Model: 1800US

Product Manual

This manual for use with Unit V2.0 (as marked on back cover) / **firmware version: F3.30**

Thank you for your purchase of the Power Badger block heater controller!

The Power Badger was engineered to be rugged, long lasting and easy to use. We are grateful you have put your trust in this device and chosen to invest your hard-earned money in our product.

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Initial plug-in, setting-up your Badger up the first time:
(and/or after an internal battery change)

The first time you plug in your Power Badger you will be prompted to make a few initial settings These settings will be saved (via the Badger's internal battery) for a period of 2-3 years, so you don't have to make these setting selections more than once per winter season and you don't have to set it up outside in the cold. You can set-up your Badger indoors and then bring it outside when ready to use. All your settings will be saved.

Follow the steps below (in the sequence given) to set up your Badger for the first time:

1). **Plug in the device:** Display flashes "12:00" in conjunction with the "Current Time" LED indicator.

2). **Set current time:**

Use the up/down selection buttons (on the right side of the device) to select the current time. Note: there is a "PM" indicator in the lower right corner of the display that will illuminate when a PM time is selected. If the "PM" indicator is not illuminated, then the time displayed is AM time. Once desired time is selected, press the "Set" button. The current time is now saved and the device prompts you to make a temperature units selection; see next step.

3). **Set day of the week:**

Use up/down selection buttons to select the current day of the week.

Once the correct current day of the week is flashing, press the "Set" button and the unit will move to the next setting (°F will now be flashing on the display).

4). **Select degrees Celsius (°C) or degrees Fahrenheit (°F):**

Use up/down selection buttons to toggle between °C and °F

Once the unit type you wish to use is displayed, press the "Set" button. The temperature units selection is now saved and the device display now flashes "24Hr" in conjunction with all the days of the week indicators (MON-SUN); see next step.

*** (If you only intend to use your Power Badger in the "Maintain" mode, you may press the "Set" button to bypass the rest of the settings, until "off" is displayed on the screen,… then skip to step 8.)

5). Select operation cycle type; one day cycle (“24hr”) or weekly cycle (“7dAy”):

Use up/down selection buttons to toggle between “24hr” and “7dAy”

This selection will determine how long the programmable cycle is.

Select “24hr” if you want the unit to repeat your same programmed start time every day (the same sequence every day, in perpetuity).

Select “7dAy” if you want to program different start times for different days of the week. Example; if you want the unit to do something different on the weekend then it does during the week.

Once the cycle type you wish to use is displayed, press the “Set” button and the unit will move to the next setting (small “S1” will now be flashing on upper left side of display).

6). Select the number of starting events needed per day (*one or two engine starting event/s per day*):

Use up/down selection buttons to toggle between just “S1” and both “S1 & S2”

Flashing “S1” indicates one starting event per day.

Flashing both “S1” & “S2” indicates that you want to program the unit for two starting events per day (such as a school bus that has both a morning and an afternoon run each day with some down-time in between).

Once the desired number of events per day is selected, press the “Set” button and the unit will move to the next setting.

7a). Set the desired "Ready Time" and "Maintain after ready" duration:

The "Ready Time" setting tells the unit when to have the engine ready to start. It is best to set the *actual time* you want to start the engine and *not an earlier time*, as the unit will be most effective and efficient when the engine is started as close to the set Ready Time as possible.

Depending upon the cycle selection you made in step 5 (daily or weekly) and the number of starting events per day you made in step 6 (one or two), the unit will prompt you to set your desired "Ready Time/s" and "Maintain After Ready" duration/s for each of the events you have selected in the previous steps.

Use the up/down selection buttons to select the desired "Ready Time". This will be the time that you want your engine ready to start (be sure to mind the "PM" indicator for setting PM times).

NOTE: If you want the unit to "skip" a ready time event, set the ready time to read: " --:-- ". This selection (to take no action for an enabled event slot) can be found between 11:59pm and 12:00am. This selection is only available in "7dAy" mode.

