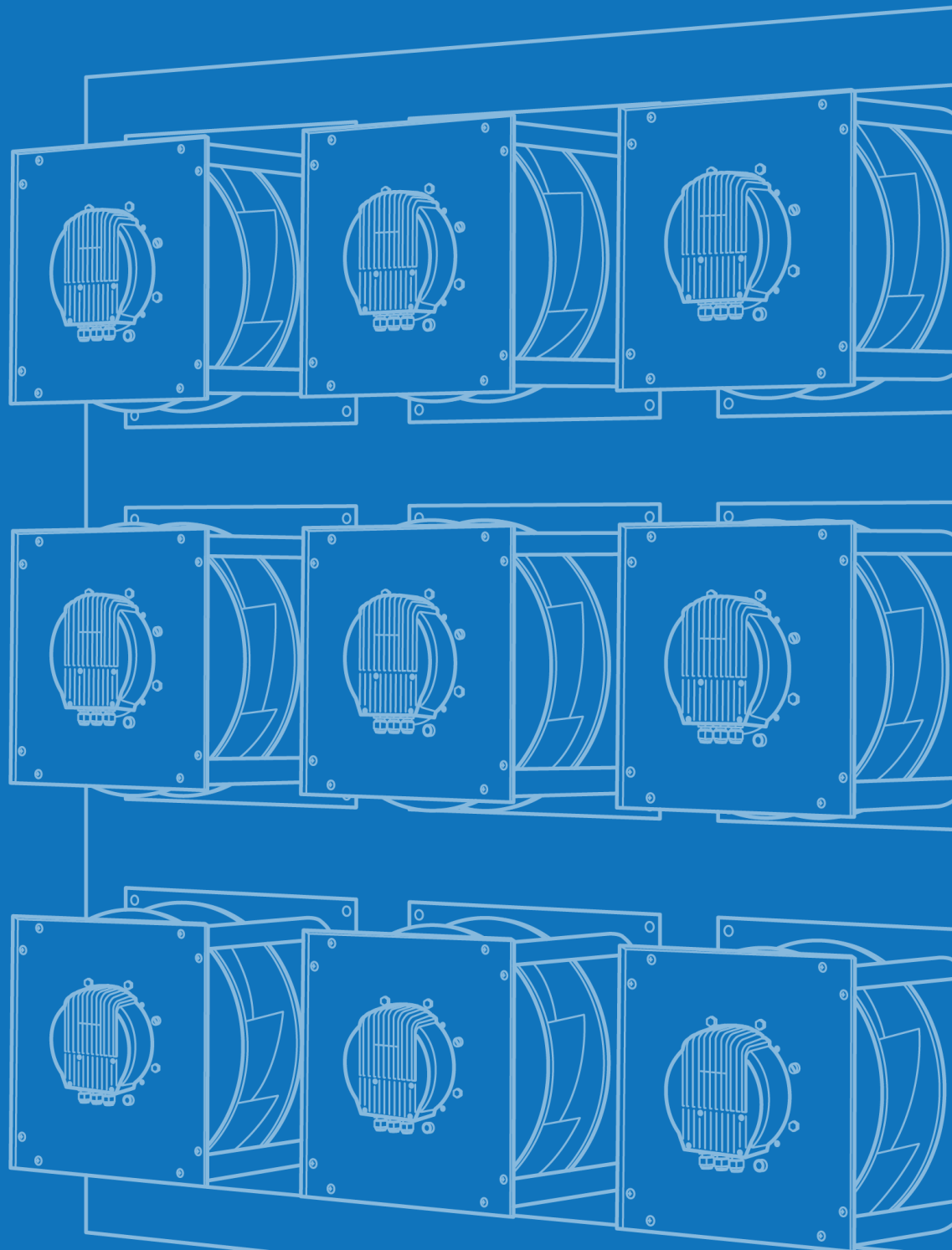


ECFanGrid

RETROFIT SOLUTIONS

Lead the way to more energy efficient buildings by providing the best fan integration retrofit solutions that the industry can offer. Featuring nine ECFanGrid retrofit case studies for reference.





What is an EC FanGrid?

Continuous and consistent airflow is essential in most facilities, making under-performing or unreliable fans simply unacceptable. In addition to reliability concerns, inefficient fans can be a buildings biggest energy consumer. An **EC FanGrid** is a multiple fan array designed to improve reliability, flexibility and efficiency in new or existing air handling systems.

Given today's economy and the increasing cause for environmental concern, designers, maintenance teams, energy managers and consultants look to select EC plug fans which will not only provide the necessary reliability, but also provide optimum efficiency and environmental benefits. In most fan systems, a single fan is selected for the required system and various methods of control are also installed to meet other operating points defined by the system duty, such as dampers.

In some instances it is advantageous to use more than one fan in a system, for example, when it is necessary for the required operating range of the system to include multiple plug fans running closer to their peak efficiencies instead of one large fan controlled over a wide operating range. Multiple fans for capacity control may be more economical if the cost of the operation is critical. By running fans in parallel when one motor fails, only one portion of the airflow is lost, unlike single fan air handlers.

Our Projects

An **EC FanGrid** consists of several modular backward curved centrifugal fans or plug fans arranged in a grid construction. Compact and flexible, the EC FanGrid is easy to clean, maintain and replace while expelling low noise and delivering a uniform air stream. A uniform air stream improves efficiency of other downstream components, for example, a thermal wheel. Our **EC FanGrid** case studies showcase some of the projects that we have undertaken to save our clients energy and CO2 on short payback periods.



Page 04-05

Technology Firm Retrofit

A total of eight EC FanGrids were used in this complete ventilation system retrofit for a leading technology company.



Page 06

Efficiency & Reliability

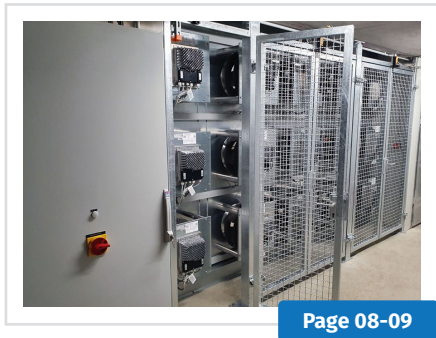
A 33 year old belt driven HVAC system was retrofitted to increase energy savings by 42%



Page 07

Air Handling in a Theatre

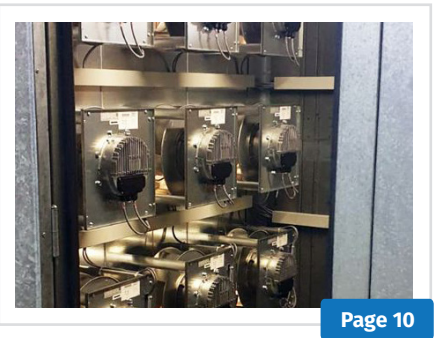
A broken blade on an old axial fan meant an urgent ventilation system upgrade. The EC FanGrid was the perfect solution.



Page 08-09

Hospital AHU Retrofit

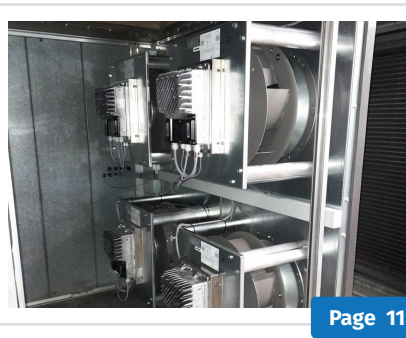
Replacing three old axial fans installed in 1975 with an energy efficient EC FanGrid solution.



Page 10

Automotive AHU Retrofit

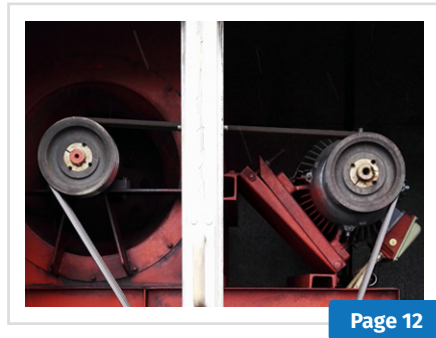
An ageing underperforming system that needed a fail-safe solution to prevent the impending complete system breakdown.



Page 11

Multiple Fans for Reliability

A bulky and efficient belt drive system that was regularly defective due to imbalance in the fan shaft system was upgraded.



Page 12

Rooftop Air Handling

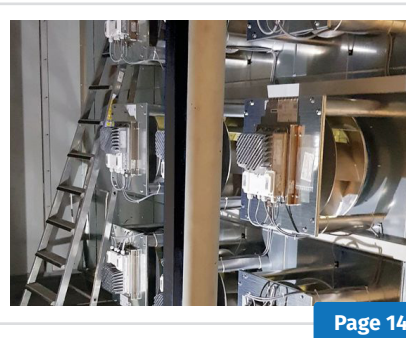
Replacement of an old twin belt drive fan that had become unbalanced over its long lifetime.



Page 13

Hotel Supply & Exhaust

A cramped room housed a very old belt driven system making maintenance a difficult task to undertake.



Page 14

Preventative Retrofit

Bulky and efficient belt driven fans with inefficient motors and an imbalance in the shaft system needed a complete overhaul.

Technology Air Handling Retrofit



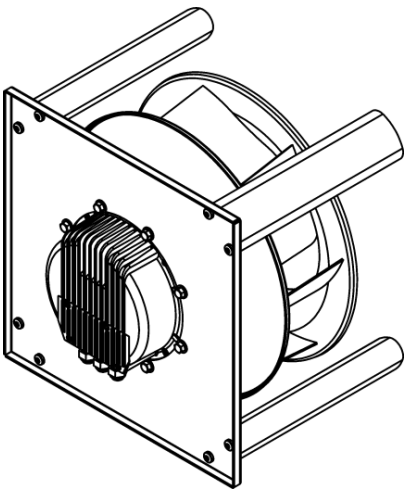
A complete ventilation system retrofit was needed for this technology company where a total of eight old belt driven fans were replaced with the efficient and fail-safe **ECFanGrid**.

Four **ECFanGrids** (3x5) with 450Ø Rosenberg EC plug fans for the supply air and four **ECFanGrids** (2x4) with 560Ø EC plug fans for the exhaust air. All fans were equipped with the latest and most powerful EC motor: the EC Generation 3+, and can achieve a total of 100,000m³/h (1000Pa) in the supply air and 115,000m³/h (800Pa) in the exhaust air.



BEFORE

AFTER: EXHAUST



MULTIPLE FANS MEANS GREATER RELIABILITY

What is Redundancy?

The air handling unit market is under constant pressure from all sides; pressure from the end user to improve indoor air quality, pressure from architects to provide more comfort and to produce more aesthetically pleasing units but also from energy consultants who demand manufacturers to deliver energy efficient units with higher airflow performance and pressures of lower installation and operating costs.

The **ECFanGrid** provides superior reliability as a result of its built-in redundancy. When using a FanGrid, fan redundancy is one of the major advantages why it is beneficial to run fans in parallel within an air handling unit. Within AHU systems a second or subsequent fan unit would be operating in parallel with the primary duty fan. Both are then sharing the demand. Should the primary fan fail, the second fan would pick up the full load to achieve the required duty by speeding up.



KEY FACT

The **ECFanGrid** kit includes all mechanical parts: fans, control cabinets, grids and screws.

ECFanGrid Benefit No 1: Efficiency

Typically 40% of a commercial buildings energy use comes from heating, ventilating and cooling with 50% of the HVAC energy consumption coming from fans. Savings as a result of moving from AC to EC occur from both improved motor efficiency and from optimising the overall system design. There is potential to achieve greater efficiency when the system's operating range includes multiple plug fans running closer to their peak efficiencies, instead of one large fan controlled over a wide operating range.



