Invert™ Pure Sine Wave Inverter

1500 and 2000 Watt Pure Sine Wave Inverters

Purkeys Invert™ Pure Sine Wave inverters provide reliable 110 VAC power in heavy-duty vehicles. Inverters are available in 1500 and 2000 watts.

For features and benefits see page 4.

Specifications:

Battery System Voltage ..... 12 VDC

Input DC Voltage (operating).....9.5-16.0V +/-2%

Absolut Maximum Input DC Voltage..... 20.0 V

Nominal Input Current .....150 A/200 A (Max Continuous Load)

Input Current (Surge) .....300 A/400 A

Input Current at No Load..... < 0.5 A

Quiescent Current (Inverter off).....< 25 mA

Maximum Continuous Output Power..... 1500 W/2000 W

Surge Output Power (<2 Seconds) ..... 3000 W/4000 W

Output Waveform..... Pure Sine

Output Voltage..... 115 VAC +/-10%

Output Frequency ..... 60 Hz +/-5%

Efficiency (at 10-100% Output).....>86%

Peak Efficiency..... 94%

Operating Temperature Range .....-4° F to 98° F (-20° C to 37° C)

Over Temperature Shutdown..... 149° F (65° C)

Over Temperature Recovery.....113° F (45° C)

Operating Humidity..... < 90%

LVD Threshold.....Dynamic

Auxiliary I/O Input Voltage .....0-16.0 V

Auxiliary I/O Input Resolution ..... 15 mV

Auxiliary I/O Input Impedance..... 167 K Ohm

Auxiliary I/O Output Type..... Active Low

Maximum Auxiliary I/O Output Current ..... 0.4 A

Maximum USB Output Current.....2.4 A

Neutral to Chassis Bonding ..... No, neutral is floating

Weight..... 10.3 lbs./12.6 lbs. (4.7 kg/5.7 kg)

Shipping Size.....7”x13”x19”/7”x15 x 20”

Shipping Weight ..... 13 lbs/15 lbs

Controller Cables Supplied .....1 ft and 8 ft

Note: The inverter controller cable can be CAT5, CAT5e, or CAT6 and must have male RJ45 connectors on both ends (shielded or unshielded are both okay).

We recommend :

- the conductor in the cable be 24 gauge or larger
- the cable be 16’ or shorter

The cable must be 8 position and 8 conductor (8p8c) and it cannot be a cross-over cable. Most RJ45/Ethernet type cables will work as long as the conductors are 24 gauge or larger.

DynaBalance™ Monitoring Technology

The Invert comes with a patent-pending controller that measures input voltage and input current (even under load) to dynamically estimate the battery's state of charge. This enables the controller to indicate available battery capacity and turn off when the battery's state of charge drops to the turn-off point.

Inverters that do not have this functionality can turn off too late if the inverter is only supplying a small amount of power, or too soon when the inverter is supplying high power (such as when powering a microwave).

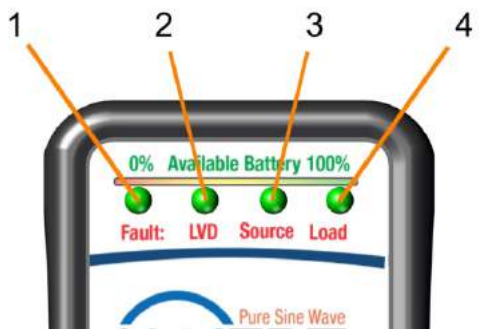
Applications:

- Heavy-Duty Truck Cabs
- Semi-Trailers
- Box Trucks
- Any vehicle application requiring battery protection when using inverters

LED Logic

Normal Operation

LED	Description
ON: NO Fault	
1	Solid Green: Less than 25% (about to shutdown)
2	Solid Green: 25-50% available battery
3	Solid Green: 50-75% available battery
4	Solid Green: 75-100% available battery



Fault Indication

LED	LED STATUS	FAULT	SOLUTION
1	Blinking red	Communication fault	Check cable connection at inverter and controller. Check cable for opens or shorts, replace if necessary.
2	Blinking red	Low Voltage Disconnect	Battery is low, inverter shut off to protect batteries. Turn off inverter, start engine to charge battery.
1, 2	Blinking red Fault LED, solid red LED 2	Undervoltage fault	Voltage to inverter is below 9.5 V, turn inverter off, then back on.
1, 3	Blinking red Fault LED, solid red LED 3	Overvoltage fault	Turn off inverter, correct overvoltage.
1, 3	Blinking red Fault LED, solid red LED 3	Over-temperature fault	Turn inverter off and let it cool down.
1, 4	Blinking red Fault LED, solid red LED 4	Overload fault	Turn off inverter, turn off some of the loads being used.

