

Datasheet

Aircore EC Frame 20, 15 HP, 1800 RPM

Motor and drive all in one

Integrated variable frequency drive (VFD) facilitates variable speed applications, reducing overall energy usage.

Power more with less

50% lighter, 30% quieter and 10% more efficient than traditional AC induction motors.



Powerful intelligence

- State-of-the-art VFD allows precise speed control, reduces energy usage, and operates at a frequency to minimize audible noise.
- I-con (motor control software) enables users to fine tune operational parameters to their specific applications.
- Maximum power density in a 50% smaller and lighter package.

Optimized efficiency

- Meets highest efficiency standards at a wide range of load conditions.
- Increased operational efficiency by eliminating torque ripple, cogging, stator hysteresis and eddy current losses.
- Compact form factor reduces wiring and facilitates direct mounting to fan applications, increasing efficiency by 10-15%.

Sustainable solution

- PCB stator uses 66% less copper and has proven to be 10x more reliable than traditional iron-core, copper-wound stators.
- Smaller and lighter housing reduces transportation emissions by 30%.
- Easy serviceability through our modular design enables the reuse and extended lifespan of components, keeping them out of the landfill.

Applications



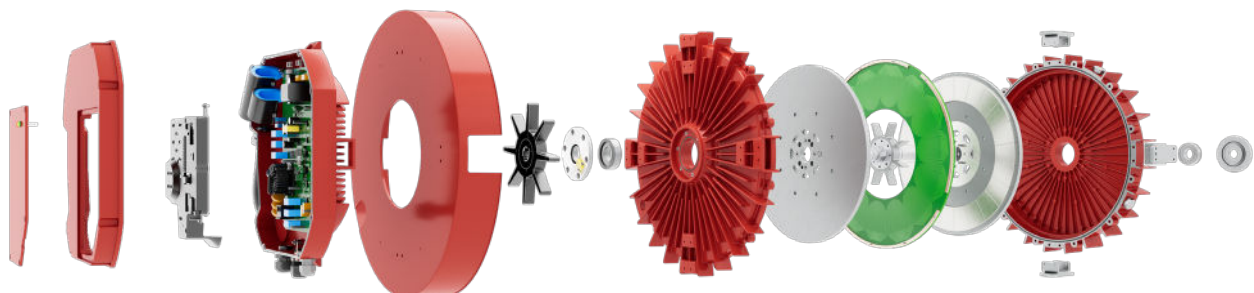
Commercial HVAC



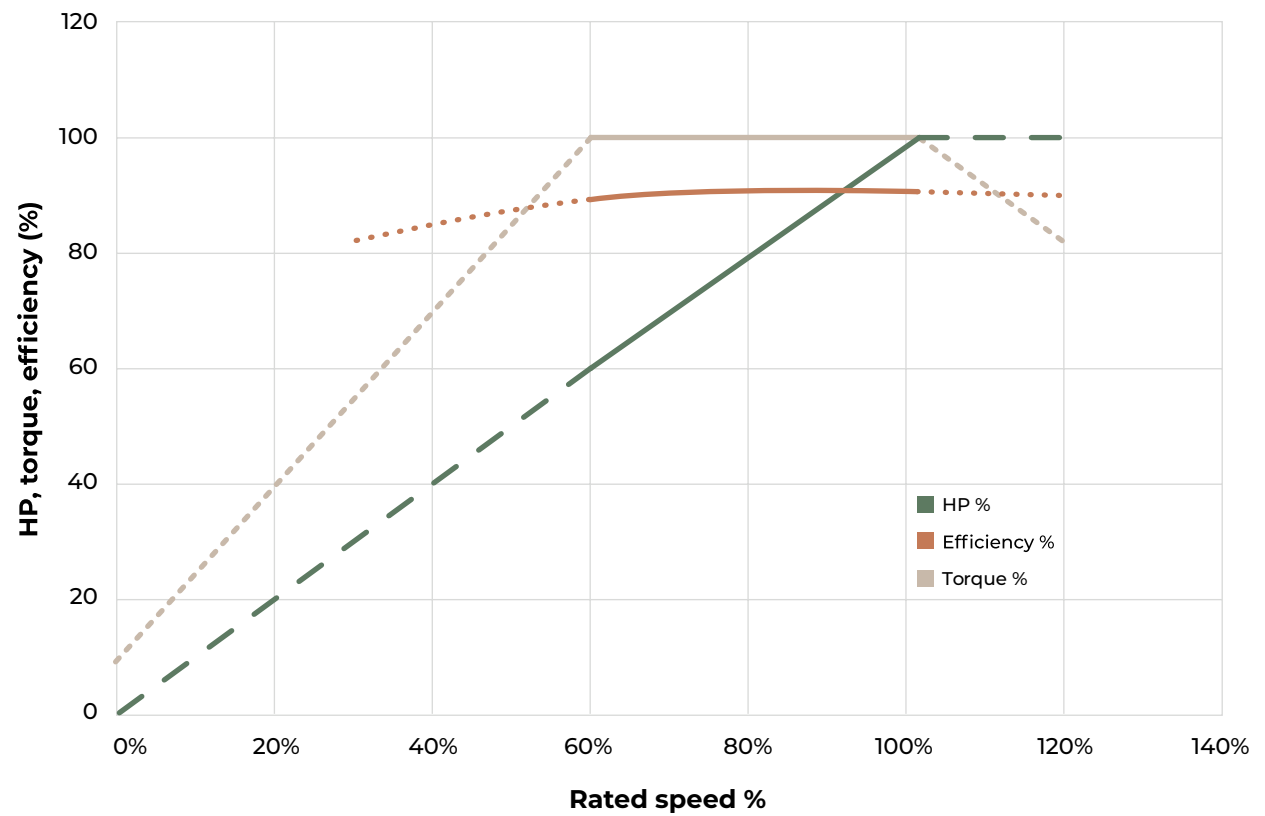
Pumps



Material handling



Performance



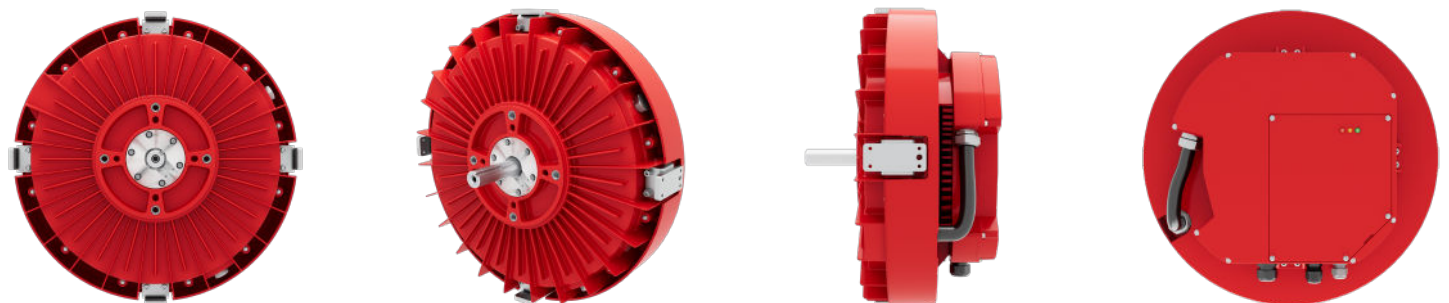
Note: Infinitum does not recommend using the motor below 60% of rated speed except when coasting or ramping up. It is also essential to restrict power and FLA within the nameplate rating when operating the motor above 100% of its rated speed. To operate the motor outside the recommended operating range, please contact the factory and our Application Engineers will provide a customized solution.

| Motor information | |
|--------------------------|----------------------------|
| Rated power | 15.0 HP, 11.19 kW |
| Rated torque | 44.3 lb-ft, 60.0 Nm |
| Rated speed | 1800 RPM |
| Max speed | 2160 RPM (see above) |
| Min speed | 100 RPM (see above) |
| Weight (motor & drive) | 128.1 lbs, 58.1kg |
| Frame diameter | 21.1", 53.7 cm |
| Length (motor & drive) | 8.9", 22.5 cm |
| System efficiency | 90.6% |
| Duty cycle | Continuous |
| Variable speed | Yes, integrated VFD |
| Service factor | 1.0 |
| Motor thermal protection | Electronically-protected L |
| Motor type | TEFC |
| Enclosure rating | IP54 |

| 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 | 18.0 A (460 VAC) |
| Motor insulation class | B |

| Mechanical | |
|-------------------------|---|
| Direction of rotation | CW/CCW |
| Motor frame material | Aluminum |
| Rotor inertia | 0.49 kg/m ² |
| Bearing type – DE | Standard: steel, 6206 sealed, permanently lubricated Optional: hybrid ceramic (see catalog number) |
| Bearing type – NDE | Standard: steel, 6206 sealed, permanently lubricated Optional: hybrid ceramic (see catalog number) |
| Grease specification | Mobil polyrex EM |
| Regreasable | No |
| Grounding brushes | Included – DE |
| Shaft design | Keyed |
| Motor mounting position | Horizontal or vertical |
| Motor mounting type | C-face (182TC) and body mount |

| Ambient operating conditions | | |
|------------------------------|--|-------------------------------|
| Condition | Operation | Storage & transportation |
| Altitude | 0 to 3300 ft. (1,000 m) above sea level 9% power derate per 1,000 m up to 4,000 m | NA |
| Ambient temperature | -13 to 104 °F (-25 to 40 °C) 2% power derate per 1 °C up to 50 °C | -40 to 185 °F (-40 to 85 °C) |
| Relative humidity | 95%, No condensation allowed | 95%, No condensation allowed |
| Contamination levels | No conductive dust allowed | No conductive dust allowed |



Control connections

Refer to [IOM Manual](#) for more details.

Note: not all I/Os are supported in every motor. (See catalog number)

| Description | Quantity | Type |
|--|----------|--|
| Analog input Software selectable for voltage or current input | 1 | Voltage signal – 0 to 10 VDC, RIN = 20 k Ω Current signal – 0 to 20 mA, RIN = 500 Ω Resolution – 0.1% Accuracy – \pm 5% |
| Analog output (see above) Software selectable for voltage or current output | 1 | Voltage – 0 to 10 VDC with 10 mA maximum Current – 0 to 20 mA with load < 500 Ω |
| Auxiliary voltage | 1 | 24 VDC user supply with \pm 5% with 1 A maximum |
| Digital input | 4 | 24 VDC with internal or external supply Input impedance – 1 k Ω |
| Digital output | 2 | Open drain output Maximum switching voltage 40 VDC Maximum switching current 350 mA |
| Relay output | 1 | Normally open (NO), normally closed (NC) contact arrangements Maximum switching voltage of 125 VAC / 30 VDC Maximum switching current of: NO – 10 A (VAC) / 5 A (VDC) NC – 3 A (VAC) / 3 A (VDC) |
| EIA-485 Interface for Modbus RTU | 1 | Shielded twisted pair cable with impedance of 120 Ω Transfer rate of 19200 baud Half duplex Modbus communication protocol |
| Modbus TCP | 1 | Ethernet |

