

ec fans & drives
an epec company



Refrigerated Products Brochure

About Us

EC Fans & Drives, an Epec Engineered Technologies company, specializes in the design and manufacture of energy efficient fans and motors for commercial refrigeration applications.

Our technically advanced range of high-efficiency motors and fans offers a solution to companies seeking reliable products as well as high-efficiency capabilities with the best power consumption.

Over the past 7 years we have secured a prominent position as one of North America's most reliable and respected manufacturers of electronically controlled fans and motors.

Our products are designed to meet the latest approval listings and can be found in bottle and wine coolers, chest freezers, ice machines, open case display cabinets, refrigerated vending machines and multi-deck display cases.

With sales offices strategically located in Asia, United Kingdom and United States of America, we are able to support our customers' global requirements and deliver an exceptional level of service to our existing and future customers.

All our products are designed at our United Kingdom engineering facility and manufactured at our facilities in Asia.

All products are manufactured to stringent quality control processes on European-designed production equipment, and are inspected by epec engineered technologies quality control personnel prior to shipment. This process ensures that each and every product meets our high and uncompromising specification.

The future is high technology, high performance and high efficiency, with EC Fans & Drives leading the way.

Technology

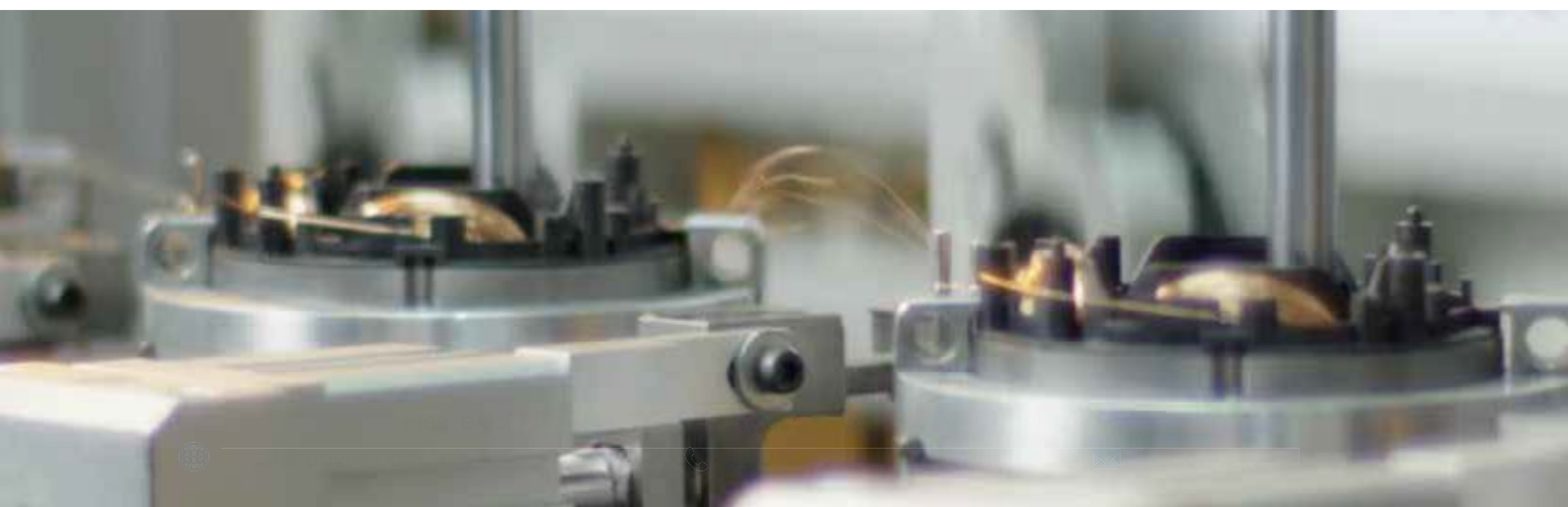
All current technical developments in electronically commutated motor and fan design are subject to constant and thorough research and evaluation by our team in the United Kingdom.

With over 35 years' experience in designing and manufacturing electric motors on a global scale, you can be assured that, in this modern and ever-evolving world of technology and innovation, our engineers are always fully informed on contemporary advances.