LVD Function

There are five low voltage disconnect (LVD) settings available on the controller.

Note that unlike other inverters that have a fixed LVD point, these inverters have a dynamic LVD point based on how much current the inverter is drawing from the battery. The approximate voltages listed here are the voltages of the battery after the inverter turns off. The inverter will actually operate down to as low as 9.5 volts under heavy loads. The inverter measures the current draw and dynamically adjusts the LVD point so that after it turns off the unloaded battery voltage will be approximately what is listed here.

Setting	Approximate Voltage	Function
Low 1	11.0	This setting is activated by connecting an active high 12 volt signal (indicating that engine auto-start is enabled) to the auxilary I/O pin
Low 2	11.8	Default setting. Allows the battery to reach near 0% state of charge (ideal for deep cycle batteries that are not needed to start a truck)
Medium 1	12.0	Allows the battery to reach about 25% state of charge
Medium 2	12.2	Allows the battery to reach about 50% state of charge
High	12.4	Allows the battery to reach about 75% state of charge

Buzzer Function

The Invert controller includes a buzzer function that does the following:

Beep Type	Description
Short Beep	Indicates power button has been pressed
Constant Beep	LVD shutoff warning (will shut off in 30 seconds)

Harness Recommendations

The current rating for the 1500 W inverter is 150 amps and the current rating for the 2000 W inverter is 200 amps. The harness that connects the inverter to the battery must be constructed with cables large enough to safely handle the high currents that the inverter will draw from the battery.

For best operation, cables should also be sized so that the total voltage drop in the cables does not exceed 0.5 volts at the rated output of the inverter. The positive cable must be fused with an appropriately sized fuse so as to protect the cables in case of a short circuit.

The following tables show the acceptable cables gauges, the maximum recommended cable length (length of the positive cable plus the length of the negative cable), and the recommended fuse sizes for harnesses for the 1500 W and 2000 W inverters.

1500 watt inverter:

Wire Gauge	Max Recommended ft. (Pos. Length + Neg. Length)	Recommended Fuse Size
6	-	-
4	13	150
2	21	200
1	27	200
0	34	200
00	43	200
000	54	200
0000	68	200

2000 watt inverter:

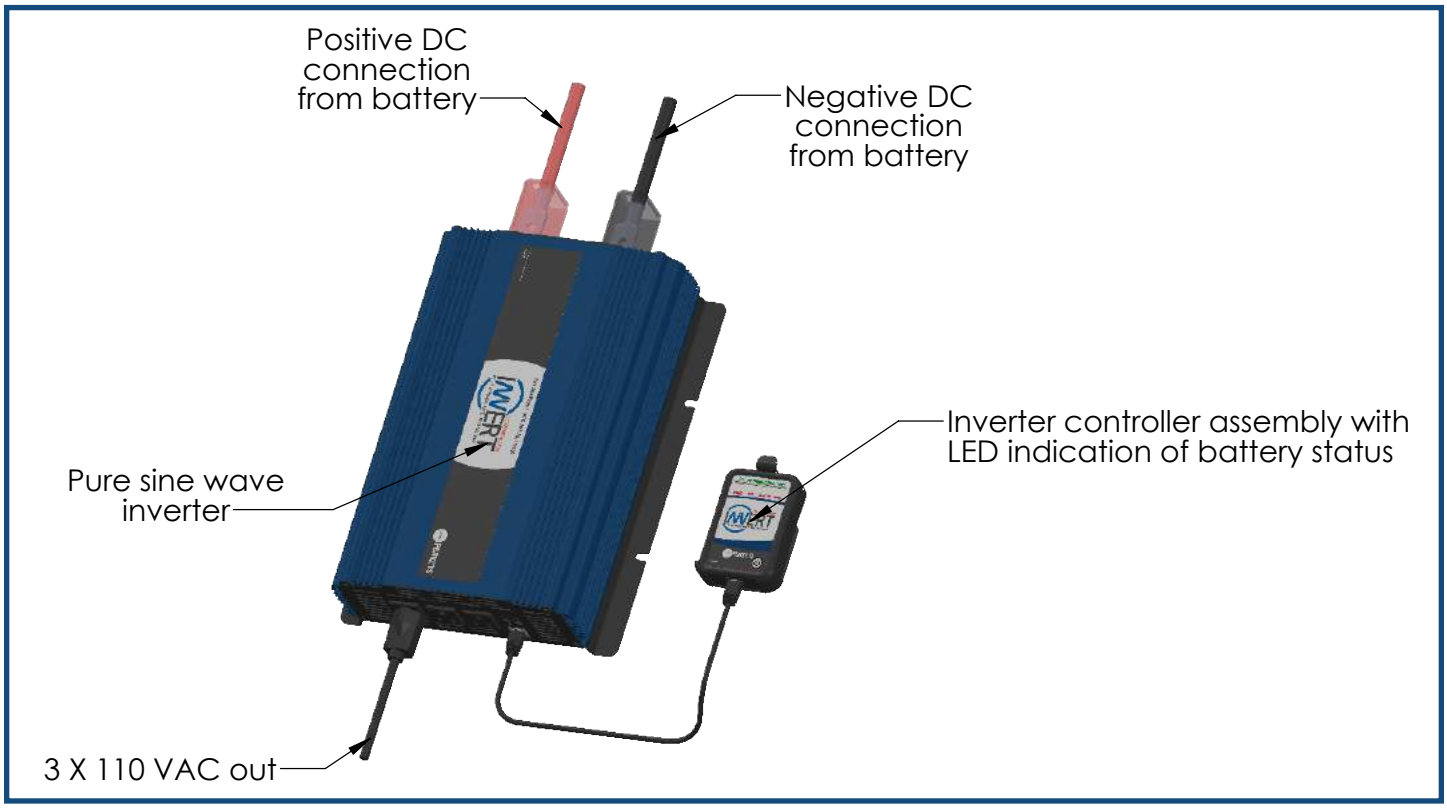
Wire Gauge	Max Recommended ft. (Pos. Length + Neg. Length)	Recommended Fuse Size
6	-	-
4	-	-
2	16	200
1	20	250
0	25	300
00	32	300
000	40	300
0000	51	300

