



HiTor Traction System

For Electric, Hybrid Electric, and Fuel Cell Powered Vehicles



An improved design that incorporates:

- **440 N·m Peak Torque**
- **50 kW peak, 30 kW continuous power**
- **Regenerative braking**
- **Full power @ 250-420 VDC input**



UQM380 Brushless PM Motor/Generator		
Dimensions		
Length	9.94 in	252 mm
Diameter	11.00 in	280 mm
Weight	90 lb	41 kg
Performance		
Peak power	67 hp	50 kW
Continuous power	40 hp	30 kW
Peak torque	325 lbf-ft	440 N-m
Continuous torque	133 lbf-ft	180 N-m
Maximum speed	5000 RPM	
Maximum efficiency	90%	
Power density (based on 50 kW)	0.74 hp/lb	1.22 kW/kg
DD45-400L 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 370 VDC	
Operating voltage input range	250 to 420 VDC	
Minimum voltage limit	180 VDC (with derated power output)	
Input current limitation	500 A	
Inverter Type		
Control type – PWM & phase advance, 3-Phase Brushless PM		
Applicable max. current	500 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
T12812 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

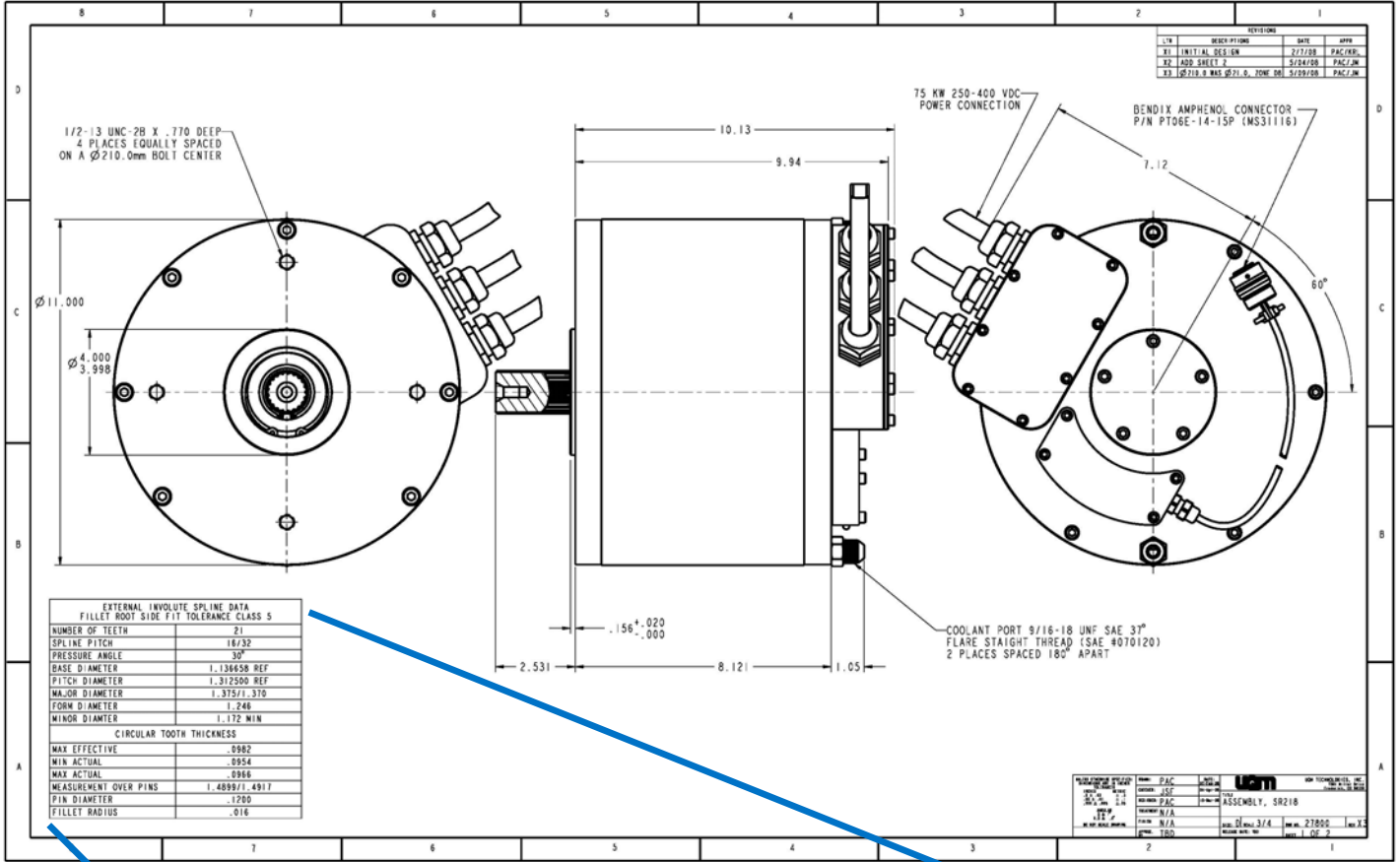
- EV/HEV traction drive or HEV starter/generator system
- 50 kW / 440 N-m
- Efficient, power dense, brushless permanent magnet motor
- Compact package
- Microprocessor- controlled inverter with sine wave drive
- CAN bus compatible (option)
- Liquid cooling
- Application-friendly graphical user interface
- Light weight

