UQM TECHNOLOGIES

HiTor Traction System

For Electric, Hybrid Electric, and Fuel Cell Powered Vehicles

An improved design that incorporates:

- **380 N·m Peak Torque**
- **35 kW peak, 23.5 kW continuous power**
- **Regenerative braking**
- **Full power @ 250-400 VDC input**

7501 Miller Drive Frederick CO 80530 Tel: 303-278-2002 Fax: 303-278-7007
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UQM380 Brushless PM Motor/Generator		
Dimensions		
Length	8.55 in	216 mm
Diameter	11.00 in	280 mm
Weight	89 lb	40 kg
Performance		
Peak power	47 hp	35 kW
Continuous power	31.5 hp	23.5 kW
Peak torque	280 lbf·ft	380 N·m
Continuous torque	111 lbf·ft	150 N·m
Maximum speed	4500 RPM	
Maximum efficiency	90%	
Power density (based on 35 kW)	0.53 hp/lb	875 W/kg
CD40-400L Inverter/Controller		
Dimensions		
Length	14.96 in	380 mm
Width	14.37 in	365 mm
Height	4.69 in	119 mm
Weight	35.0 lb	15.9 kg
Operating Voltage		
Nominal input range	270 to 336 VDC	
Operating voltage input range	250 to 400 VDC	
Minimum voltage limit	180 VDC (with derated power output)	
Input current limitation	300 A	
Inverter Type		
Control type – PWM & phase advance, 3-Phase Brushless PM		
Applicable max. current	475 A peak	
Power device	IGBT module half bridge x 3	
Switching frequency	20 kHz	
Standby power consumption	17 W (inverter and microprocessor)	
Liquid Cooling System		
Minimum coolant flow	8 l/min (50/50 water/glycol mix)	
Max. inlet temp of controller	131 °F	55 °C
Inner diameter of hose	5/8 in	16 mm
Max. inlet pressure	10 psig	0.7 bar
EVPH332 Microprocessor (internally packaged)		
Nominal input voltage	12 VDC	
Input supply voltage range	8 to 15 VDC	
Input supply current range	0.3 to 0.5 A	

Key Features

- **EV/HEV traction drive or HEV starter/generator system**
- **35 kW / 380 N·m**
- **Efficient, power dense, brushless permanent magnet motor**
- **Wheel hub configuration**
- **Compact package**
- **Microprocessor- controlled inverter with phase advance**
- **CAN bus compatible (option)**
- **Liquid cooling**
- **User/application-friendly interface**
- **Light weight**

Drive Electronics Incorporate…	
Serial communication	Temperature sensing/alarm
CAN bus compatibility	Speed sensing
Diagnostic capability	Charger port and parking brake interlocks
Digital “power-up” control signals	Coolant fan control
Software controlled, four quadrant operation	IGBT power switches
Operation tailorable for battery management	
Features	**Benefits**
Torque based traction control	Smooth vehicle operation
Phase advance control	Eliminates gear change requirements
Regenerative braking (selectable)	Improved braking and extended range
Rugged, weatherproof enclosure	Suitable for automotive applications
Liquid cooling	Enhanced thermal management
Vehicle control software	Customized (optional)

(All data subject to change without notice)

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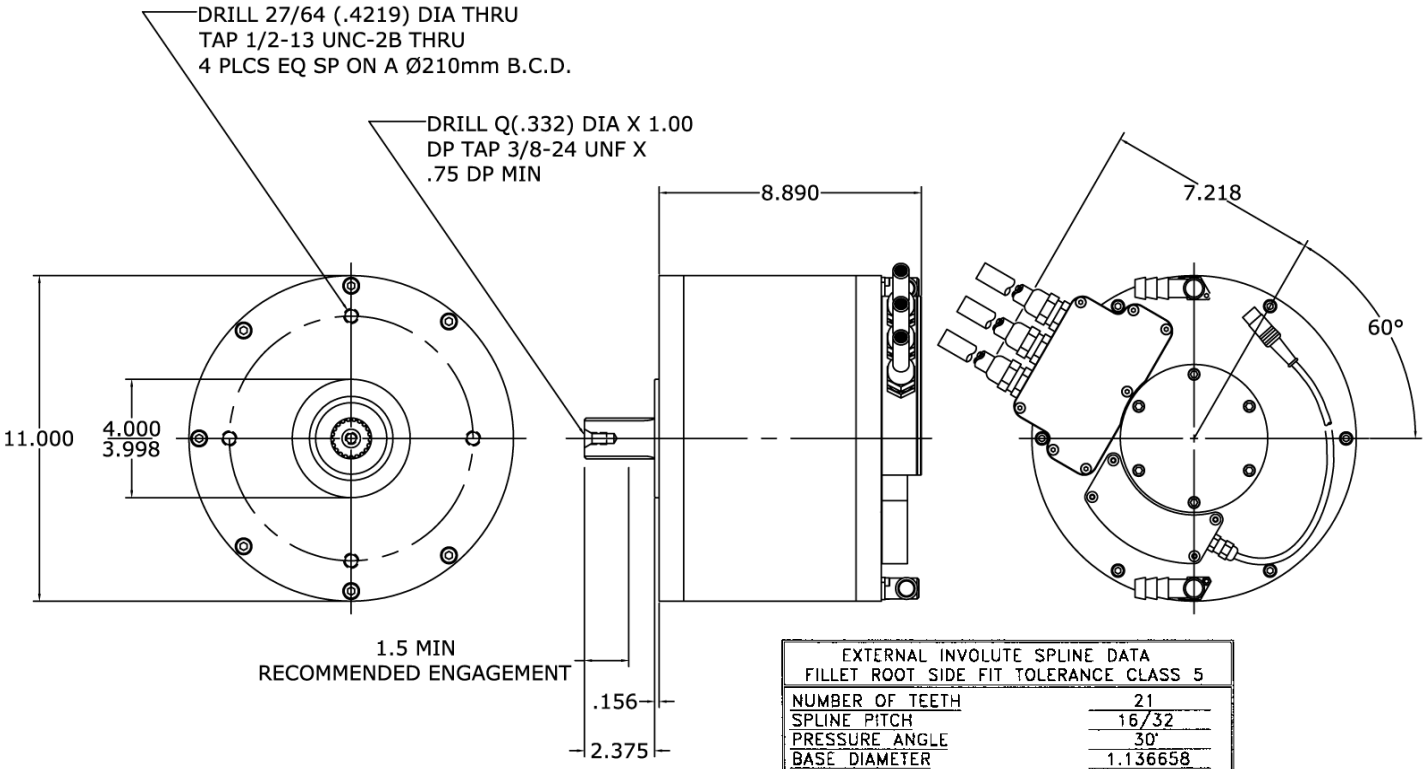
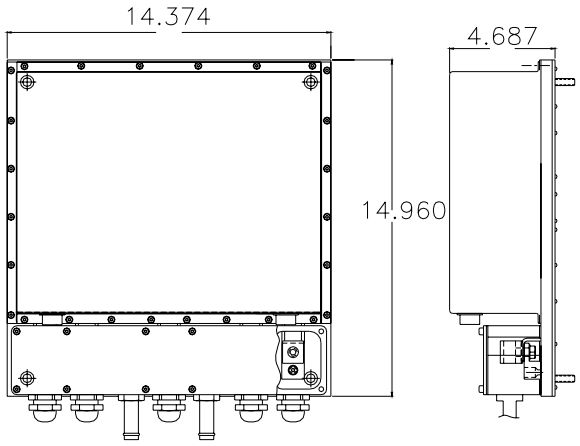
UQM380 Motor/Generator



EXTERNAL INVOLUTE SPLINE DATA FILLET ROOT SIDE FIT TOLERANCE CLASS 5	
NUMBER OF TEETH	21
SPLINE PITCH	16/32
PRESSURE ANGLE	30°
BASE DIAMETER	1.136658
PITCH DIAMETER	1.312500 REF
MAJOR DIAMETER	1.375/1.370
FORM DIAMETER	1.246
MINOR DIAMETER	1.172 MIN
CIRCULAR TOOTH THICKNESS	
MAX EFFECTIVE	.0982
MIN ACTUAL	.0954
MAX ACTUAL	.0966
MEASUREMENT OVER PINS	1.4899/1.4917
PIN DIAMETER	.1200
FILLET RADIUS	.016

UQM CD40-400L Inverter-Controller



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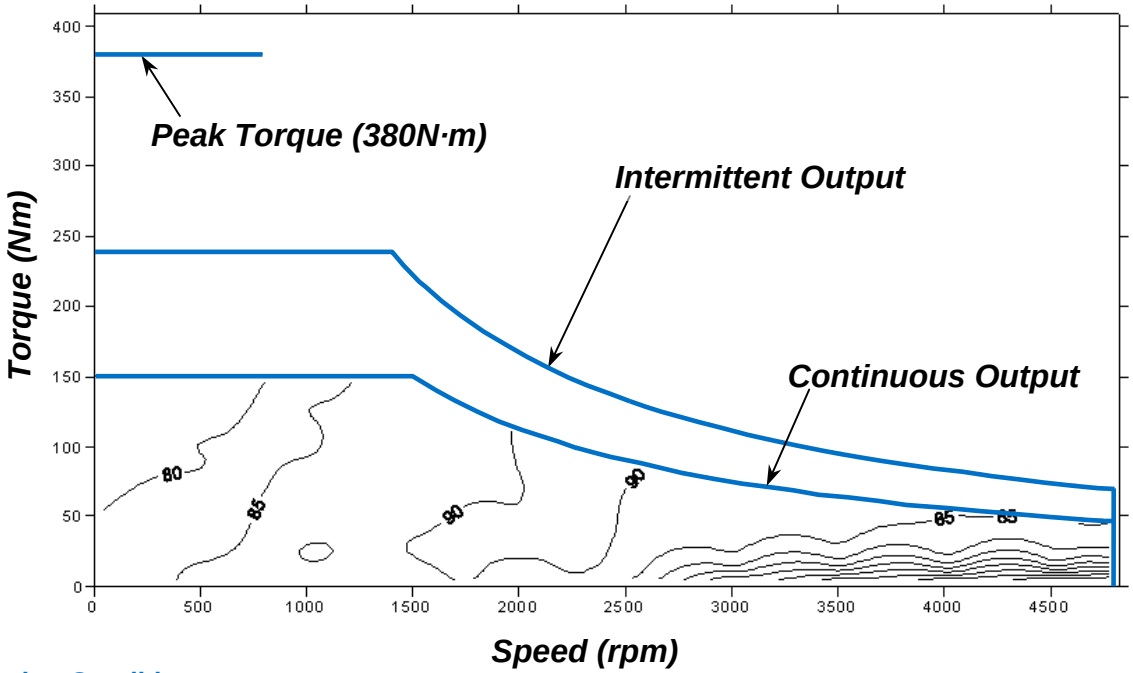
HiTor Efficiency Map (From Test Data)



Testing Conditions

Continuous Output: 300 VDC input, 55 °C coolant
Intermittent Output: 300 VDC input, 55 °C coolant, duration 45-60 seconds
Torque Rating: Applications with high torque ripple should consult UQM Engineering. Rating is based on at least 1.5 in. of shaft engagement.

UQM Technologies, Inc.

A world recognized technology leader in the development and manufacture of energy efficient, power dense electric motors, generators and electronic inverters for:

- Clean electric, hybrid-electric and fuel cell-electric on-road and off-road vehicles
- Vehicle auxiliaries including 42-volt systems
- Environmentally friendly distributed power generators

Product engineering services:

- Custom brushless PM motor development
- Custom power electronics and controls development
- Complete electric traction system development
- Electric and hybrid electric vehicle systems integration
- On-site facilities for product concept, design, engineering, prototyping and production

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