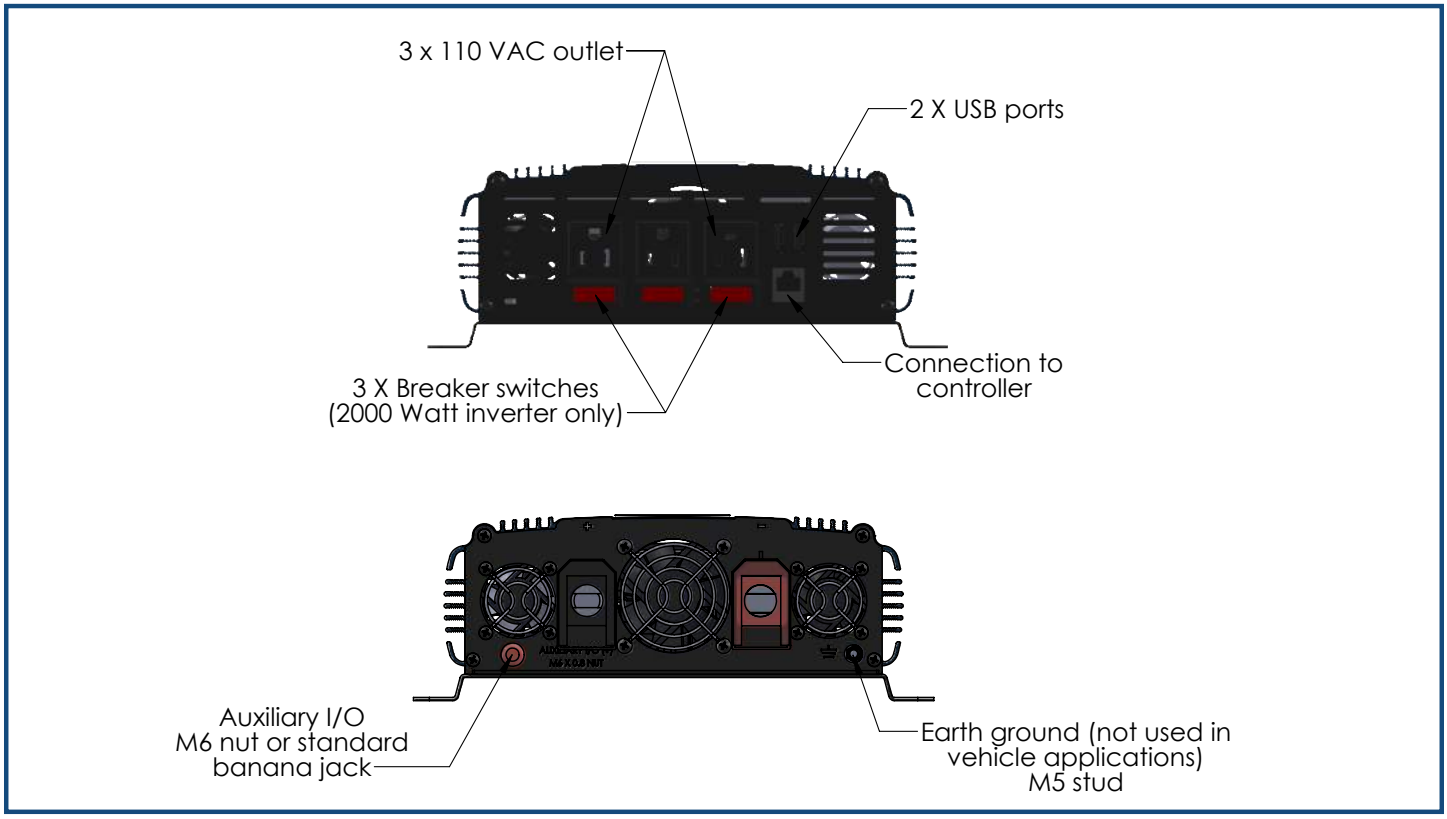
Features:

Benefits:

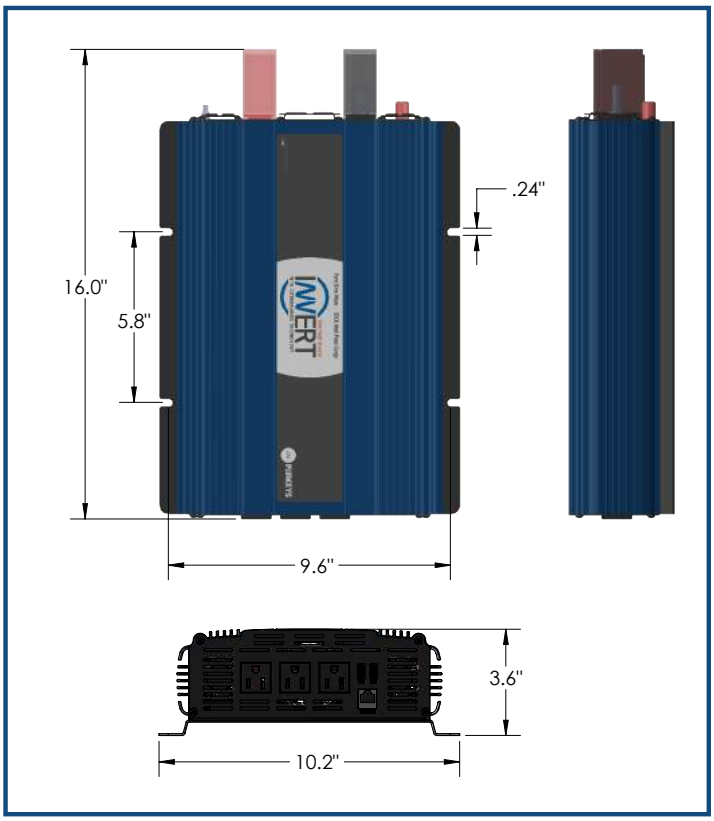
Features:	Benefits:
Patent-Pending DynaBalance™ Technology	Provides AC power while protecting truck batteries from discharging too deeply
Controller w/clip	Puts control and indication where it is needed
Pure Sine wave AC power	Powers any AC device, just like AC power in your house
Extruded aluminum housing	Durable, helps dissipate heat quickly
1500 W or 2000 W AC power	Plenty of power when you need it
3000 W or 4000 W surge power	Plenty of power when devices first power on
Pre-shutdown warning buzzer	Alerts driver before shutting down due to low voltage
Will function with input voltage as low as 9.5 V	Will not turn off or reset during engine crank (important when powering medical devices such as CPAPs)
Selectable shut-down point	Allows inverter to be configured for the application
Auxiliary input or output	Can be specially configured to meet a unique fleet requirement (minimum purchase required)
Heavy-duty lug terminals with 3/8” bolts	Allows for easy, robust cable connections
Temperature-controlled fan cooling	Stays cool and runs quietly
3 NEMA5-15R AC power outlets	Provides sufficient connections for most applications
Individually switched AC outlets (2000 W only)	Convenient AC power switching
2 USB power ports	Convenient 5 V power for electronic devices
Flanged mounting	Easy and secure mounting
Overload protection	Protects itself from overload or short circuit
Undervoltage protection	Protects itself from undervoltage
Overvoltage protection	Protects itself from overvoltage

