

BULL Inverters

Permanent Magnet/AC Induction

Liquid Cooled

350, 750 & 1000 V Versions

450 & 600 A_{PK-RMS} Versions

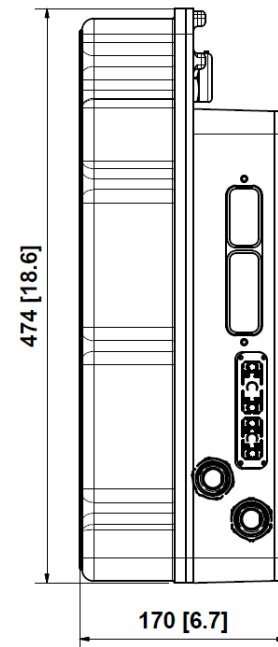
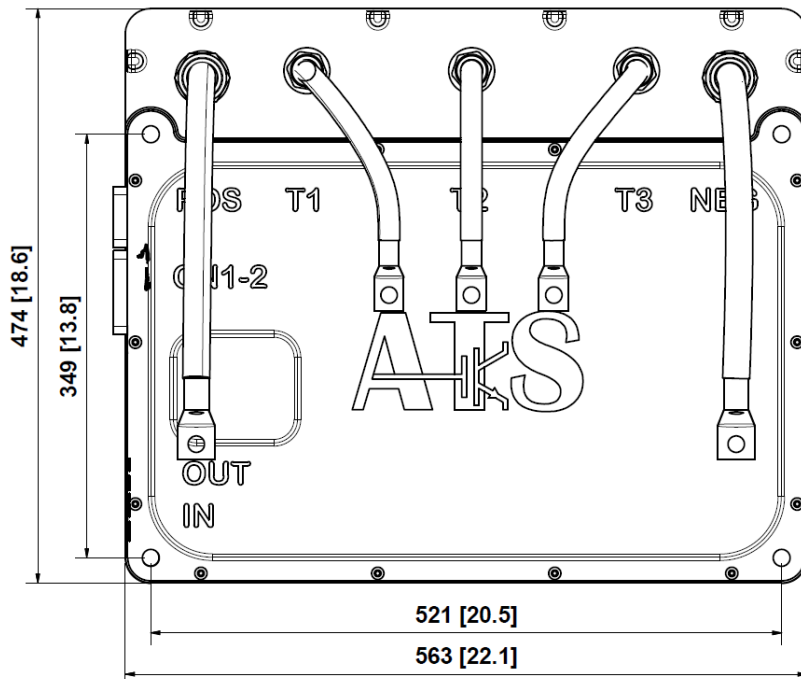
150 — 500 kVA_{PK}



Features

- Permanent Magnet Synchronous or Induction motor controller
- Suitable for Propulsion or Generator applications
- Liquid-cooled power components (IGBT and DC Bus Capacitors)
- Resolver or Encoder feedback
- Up to 1,000 Hz output
- Continuously Variable Switching Frequency—Increases with motor RPM (2 to 9 kHz — Double-edge PWM)
- Smart OV, UV and Temperature 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
- Up to four inverters on one CAN control bus
- IP67 rated cast aluminum enclosure (Optional)
- Built-in DC Bus voltage Pre-charge (Optional)

Mechanical Specifications	
Size	22.5" (572 mm) x 18.6" (472 mm) x 6.7" (170 mm)
Weight	105 lb (48 kg)
Operating Temp	-40°C to 70°C
Cooling	50°C @ 11 L/min 50-50 WEG

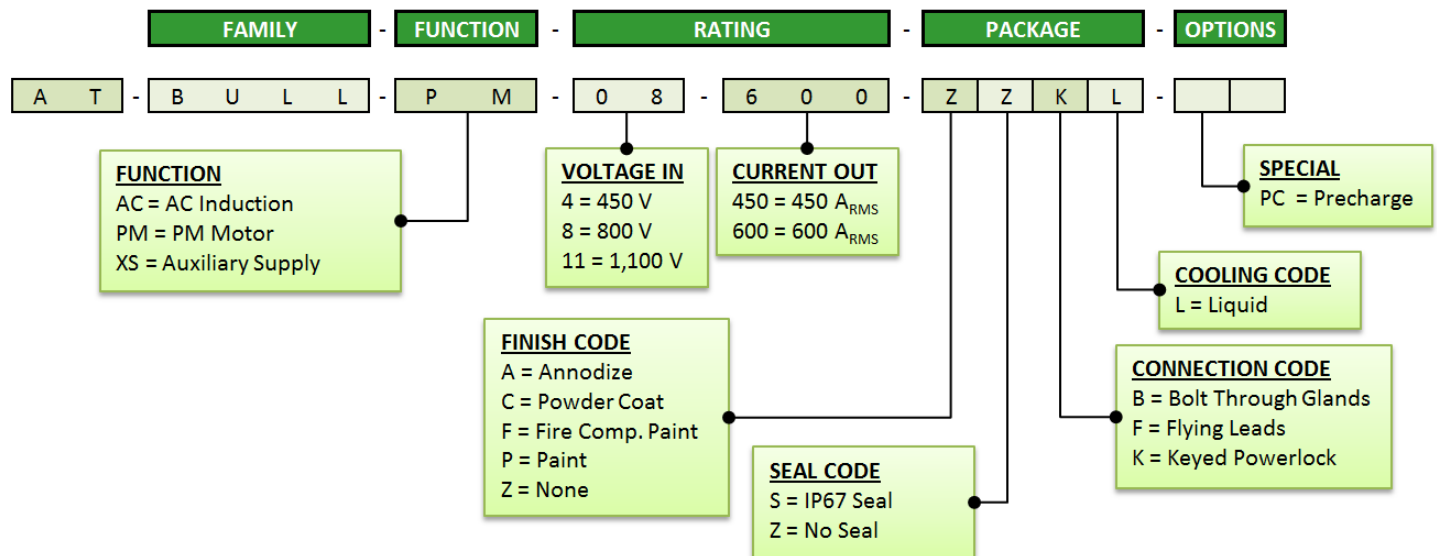


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Controller Description

The BULL Inverters are designed to control Permanent Magnet or AC Induction motors at DC bus levels ranging from 300 to 1100 V and is suitable for propulsion or auxiliary motor applications. The motor control algorithm, Adaptive Torque Control™, uses models based on the physics of the motor and not lookup tables to control the PM or AC motor. ATC™ is an advanced Field-Oriented Control scheme that optimizes torque by accounting for varying supply voltages, motor inductances, motor resistances, motor temperature, speed, and slip. The algorithm monitors the system for over voltage, under voltage, IGBT temperature, motor temperature and over speed conditions to operate the motor more efficiently. In induction motors, this enables operation at or near the breakdown torque of the motor and in PM motors, it utilizes the synchronous reluctance effect to maximize torque.

Model Number & Description



Model Number	DC Bus Voltage [V]		Output Current [A _{RMS}]		DC Bus Capacitance [µF]
	Typ.	Max	Continuous	Peak	
AT-BULL-xx-04-450-xxxx	300	450	375	450	2200
AT-BULL-xx-04-600-xxxx	300	450	500	600	2200
AT-BULL-xx-08-450-xxxx	700	800	338	450	1400
AT-BULL-xx-08-600-xxxx	700	800	450	600	1400
AT-BULL-xx-11-450-xxxx	900	1100	262	450	1000
AT-BULL-xx-11-600-xxxx	900	1100	350	600	1000

Output Voltage = 0 - 0.7 x DC Input Voltage, coolant temperature 60°C
 The values above are typical and are dependent on the motor and application