AFTER: INLET



KEY FACT

We will work with you to develop a specification that suits your requirements. A specification form can be found online. Scan above.

ECFanGrid Benefit No 2: Flexibility

The number of plug fans in each **ECFanGrid** system can vary according to the airflow requirements. For example, in a wall of nine fans in a 3x3 configuration where only seven fans may be required for normal operations to deliver the designed duty, the eighth and ninth space can be blanked off. If the demands on the AHU increase through building expansion for example, the blanking plates can be removed and one or two fans can be added to the grid to meet the new requirements.

A Focus on Efficiency & Reliability

For a large newspaper publisher, a retrofit was carried out on a 33 year old HVAC ventilation system. Since the systems were in operation for a long service life; for over three decades, the focus was on energy savings and ensuring reliability. Both systems, each 40,000m³/h at 600Pa were equipped with an ECFanGrid. This optimally combines both aspects of energy efficiency and reliability. Thanks to the new energy efficient fans and the optimisation of the air volume for the actual demand, an energy saving of 42% was achieved.



Suitable for new projects and as a replacement for large single fans in retrofit air handling units, modular backward curved centrifugal fans or plug fans are arranged in a grid construction and offer numerous benefits over belt driven single fans.



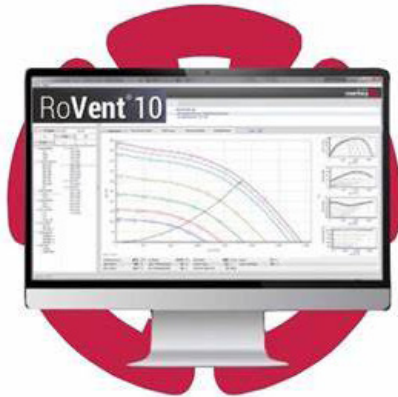
42%
ENERGY SAVINGS

Air Handling in a Theatre



After years of operation, the replacement of the old axial fan became urgent after one blade was broken. Due to the location of the equipment room in the basement, replacing the bulky fan became a challenge. For this reason it was absolutely necessary for the customer that the replacement would be much easier in the future.

The new ECFanGrid system with a volume flow of 130,000m³/h was a good choice as two people can handle all components. The installation was carried out via normal stairs and lifts to bring the material to the site. Due to the structural conditions, a service door was integrated instead of a bulkhead plate. This also reflects the flexibility of the ECFanGrid retrofit system.



Free to Download Fan Selection Software: **RoVent**

We combine knowledge of the market with customer needs and technical know how, our ECFanGrid retrofit solution is a simple, easy to assemble multiple fan array designed with energy efficiency at its core. Rosenberg Ventilations free to download fan selection software RoVent can be used to quickly and simply select the right industrial fans and ECFanGrid configuration to suite your requirements. If you would like us to specify an ECFanGrid for your application or need more information about installation please call us on 01782 349 430.

Hospital Ventilation System

The ECFanGrid was chosen to retrofit an existing ventilation system with three axial fans from 1975 for a hospital. In only five days three systems were retrofitted with an energy-efficient ECFanGrid. A special feature was the sloping installation in the existing concrete duct. Due to this, various components and inspection doors had to be individually customised. The sheet metal processing line at Rosenberg headquarters means that custom solutions are no problem.



In total 33 GKHF 450-CEG.128-6IF Plug Fans were installed

PROJECT

3 SYSTEMS

- PROBLEM:**

The old systems were inefficient and bulky.
- SOLUTION:**

The ECFanGrid allows greater control due to its adaptable design.
- PROBLEM:**

Installing a new axial fan would have meant additional building works to allow access for large components.
- SOLUTION:**

Small ECFanGrid components are easily portable through existing pedestrian doors by no more than two people.

There are many challenges presented by old air handling units that can be overcome with the use of a FanGrid. Turbulent airflow can be corrected as the grid system offers an even distribution of air velocity over the entire duct, significantly increasing efficiency. System failures cost time and money, FanGrids respond to individual fan failure quickly through built in redundancy. Noise or energy loss through sound transmission is reduced.



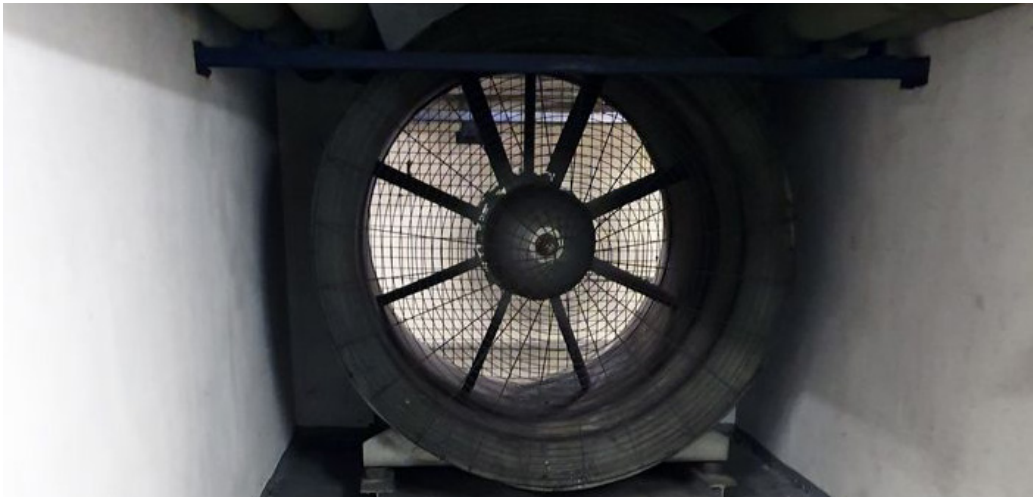
TIME TAKEN

5 DAYS

Increasing System Efficiency

The new plant now moves 252,000m³/h (850Pa) of air with the potential to reach 300,000m³/h (1,180 Pa) if required. The total overall system efficiency of the plant is 64% when in 24/7 operation.

