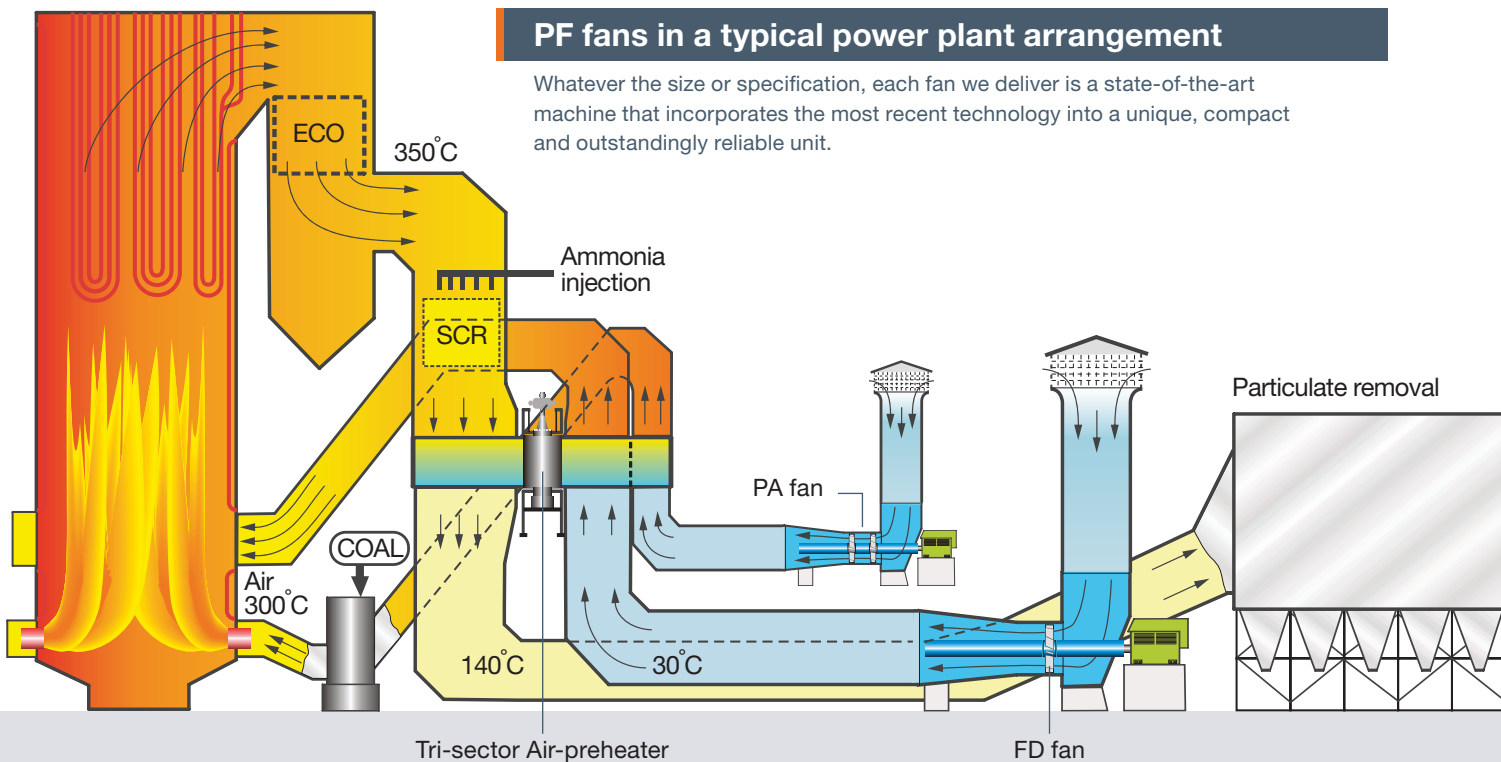


Uppsala Combined Heat and Power Plant, Vattenfall AB, Sweden.