Call-outs:


Positive DC connection from battery
Negative DC connection from battery
Inverter controller assembly with LED indication of battery status
Pure sine wave inverter
3 X 110 VAC out


3 x 110 VAC outlet
2 X USB ports
Connection to controller
3 X Breaker switches (2000 Watt inverter only)
Auxiliary I/O M6 nut or standard banana jack
Earth ground (not used in vehicle applications) M5 stud

1500 Watt Inverter Dimensions:



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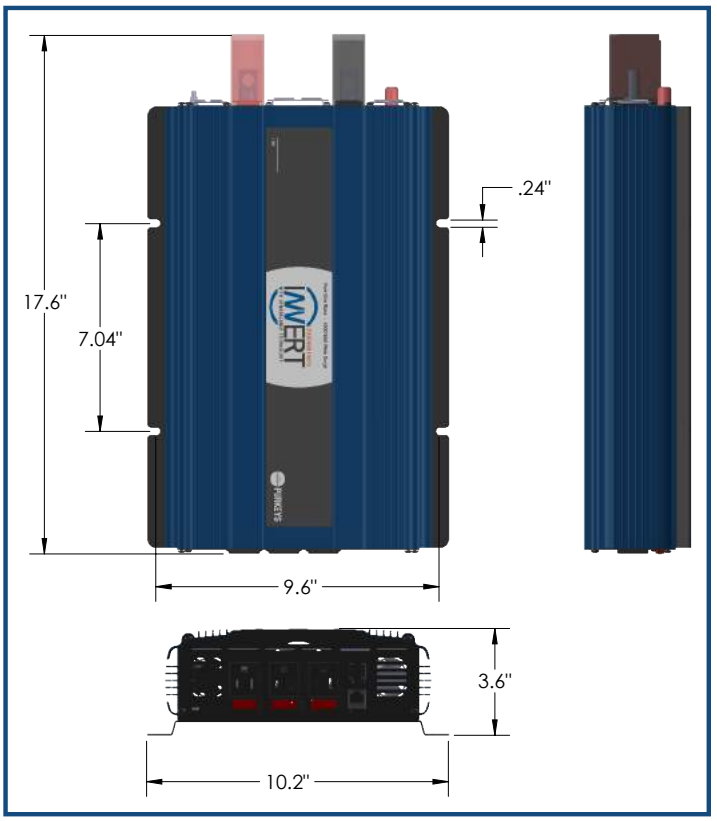
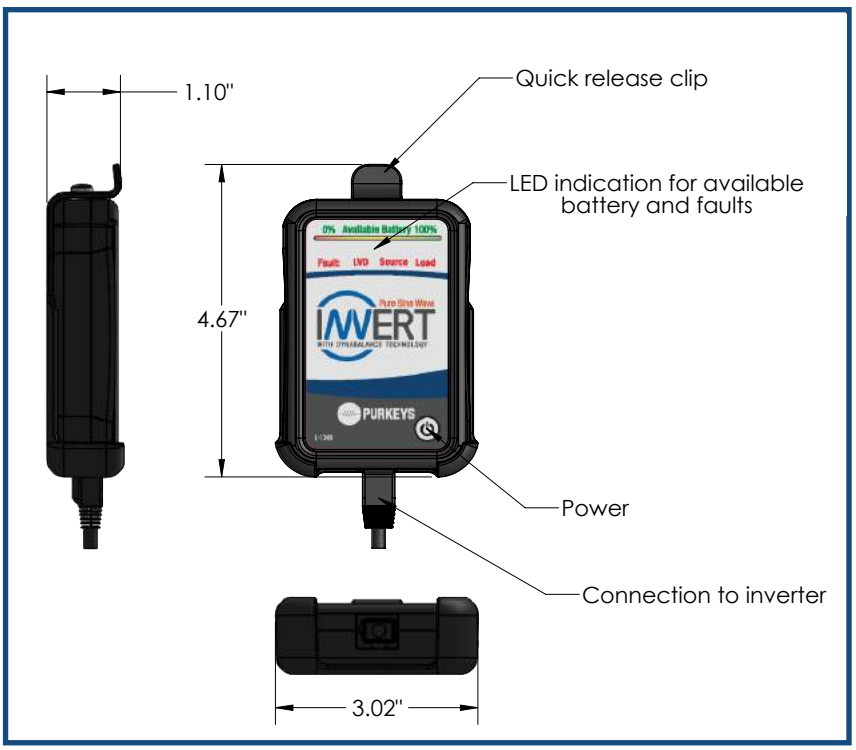
Controller Dimensions: