

Force Drive™ Electric Drive Solutions

AC55 Motor with DMOC445 Controller



Overview

The Azure Dynamics AC55 with DMOC445 Drive System features the Azure AC55 motor mounted in an axial design. This single motor directly drives the differential, typically via a short driveshaft. Because of the direct drive layout, the drive unit fits into the area formerly occupied by the traditional drive shaft of delivery vans, trucks, etc., making vehicle conversions fast and easy.

Applications & Features

In battery-EV applications, the AC55 and DMOC445 drives are designed for use in vans, trucks and buses weighing from 5,000 to 11,000 lbs. The motor is of a low-speed design for a typical 3-5:1 overall vehicle drive ratio.

- AC induction motor
- Air-cooled
- High-efficiency brushless design
- Compact, lightweight construction
- Low rotating losses
- Low electrical resistance
- Cost effectiveness and high reliability
- Because it is used in conjunction with an Azure DMOC motor controller, the AC55 can function as an “electronic transmission,” eliminating the need for a multi-speed gearbox in some applications, directly driving the vehicle’s wheels with a fixed ratio.

DMOC445 Digital Motor Controller

Azure’s DMOC445 is a DSP-controlled, rugged, waterproof (except for cooling fans) inverter for controlling 3-phase AC motors and generators. Liquid-cooling is available.

- DSP-based control
- Regenerative braking
- Space Vector PWM and Field Oriented Control
- Internal contactor with pre charge circuitry
- Lightweight aluminum chassis
- Waterproof, rugged construction
- Trenchgate IGBTs for maximum efficiency
- Over voltage and under voltage protection
- Three-level over current protection:
 - > 10kHz DSP-based current control
 - > Analog over current watchdog
 - > “Desat” protection at gate level
- Inverter over temperature protection
- Motor over temperature protection
- Over speed torque limit
- Diagnostics and data visualization via Controller Area Network (CAN) or RS232
- CAN control with upper/lower torque limits and speed setpoint commands, plus DMOC status messages over CAN. (Note, customers must provide their own CAN interface for both.)

Specifications

Peak Torque	Nm	280
Continuous Torque* at Nominal Speed	Nm	140
Nominal Speed	Rpm	2000
Maximum Mechanical Speed	Rpm	8000
Maximum Current	A rms	250
Continuous Shaft Power* at 1500-2500 rpm	kW	25
	At a voltage of	VDC
		312
Peak Efficiency	%	87
Peak Shaft Power	kW	59
	At a voltage of	VDC
		312
Weight AC55	kg	106
Weight DMOC445	kg	14.7
Diameter AC55	mm	343
Length AC55	mm	447
Length DMOC445	mm	450
Width DMOC445	mm	228
Height DMOC445 (with fan)	mm	238
Minimum Recommended Nominal Battery Voltage	VDC	312
Maximum Nominal Battery Voltage	VDC	336
Minimum Operational Voltage	VDC	100
Maximum Operational Voltage	VDC	400
Maximum Voltage “On Charge”	VDC	450
Minimum/Maximum Operating Temperatures	°C	-40 to 60

*At 25°C

System design and application affect performance. These specifications are guidelines to help facilitate system design and application and are not guaranteed in any particular application. All specifications are subject to change without notice.



Driving a *WORLD* of difference

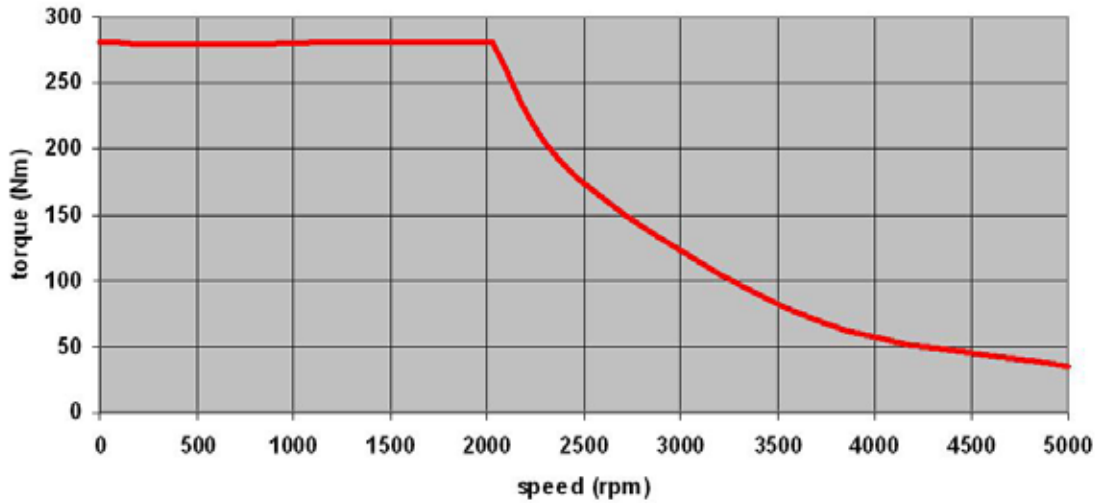
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781.932.9009 Ext. 6224 sales@azuredynamics.com or call toll free 877.932.9009

