PML-7-600 Inverter

Permanent Magnet
Liquid Cooled
700V Class
400A Continuous—600A Peak Current
330kVA (490kVA peak)

Features

- Permanent Magnet Synchronous Motor controller
- Suitable for Propulsion or Generator applications
- Also available for AC Induction Motor systems
- Liquid-cooled power components (IGBT and DC Bus Capacitors)
- Resolver or Encoder feedback
- Up to 1,000Hz output
- Built in DC Bus voltage Pre-charge
- Variable Switching Frequency—increases with motor RPM (2 to 9kHz — double edge PWM)
- Smart OV, UV and Temperature Based Power Limiting
- Discontinuous Pulse Width Modulation (DPWM)
- Adaptive Torque Control—no look-up tables required
- Validated on motors with up to 20 poles
- CAN-bus Control and Diagnostics
- IP67 rated cast aluminum enclosure
- Up to four inverters per vehicle on one control bus

The Buckeye Bullet 3
Fourth generation Land Speed Record EV powered by ATS
240.320 mph (386.757 kph) August 2015

Specifications

Description	Specifications for up to 40 pole or 1,000Hz motors		
Electrical			
Input Voltage	Minimum 300VDC	Nominal 700VDC	Maximum 800VDC
Output Power (@700VDC)		Continuous 330kVA	Peak (30 sec) 490kVA
Output Current (rms) (@700VDC)		Continuous 400A	Peak (30 sec) 600A
Control Power	24VDC (18V—36V) @4A Maximum		
Mechanical			
Size	22.5”w (572mm) x 18.6”h (472mm) x 6.7”d (170mm)		
Weight	105 lbs (48kg)		
Operating temperature	-40°C to 70°C		
Cooling	50°C @ 11L/min 50-50WEG		

www.americantraction.com
10076 Bavaria Road | Fort Myers, FL 33913 USA | 239-768-0757

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Controller Description

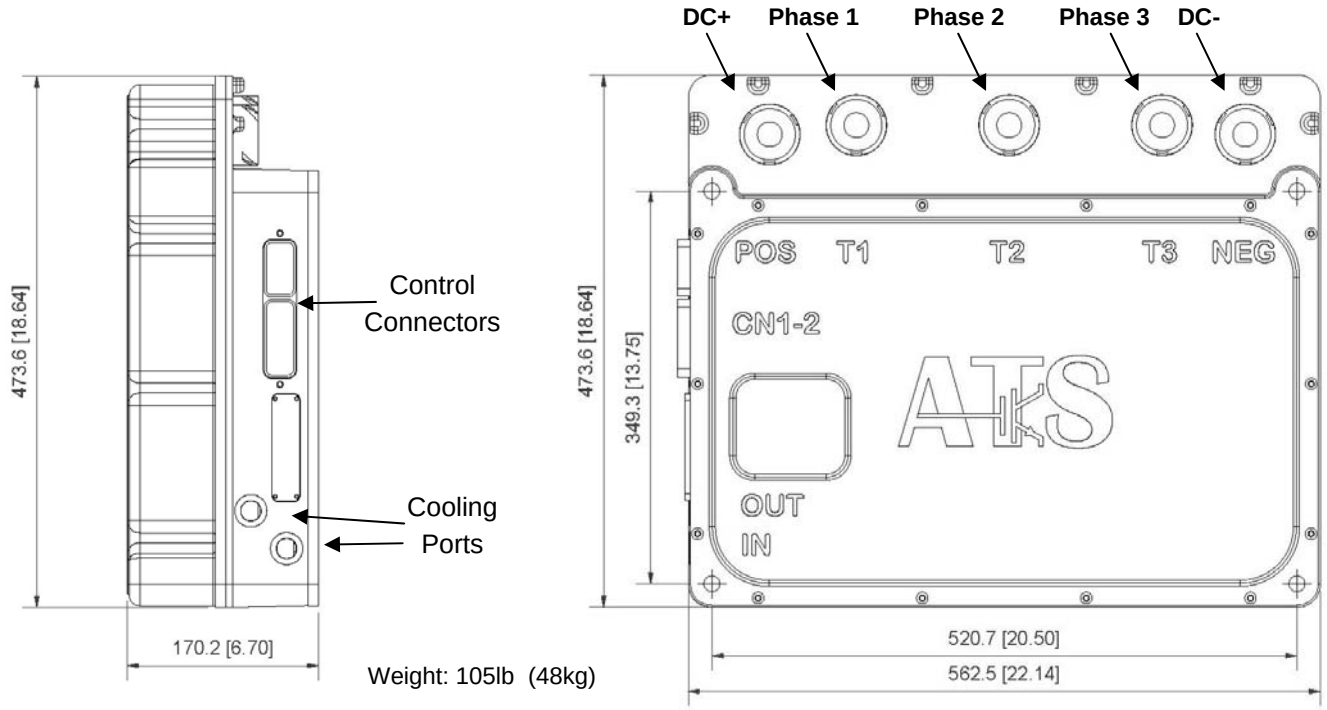
The PML-7-600 is designed to control a permanent magnet synchronous motor (PMSM).

The inverter is designed to operate over a DC bus voltage range of 300V to 800V with optimal performance at 700V.

When the motor controller is used to control a PMSM, it controls the stator current by applying pulses of the DC bus voltage directly to the terminals. The pulse width and the polarity of the pulses are varied in accordance with the voltage required by each terminal. This requirement is determined by high-speed current regulators which continuously seek to maintain the output current levels required to maintain the motor flux at the correct level and motor torque at a level consistent with the traction reference. The mean current drawn from the DC bus is proportional to the average duty cycle of the pulses as well as the power factor of the stator current. This means that the controller can supply the stator with a very large amount of current at low speed while consuming a relatively small amount of current from the DC bus. The motor controller also receives an absolute position feedback signal from the motor that it is driving. Its purpose is to detect the change in rotor position used by the current regulators to position the stator current pattern to produce the correct flux and torque.

The motor controller can also operate very effectively as a dynamic brake down to very low speeds. It achieves this by rearranging the current pattern in the stator so that negative torque is produced. This change occurs as a seamless transition when the polarity of the traction reference is reversed.

Energy recovered from the traction motors during dynamic braking is returned to the DC bus. All of the energy returned to the bus must be dissipated without resulting in a large increase in voltage.



Weight: 105lb (48kg)