Once the desired "Ready Time" time is selected, press the "Set" button. The current time is now saved and the device displays "2 HR" and flashes the "Maintain Ready" LED, prompting you to make a "maintain after ready" selection of between 0 and 9 hours.

7b). Set the "Maintain after ready" duration:

This selection (settable at 0-9 hours) controls how long the unit maintains your engine in a "ready-to-start" condition *<u>after</u>* your selected "Ready Time" has been reached.

*Example: If you have the "Ready Time" on your Badger set to 6:30am, the "maintain after ready" duration you select (0-9 hours), controls how long your unit will go into "Maintain" mode *<u>after</u>* 6:*31*am. If you select "3HR" then your engine will be put in "Maintain" mode for 3 hours after the ready time….so, in this example of "3HR" selected, the engine would be maintained in a ready to start condition until 9:30am.

9 hours is the maximum amount of time the unit can be set to maintain *after* a "Ready" event. If longer than a 9 hour maintain duration time is desired, you may consider setting two separate starting events (see step 6) or consider putting the Badger permanently in "Maintain Mode", as discussed later in this manual.

To select the desired "maintain after ready" duration, use the up/down selection buttons to make your selection of 0-9 hours. Once you have made your selection, press the "Set" button and the unit will move on to the setting for the next event. Once all events have been set the display will show "OFF", indicating the conclusion of all the user defined selections and settings for all of the selected events. If you hit the "Set" button again after you see "OFF", you will re-enter the event settings menu again and you will have to keep pressing the "Set" button until you see "OFF" on the display again, indicating you are now ready to select your Mode of operation, as covered in the next step….

8). Set your desired Mode:

Next, using the “Mode” button, you will set the mode that your Badger will operate in. Each press of the mode button will scroll to the next operational mode of the device. Illustrations below show examples of what the screen and LED’s will look like in each of the 4 modes:

OFF Mode:

Timed Ready Mode:

Maintain Ready Mode:

On Mode:

Mode Selection:

Press the “Mode” button, to toggle through the 4 different modes of your Power Badger. Each press of the Mode button will scroll to the next choice. Once the desired choice is displayed, no further action is needed, the device is then in that mode of operation.

Your choices are:

1). OFF: unit is powered and ready but will take no action.

2). Timed Ready: The device will have your engine ready to start at your set “Ready Time”. The “Timed Ready” LED will remain illuminated. The time related LED’s and display will cycle through the following sequence when in this mode: current time, ready time, current temperature.

3). Maintain Ready: The device will maintain your engine in a ready-to-start condition in perpetuity. The “Maintain Ready” LED will remain illuminated and the display will scroll the current temperature and “rEdy”, indicating the engine is being maintained in a ready-to-start condition.

4). Constant ON: The device will supply constant power to the heater without further control (in perpetuity).

More information on each particular mode can be found on page# 10 (Power Badger Term Definitions).

Hidden Menu Display Readouts:

- **Total Relay Cycles:** This hidden feature is only accessible when the device is in the "OFF" mode: (buttons must be pressed in this order); First, press and hold the "up" button, *then* press and hold the "Mode" button (for 3 seconds) until the unit displays total relay cycles. This function displays the total number of times the relay has cycled over the (current battery) lifetime of the unit (x1000). Press any key to escape this mode.

- **Total Energy Hours Saved:** This hidden feature is only accessible when the device is in the "OFF" mode: (buttons must be pressed in this order); First, press and hold the "down" button, *then* press and hold the "Mode" button (for 3 seconds) until the unit displays total hours saved. This function displays the total number of hours saved over the (current battery) lifetime of the unit (x1000). This calculation is based upon time that the unit is plugged in, but not feeding power to the heater, thereby calculating time (that without the Power Badger unit) the heater would otherwise be using power. Press any key to escape this mode.

