ec fans & drives

an epec company

Refrigerated Products Brochure

USA Edition - 2206

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

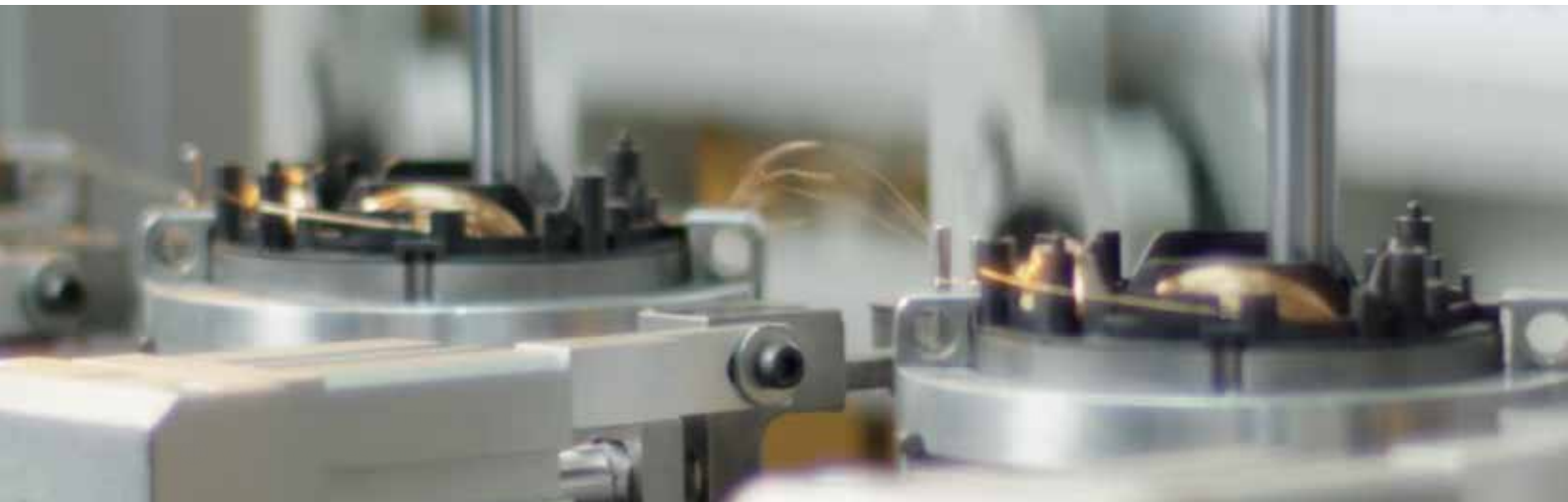
All current technical developments in electronically commutated motor and fan design are subject to constant and thorough research and evaluation by our team in the United Kingdom.

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:

‘Eliminates 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)

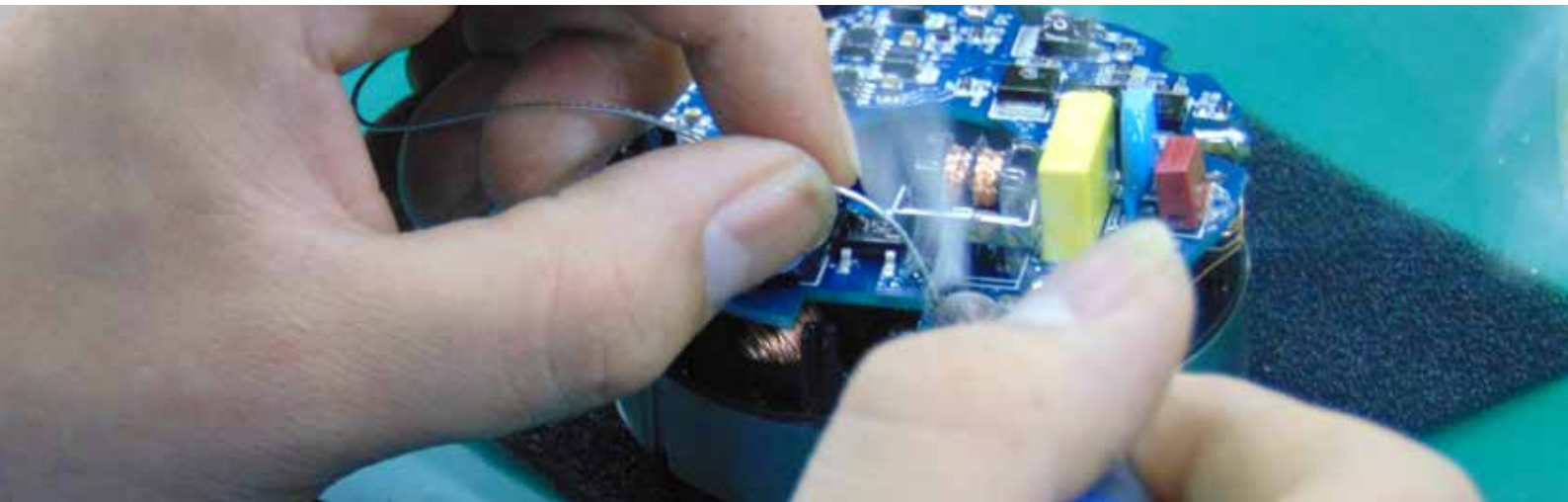
Once a failure mode is detected in HALT, our engineers then incorporate the ALT protocol to determine when the product would fail and ensure that the failure is outside of the product’s design criteria and warranty, thus, ensuring that it meets customers’ application criteria and expectations.