Custom designed for precision performance

Every PF fan is individually designed to provide the best aerodynamic performance across the operating range defined by the customer. We can draw on a wide choice of impeller diameters, hub sizes and drive speeds to provide the optimum configuration for the defined duty spectrum.

BOILER

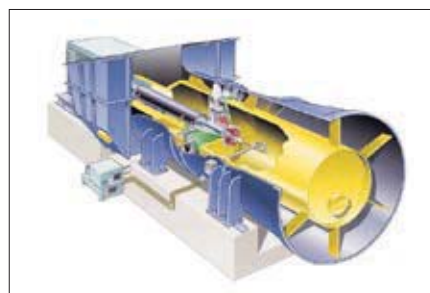


PF fans in a typical power plant arrangement

Whatever the size or specification, each fan we deliver is a state-of-the-art machine that incorporates the most recent technology into a unique, compact and outstandingly reliable unit.

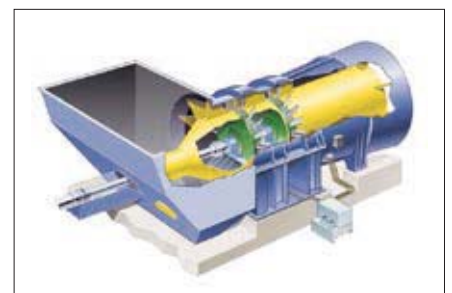
Howden PF fans are designed for process-critical roles in industries like power generation, where absolute dependability is essential.

Today's PF fans are the product of decades of continual evolution. Fans installed many years ago are still in constant operation in power stations and other applications throughout the world. While they go on providing excellent, dependable service year after year, in many cases we have installed upgrades to bring the specification into line with today's demands for greater energy efficiency and lower running costs at a fraction of the cost of installing a new fan. In addition to their value in the critical primary air (PA), induced draught (ID) and forced draught (FD) fan duties in a power station, PF fans are widely used in ancillary positions including fluid gas desulphurisation and selective catalytic reduction systems, where their inherent fuel economy makes an important contribution to reducing environmental impact.