- **Firmware Version Display:** This hidden feature is only accessible when the device is in the "OFF" mode: Hold both UP and DOWN buttons simultaneously, then press the MODE button (for 3 seconds). This displays the firmware version the unit is running. Display format is: "Fx.yy"

- **Factory Reset:** This hidden feature is only accessible when the device is in the "Constant ON" mode, with red "heater on" LED indicator illuminated: Press and hold the UP and DOWN and SET buttons simultaneously until reset occurs,… about 1 sec. Unit will display a flashing 12:00 to indicate reset has been successful.

- **Sliding Temperature Adjustment:** This advanced adjustment will allow the user to "slide" the temperature scale "up" or "down" to have two (different and distinct) effects on the unit's operation. The factory default (and recommended) starting point for the Power Badger's calculations is 39°F / 4°C. This is correct for most all modern diesel engines. Please don't use this adjustment unless you have a genuinely special piece of equipment that requires heating at abnormally warmer outside temperatures or an engine that does not require any heating until lower temperatures (such as a gas engine).

  * If this parameter is adjusted "up" (above 39°F / 4°C) The unit will begin heating calculations at the indicated user defined temperature (now higher) than the initially default programmed 39°F / 4°C
  This type of adjustment may be useful for older (mostly 1950's and older agricultural equipment) that may have a low compression engine and not have a glow-plug system and may requiring heating above the default starting temperature pre-set in the Power Badger (39°F).

  * If this parameter is adjusted "down" (below 39°F / 4°C) The unit will begin heating calculations at the indicated user defined temperature (now lower) than the initially default programmed 39°F / 4°C.
  This type of adjustment may be helpful when using the Power Badger in conjunction with a gas engine that may not require heating until about 0°F / -18°C.

  To activate the "sliding temperature adjustment" feature; Using the MODE button, place the unit in the OFF mode, then press the SET button until you reach the "set temperature units" (C°/F°)

screen, then press and hold the MODE button for 4 seconds, then use the UP / DOWN buttons to make adjustments. (0˚to 61˚F) or (-18˚to +16˚C). Once the desired setting has been made, press the SET button to escape the programming, this will save your setting.

- **Escape Programming:** Escapes any of the programming menu/s at any point during the process. Configurations set prior to use of the escape feature are not saved to unit memory. Previously programmed values are retained as long as power is maintained or battery is active. Hold SET button and then press MODE button.

****

Never allow an immersion-type coolant heater to be energized while the subject engine is running. Energizing an immersion-type coolant heater while the engine is running will cause cavitation around the heating element (from the coolant passing by the element quickly). The heating element will overheat, causing heater element failure (often within just a couple minutes). See page #9 for special considerations for use with a generator / genset.

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General Information

Location: The Power Badger unit must be in approximately the same temperature environment as the engine heater it will be controlling. It is best to keep the unit out of direct sunlight, as the direct sunlight can affect the measured temperature readings at the unit. If the vehicle being controlled is in the direct sunlight, then just underneath the vehicle it is controlling is a good spot for the Badger. The Badger calculates firing times and duration algorithms based upon temperature readings in its ambient environment. If the observed temperature at the Power Badger is different than where the engine is located, then the calculations will not be as intended and the result could be an engine that is not as ready to start as programmed.

Internal Battery: The Power Badger contains an internally mounted lithium battery (CR2032) that allows the unit to save the user settings for a period of about 2 years without external power. Once this battery becomes depleted and user settings (such as the current time) are no longer retained (when unplugged) it will be necessary to replace the internal battery.

Battery Change Instructions: The internal battery is a standard CR2032 Lithium "button" cell, readily available at most battery retailers.
To replace the internal memory retention battery:

1). Unplug the Power Badger from 120v Power

2). Remove the 6 Phillips head screws that retain the back cover.

3). Remove the back cover

4). On the battery holder (mounted on the circuit board); Carefully lift the top battery retaining tab slightly away from the battery and slide the battery out. Be careful not to bend the retaining tab too much or it will no longer retain the battery upon re-installation.

5). Slide the new CR2032 battery under the tab and be sure it is seated in the battery holder properly. Be sure the flat positive (+) side of the battery (the side with the part# on it) is facing up and in good contact with the top retaining tab.

6). Carefully replace the rear cover gasket into the enclosure groove, replace rear cover and re-attach cover using the 6 Phillips head screws that were removed during step "2". **Screws must be re-torqued to 45 in/lbs in order to properly seal the back cover gasket, otherwise water intrusion may occur, potentially causing unit failure and creating possible dangerous conditions. It is recommended that the center two screws be installed first, then the outer screws, alternating from side to side for each screw installation, until all screws are torqued to within the specification.

7). Follow instructions on page 2 for setting-up your user defined settings.

Internal Fuse: The Power Badger is equipped with an internal fuse to keep your unit safe in the event of an overload condition. Common causes of an overload condition can be:

a). more than 1800 watts of load on the Badger

b). failed/electrically shorted engine heating element

c). internal water intrusion into the Badger's enclosure

Internal Fuse Replacement Instructions: The internal fuse is a standard 20 amp 250v (Bel Fuse#3AB20 or Littelfuse#0314020.MXP) readily available at most electrical parts retailers

To replace the internal fuse:

1). Unplug the Power Badger from 120v Power

2). Remove the 6 stainless steel Phillips head screws that retain the rear cover.

3). Remove the rear cover. The fuse is cylindrical and made of white ceramic, located next to where the output cord exits the enclosure.

4). Carefully lift one end of the fuse and remove (using a small screwdriver or the like). Be careful not to bend the retaining tabs or the will no longer retain the fuse properly upon re-installation.

5). Install the new fuse within the tabs and be sure it is seated in the fuse holder properly.

6). Carefully replace the rear cover gasket into the enclosure groove, replace rear cover and re-attach cover using the 6 Phillips head screws that were removed during step 2. **Screws must be re-torqued to 45 in/lbs in order to properly seal the back cover gasket, otherwise water intrusion may occur, potentially causing unit failure and creating possible dangerous conditions. It is recommended that the center two screws be installed first, then the outer screws, alternating from side to side for each screw installation, until all screws are torqued to within the specification.

Wind: High wind conditions can take heat from the engine compartment and make the engine more difficult to warm. It is preferable to protect the vehicle's engine from the wind as much as possible. Even putting the front of the vehicle near the wall of a building or other vertical surface higher than the grille can help maintain engine heat.

Heaters Type: The Power Badger Model 1800US is designed to power up to 1800 watts of resistive type load, such as: Engine block heaters, Battery blankets/pads, Oil, fuel and Oil pan mounted heaters. These heaters must be suited to their application and sized properly for their intended use, otherwise dangerous conditions could result. Regardless of whether the Power Badger to controls these devices or not, the heaters installed on a vehicle or on/in an engine must be sized and suited properly for their application.

Use with a Generator / Genset: When using The Power Badger to control an immersion-type coolant heater in a generator / genset engine, the "Maintain Mode" should be selected on the unit and special precaution must be taken to never allow the heating element to be energized while the engine is running. Energizing the heater while the engine is running will cause cavitation around the heating element (from the coolant passing by the element quickly). The heating element will overheat, causing heater element failure (often within just a couple minutes). The general fix for this is to use a relay (triggered by the power output of the generator) to disconnect electricity to the Power Badger, thus anytime the generator is running the heater cannot be energized at the same time. The relay used must be rated for at least 30A @ 120VAC.

In the Event of a Power Outage: If power is interrupted during operation, once the power returns, the Power Badger is programmed to continue the same mode of operation as it was in when the power failed. If the unit was in "Timed Ready" mode when the power failed, the unit will resume operation to ready the engine for its intended start time, but if the power outage was too long, the unit may not have enough time to fully prepare the engine to start as intended. In the same way, if the unit was in "Maintain Ready" mode when the power failed (and the power was out for too long) the unit may not be able to restore the engine to a "start-ready" state (depending upon the ambient temperature).