Certifications

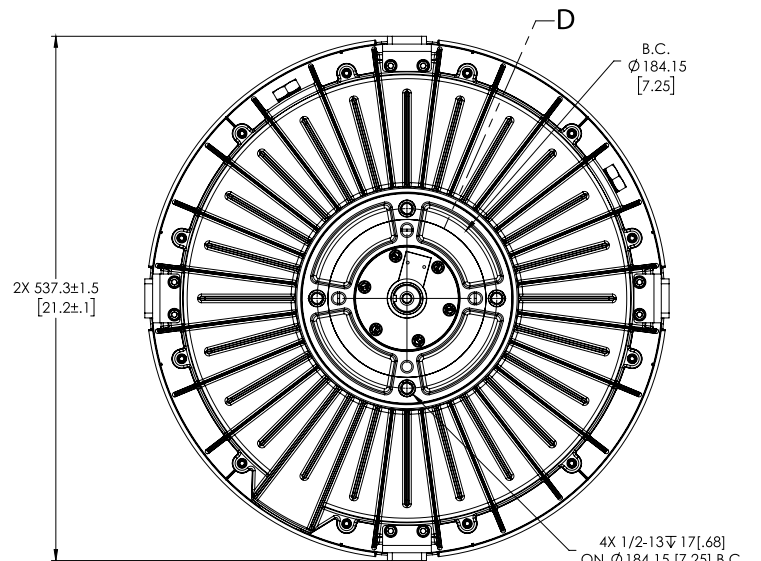
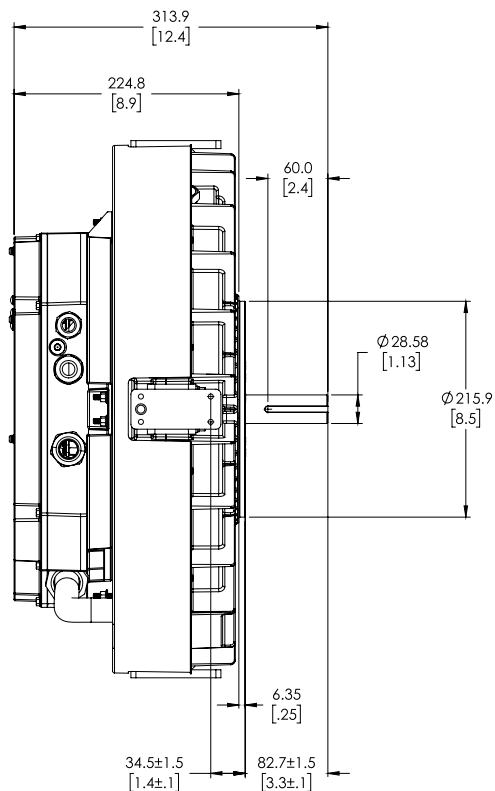
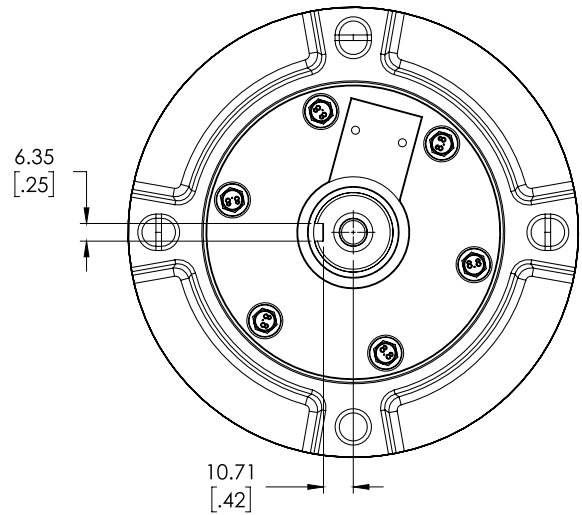
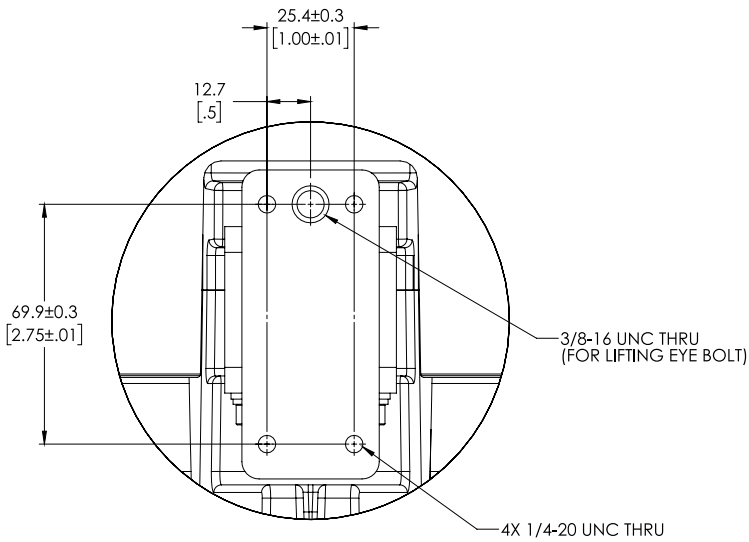
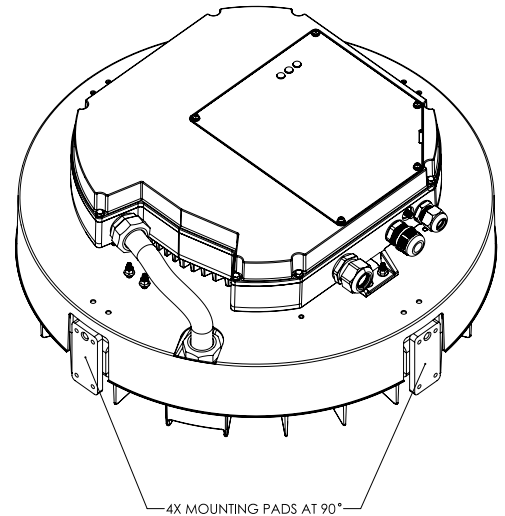
| Regulatory | |
|-----------------|---|
| UL 1004-7 | Standard for electronically protected motors |
| UL 1004-1 | Rotating electrical machines – general requirements |
| CSA C22.2 No.77 | Motors with inherent overheating protection |
| UL 61800-5-1 | Standard for adjustable speed electrical power drive systems, Part 5-1: safety requirements & electrical, thermal & energy |



Mounting & dimensions

Below are the 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.
- 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.



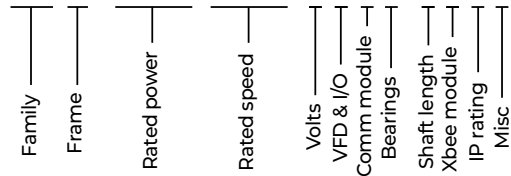
Catalog number decoder

| Family | Frame | Rated power | Rated speed | Volts | VFD & I/O | Comm module | Bearings | Shaft length | Xbee module | IP rating | Misc |
|-----------|-----------|-------------|-------------|-------------------|--------------------------|-------------|------------------------|---------------------|-------------|-----------|----------|
| XX | XX | XXXX | XXXX | X | X | X | X | X | X | X | X |
| AE | 20 | 1500 | 1800 | A*: 460 V / 60 Hz | A*: Modbus, analog input | A*: none | S*: steel H: hybrid | A*: 3.3" B: 4.0" | A*: none | 4*: IP54 | 0*: EPL |

*Standard

Example catalog number

AE20-1500-1800-AAAS-AA40



Example decoded

AE20 = Aircore EC, 20 frame

1500 = 15 HP

1800 = 1800 RPM

AAAS = 460 V / Modbus / Analog Input / No communication module / Steel bearings

AA40 = 3.3" shaft length / No IoT module / IP54 rating / Electronically Protected-L

Ordering information

| Catalog number | Description |
|--------------------------|---|
| AE20-1500-1800-AAAS-AA40 | Aircore EC, frame 20, 15 HP, 1800 RPM, 460 V / 60 Hz, Modbus RTU, analog input, no comm module, steel bearing, standard shaft, no Xbee module, IP54, electronically protected for locked rotor |
| AE20-1500-1800-AAAH-AA40 | Aircore EC, frame 20, 15 HP, 1800 RPM, 460 V / 60 Hz, Modbus RTU, analog input, no comm module, hybrid bearing, standard shaft, no Xbee module, IP54, electronically protected for locked rotor |
| AE20-1500-1800-AAAS-BA40 | Aircore EC, frame 20, 15 HP, 1800 RPM, 460 V / 60 Hz, Modbus RTU, analog input, no comm module, steel bearing, custom shaft, no Xbee module, IP54, electronically protected for locked rotor |
| AE20-1500-1800-AAAH-BA40 | Aircore EC, frame 20, 15 HP, 1800 RPM, 460 V / 60 Hz, Modbus RTU, analog input, no comm module, hybrid bearing, custom shaft, no Xbee module, IP54, electronically protected for locked rotor |



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