Drive Electronics Incorporate:	
Serial communication	Temperature sensing/alarm
CAN bus compatibility	Speed sensing
Diagnostic capability	User friendly graphical user interface
Software controlled, four quadrant operation	IGBT power switches
Features	Benefits
Torque based traction control	Smooth vehicle operation
Voltage control	Tight voltage regulation
Regenerative braking (selectable)	Improved braking and extended range
Rugged, weatherproof enclosure	Suitable for automotive applications
Liquid cooling	Enhanced thermal management

(All data subject to change without notice)



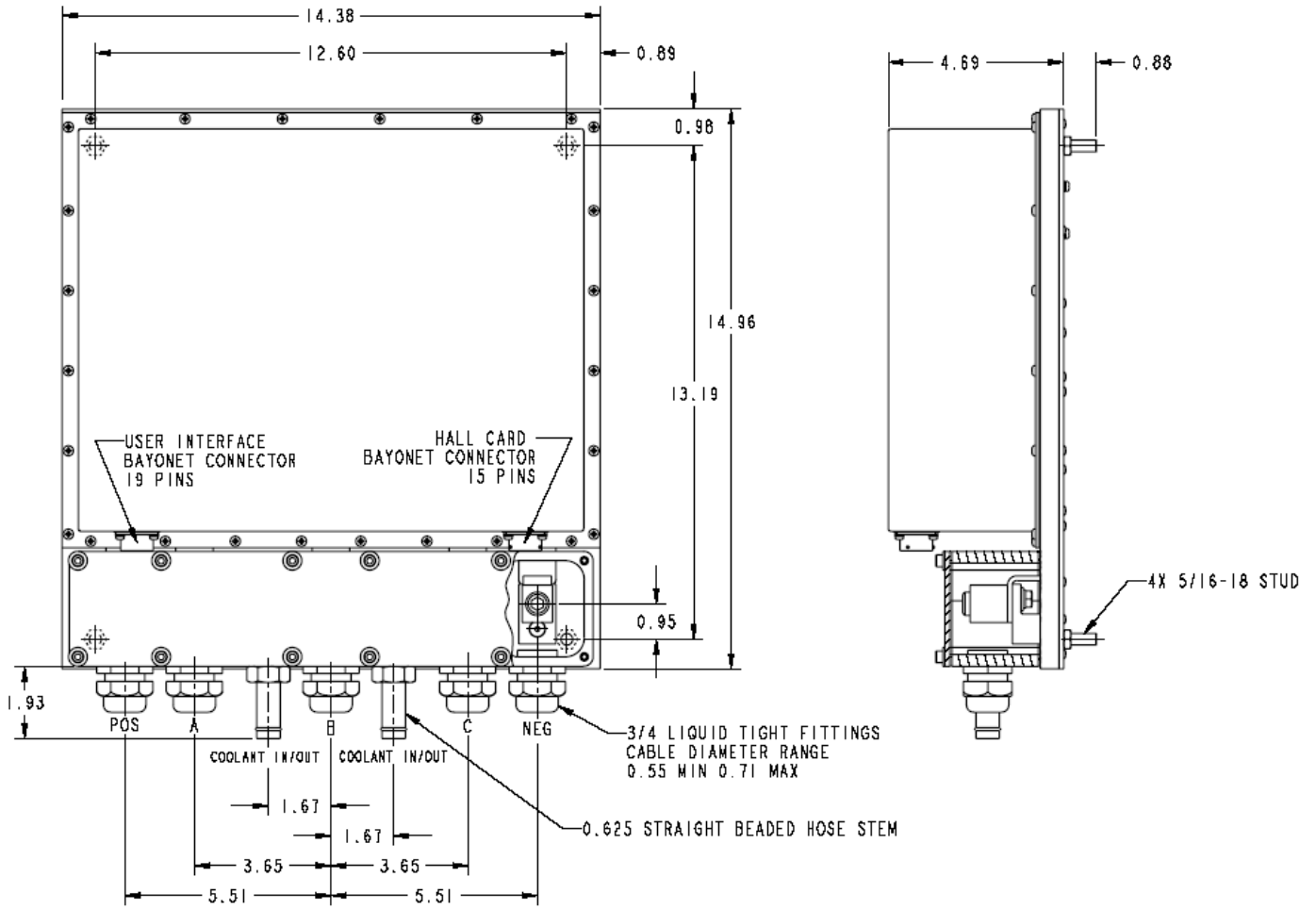
UQM380 Motor/Generator



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



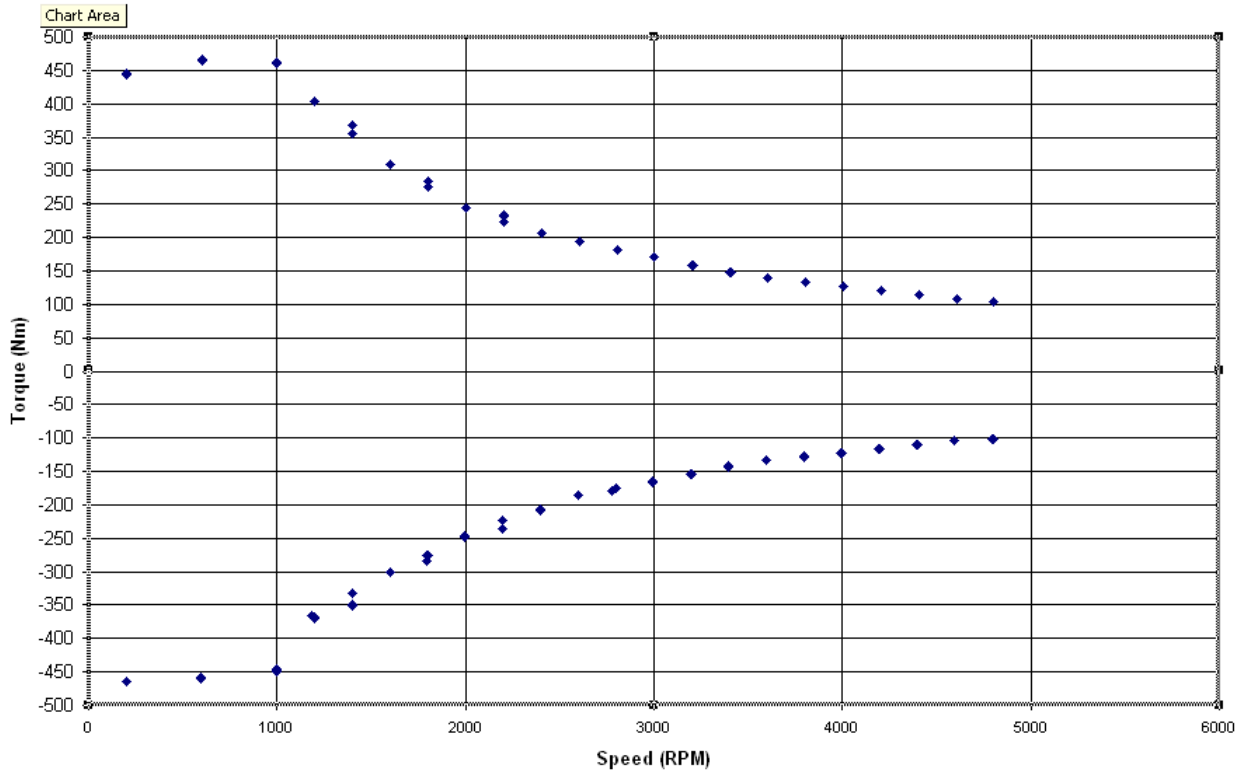
UQM DD45-400L Inverter-Controller





HiTor Speed vs Torque (From Test Data)

SR218_5T Improved Torque Output



Testing Conditions

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.