It's with our shared vision for future efficiency that our engineers take, try and test the leading technology to bring you the most innovative products on the market.

Our range of products meet or exceed the current operating efficiencies offered by other competing products. To support us in this, we have assisted refrigeration manufacturers who meet these demanding high levels of efficiency.

If energy efficiency is a key objective for your application, EC Fans & Drives can supply the best available solution at the most competitive price.



Design & Reliability

All EC Fans & Drives products are designed and continually tested by our own engineering team in the United Kingdom, allowing us to meet one of our companies core values:

‘Eliminate Risk and Improve Reliability’

This concept provides our customers with the confidence that they are dealing directly with the manufacturer who knows the product capabilities and can become an extension of the customer’s in-house engineering team, thus, providing up-to-date engineering support.

This is something our competitors cannot offer as they are usually a distributor who have little or no knowledge in what the product can achieve.

Our focus is on delivering high quality, reliable products that are qualified by our engineers’ proven and robust reliability test processes, ensuring that all products exceed customer expectations.

We are constantly reviewing and testing our products to proven test protocols.

Our product reliability testing is broken down into 3 areas:

Highly Accelerated Life Testing (HALT)

HALT is a proven reliability test protocol which is used for finding predominant failure modes in the design of the product in a short period of time.

Accelerated Life Testing (ALT)

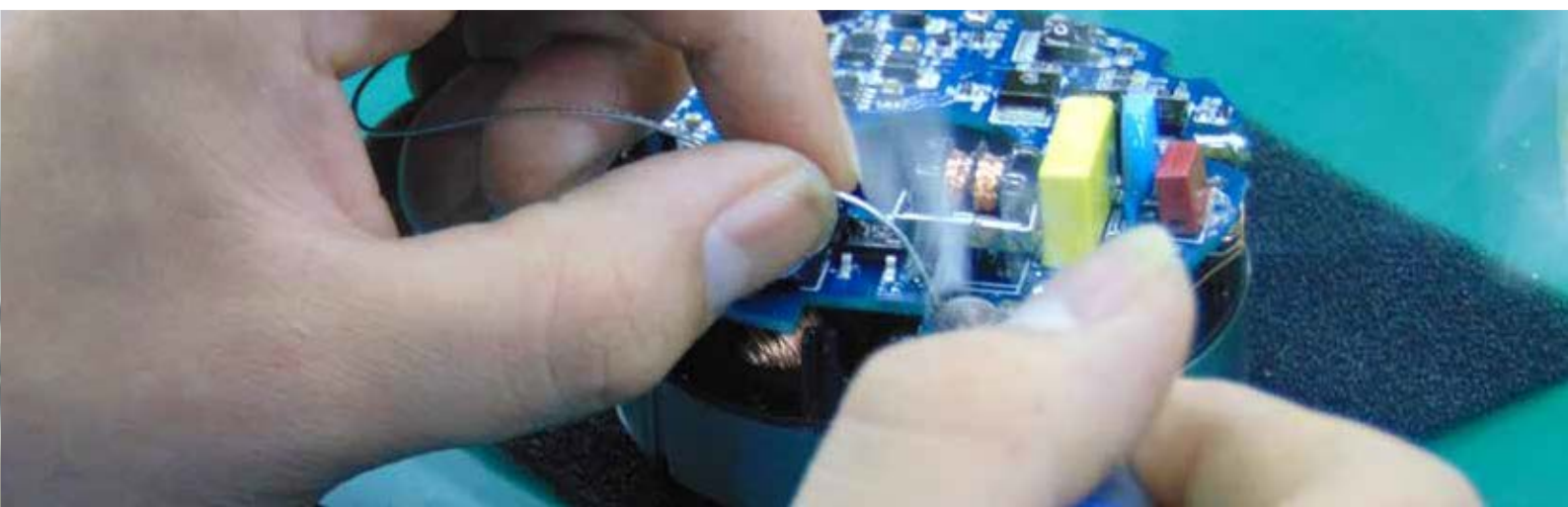
Once a failure mode is detected in HALT, our engineers then incorporate the ALT protocol to determine when the product would fail and ensure that the failure is outside of the product’s design criteria and warranty, thus, ensuring that it meets customers’ application criteria and expectations.

To satisfy HALT and ALT testing, EC Fans & Drives use airflow chambers, dynamometers, ingress protection chambers (dust & water), humidity and thermal shock chambers (-40°C to +70°C) that allow our engineers to stress the products to worst case scenarios.

Simulated Long-Term Testing

As part of our on-going reliability testing programme, our engineers continually test production products to ensure that they meet the original design criteria. At any one time we have over 200 products on simulated long-term testing.

This allows our engineers to monitor products in various conditions (constant, intermittent & stall mode) with varying input voltages (nominal supply +/- 20%) and varying load conditions and speed settings (combination of maximum/minimum load at maximum/minimum speed setting).



ECY Series Motor

Introduction

The ECY Series motor platform is an electronically commutated (EC) motor designed for condenser and evaporator applications in commercial refrigerated cases and bottle coolers.

The ECY motor series has been designed to allow direct replacement with existing shaded pole motors; therefore, allowing drop in replacement into existing inefficient refrigeration systems.

The ECY motor is available in the following variants:

- ECY-01 Single speed;
- ECY-02 2-speed: high and low speed settings; reverse function on demand or time defined.
- ECY-03 Variable speed using pulse width modulation (PWM)

The ECY series motor can be supplied with fan rings and axial fan blades (ø154mm ~ ø254mm) completely assembled

The ECY series motor cable can be supplied to the customer's preferred length and complete with connectors and moulded plugs already assembled for quick connection to final application.

The ECY Series motor can be supplied with imperial or metric fastenings, with either the European standard drive plate (drive pips ø3.5mm) or the USA standard drive plate (drive pips ø 4.2mm).

Outline Specification

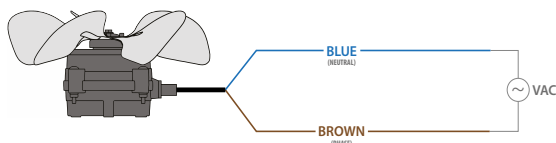
Input Voltage Range	120VAC 50/60Hz (90-138VAC) 230VAC 50/60Hz (190-265VAC) 12, 24 or 24VDC
Output Power Range	03 ~ 21 Watt
Speed Range (ECY-01) (ECY-02)	600~2100rpm (constant speed) Speed 1: 500~2100rpm (constant speed) Speed 2: 500~2100rpm (constant speed)
Maximum Input Power	30 Watt
Maximum Input Current	0.25 amp @ 230VAC 50/60Hz 0.45 amp @ 120VAC 50/60Hz
Insulation Class	Class B (130°C)
Thermal Protection	Thermally Protected Windings
Electronic Protection	Locked rotor, soft start function & current limit
Earthing Protection	Double Insulated
Ingress Protection Rating	IP55 (per ISO/EN 60529:2013) IP67 (per ISO/EN 60529:2013)
Housing Material	UL recognised (V0) rated re-inforced plastic
Bearing System	High precision sealed ball bearings
L10 Life Expectancy	40,000 hours at 40°C ambient
Operating Temperature Range	-40°C to +50°C (-40°F to +122°F)
Storage Temperature Range	-40°C to +80°C (-40°F to +176°F)
Weight	0.62 Kilo (1.3lb)



*available 2018

Please contact us if you have any queries or need additional information

ECY Series Motor - Wiring

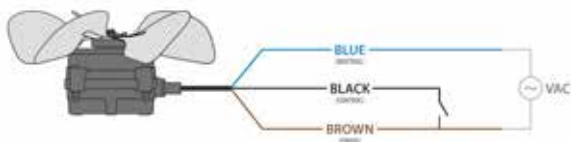


ECY-01

ECY-01 motor should be wired so that motor powers 'on' when compressor starts its cycle and powers 'off' when compressor stops its cycle

For safety reasons the motor should be wired so that it powers 'off' when the door to the cabinet is opened.

Connection	Colour	Assignment / Function
Phase	Brown	VAC ~ Connect to Phase (L)
Neutral	Blue	VAC ~ Connect to Neutral (N)

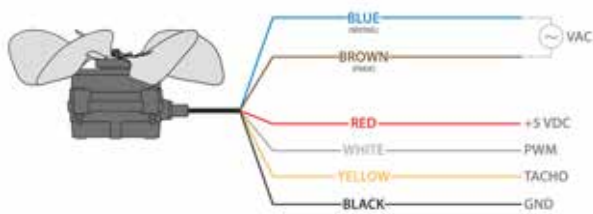


ECY-02

ECY-02 motor should be wired so that motor powers 'on' when compressor starts and switches to second speed (trickle) when compressor stops its cycle.

For safety reasons the motor should be wired so that it powers 'off' when the door to the cabinet is opened.

Connection	Colour	Assignment / Function
Phase	Brown	VAC ~ Connect to Phase (L)
Neutral	Blue	VAC ~ Connect to Neutral (N)
Speed	Black	Speed Control ~ Second Speed or Reverse Function
		Speed 1 ~ Black Wire Disconnected (disabled & isolated)
		Speed 2 ~ Black Wire Connected to Brown (enabled)



ECY-03

ECY-03 motor should be wired so that motor powers 'on' when compressor starts and switches to variable speed (trickle) when compressor stops its cycle.

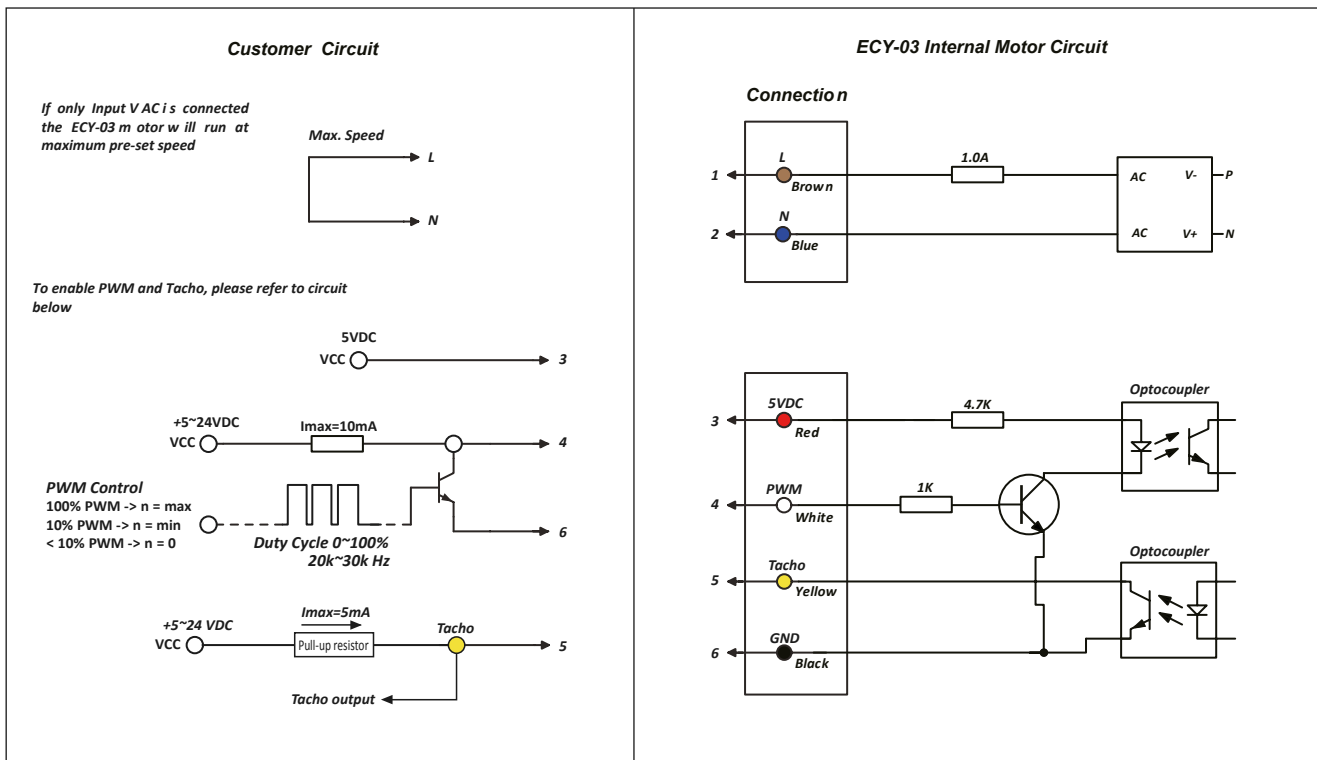
For safety reasons the motor should be wired so that it powers 'off' when the door to the cabinet is opened.

Connection	Colour	Assignment / Function
Phase	Brown	VAC ~ Connect to Phase (L)
Neutral	Blue	VAC ~ Connect to Neutral (N)
Control	Red	Voltage Output (5VDC/0.50mA) electrically isolated
	White	PWM, electrically isolated
	Yellow	Tacho output, open collector, 2 pulse per revolution, electrically isolated
	Black	Ground, connection for control interface

Please contact us if you have any queries or need additional information

ECY-03 Motor Wiring Detail

Circuit Diagram



No.	Connection	Colour	Assignment / Function
1	Phase (L)	Brown	VAC Input - Phase
2	Phase (N)	Blue	VAC Input - Neutral
3	5VDC	Red	Voltage output 5VDC, electrically isolated
4	PWM	White	PWM 0%-100%, electrically isolated
4	Tacho (FG)	Yellow	Tachograph Output: Open Collector, 1 pulse per revolution, electrically isolated
5	Ground (GND)	Black	GND - Connection for control interface

EC-PWM Speed Controller



The EC Fans & Drives engineering team have designed a bench mounted speed controller which communicates directly with both the [ECY-03](#) and the [EC Axial fans](#) via the pulse width modulation (PWM) & Tacho functions.

This allows customers to 'map' the speed of our products in application and gives the following useful information via the LED displays at any desired operating point:

Input Voltage, Input Watts, Input Current, PWM Duty, Power Factor and Speed.

Please contact us if you have any queries or need additional information

ECY Crossflow Fan



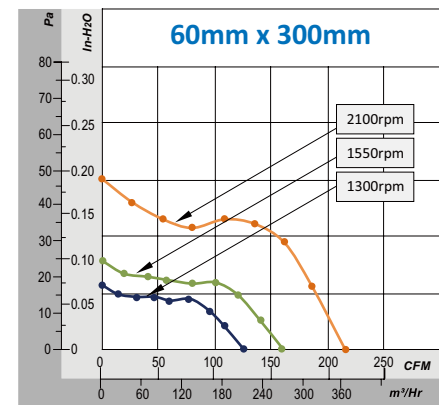
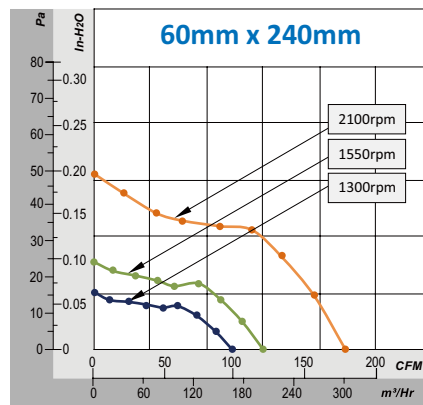
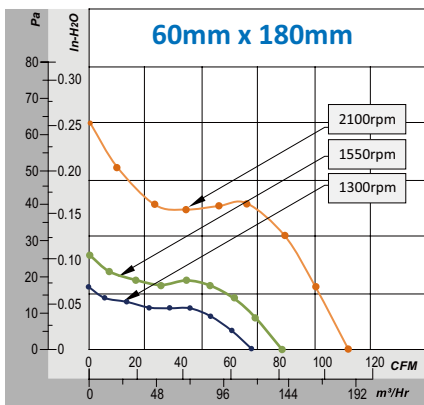
The ECY crossflow fan has been designed to meet refrigeration and ventilation applications where evenly distributed airflow is required with a low noise level and efficient energy consumption.

At the heart of the ECY crossflow fan pack is the ECY series motor which allows customers to define single speed, 2-speed (high & trickle) or variable speed control via PWM.

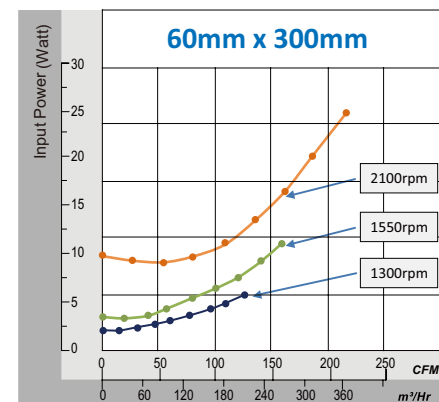
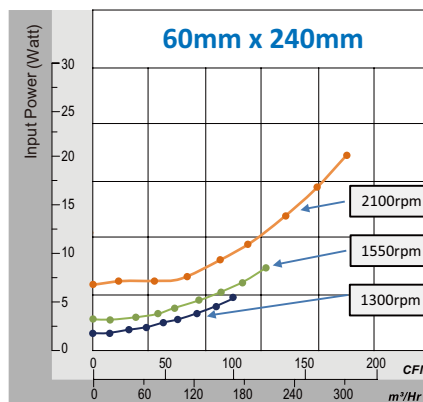
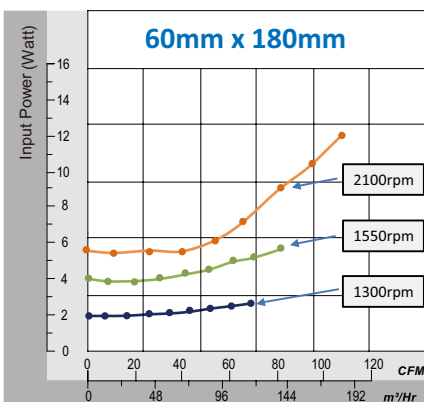
Model	Speed	VAC/Hz	Airflow	Input Power
ECY-60-180-1330-XXX	1330rpm	110VAC 50/60Hz	68 CFM	3.6 Watts
ECY-60-180-1550-XXX	1550rpm	110VAC 50/60Hz	80 CFM	6.3 Watts
ECY-60-180-2100-XXX	2100rpm	110VAC 50/60Hz	110 CFM	11.8 Watts
ECY-60-240-1330-XXX	1330rpm	110VAC 50/60Hz	100 CFM	5.5 Watts
ECY-60-240-1550-XXX	1550rpm	110VAC 50/60Hz	120 CFM	8.6 Watts
ECY-60-240-2100-XXX	2100rpm	110VAC 50/60Hz	180 CFM	18.1 Watts
ECY-60-300-1330-XXX	1330rpm	110VAC 50/60Hz	125 CFM	6.9 Watts
ECY-60-300-1550-XXX	1550rpm	110VAC 50/60Hz	155 CFM	11.2 Watts
ECY-60-300-2100-XXX	2100rpm	110VAC 50/60Hz	220 CFM	24.2 Watts

Note – ECY motor mode of operation is constant speed

Airflow Curves



Power Curves



Please contact us if you have any queries or need additional information

EFS Fan Pack



The EFS series fan pack is the traditional steel fan ring (or plastic) and aluminium fan blade assembled to the ECY series motor.

All our aluminium fan blades and steel fan rings are sourced from reputable manufacturers, who are renowned for supplying high quality, cost effective products.

At the heart of the EFS series fan pack is the ECY series motor which allows customers to define single speed, 2-speed (high & trickle) or bi-directional whereby the reverse function can be time defined or on demand. Also available with ECY-03 motor (variable speed control via PWM)

Fan rings available in \varnothing 154mm, \varnothing 172mm, \varnothing 200mm, \varnothing 230mm and \varnothing 254mm

Aluminium fan blades available in \varnothing 154mm, \varnothing 172mm, \varnothing 200mm, \varnothing 230mm and \varnothing 254mm with airflow direction sucking or blowing and with various pitches.

Airflow curves from our AMCA approved airflow chamber can be supplied on request.



**available 2018*

EFP Fan Pack



The EFP series fan pack is a fully integrated assembly that has been aerodynamically designed to deliver high efficiency flow rates at static operating point 50 pascal (0.20 in-H₂O) and blow.