PFS single-stage fans

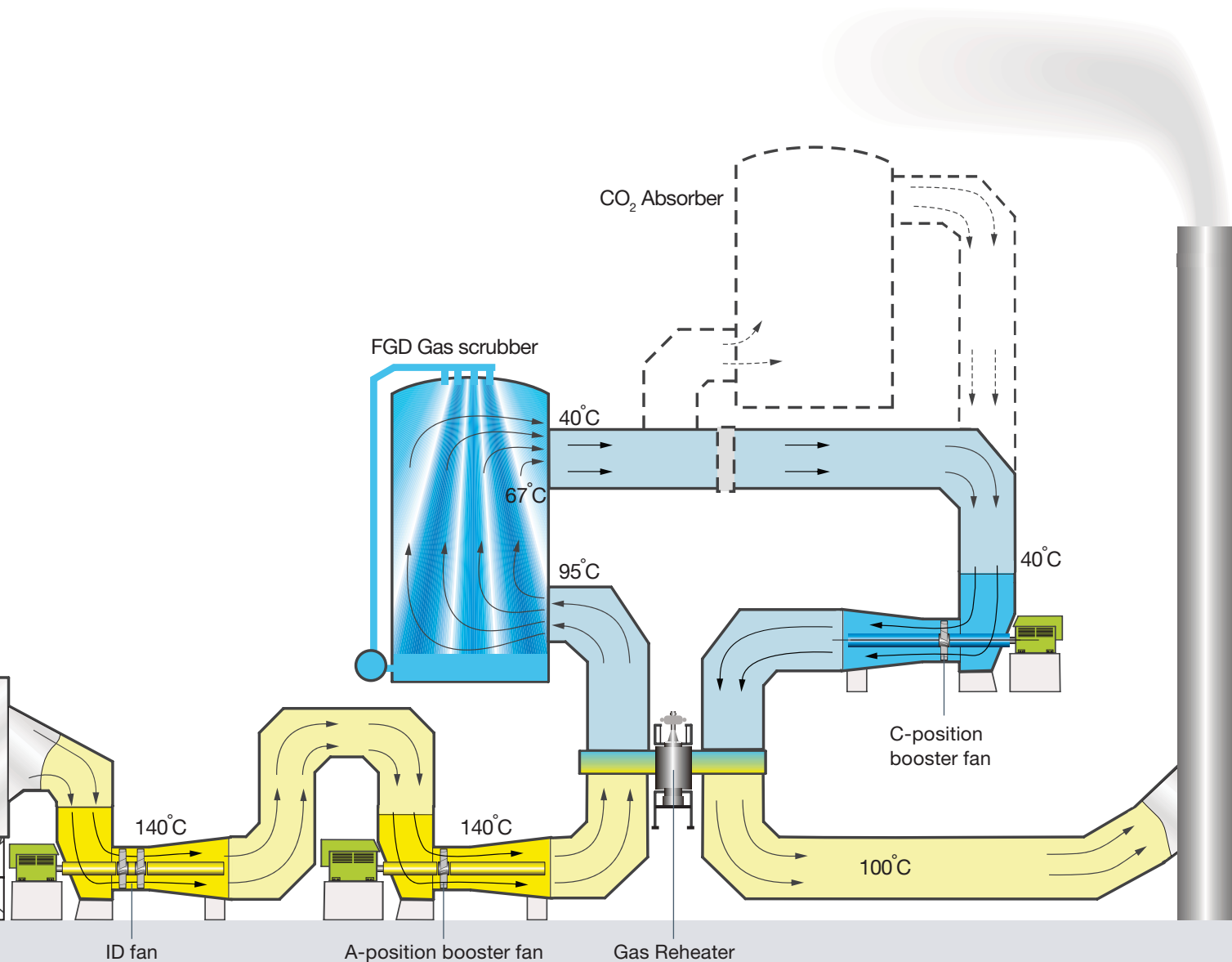
Single stage PFS fans are capable of delivering volumes of 1000m³/s at up to 15 kPa. They incorporate oil-lubricated shaft bearings that have been designed as a separate unit that facilitates fast, problem-free servicing or repair.



PFT two-stage fans

With two impellers mounted on a common shaft, separated by an arrangement of guide vanes, the PFT fan can deliver volumes of 1000m³/s at up to 30kPa, doubling the pressure available from the single stage unit.

The compact arrangement not only minimises the overall dimensions of the fan, the use of the shortest practical shaft length also provides the rigidity required to eliminate the possibility of vibration and resonance problems arising.



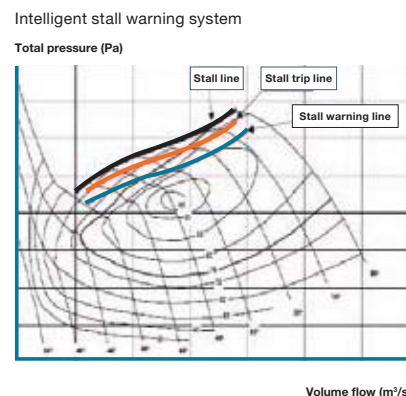
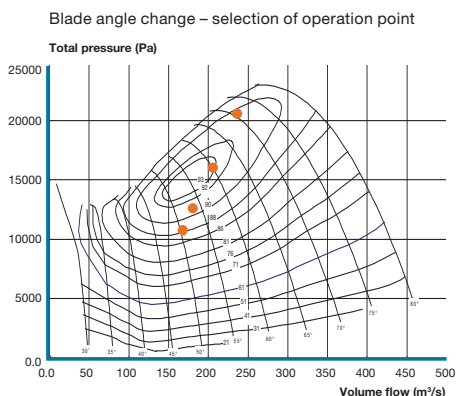
Stringent quality control is the key to extended, problem-free operation

We use a thorough and meticulous quality control system to ensure that every fan complies with every detail of the customer's specification. Each individual component is comprehensively checked before assembly, and the completed fan is methodically spin tested throughout the full range of blade angles. Significantly, we use a weld-free construction for the rotor, removing any risk of weld cracks and thus any need for time-consuming weld inspection either at the construction stage or during the life of the fan.