Power Badger Term Definitions

Modes Defined:

1). OFF: unit is powered and ready but will take no action.

2). Timed Ready: The device will have your engine ready to start at your set "Ready Time" based upon the observed temperature and the "Ready Time" setting. The Power Badger will use the minimum amount of power necessary to get the engine fully ready to start at your desired "Ready Time". The Badger will automatically follow the user programmed settings for each day of the week (in perpetuity) until changed or unplugged.

3). Maintain Ready: The device will maintain your engine in a ready-to-start condition in perpetuity.

4). ON: The device will supply constant power to the heater without further control (in perpetuity).

Maintain after ready:

This selection controls how long the unit maintains your engine in a "ready to start" condition *after* your selected "Ready Time" has elapsed. This is a user selectable parameter of between 0 hours and 9 hours.

*Example: If you have the "Ready Time" on your Badger set to 6:00am, the "maintain after ready" duration you select (0-9), controls how long your unit will go into "Maintain" mode *after* 6:*01*am. If you select "3HR" then your engine will be put in "Maintain" mode for 3 hours after the ready time….so, in this example of "3HR" selected, the engine would be maintained in a ready to start condition until 9:00am. 9 hours is the maximum amount of time the unit can be set to maintain after a "Ready" event. If longer than a 9 hour maintain duration time is desired, the Badger can be put permanently in "Maintain Mode", as discussed later in this manual.

Ready Time:

"Ready Time" is a user defined setting, defining at what time the Power Badger device will aim to have the engine ready to start. The device will use the (user defined) ready time along with the outside temperature measurements to calculate when to fire the engine heater and for how long.

Maintain Ready Mode:

The function of the "Maintain Ready" mode is to keep (or maintain) an engine that is already ready to run in a startable condition (ie..vehicle was just parked after running or was just brought up to temperature by the "Ready" mode). The Power Badger device senses the outside temperature and calculates a firing duty cycle algorithm designed to use the minimum amount of electricity necessary to maintain the engine in a startable condition. To achieve this, the microprocessor inside the Badger divides that cycle into segments of on and off, based upon the measured outside temperature. The Badger will automatically maintain the engine in a startable condition, in perpetuity, until changed or unplugged.

Please note: no heating will occur at or above 39°F (4°C) in any mode unless manually adjusted to do so. Under normal conditions, an engine should not need any heating at or above 39°F (4°C).

Power Badger – How does it work? – explained

The Power Badger has two selectable active control modes:

- **Timed Ready Mode – (most efficient) use this mode when you know about what time you will be using the engine.**
- **Maintain Ready Mode – use this mode when you need the engine to be ready to start anytime / all the time.**

Below explains what the device is doing during each of these modes:

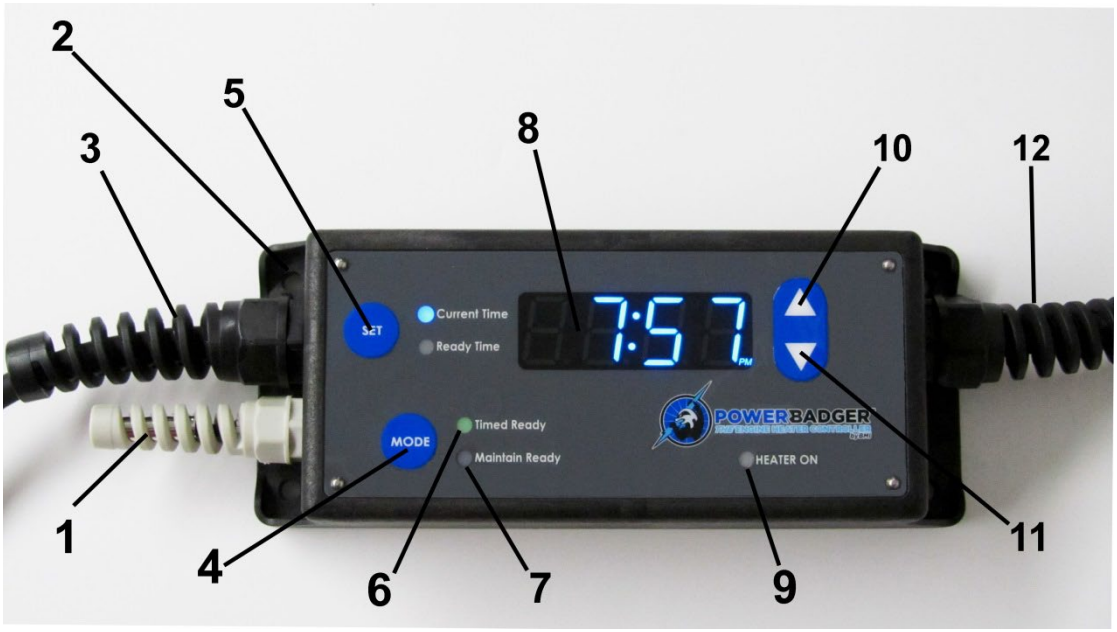
Timed Ready Mode:

- When the Power Badger is put into "Timed Ready" mode, the user will have already input their desired "Ready Time" (their intended start time of the engine) into the device (during the initial setup process). The unit uses the outside temperature sensor and factory pre-programmed algorithm to calculate the optimum time to begin heating the engine *ahead of the selected "Ready Time"*. The unit will turn on at the calculated time (temperature dependent) and remain steady-on until the selected "Ready Time" is reached. Once the user programmed ready time has passed, the unit will automatically switch to "maintain after ready" mode for the user selected amount of hours (0-9), thereby keeping the engine ready to start for that amount of time.
  Example; if the controller is set with a "Ready Time" of 6:00am and 2 hours are selected for "maintain after ready", then the engine would be ready to start at 6:00am and then remain ready until 8:00am. Once the user selected amount of hours to maintain after ready has elapsed, the unit will shut off the heater and ready itself for the next programmed event.
  The Power Badger's factory settings will not allow heating to begin if the sensed temperature is at or above 40°F (5°C).

Maintain Ready Mode:

- When the Power Badger is put into "Maintain Ready" mode, the microprocessor senses the outside temperature and calculates a duty cycle for the heater. It divides the hour into 6 cycles (of ten total minutes each) and calculates how much of that ten minutes will be *heater on* and how many will be *heater off*. Example; at 28°F / 2°C the unit would be at a 50% duty cycle. A 50% duty cycle would mean that the controller turns the heater on for 5 minutes on then off for 5 minutes,… repeating that cycle for 6 duty cycles every hour.
  The Power Badger's programming begins a duty cycle calculation at 39°F (4°C) and colder. As the temperature drops, the Power Badger will increase the duty cycle, until it is at 100% (which happens at -22°F / -30°C and colder). No cycle "on time" will be assigned at temperatures above 39°F (4°C).

Device Map



1: Temperature sensor inside protective strainer (light colored to reduce sun heat from affecting readings)

2: Mounting holes on enclosure to screw to wall or vehicle

3: Input power cord strainer

4: Mode button; used to select operational mode of device

5: Set button; set time of day, temp units (°F or °C), start/ready time and maintain duration time

6: Timed Ready LED; illuminated when the unit is set in timed ready mode. Display shows the user set start/ready time (the time the device will have the engine ready to start).

7: Maintain Ready LED; illuminated when the unit is set in maintain ready mode. Display shows current temperature.

8: Digital display

9: Heater on LED; Illuminated whenever power is being supplied to the output cord

10: Up select button; used to adjust settings in conjunction with set button

11: Down select button; used to adjust settings in conjunction with set button

12: Output power cord strainer

Device Features

The Power Badger was carefully engineered to be rugged and long lasting. We want the owners of The Power Badger to know that their unit is well built. We assemble every unit right here in North Carolina, USA, using no-compromise, high-quality components that (in many cases) were engineered and produced specifically and exclusively for the patented Power Badger product. The Power Badger has been extensively tested for functionality and durability down to -50°F / -45°C.

Here we list some of the features and details of the product that may not be readily apparent at first glance:

1). **Mounting Screws:** the 6 rear mounting screws are made of high quality stainless steel

2). **Temperature Sensor:** clad in stainless steel and uses premium silicone wire (for flexibility in extreme cold)

3). **Sensor Strainer:** the grey strainer that contains the temperature sensor is made of a special low temperature plastic that resists shattering in the extreme cold. The strainer is grey in color to reduce the effect that direct sunlight may have on the temperature reading at the sensor.

4). **Circuit Board:** has a special coating on selected surfaces to resist damage from internal water intrusion and condensation

5). **Cords:** both the (15 amp rated) input and output cords use specially formulated low-temperature rubber sheathing for maximum flexibility in extreme cold conditions.

6). **Front Membrane:** uses a very thick and durable Lexan substrate and 3M's latest and best VHB industrial adhesive. These premium materials coupled with the stainless rivet nails that hold down the corners of the front membrane offer the best durability and low-temperature functionality available.

7). **Enclosure:** made of a special low-temperature poly blend plastic with fiber additive, engineered to be rugged in extreme low temperatures. The enclosure also features reinforced "feet" cast into the mold that allows the bottom of the unit to stand off the ground slightly, helping to reduce water intrusion. These feet also have holes cast through them to allow permanent mounting of the unit on a wall or a vehicle.

8). **Rear Cover Gasket:** a form-fitting gasket seals the aluminum rear cover to the enclosure for water resistance.

9). **LED Display:** the Badger's specially designed low-temperature LED display will look just as bright at -50°F / -45°C as it does at room temperature. The unit is programmed to save power and extend the life of the LED's and display by dimming after 10 seconds of no keys being pressed.

10). **Strainers:** all through-holes in the enclosure (for cord and sensors) use weather-tight strainers featuring an internal clamping mechanism (on their respective cord) and an external rubber gasket to seal out moisture.

11). **Fuse and Battery Holders:** the internally mounted battery and fuse holders are specially designed to retain their respective parts through hard external impact situations.

12). **Development and Testing:** after many revisions to increase durability and reliability; the final electronic hardware and firmware versions were mercilessly tested at sub-zero temperatures through 10,000+ resets, power interruptions and physical abuse to assure flawless electronic performance during the harshest of conditions.

13). **Internal Transformer:** (inside the unit) is designed to be as low-profile as possible with many attaching points to the board, so this important (and relatively heavy) component does not come off the board during very rough handling at cold temperatures.

14). **Rear Cover:** made of thick, high quality laser cut aluminum that has been specially coated and laser etched for durability and longevity.

Parts List

Power Badger Model# 1800US Replacement Parts List

Part number	Description	Qty per unit
PB1001	Enclosure / Housing	1
PB1002	Bottom / back aluminum cover	1
PB1003	Front membrane / face	1
PB1006	PCBA assembly, w/blue display	1
PB1007	Input power cord / 120v / male	1
PB1008	Output power cord /120v / female	1
PB1009	Thermistor / temperature sensor	1
PB1010	Input/output cord strainer M20 / black	2
PB1011	Thermistor cord strainer / M16 /grey	1
PB1018	Bottom / back cover stainless mounting screw	6
PB1019b	Bottom / back cover to enclosure, molded gasket	1
PB1021	Stainless nails for front membrane/face	4
PB1022	Back cover ground wire	1

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The Power Badger's design and operation is covered by:
US Patent# 10,859,056 and Canadian Patent# 2,947,304

