

Electric Motor Datasheet

## Aircore EC IES150 5HP 2400RPM

### Integrated motor & drive

Infinitum's electric motor with integrated VFD facilitates variable speed applications, reducing overall energy usage by running the motor at lower speeds when possible.

### Aircore EC efficiency

The copper-etched PCB stator design increases efficiency by 10 to 15 percent by eliminating high-loss eddy currents and improved fan-to-motor mounting proximity.



100–2880 RPM

Operating range

88.0%

System efficiency

50%

Lighter & smaller than similar motors

### Key Benefits

#### Short lead times

Available for immediate shipping. Our simplified electric motor design and PCB stator technology can be rapidly manufactured with exact, reliable specifications.

#### Superior control

The integrated variable frequency drive (VFD) facilitates variable speed applications, reducing overall energy usage by running the motor at lower speeds when possible.

#### Software enabled

Our programmable software provides direct control over operational perimeters providing maximum performance for the lifetime of the motor, allowing you to create customized sequences for application-specific functionality. The built-in connectivity improves reliability from real-time data monitoring of critical equipment.

#### Small and powerful

Our lightweight durable materials generate the same amount of power as a traditional iron core motor in a package that is 50% lighter and smaller. The PCB stator maximizes power density by combining low-volume, high-energy product magnets and direct coil cooling, providing two to three times the current density of a conventional motor.

### Applications

Commercial HVAC

Datacenters

Material handling

Exhaust fans

Cooling towers



#### Easy to install

Aircore EC motors are smaller and lighter than traditional iron core motors, making it possible to directly mount the motor on applications — Resulting in smaller systems with increased efficiency that saves space, reduce wiring costs, and shorten commissioning time.



#### Easy to maintain

Optional IoT connectivity makes predictive and prescriptive maintenance possible by collecting and analyzing data to provide real-time, actionable insights. In the event a component needs replacing, the modular design facilitates replacing just that part rather than the entire motor.



#### A motor to last a lifetime

With negligible bearing current, Infinitum electric motor systems are much less likely to fail, and only parts that fail need to be replaced. With our circular design strategy, the majority of components can be reused and kept in service for over 100 years.

### Ordering Information

#### Catalog Number

IES150-5-2400-460-A

Note: See Control Connections

#### Catalog Number

IES150-5-2400-460-C

Note: See Control Connections

#### Catalog Number

IES150-5-2400-460-(A/C)-H

Note: See Mechanical Below

### Motor Information

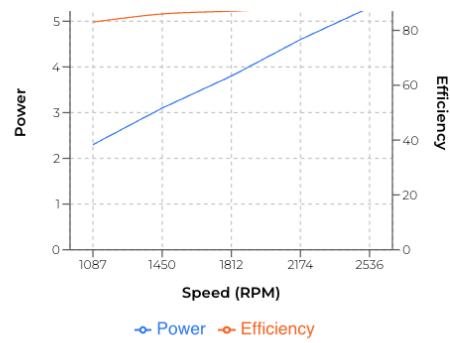
Rated Power

5 HP, 3.73 kW

### Performance



Rated Torque	15 Nm, 11.1 ft-lb
Rated Speed	2400 rpm
Max Speed	2880 rpm
Min Speed	100 rpm
Weight (Motor and Drive)	93.2 lbs, 42.3 kg
Frame Diameter	16.18", 41.1 cm
Length (Motor and Drive)	9.4", 23.9 cm
System Efficiency	88.0%
Duty Cycle	Continuous
Variable Speed	Yes, Integrated VFD
Service Factor	1.0
Motor Thermal Protection	Electronically-Protected L
Motor Type	TEFC
Enclosure Rating	IP54



### Energy Consumption ^

Energy Consumption: **10,732.7 kWh / Year**

Yearly Operating Cost: **\$965.90**

*\* Energy usage computed based on a IES150-5-2400-460 motor running at a rated speed of 2400 RPM and producing 5 horsepower.*

### Electrical

Supply Voltage	460 VAC $\pm$ 10%
Supply Phase	3 Phase
Supply Voltage Frequency	60 Hz $\pm$ 5%
Voltage Imbalance	$\pm$ 3% Phase to Phase Voltage
Short Circuit Current Rating (SCCR)	Input - 5 kA, 500 V maximum
Rated Amps	6.0 A (460 VAC)
Motor Insulation Class	B

### Mechanical

Direction of Rotation	CW/CCW
Motor Frame Material	Aluminum
Rotor Inertia	0.49 kg/m <sup>2</sup>
Bearing Type - DE	Standard: Steel, 6206 sealed, Permanently Lubricated Optional: Hybrid Ceramic (-H in Catalog Number)
Bearing Type - NDE	Standard: Steel, 6206 sealed, Permanently Lubricated Optional: Hybrid Ceramic (-H in Catalog Number)
Grease Specification	Mobil Polyrex EM
Regreasable	No
Grounding Brushes	Included - DE
Shaft Design	Keyed
Motor Mounting Position	Horizontal or Vertical (Shaft Down)
Motor Mounting Type	C-Face (182TC) and Body Mount

### Ambient Operating Conditions

Condition	Operation	Storage & Transportation
Altitude	0 to 1,000 m (3,300 ft.) above sea level 9% power derate per 1,000 m up to 4,000 m	NA
Air Temperature	-25 to 40 °C (-13 to 104 °F)	-40 to 85 °C (-40 to 185 °F)
Relative Humidity	95%, No condensation allowed	95%, No condensation allowed
Contamination Levels	No conductive dust allowed	No conductive dust allowed

**Power, intelligence and controls all in one**

We designed our VFD and motor to meet the thermal performance of

**Real-time IoT operational monitoring**

The optional IoT module provides static and real-time operational

various load conditions. Our integrated VFD continuously monitors voltage, currents, and the temperature of electronic circuits. The VFD is specifically tuned to the motor — matched for stress and load conditions, with fewer opportunities for failure.