Our advances in science and technology would be greatly devalued by any lapse in quality control. We are enormously proud of our hard-won reputation for engineering of the highest quality.

Intelligent blade control for optimum performance

Our hydraulic control system varies the blade angle while the fan is in normal operation, allowing performance to be instantly matched to changing demands while the drive is running at a constant speed, offering maximum economy. New angles are transmitted back to the control system, which has a built-in monitoring capability that removes any possibility of hysteresis error.



Every detail is the product of our constant search for perfection

At Howden, continuous improvement is our way of life. From fundamental aerodynamic principles to the high-quality finishing of our fans, we are striving to always deliver better, more robust and more efficient equipment.

From selecting materials to transporting and installing the finished product, we check and double-check every detail. We know that we can only stay ahead of our competitors by continuing to lead in technology, quality and service.



Simple maintenance and servicing

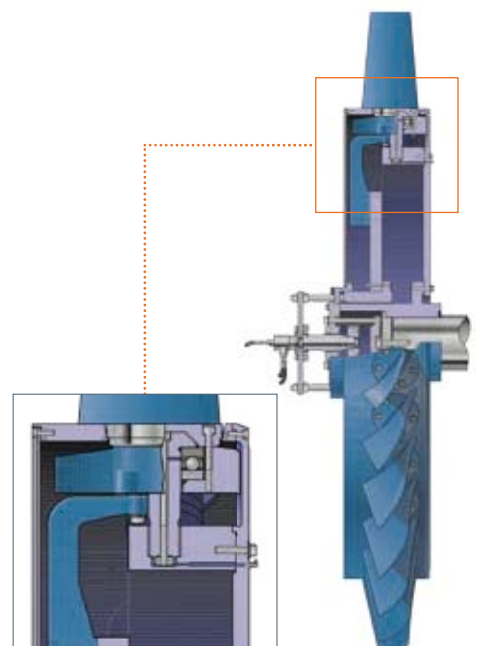
Howden PF fans are designed to give long term uninterrupted service with the minimum of maintenance. When necessary, blade bearings and the blades themselves can be checked, serviced and even replaced by removing the strategically placed inspection cover in the fan casing. There should be no need for complex, time-consuming dismantling of the unit at any time over its many decades of service.