The Power Badger Model# 1800US is certified by CSA/US file # 300461

CSA file# 300461

Power Badger Model: 1800US Product Details and Specifications

Item:	Power Badger Model: 1800US
Operating Voltage:	120-125VAC / 60HZ
For Use With:	Resistive Type Heating Elements and Pads
Certification:	CSA (Canada & USA listed) file# 300461
Patents:	USA Patent# 10,859,056 /// Canada Patent# 2,947,304
Application:	Truck, Automotive, Commercial, Military, Equipment and Agricultural
Purpose:	Save Energy When Utilizing Engine Heater / Warmers
Function:	To Control the Energy Usage of Resistive Load Type Heaters
Enclosure Type:	CSA Type 3R (weather-proof outdoor use in rain / snow / ice)
Intended Mounting Position:	Face up (horizontal) on ground or mounted through feet (vertically or horizontally)
Controlling Amps Capacity:	1800 Watts / 15 Amps @ 120VAC
Operating Temp Range:	-45° to +122° Fahrenheit (-43° to +50° Celsius)
Input Cord Length:	55 inches (138 cm)
Output Cord Length:	55 inches (138 cm)
Input Cord Wire Gauge:	14 AWG Copper
Output Cord Wire Gauge:	14 AWG Copper
Overall Product length (with both cords):	10' or (120 inches) or (305 cm)
Product Enclosure Width:	3.5 inches (8.89 cm)
Product Enclosure Length (not including cord strainers):	9 inches (22.86 cm)
Product Enclosure Height (not including cord strainers):	2.25 inches (5.71 cm)
Controller Unit Weight:	3 Lbs / (1.36 Kg)
Enclosure Material:	Cold Weather Polypropylene With Infused Fibers For Strength
Back Cover Material:	Aluminum
Indoor / Outdoor:	Yes
Water Resistant:	Yes
Portable:	Yes
Wall or Vehicle Mountable:	Yes
Installation Necessary:	No
Included In Package:	1x Power Badger Model 1800US , 1x Product manual

Power Badger™ Limited Warranty

Limited Warranty - This limited warranty is expressly limited to Bostic Motors Inc's products (hereafter referred to as "*The Company"*) that have been purchased by the original consumer purchaser or for purposes of resale or in the ordinary use by the end-user. The term original consumer (end-user) purchaser is defined as the person who purchases Company products for personal, residential or business use.

The Company's products are warranted against defects in materials and workmanship for a period of one year from date of purchase by consumer / end-user. The exclusive remedy for any product found to be defective during this limited warranty period consists of the repair or replacement of the defective product. This limited warranty does not apply to defects which arise from normal wear and tear, accident, misuse, abuse, neglect, mishandling, misapplication, faulty installation, modification, improper or extraordinary use or use inconsistent with any instruction or recommendation issued by the Company.

The foregoing limited warranty is exclusive and in lieu of all other warranties, whether written or oral, express, implied or statutory.

NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. THE LIMITED WARRANTY CONTAINED HEREIN DOES NOT EXTEND TO INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF A BREACH OF THIS WARRANTY.

To obtain performance of this limited warranty, the alleged defective product must be returned, together with reasonable proof of purchase, written explanation of the problem and postage or freight prepaid, directly to:

In U.S.A & Canada:

Bostic Motors Inc, Attn: Warranty Claims

176 North Main St.

Bostic, NC 28018

The Company will return the repaired or replaced product, postage or freight prepaid. Final determination of defects shall be made in accordance with procedures established by the Company.

This limited warranty gives the original consumer purchaser specific rights. You may have other rights which vary from state to state or province to province depending upon the location of your residence. Some states do not allow the exclusion or limitation of incidental or consequential damages.

Manufacturer's rights retained: The Company reserves the right to make changes in design, additions or improvements to any of its products at any time without incurring any obligation whatsoever to install or replace the same or improve upon products previously manufactured.

Bostic Motors Inc. - Revised 02/2026