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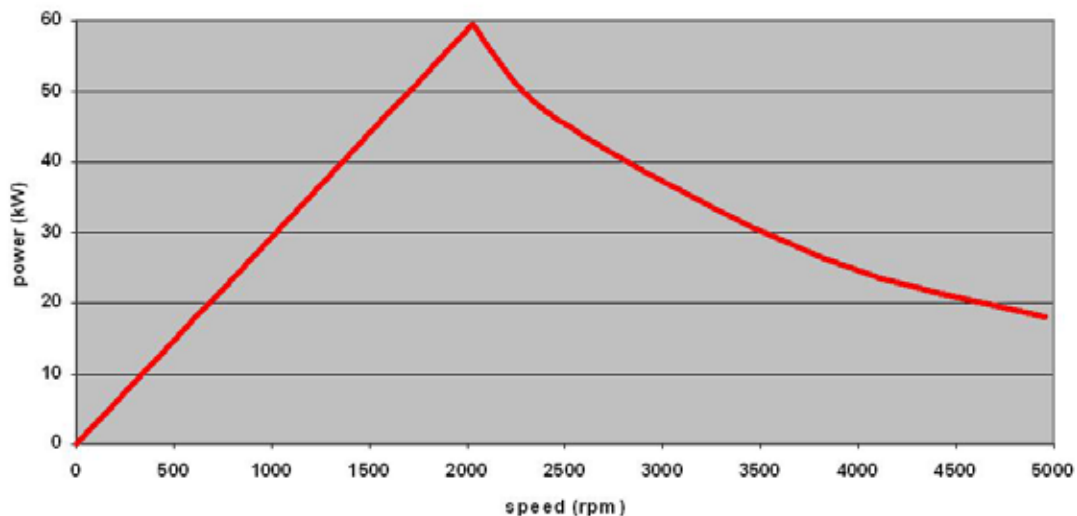
Torque-Speed Envelope

AC55 Torque vs. Speed
400A peak, 312VDC



Power-Speed Envelope

AC55 Power vs. Speed
400A peak, 312VDC



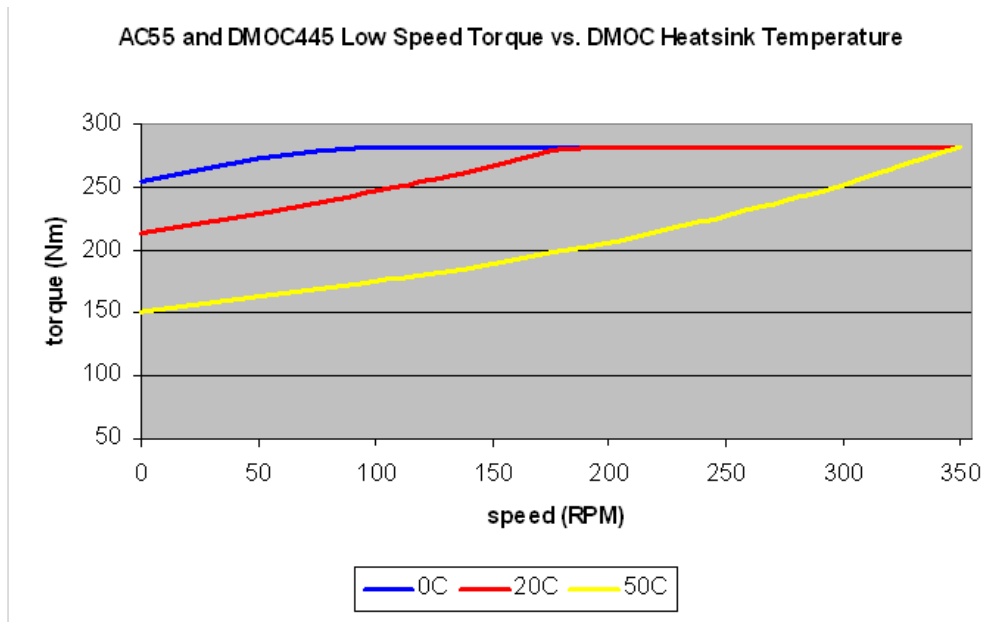
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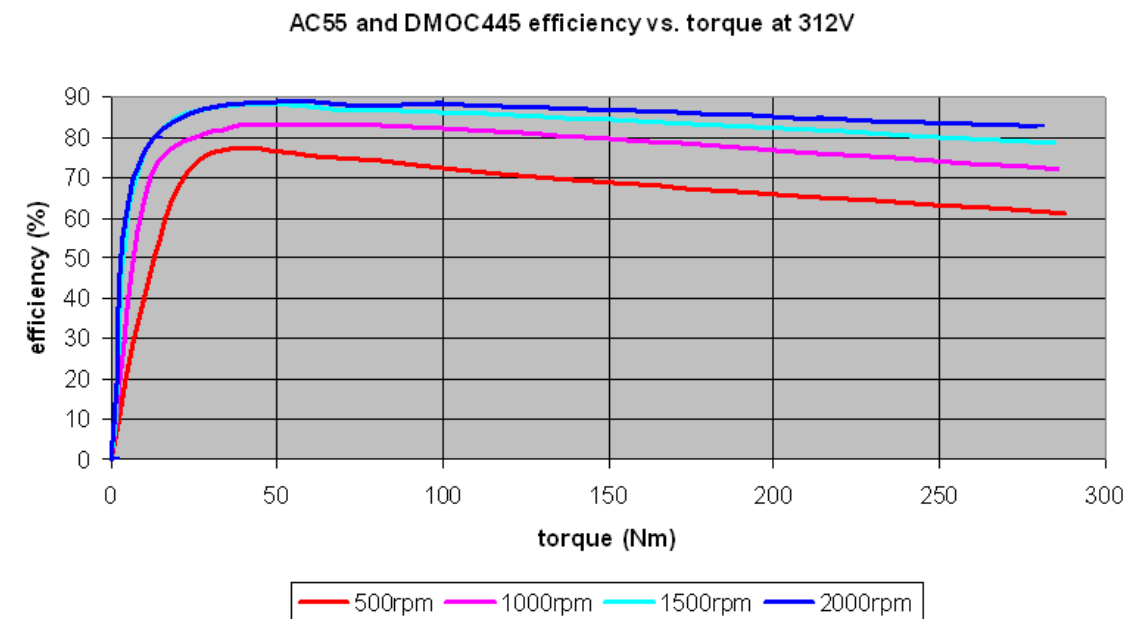
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AC55 Motor with DMOC445 Controller

Low Speed Torque vs. RPM



Efficiency vs. Torque



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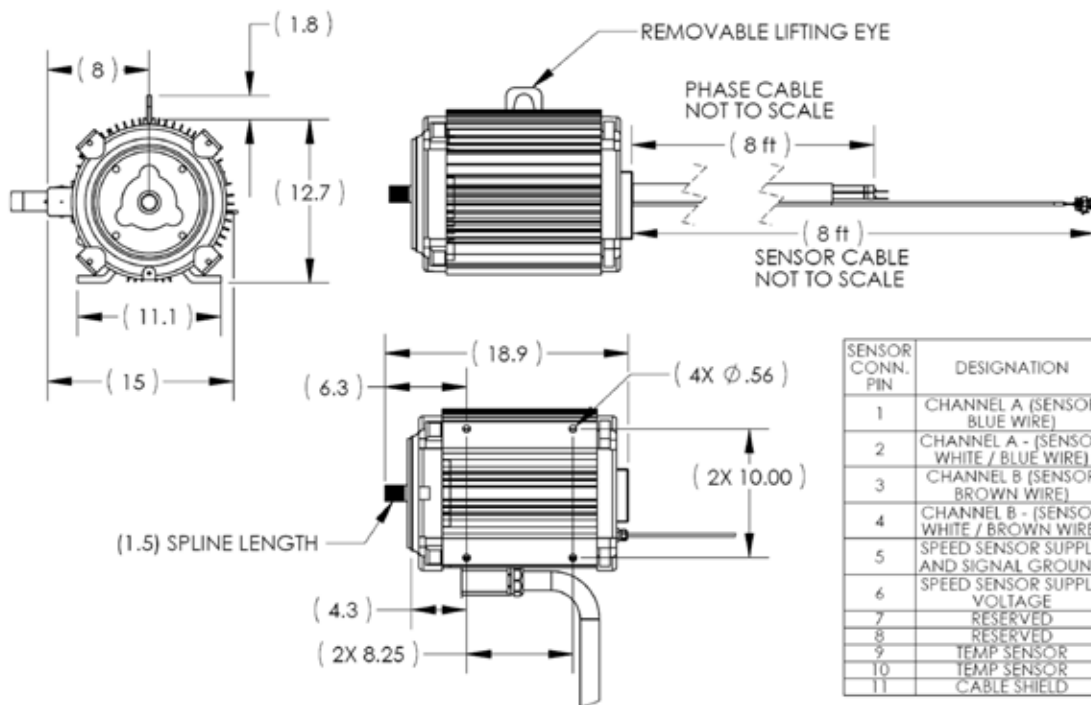
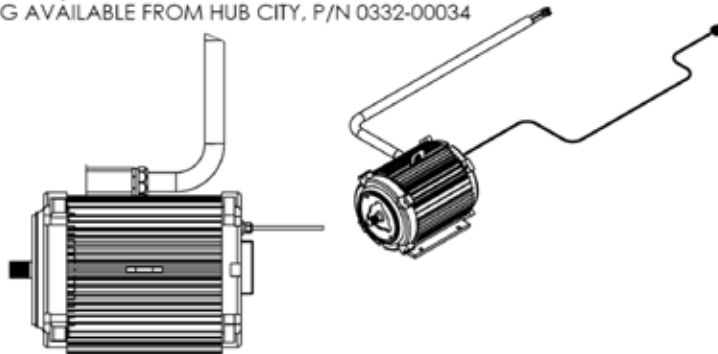
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AC55 Motor

- NOTES:**
1. SPEED SENSOR / TEMPERATURE SENSOR CABLE CONNECTOR - AMP PART NUMBER 776273-1
 2. SEE TABLE FOR SENSOR CABLE PIN DESIGNATION
 3. SPEED SENSING PROVIDED BY QUADRATURE SENSOR - CONTREX PART NUMBER 7200 0992 AND 60 TOOTH SENSOR DISC.
 4. DELTA CONFIGURED MOTOR IS P/N MTA-010082
WYE CONFIGURED MOTOR IS P/N MTA-010073
 5. MATING SPLINE COUPLING AVAILABLE FROM HUB CITY, P/N 0332-00034

EXTERNAL INVOLUTE SPLINE DATA	
FLAT ROOT SIDE FIT	
NUMBER OF TEETH	14
SPLINE PITCH	12/24
PRESSURE ANGLE	30°
BASE DIAMETER	1.010363 REF.
PITCH DIAMETER	1.166667
MAJOR DIAMETER	1.2500/1.2495
FORM DIAMETER	1.082
MINOR DIAMETER	1.040 MIN.
CIRCULAR TOOTH THICKNESS	
MAX. EFFECTIVE	0.1309
MIN. ACTUAL	0.1280
MIN. MEASUREMENT OVER PINS	1.4053 REF.
PIN DIAMETER	0.1600



SENSOR CONN. PIN	DESIGNATION
1	CHANNEL A (SENSOR BLUE WIRE)
2	CHANNEL A - (SENSOR WHITE / BLUE WIRE)
3	CHANNEL B (SENSOR BROWN WIRE)
4	CHANNEL B - (SENSOR WHITE / BROWN WIRE)
5	SPEED SENSOR SUPPLY AND SIGNAL GROUND
6	SPEED SENSOR SUPPLY VOLTAGE
7	RESERVED
8	RESERVED
9	TEMP SENSOR
10	TEMP SENSOR
11	CABLE SHIELD

2	LEGACY COMPONENT	6-26-07	KSH
REV.	REVISION REFERENCE	DATE	APPROVED
REVISION HISTORY			

ALL DIMENSIONS ARE GIVEN IN INCHES WITH +/- 1/4" TOLERANCE AND ARE FOR REFERENCE ONLY.