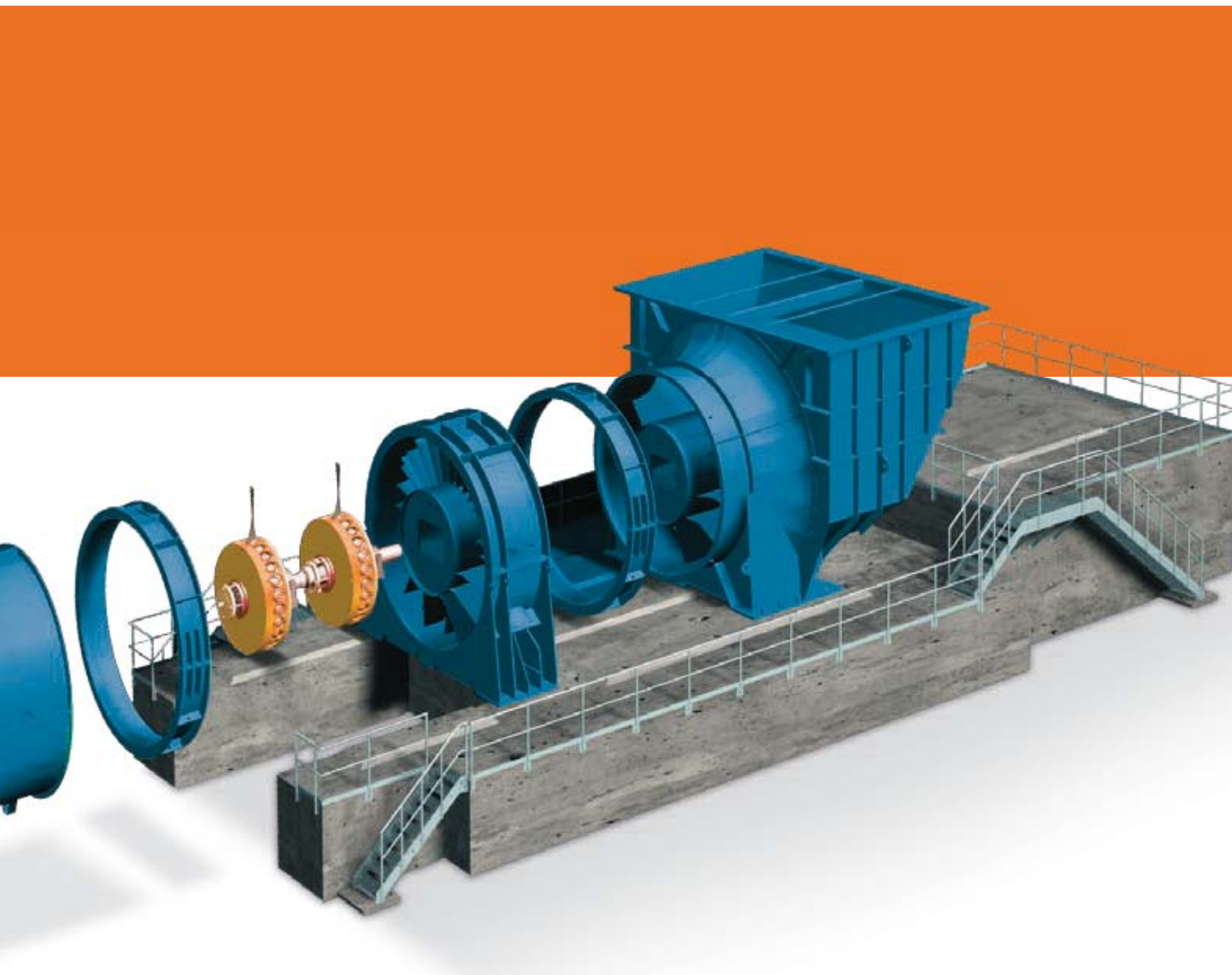


Long-life thrust bearings

The larger the bearing, the lower the concentration of the load upon it. By moving the bearings as far as possible from the centre of the impeller, we have been able to use larger bearings as standard, and so reduce wear on the bearings and extend their working life.

The bearings are lubricated using a unique hermetically sealed system that retains all the lubrication within the bearing assembly. It maintains continuous lubricant pressure, and is completely independent of any shaft seal arrangements. The arrangement not only guarantees continuous lubrication of the bearings themselves, it removes any possibility of gas or particulate matter contaminating the lubricant. By completely eliminating the possibility of contaminants impairing the effectiveness of the lubrication or, worse, damaging the bearings, this enormously practical feature can significantly lengthen the life of the fan.