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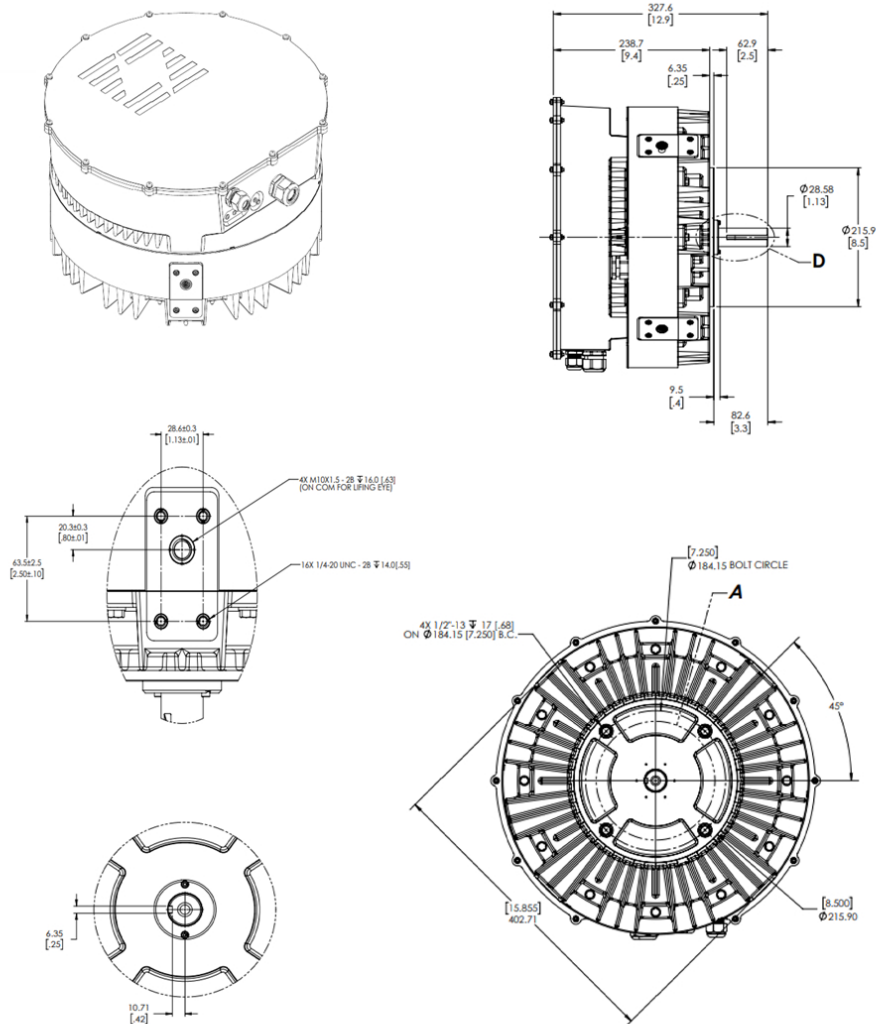
information. This IoT module utilizes an FCC-certified Digi Xbee® 3 hardware platform, communicating cloud-based applications via a cellular (4 G LTE-M) transceiver. End-to-end encryption, authentication and integrity are provided via the Digi module.

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## Electric Motor Mounting Information

Below are the basic measurements needed for installation tasks.

- There are four mounting pad locations.
- Each pad is spaced 90° apart, containing 4 mounting holes and one lifting eye hole.
- This design accommodates many different installation arrangements.



Shaft and keyway dimensions

- The DE face of the mounting block has threaded holes for four bolts (1/2"-13).
- All bolt holes should be used for secure mounting of the motor to equipment.

## Control Connections

The IEs User Manual has graphics showing locations of the following Inputs and Outputs.

**Note:** The letter at the end of the Catalog Number indicates supported VFD Inputs and Outputs

- A motors support all the I/Os listed below
- C motors do not support Analog Outputs

Description	Quantity	Type
Analog Input Software selectable for voltage or current input	1	1. Voltage Signal – 0 to 10 VDC, Rin = 20 kΩ 2. Current Signal – 0 to 20 mA, Rin = 500 Ω 3. Resolution – 0.1% 4. Accuracy - ± 5%
Analog Output (See Above) Software selectable for voltage or current output	1	1. Voltage – 0 to 10 VDC with 10 mA maximum 2. Current – 0 to 20 mA with load < 500 Ω
Auxiliary Voltage	1	1. 24 VDC User Supply with ±5% with 250 mA maximum
Digital Input	4	1. 24 VDC with internal or external supply 2. Input impedance – 1 kΩ
Digital Output	2	1. Open drain output 2. Maximum Switching Voltage 40 VDC 3. Maximum Switching Current 350 mA
Relay Output	1	1. Normally Open (NO), Normally Closed (NC) contact arrangements 2. Maximum Switching Voltage of 125 VAC/30 VDC 3. Maximum Switching Current of: a. NO – 10 A (VAC)/5 A (VDC) b. NC – 3 A (VAC)/3 A (VDC)
EIA-485 Interface for Modbus RTU	1	1. Shielded twisted pair cable with impedance of 120 Ω 2. Transfer rate of 19200 baud 3. Half duplex Modbus communication protocol

## Regulatory

UL 1004-7	Standard for Electronically Protected Motors
UL 1004-1	Rotating Electrical Machines – General Requirements
CSA C22.2 No.77	Motors with Inherent Overheating Protection
UL 61800-5-1	Standard for Adjustable Speed Electrical Power Drive Systems, Part 5-1: Safety Requirements & Electrical, Thermal and Energy



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