At the heart of the EFP series fan pack is the ECY series motor which allows customers to define single speed, 2-speed (high & trickle) or bi-directional whereby the reverse function can be time defined or on demand. Also available with ECY-03 motor (variable speed control via PWM).

Available in 172mm, 200mm & 230mm diameters (speed range 600rpm to 2100rpm).

Constant speed (regardless of power supply fluctuation) with output power range from 3 Watts to 21 Watts.

Available in LVDC, 120VAC 50/60 Hz or 230VAC 50/60Hz

Airflow curves from our AMCA approved airflow chamber can be supplied on request.



**available 2018*

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EXRi-50 Fan Pack



The EXRi50 series fan pack is a fully integrated assembly that has been aerodynamically designed to deliver high efficiency flow rates at static operating point 25 pascal (0.10 in-H₂O) and below. It is suited to low power evaporator applications.

The EXRi50 fan pack operates at a constant speed (regardless of power supply fluctuation) and has a maximum input power of 15 watts which is suited to applications with an output power range of 3 to 10 watts.

The motor has an external rotor design with the motor lamination and windings over-moulded to assist in giving maximum ingress protection.

Available in 154mm, 172mm & 200mm diameters with pre-set speeds 1330, 1600, 1850 and 2100rpm (maximum speed for 200mm diameter is 1600rpm).

Available in LVDC or 85VAC~265VAC 50/60 Hz (global voltage).

Airflow curves from our AMCA approved airflow chamber can be supplied on request.



**available 2018*

EXRi-50 - Motor & Fan



The EXRi50 series motor and integrated fan assembly that has been aerodynamically designed to deliver high efficiency flow rates at static operating point 25 Pascal (0.10 In-H₂O) and below. It is best suited to low power condenser applications.

The EXRi50 series motor with integrated fan can be supplied with brackets or fixing via 3 x M4 Screws on rear fixing plate.

The EXRi50 motor operates at a constant speed (regardless of power supply fluctuation) and a maximum input power of 15 watts which is suited to applications with an output power range of 3 to 10 watts.

The motor has an external rotor design with the motor lamination and windings over-moulded to assist in giving maximum ingress protection.

Available in 154mm, 172mm & 200mm diameters with pre-set speeds 1330, 1600, 1850 and 2100rpm (maximum speed for 200mm diameter is 1600rpm).

Available in LVDC or 85VAC~265VAC 50/60 Hz (global voltage).

Airflow curves from our AMCA approved airflow chamber can be supplied on request.



**available 2018*

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EC Axial Fans



A complete range of electronically commutated (EC) tube axial fan units that are designed with enhanced reliability, environmental protection and control features which result in 75% less power consumption than traditional AC axial fans.

All models are supplied as global voltage (85~265 VAC 50/60 Hz) which allows customers to purchase one SKU for the global market.

The complete range of EC axial fans incorporate on-board electronics; therefore, eliminating any additional external power supply.

The EC axial fans have been designed as drop-in replacements to existing AC axial fans, and, due to the motor being a brushless DC construction, we have a range of higher airflow versions available that can produce up to 40% more air flow compared to existing AC axial fans.

Available in the following frame sizes in various airflows:



- 60mm x 60mm x 25mm
- 80mm x 80mm x 25mm
- 80mm x 80mm x 38mm
- 92mm x 92mm x 25mm
- 92mm x 92mm x 38mm
- 120mm x 120mm x 25mm
- 120mm x 120mm x 28mm
- 172mm x 150mm x 51mm
- 200mm x 200mm x 60mm

Standard Specification



- Voltage Range (85~265 VAC 50/60 Hz)
- Constant speed configuration as standard
- Variable speed options available (PWM, Tacho etc.)
- Ingress Protection IP54 as standard (IP55 and IP68 on request - see below)
- High Precision Ball Bearings
- Operating Temperature range -30°C to +70°C



ATEX IP55 & IP68 EC Axial Fan

EC Fans & Drives engineering have designed an ATEX approved IP55 and IP68 version of the EC12038 axial fan

ATEX has been obtained by a third-party approval agency: TUV.

The IP68 version incorporates the motor, windings and electronics which are over-moulded; thus, allowing the EC axial fan to be used in severe applications whereby the fan can be operated fully immersed in water.

We can supply this ATEX approved EC12038 axial fan in 5 different flow rates varying from 60CFM to 135CFM.



EC Axial Fan - Wiring detail

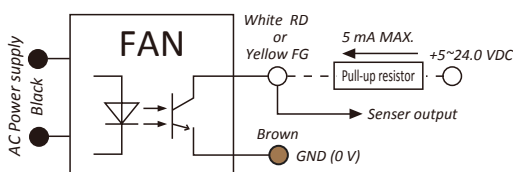
EC Axial Fan - Standard - 2 Wires



Note:
Standard EC Axial has 2 wires or 2 male 2.8mm terminals

No.	Connection	Colour	Assignment / Function
1	Phase (L)	Black	VAC Input - Phase
2	Neutral (N)	Black	VAC Input - Neutral

EC Axial Fan - Alarm (RD) or Tacho (FG) - 4 Wires



Wiring For Tacho (FG) Function

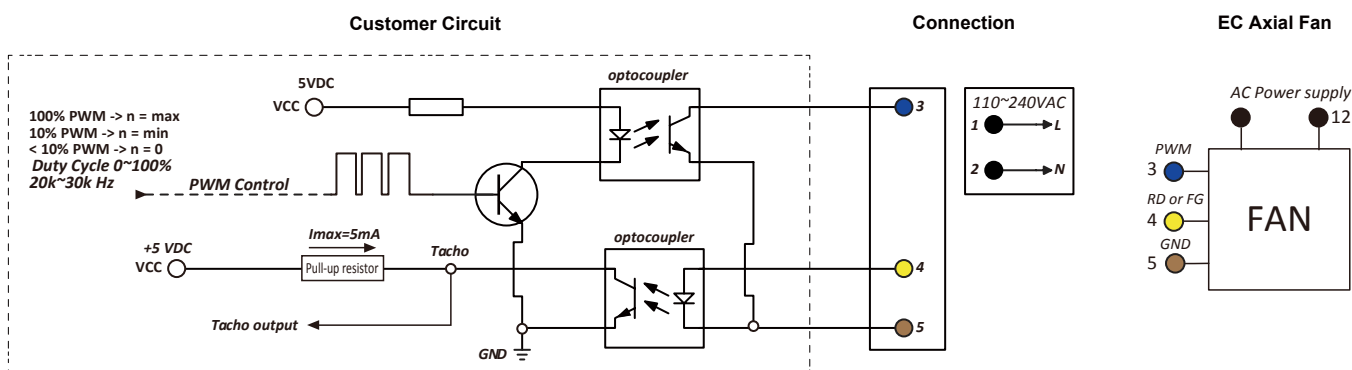
VAC Input (L) is Black Cable
VAC Input (N) is Black Cable
Tacho (FG) is Yellow Cable
Ground (GND) is Brown Cable

Wiring For Alarm (RD) Function

VAC Input (L) is Black Cable
VAC Input (N) is Black Cable
Alarm (RD) is White Cable
Ground (GND) is Brown Cable

No.	Connection	Colour	Assignment / Function
1	Phase (L)	Black	VAC Input - Phase
2	Neutral (N)	Black	VAC Input - Neutral
3	Alarm (RD)	White	Alarm (RD) High Output: Open Collector, when fan stopped the RD will show high voltage, electrically isolated
3	Tacho (FG)	Yellow	Tacho (FG) Output: Open Collector, 1 pulse per revolution, electrically isolated
4	Ground (GND)	Brown	GND - Connection for control interface

EC Axial Fan - Alarm (FG) or Tacho (FG) with PWM Speed Control - 5 Wires



No.	Connection	Colour	Assignment / Function
1	Phase (L)	Black	VAC Input - Phase
2	Neutral (N)	Black	VAC Input - Neutral
3	PWM	Blue	PWM 0%-100%, electrically isolated
4	Alarm (RD)	White	Alarm (RD) High Output: Open Collector, when fan stopped the RD will show high voltage, electrically isolated
4	Tacho (FG)	Yellow	Tacho (FG) Output: Open Collector, 1 pulse per revolution, electrically isolated
5	Ground (GND)	Brown	GND - Connection for control interface

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