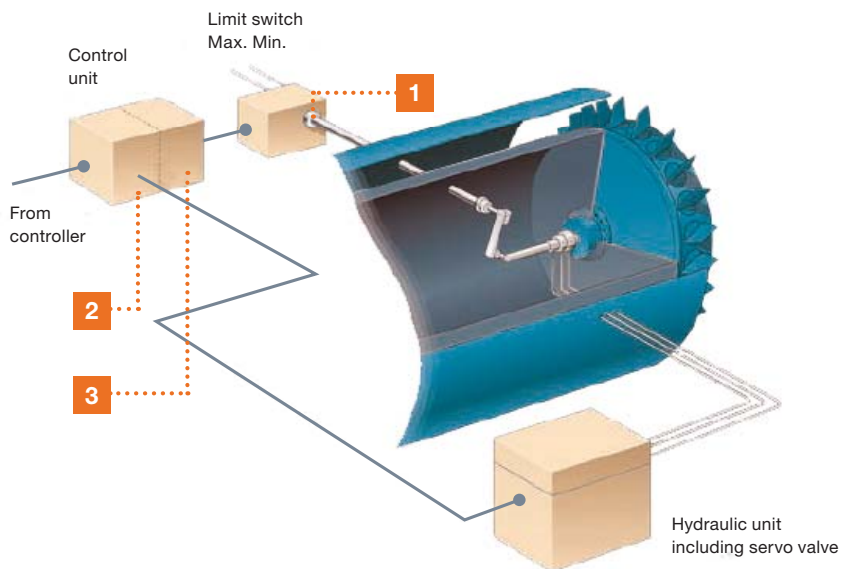




Highly accurate hydraulic control

Blade pitch in the PF fans is controlled by a hydraulic cylinder built into the impeller hub, providing instantaneous movement in response to the input signal from the control unit. The signal initiates movement in a double-acting servo valve that governs the movement of the cylinder, and that movement repositions the blades from their initial position to the required angle. The new position of the blades is then transmitted back to the control system by a feedback loop, so that the system has a built-in monitoring capability that removes any possibility of hysteresis error. The mechanism uses a stepless, infinitely variable mechanism to deliver exactly the required blade angle, and thus the precise flow required.

By reducing the number of moving parts involved in the process to a minimum, we have increased its simplicity, efficiency and effectiveness, and removed the potential mechanical problems arising in more complex arrangements.



Control system:

- 1** Positioner
- 2** Servo card
- 3** Signal converter

With every fan, we deliver a lifetime commitment

Customer service is at the heart of all our work. While we are happy to build a custom-designed PF fan to a given specification and ship it for installation by third party engineers, we prefer to offer advice throughout the process.

Because application engineering is central to our operations and our expertise, we can usually provide valuable insight into the most effective and efficient design by considering the fan within the context of its circumstances as well as its duties.

Factors like the ambient temperature range, air quality, surrounding civil engineering and ductwork and even the level of in-house fan expertise can all have an effect on performance. Sometimes, a suggested change of orientation or ductwork details can have a significant effect on the efficiency of the overall system.

Just as we are happy to become involved at the earliest stage, we welcome the opportunity to supervise or carry out the installation and commissioning process.

Essentially, we endeavour to match the service we provide to the route that offers the greatest speed, economy and convenience to our customers.

Every fan we supply comes with an absolute commitment to support, service, spares and advice throughout its working life, and a dedication to extend that life to the maximum possible extent.

We retain, as a matter of course, a full production record and detailed specification for every fan we build, so that the spares we supply are guaranteed to be an exact match for the original. In addition to the supply of spares, we can offer a full suite of on-site services from routine scheduled maintenance to troubleshooting, diagnostic investigations and emergency responses.

We firmly believe in the benefits of regular preventative maintenance, and the importance of timing inspection and servicing to coincide with the scheduled downtime of the plant. Our approach is to remain as flexible as possible, providing a service agreement that gives our customers the level of intervention they choose, at the times most convenient to them.

We can also keep customers advised about technical developments that might improve the aerodynamic efficiency of their installation. As ongoing research and development open up new possibilities and raise energy efficiency and reliability to even greater levels, we can provide fully costed proposals demonstrating how an upgrade project might lead to sufficient savings in fuel and downtime to repay its investment in a surprisingly short time.



Spare parts made for your installation



Blade bearing



Blade holder



Hydraulic cylinder



Blade



Blade cone



Blade shaft



Rotating union



Regulating arm



At the heart of your operations

Howden people live to improve our products and services and for over 160 years our world has revolved around our customers. This dedication means our air and gas handling equipment adds maximum value to your operations. We have innovation in our hearts and every day we focus on providing you with the best solutions for your vital operations.



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Revolving Around You™