To satisfy HALT and ALT testing, EC Fans & Drives use airflow chambers, dynomometers, 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 communtated (EC) motor designed for commercial refrigeration condenser, evaporator and walk-in cooler applications

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 platform is available in the following models:

ECY-15 15 Watt Input Power – 10 Watt Output Power
ECY-30 30 Watt Input Power – 21 Watt Output Power
ECY-45 45 Watt Input Power – 32 Watt Output Power

All models have been designed to offer the following features

1-Speed	Single speed
2-Speed	High and low speed settings; reverse function on demand or time defined.
Variable Speed	Using pulse width modulation (PWM) with option of alarm feature or tacho

Outline Specification

Input Voltage Range	120VAC 50/60Hz (90-138VAC) 230VAC 50/60Hz (190-265VAC) 120-230VAC 50/60Hz (85VAC-265VAC) 12, 24 or 24VDC
Speed Range	Single Speed 600~2400rpm (constant speed) Maximum 2400rpm (variable by PWM)
Insulation Class	Class B (130˚C)
Thermal Protection	Thermally Protected Windings
Electronic Protection	Locked rotor & auto-restart, soft start function & current limit
Earthing Protection	Double Insulated
Ingress Protection Rating	IP65 (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)

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).

Motor cable can be supplied to customer preferred length with customer specific connectors or moulded plugs already assembled for quick connection during assembly

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

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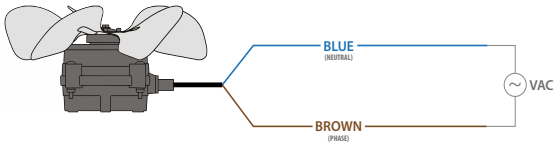
ECY Series Motor - Wiring

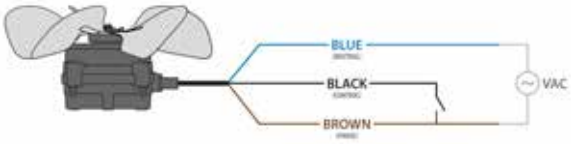


ECY-01

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)

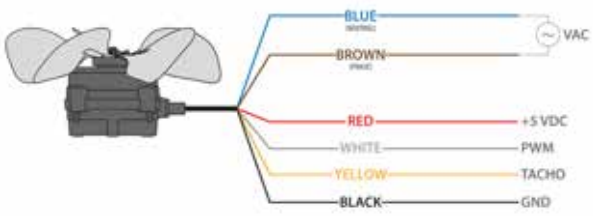


ECY-02

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

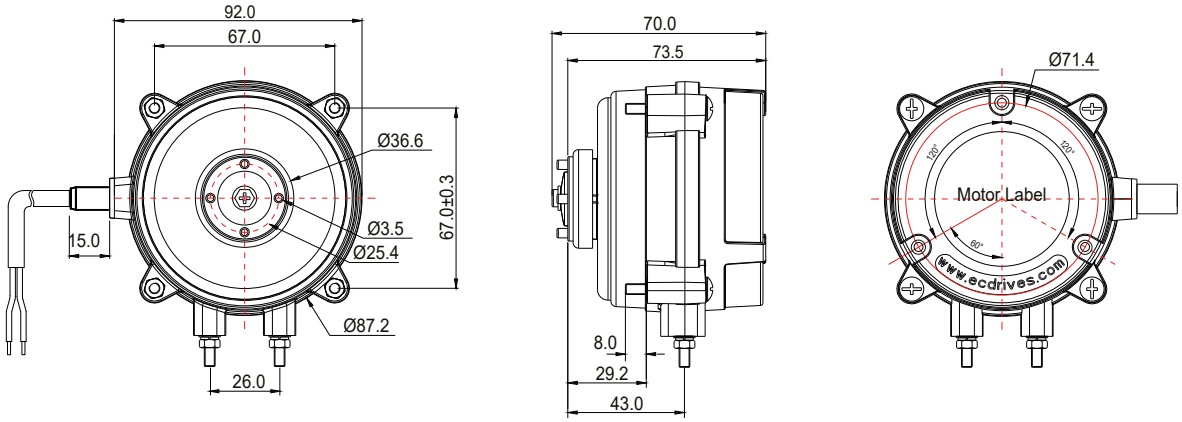
ECY-03 motor should be wired so that motor powers ‘on’ when compressor starts and switches to variable speed (trickle) when compressor stops its cycle.

