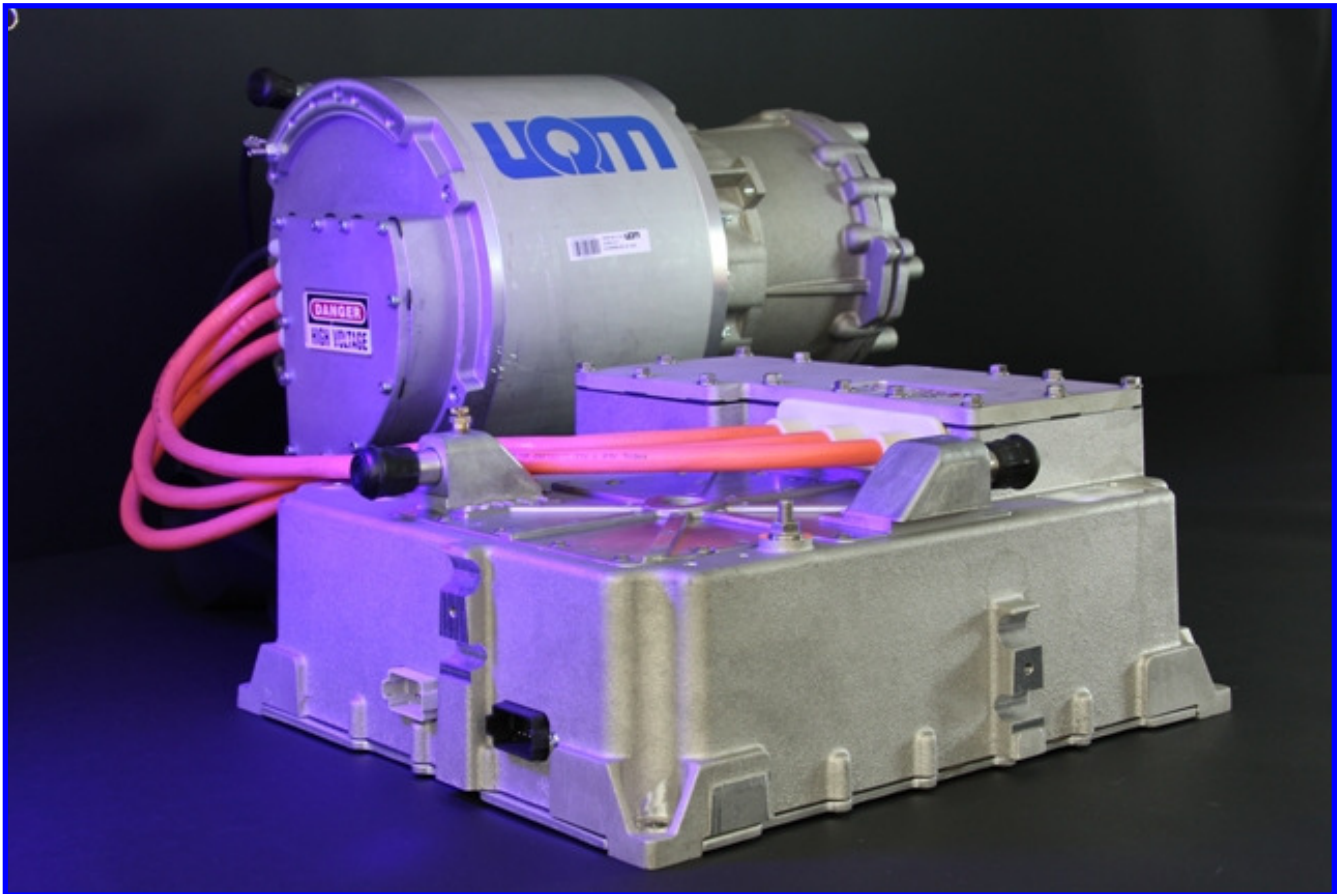




## *PowerPhase<sup>®</sup> 135 Traction System*



### *A reliable design that incorporates:*

- **340 Nm Peak Torque**
- **135 kW peak, 60 kW Continuous Motor Power**
- **150 Adc Continuous Generator Current**
- **Full power @ 270-425 VDC input**