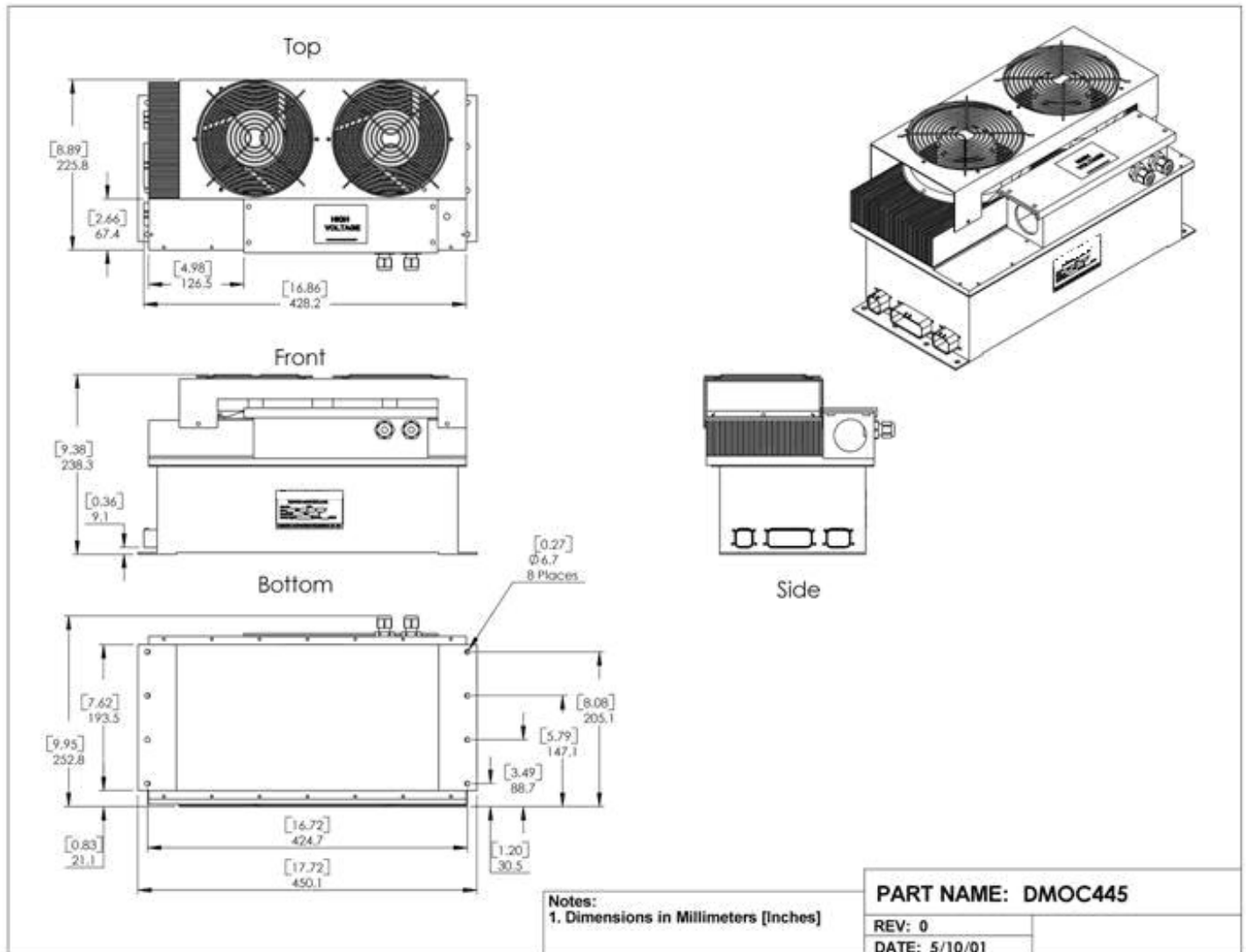
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DMOC445 Motor Controller



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