The existing system was equipped with inefficient axial fans. Inefficient fans can be a buildings largest energy consumer with 50% of the HVAC energy consumption coming from them.



CEG Plug Fans Fans used in this project are designed for high pressure applications.

64

% PLANT EFFICIENCY

ECFanGrid Benefit No 3: Ease of Maintenance

Unlike a traditional belt drive unit which covers a large floor space, the ECFanGrid is completely free of the floor. This means that maintaining the hygiene of the AHU is quicker, simpler and more effective. No dust is released into the supply air as there are no belt drives to degenerate over time. Component failure is quickly dealt with due to the modular nature of the ECFanGrid. For example, a single fan module could be replaced and the AHU back online within an hour of shut down.

Automotive AHU Retrofit

For a manufacturer in the automotive sector, we were able to retrofit two supply air systems within a short period of time. Both units were no longer running properly due to their advanced age and a complete breakdown was imminent. This would have been a disaster for the production process.

Within a short time, we were able to offer and implement a state-of-the-art, energy-efficient and fail-safe solution with our ECFanGrid retrofit system. Each system now reliably delivers an air volume of 56,000 m³/h (1,850 Pa pressure). Our customer can rely on the ventilation system for the foreseeable.



If you're looking for a fully comprehensive service from start to finish Axair and our team of contractors can help. We offer a full turnkey solution from the initial site visit right through to post install commissioning and service.

The ECFanGrid contains all of the components needed for a fast and efficient install to prevent extended system downtime.

“
We offer a full turnkey solution from initial site survey right through to post install commissioning and service.”

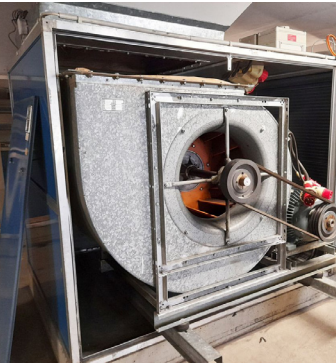
ECFanGrid Benefit No 4: Noise Attenuation

In the world of HVAC the efficiency of industrial fan systems is often compromised by an ineffectively designed air movement system and poor efficiency. This is often accompanied by unwanted fan or air velocity noise making the whole system less than desirable. Case studies show that sound is not an issue when using an ECFanGrid, on the contrary there will be more possibilities to significantly lower noise. When using an ECFanGrid there are two major advantages to attenuate noise. First, the noise spectrum of smaller impellers contain higher frequencies, thus the wave lengths are shorter, allowing for the use of shorter attenuators. Second, the required length of the fan section in a typical air handling unit, using a single large radial fan can be reduced dramatically - in some cases up to 50%.

Multiple Fans for Greater Reliability

An old ventilation system needed an overhaul after providing supply and exhaust air to operating rooms for 42 years.

Our installation team provided a full service throughout the entire retrofit by organising additional services including crane positioning, hygiene cleaning and assembly work.



The customer was 100% satisfied with the overall performance of the new ECFanGrid solution, especially with the uncomplicated, fast and tidy install while they were on holiday with no problems.

A fantastic job done by the ECFanGrid install and selection team.



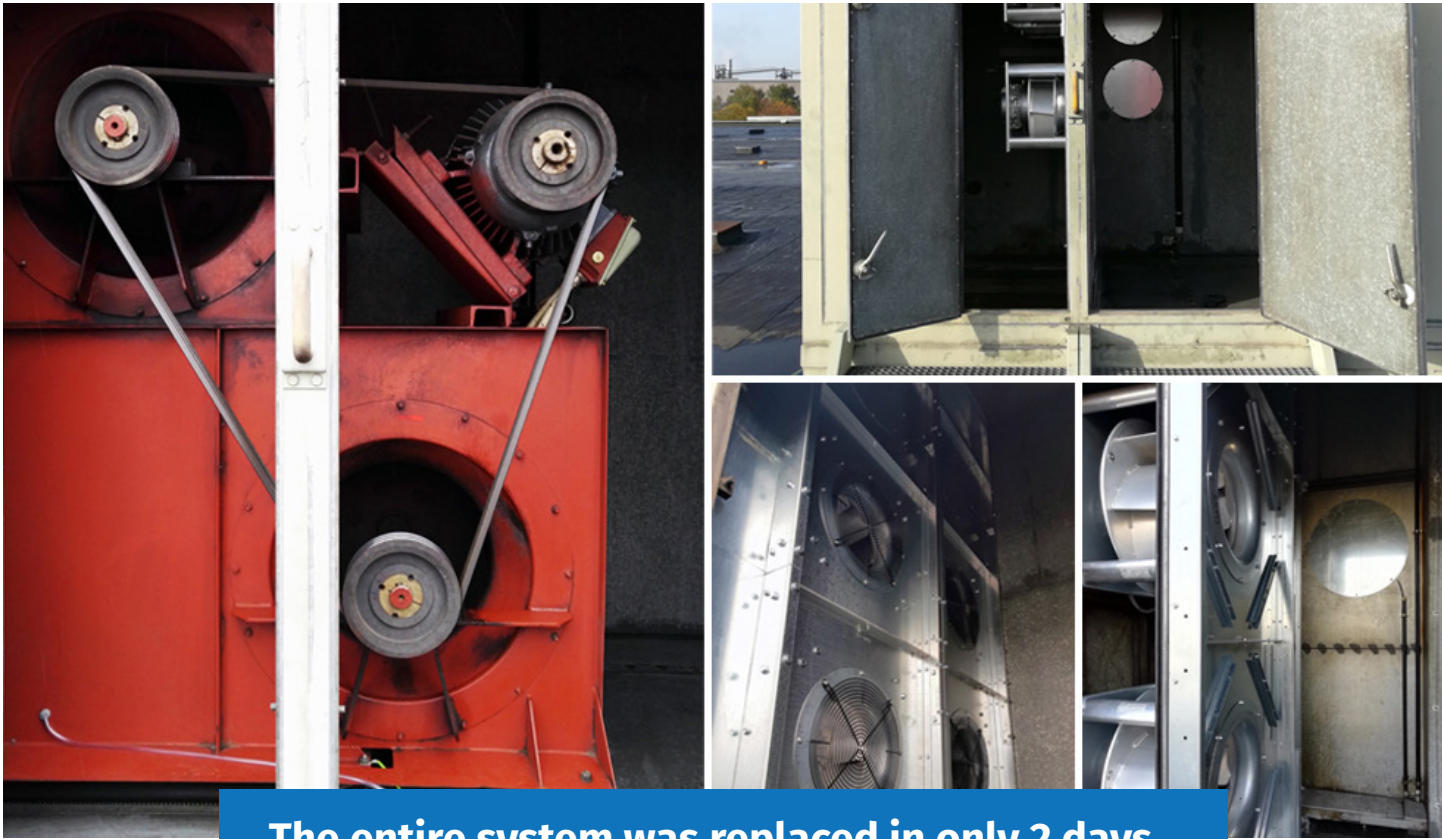
ECFanGrid Benefit No 5: Ease of Installation

ECFanGrids are ideally suited for retrofit AHU projects, particularly where a single large radial fan is being replaced. It is often the case that buildings have expanded around an AHU over its years of operation. This can make the extraction of the old fan problematic and the install of the new fan impossible without minor works to the fabric of the building.

Due to its smaller component size, the ECFanGrid can be walked through standard doorways by no more than two operatives; a significant factor in maintaining a tight replacement schedule and reducing costs. The use of plug fans, where time and space is an issue, risks the least downtime and offers the best opportunity for a rapid return to normal operation.

Roof Air Handling

Replacement of an old twin belt-drive fan in a roof-mounted air handling unit in the office building of an automotive supplier with a supply air volume flow of 27,800 m³/h. The fan drove two impellers simultaneously with one motor. Both bearings were permanently lubricated. Over time, the entire system became unbalanced. This created a large gap between the impeller and cone, which led to a significantly reduced efficiency of the fan. The replacement optimised not only the energy efficiency but also the entire system in terms of pressure losses, cleanliness, maintenance and balancing.



The entire system was replaced in only 2 days.

Payback Period

3 YEARS

Increasing Efficiency with EC Plug Fans

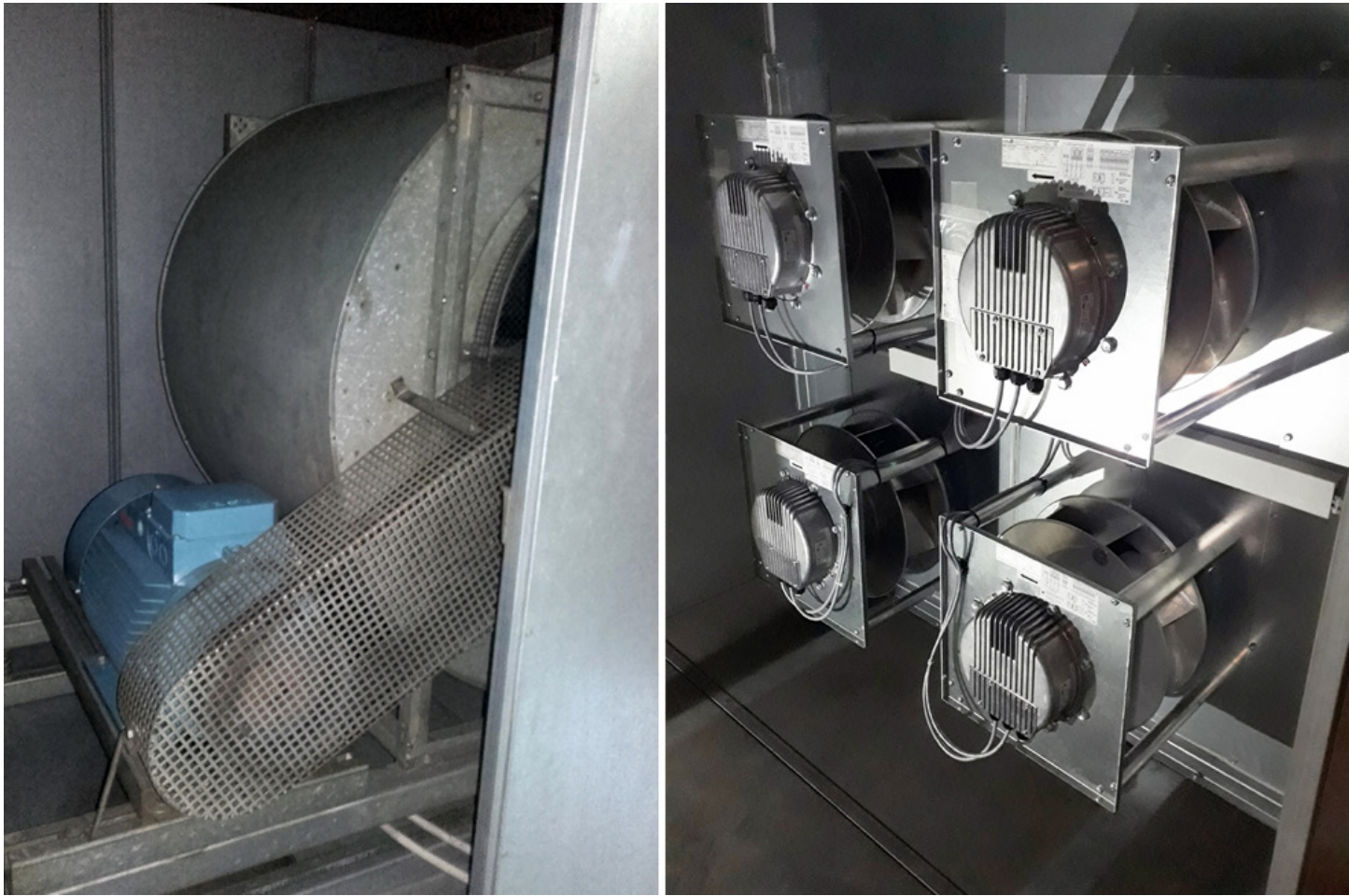
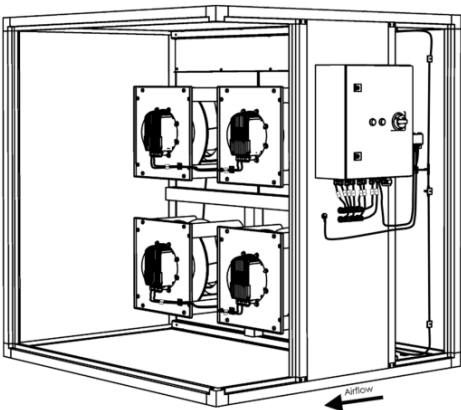
Modern plug fan technology fitted with high efficiency EC motors and integrated drives can significantly increase the operating duty of both volume and pressure of the ventilation system, while also offering major reductions in operating noise and benefitting from built in electronics for communication, control and greater reliability. For example, the Rosenberg Generation 3 EC motor allows 40% more motor winding density creating a 30% increase in power.

Many air handling unit manufacturers have extended the life of their AHU's by replacing old centrifugal fans with modern plug fans. Once installed EC fans can be commissioned to run at fixed speeds where needed. Modulating the fan speed in response to specific time requirements or occupancy-based controls allows even further reductions to energy usage.

Hotel Supply & Exhaust Air

Following a site visit and an initial validation of whether the project would be successful in achieving upgraded system efficiencies, a successful ECFanGrid retrofit was implemented in a 5-star hotel.

Four old ventilation systems were equipped with the latest EC technology during the renovation of a large conference room. ECFanGrids were used in various arrangements, always optimally adapted to the cross-section of the existing AHU. The technical rooms which housed the old HVAC system were very cramped with the old and large belt driven system. Due to the compact design of an ECFanGrid Retrofit, the upgrade was easily implemented and left a large amount of space for future servicing and commissioning.



Download the Technical White Paper

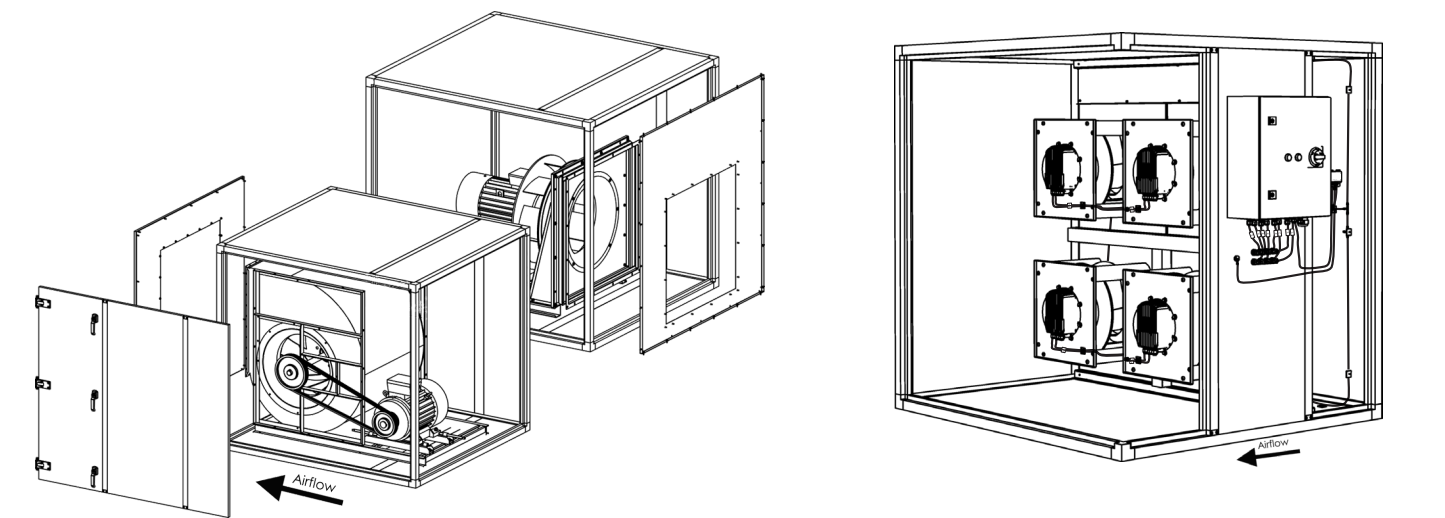
Go into depth with the ECFanGrid solution by learning more about spacing, how to calculate & attenuate noise, determine the need for separators, control, constant pressure, ModBus RTU, electrical wiring, covering and handling failures and indepth explanations of test conditions by downloading our ECFanGrid technical white paper at www.axair-fans.co.uk.



Preventative Retrofit

A preventative retrofit of old fans not only protects against failure. Modern energy efficient fans save energy, CO2 and reduce overall maintenance and operating costs.

The retrofit of this existing air handling system included an old belt drive fan that was bulky and inefficient with a motor that was regularly defective due to imbalance in the fan shaft system. The solution was a highly efficient 6x3 ECFanGrid featuring nine fans. The future expansion plans of the factory could then also be taken into account to pick up on the additional duty as the existing airflow could be doubled by adding an additional nine fans.



Why Choose the ECFanGrid?

Some of the challenges presented by old air handling units are listed below alongside the solution provided by the ECFanGrid.

<p>Problem</p> <p>Turbulent air flow path.</p> <p>Solution</p> <p>More even distribution of air velocity over the entire duct significantly increases the efficiency of the entire system.</p>	<p>Problem</p> <p>Inflexible and bulky system.</p> <p>Solution</p> <p>Greater control due to the adaptable design of the EC FanGrid.</p>	<p>Problem</p> <p>No Redundancy.</p> <p>Solution</p> <p>Protection against total system failure due to the inherent system redundancy.</p>
<p>Problem</p> <p>System failures costing time and money.</p> <p>Solution</p> <p>The auto response of the ECFanGrid to individual fan failure.</p>	<p>Problem</p> <p>Costly maintenance downtime.</p> <p>Solution</p> <p>Redundancy in system allows for efficient works planning.</p>	<p>Problem</p> <p>Complex installation of an entire AHU.</p> <p>Solution</p> <p>Simple, fast assembly that requires fewer installers.</p>
<p>Problem</p> <p>Damage to building fabric due to minor works during installation.</p> <p>Solution</p> <p>Smaller component parts are easily portable through pedestrian doors.</p>	<p>Problem</p> <p>Concerns over delivering the highest air quality to building occupants.</p> <p>Solution</p> <p>Hygienic, easy to clean design that's built free of the floor.</p>	<p>Problem</p> <p>Noise pollution and energy loss through noisy system.</p> <p>Solution</p> <p>Noise attenuation by design to reduce sound transmission.</p>

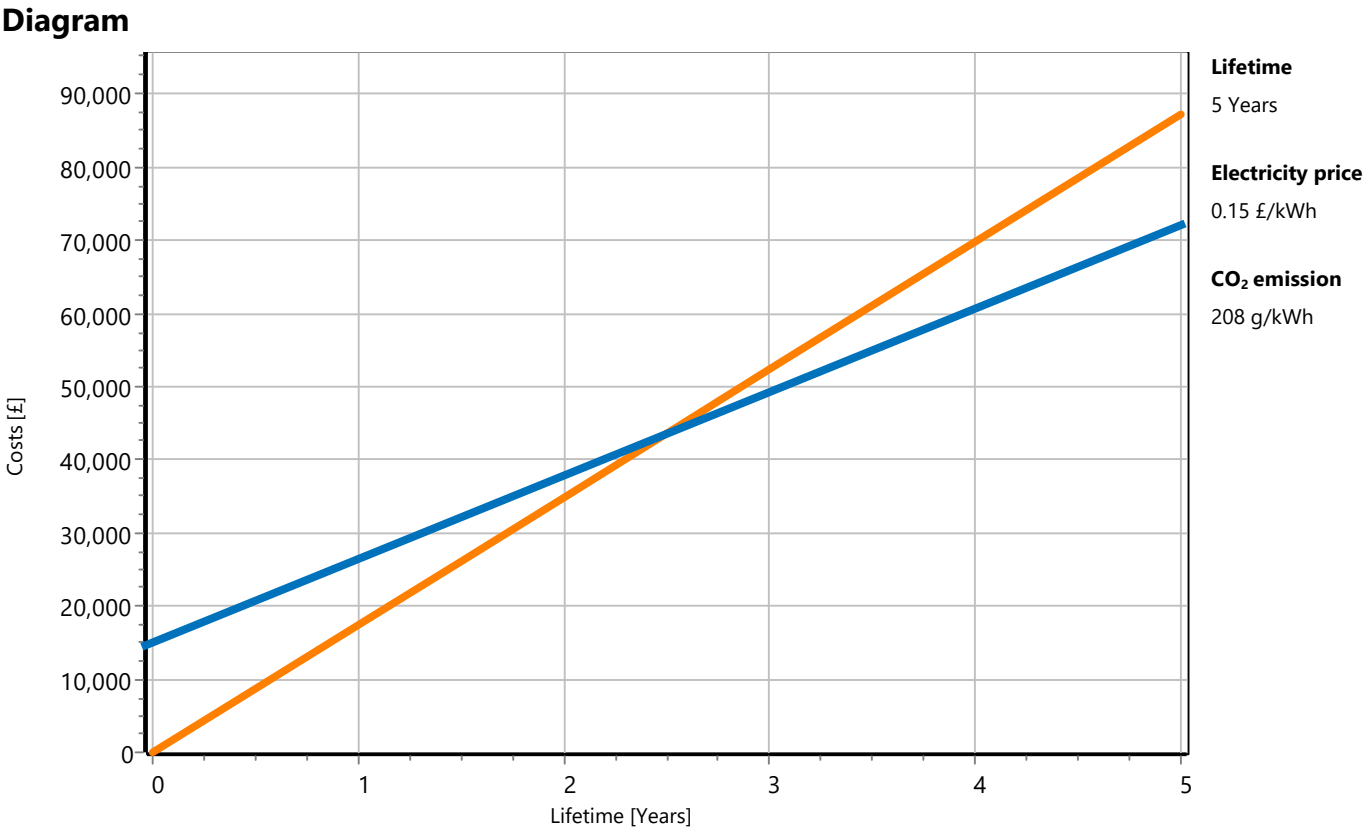
COMPACT • FLEXIBLE • EFFICIENT

Calculating the Payback Period

To accurately calculate the payback period of an ECFanGrid, it's a simple case of comparing the absorbed power for the existing system against the absorbed power for the ECFanGrid.

To do this a validation survey is undertaken and the volume flow rate and total static pressure of the existing fan is measured. The absorbed power of the fan system is simultaneously recorded. This data is then compared to the absorbed power figures of the ECFanGrid. The easiest way to consider this data is in graphical form.

- ECFanGrid
- Existing System




CO ₂ Reduction	Cost Saving	Return on Investment
6,227 kg/Year	5,991 £/Year	2.5 Years

What is A Validation Survey?


A validation survey gives our clients peace of mind. Completed by our specialist team of commissioning and testing engineers we evaluate plant and systems to provide a comprehensive understanding of existing performance, condition and capacity to inform the future design, specification, duration of project and to prioritise risk. A validation survey will highlight any short comings or defects and make the necessary testing and commissioning recommendations.

ECFanGrid Statistics


The below shows the statistics at time of print for all Rosenberg Ventilation projects. If you would like us to specify an ECFanGrid for your application, need more information about installation or general assistance, please contact our team on 01782 349 430 or email sales@axair-fans.co.uk. Visit our youtube page to view an example ECFanGrid timelapse project demonstrating the easy to install solution.




691
Retrofitted
Systems




5987MW
Energy Savings
per Year




2980t
CO₂ Savings
per Year



up to 50%
Energy & Co₂
Savings



2-5 Years
Average
Payback Period



Validation
Request A
Survey

The Future of Retrofit

It's clear to see from industry changes and company exhibitions such as ISH that the FanGrid is the way forward with air handling unit refurbishments and other HVAC projects. The flexibility, operation and maintenance efficiency and excellent track record for maintaining specific air quality and acoustic conditions are just the start.

Fan Integration Experts

Lead the way to more energy efficient buildings by providing the best fan integration retrofit solutions that the industry can offer. We combine knowledge of the market with customer needs and technical know how to deliver the best solution to a wide range of OEM & industrial markets in the UK.

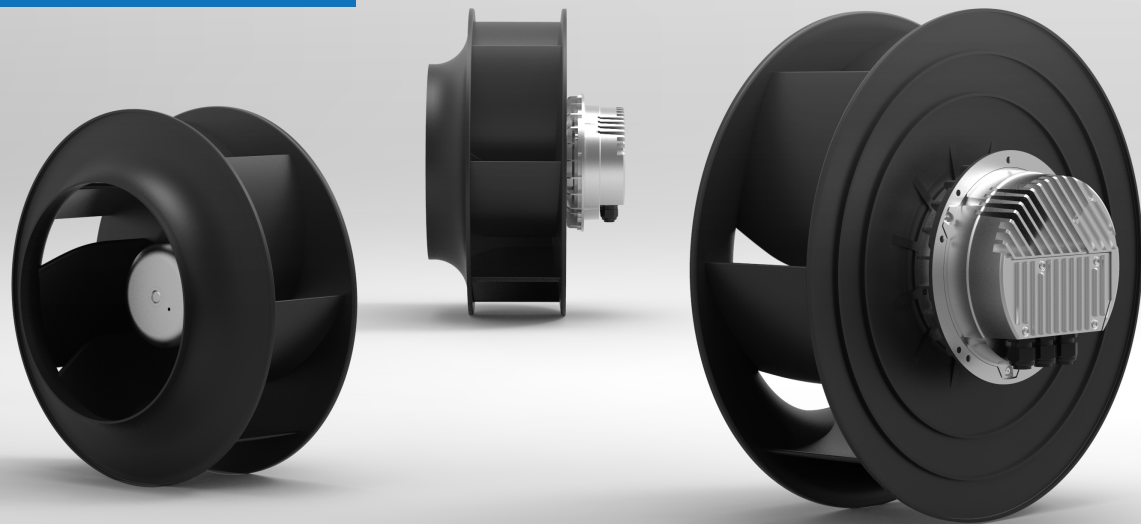
“
We understand the key issues and frustrations that occur in the UK fan market and we’re here to support you when you need us.”

We’ve been working with air handling manufacturers, contractors and installers for over 30 years. We understand the key issues and frustrations that occur in the UK fan market and we’re here to support you when you need us.

In 2020 we extended our warehouse to enable us to increase our stock holding of our most popular industrial fans for the air handling market. This means we hold a large amount of stock of our most energy efficient and cost effective modular plug fans to service our UK customers.

We’re confident that our stock and logistics policy and the support of our manufacturers enables us to maintain a position that will provide continuity of business and a cost effective solution for industrial fan procurement.

Contact our technical team on sales@axair-fans.co.uk to discuss your project in depth. We’ll advise on possible fan integration options and determine the best ECFanGrid configuration to suit your project objectives.



What to Expect from Us

Your ECFanGrid Project Schedule

Following initial discussions about your requirements a typical project schedule is shown below. Start your journey with us by completing the ECFanGrid specification form on our website.

Site & AHU Validation Surveys

To ensure that any problems can be identified and incorporated into your project specification as early as possible we can carry out a site validation survey. We’ll assess physical condition, compliance and capacity. Site and AHU validation surveys are POA and invoiced in advance of any project quotations.

Energy Surveys

If you’d like to record and compare the efficiency and CO2 reduction of your old and new system we’ll take measurements to allow you to present figures to those who need them the most. This can be done at the same time or on a different day than the site and AHU validation survey. POA.

Fan Selection

We’ll use our fan selection software RoVent, along with the assessed operating duties and system requirements to determine the right size and configuration for your air movement project.

Discuss Additional Works

We’ll discuss any additional works you’d like carrying out at the same time. We’ll organise removals, cranes, cleaning and much more if required. All to make the project simple and easy for you.

Quotation

Once we establish your requirements, one of our technical product engineers will prepare a formal quotation for you to review based on the specification and all other key information discussed.

Installation or Delivery

Whether you choose to install the ECFanGrid yourself or have our install team complete the project, we’ll deliver the full ECFanGrid kit that contains all mechanical parts, to your specified location and delivery date. We offer competitive lead times and if needed we can supply a wide range of ancillary items to further increase the efficiency of your installation.

Post Commissioning, Service & Technical Support

Our team can be scheduled to do post install commissioning and yearly servicing to ensure your ECFanGrid stays running at optimal performance. POA. Our team of technical engineers are also available to answer any technical questions. Contact sales@axair-fans.co.uk or 01782 349430.



Contact Us

Whatever your issue, concern or question, contact our OEM team using the below contact details. Alternatively, visit our website and open a live chat to start discussions.

01782 349 430

sales@axair-fans.co.uk