SPM195-114-3 Brushless PM Motor/Generator		
<b>Dimensions</b>		
Length	10.9 in	276 mm
Diameter	11.25 in	286 mm
Weight	110 lb	50 kg
<b>Performance</b>		
Peak power	180 hp	135 kW
Continuous power	80 hp	60 kW
Peak torque	250 lbf-ft	340 N·m
Continuous torque	106 lbf-ft	145 N·m
Maximum speed	8000 RPM	
Maximum efficiency	94%	
Power density (based on 100 kW)	1.22 hp/lb	2.0 kW/kg
1000T-002 Inverter/Controller		
<b>Dimensions</b>		
Length	16.49 in	419 mm
Width	15.49 in	393 mm
Height	7.07 in	180 mm
Weight	61 lb	27.7 kg
<b>Operating Voltage</b>		
Nominal battery input range	300 to 370 VDC	
Operating voltage input range	270 to 425 VDC	
Minimum voltage limit	230 VDC (with derated power output)	
Input current limitation	400 A	
<b>Inverter Type</b>		
Control type - PWM, 3-phase	Brushless PM	
Power device	IGBT module half bridge x 3	
Switching frequency	12.5 kHz	
Standby power consumption	15.6 W (inverter and microprocessor)	
<b>Liquid Cooling System</b>		
Minimum coolant flow	8 l/min (50/50 water/glycol mix)	
Max. inlet temp of controller	150°F	65°C
Inner diameter of hose	3/4 in	16 mm
Max. inlet pressure	30 psig	bar
T12812 Digital Signal Processor (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	
Drive Electronics Incorporate...		
Serial communication	Temperature sensing/alarm	
CAN bus compatibility	Speed sensing	
Diagnostic capability	IGBT power switches	
Digital control signals	Operation configurable for battery management	
Software controlled, four quadrant operation		
Features	Benefits	
Regenerative braking (selectable)	Improved braking and extended range	
Rugged, weatherproof enclosure	Suitable for automotive applications	
Liquid cooling	Enhanced thermal management	

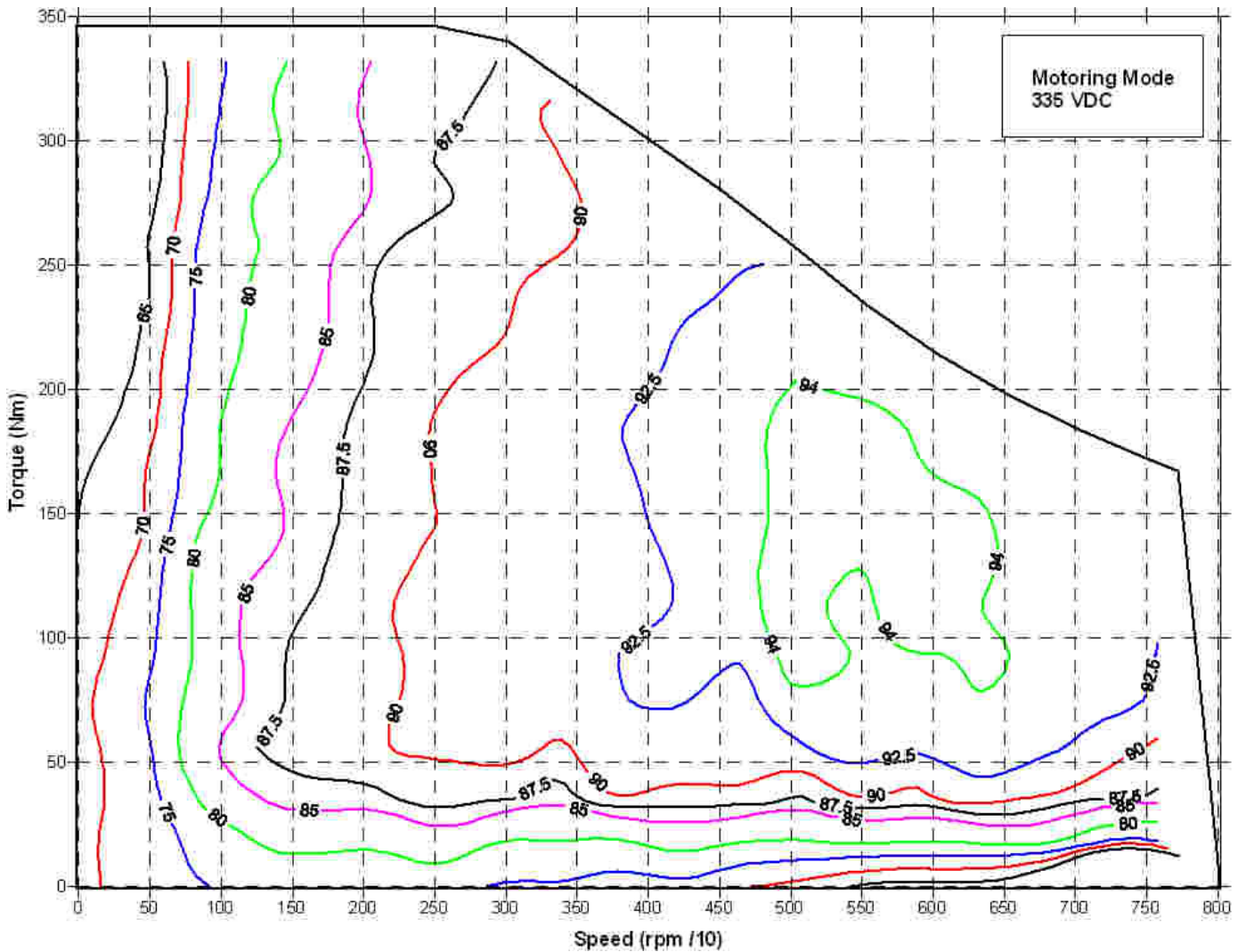
(All data subject to change without notice)

## Key Features

- EV/HEV traction drive or HEV starter/generator system
- 135 kW / 340 N·m
- Efficient, power dense, brushless permanent magnet motor
- User selectable Torque, Speed, or Voltage Control
- DSP-controlled inverter with sine wave drive
- CAN bus compatible
- Liquid cooling
- User/application-friendly interface
- Light weight / Compact