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

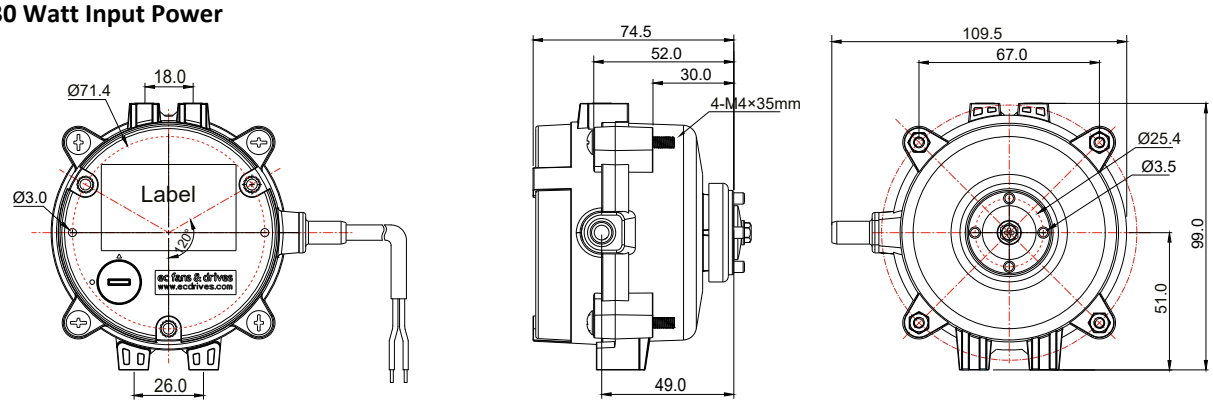
Connection	Colour	Assignment / Function
Phase	Brown	VAC ~ Connect to Phase (L)
Neutral	Blue	VAC ~ Connect to Neutral (N)
Control	Red	Voltage Output (5VDC/0.50mA) electrically isolated
	White	PWM, electrically isolated
	Yellow	Tacho output, open collector, 2 pulse per revolution, electrically isolated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

ECY-01 Motor Diagram

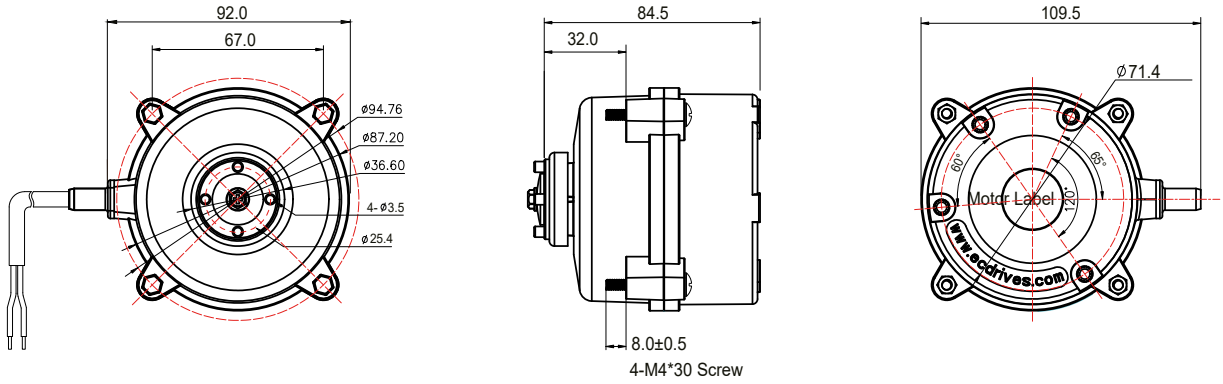
ECY-15 - 15 Watt Input Power



ECY-30 - 30 Watt Input Power



ECY-45 - 45 Watt Input Power



ECY Airflow

			1300rpm						1550rpm					
	Fan ø (Metric)		154mm	172mm	200mm	230mm	254mm	300mm	154mm	172mm	200mm	230mm	254mm	300mm
	Fan ø (Imperial)		(6”)	(7”)	(8”)	(9”)	(10”)	(12”)	(6”)	(7”)	(8”)	(9”)	(10”)	(12”)
ECY-15	22°	m3/Hr	140	178	317	-	-	-	166	213	375	-	-	-
		CFM	82	105	187	-	-	-	98	125	221	-	-	-
	28°	m3/Hr	185	228	351	-	-	-	218	272	418	-	-	-
		CFM	109	134	207	-	-	-	128	160	246	-	-	-
	34°	m3/Hr	177	253	490	-	-	-	210	302	566	-	-	-
		CFM	104	149	288	-		-	124	178	333	-		-

			1300rpm						1550rpm					
	Fan ø (Metric)		154mm	172mm	200mm	230mm	254mm	300mm	154mm	172mm	200mm	230mm	254mm	300mm
	Fan ø (Imperial)		(6”)	(7”)	(8”)	(9”)	(10”)	(12”)	(6”)	(7”)	(8”)	(9”)	(10”)	(12”)
ECY-30	22°	m3/Hr	140	178	317	500	670	-	166	213	375	596	799	1469
		CFM	82	105	187	294	394	-	98	125	221	351	470	865
	28°	m3/Hr	185	228	351	607	777	-	218	272	418	724	926	-
		CFM	109	134	207	357	457	-	128	160	246	426	545	-
	34°	m3/Hr	177	253	490	672	918	-	210	302	566	801	1095	-
		CFM	104	149	288	395	540	-	124	178	333	471	644	-

			1300rpm						1550rpm					
	Fan ø (Metric)		154mm	172mm	200mm	230mm	254mm	300mm	154mm	172mm	200mm	230mm	254mm	300mm
	Fan ø (Imperial)		(6”)	(7”)	(8”)	(9”)	(10”)	(12”)	(6”)	(7”)	(8”)	(9”)	(10”)	(12”)
ECY-45	22°	m3/Hr	140	178	317	500	670	1232	166	213	375	596	799	1469
		CFM	82	105	187	294	394	725	98	125	221	351	470	865
	28°	m3/Hr	185	228	351	607	777	1371	218	272	418	724	926	1663
		CFM	109	134	207	357	457	807	128	160	246	426	545	-
	34°	m3/Hr	177	253	490	672	918	1514	210	302	566	801	1095	1805
		CFM	104	149	288	395	540	891	124	178	333	471	644	-

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 ø 154mm, ø 172mm, ø 200mm, ø 230mm and ø 254mm

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

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

EFP Fan Pack

The EFP series fan pack is a fully integrated assembly that has been aerodynamically designed to deliver high efficency 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.

ECi Fan Pack

The ECi 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 condenser and evaporator applications.

The ECi 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 conformally coated to assist in giving maximum ingress protection.

Available in fan diameter 125mm (5”), 154mm (6”), 172mm (7”) & 200mm (8”)

The ECi can be supplied with or without plastic fan ring

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

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

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.

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
- 135mm x 135mm x 38mm
- 172mm x 150mm x 51mm
- 200mm x 200mm x 60mm
- 254mm ø x 89mm

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.

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

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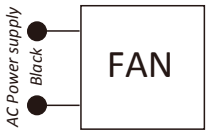
EC Axial Fan - Wiring detail

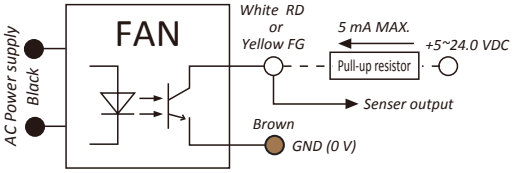
EC Axial Fan - Standard - 2 Wires



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

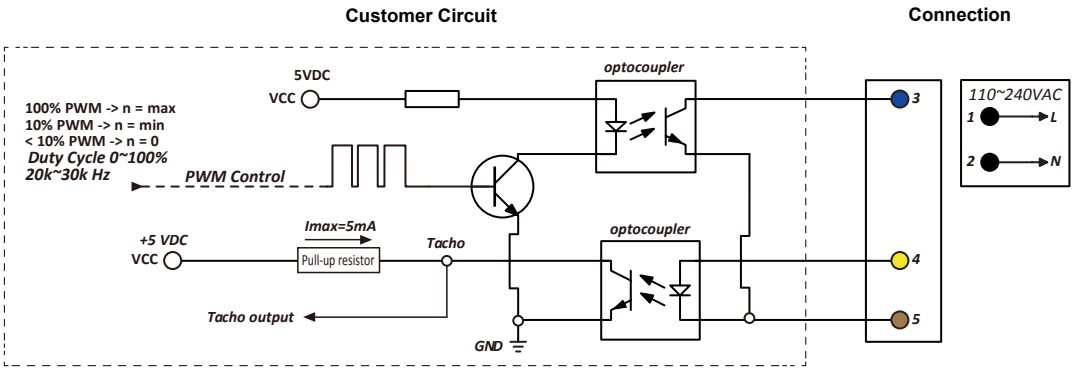
VAC Input (L) is Black Cable
VAC Input (N) is Black Cable
Tacho (FG) is Yellow Cable
Ground (GND) is Brown Cable

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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