## PowerPhase® 135 Efficiency Maps Motoring Mode (From Test Data)

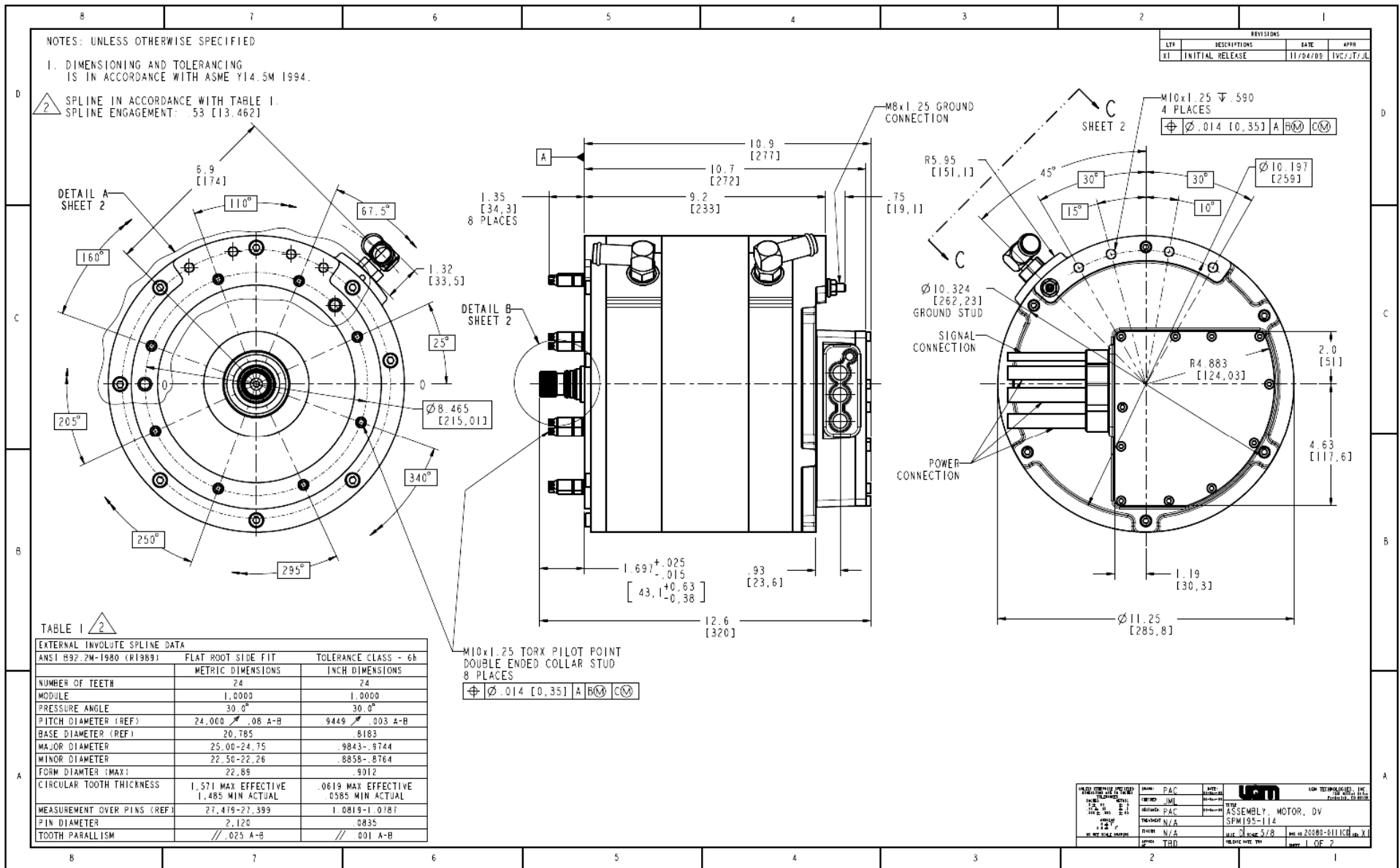


### Testing Conditions

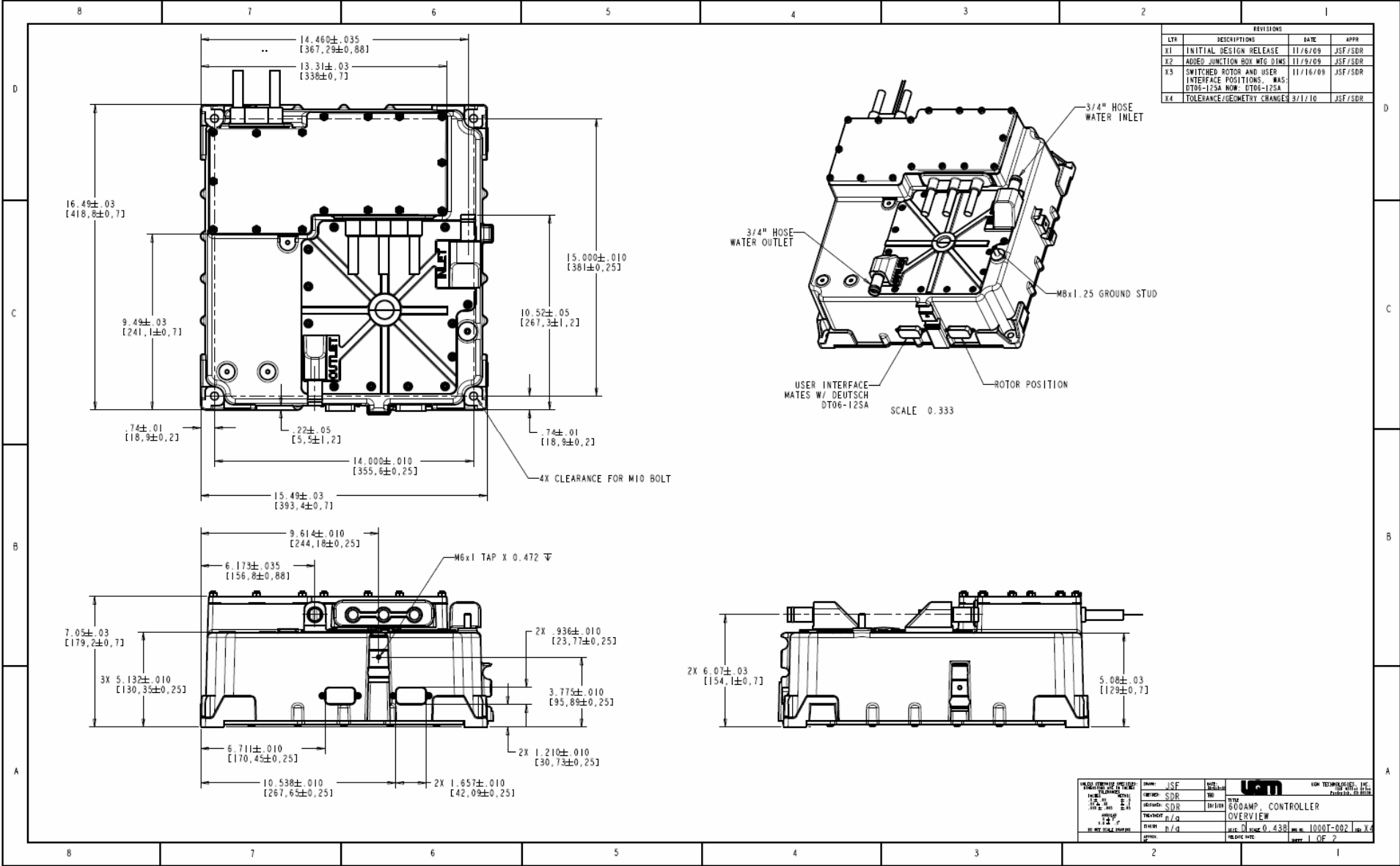
**Continuous Output:** 60 kW at >4000 rpm with 335 VDC input, 55 °C coolant

**Peak Output:** 335 VDC input, 55 °C coolant, duration 10-30 seconds

# SPM195 Motor/Generator



# UQM 1000T-002 Inverter-Controller



DESIGNED BY	JSF	DATE	11/6/09
DESIGNED BY	SDR	DATE	11/9/09
DESIGNED BY	SDR	DATE	11/16/09
DESIGNED BY	n/g	DATE	3/1/10
APPROVED BY	JSF	DATE	11/6/09
APPROVED BY	JSF	DATE	11/9/09
APPROVED BY	JSF	DATE	11/16/09
APPROVED BY	JSF	DATE	3/1/10

**UQM** LOW VOLTAGE ELECTRONICS, INC.  
 7501 MILLER DRIVE, FREDERICK, CO 80530

**300AMP CONTROLLER OVERVIEW**

REV: 0.438 | UQM 1000T-002 | SHEET 1 OF 2