#### LITERATURE NUMBER MPD 33122





# Atwood® Comfort Control System (ACCS)

WITH OPTIONAL LOADSHED AND AGS

#### ENGLISH, FRANCAIS (et Canada)

INSTALLER: INSTRUCTIONS MUST BE SUPPLIED WITH FURNACE TO CONSUMER. CONSUMER: RETAIN THESE INSTRUCTIONS FOR FURTHER REFERENCE.

POWER SUPPLY REQUIREMENTS	
Low Voltage DC Supply	Operating voltage: 12 VDC nominal
	10.2 VDC to 16 VDC range (-15% to
	+33%) (filtered and unfiltered)
	Operating current: max 0.25 A / Zone
	Control Module protected by internal 3 A
	Fuse (replaceable)
High Voltage AC Supply	Operating voltage: 117 VAC nominal
(117 VAC Line Connection)	Operating frequency: 50 / 60 Hz
	No internal fuse protection provided
GENERAL	
Operating & Storage Temp.	<b>Operating:</b> $+32^{\circ}F$ to $+122^{\circ}F$ (0°C to 50°C)
	<b>Storage:</b> -68°F to +158°F (-20°C to 70°C)
Moisture Protection	95%
Mounting	#8 sheet metal screws
Temperature Sensors	Integrated thermistor in Command Center
	Remote room temperature sensors (optional)
	Freeze sensors for A/C evaporator coil
	Ambient sensors for H/P operation (optional)
CONNECTION	
	Zone Control Module:
	2 wires for 12 VDC Battery connection*
	3 wires for 117 VAC Line connection
	3 connectors for Temperature Sensors
	2 RJ-45 connectors/communications cables
	Command Center:
	RJ-45 connector for communication cable
	Load Shed Input:
Furnace Outputs	1 wire 12 VDC Standard furnace:
Turnace Outputs	2 wires, switched 12 VDC / max 1A *
	2-Stage Furnace: 1 wire*
A/C & Heat Pump Outputs	9-pin AMP type connector: (2-stage A/C or
700 di licat i dilip Gatpato	heat pump)
	Compressor: 117 VAC 72 LRA / 14 FLA
	Fan: 117 VAC 1/3 HP
	6-pin AMP type connector: (3-stage A/C / 2-
	stage H/P)
	Compressor: 117 VAC 72 LRA / 17 FLA
	Fan: 117 VAC 1/3 HP
Heat Strip Output	3-pin AMP type connector: 117 VAC 15 A
AGS Output	AGS (Automatic Generator Start) - output
	1 wire 12 VDC
Load Shed Input	1 wire for signal for Load Shed.
TEMPERATURE SET POINT SPECIFICATIONS	
Set Point Temperature	Control Range: +55°F to +90°F
Room Temperature	Display Range: +35°F to +90°F (+/- 1°F)

#### WIRING INSTRUCTIONS

Required Wiring: See example in FIG 1

- 12vdc Provide positive and negative 12 vdc to all appliances.
- 115vac Provide 115vac to A/C or Heat Pump locations.
- 115vac Incoming power must be fused or circuit breaker per NEC.
- COMMUNICATION CABLE Provide a RJ-45 communication cable between the following locations:

### •Installation •Operation •Maintenance

Effective 1/08

- 1. Between Zone Control Module in Zone 1 and Command Center
- Between Zone Control Module in Zone 1 and Zone Control Module in Zone 2, and
- Between Zone Control Modules for each additional Zone up to a total of four zones.
- FURNACE WIRE Provide two (2) 22 gauge wires (minimum) between the standard furnace and the Zone Control Module in each zone. If a 2-stage furnace is being installed, you need only provide one 22 gauge minimum wire between the furnace and the Zone Control Module in each zone. For identification, blue wire is recommended. NOTE: For Hydronic Heating System, use "Standard Furnace" connections.
- REMOTE SENSOR Install a remote sensor between the Zone Control Module in the A/C unit to a typical thermostat location on the wall in that zone. NOTE: The Command Center has its own integrated thermister that monitors the zone in which it is installed, so a remote sensor is not required in that area. If the Command Center is placed in a specialized enclosure where it cannot sense convection air currents, a remote sensor is recommended for that zone.
- AMBIENT SENSOR If a Dometic® or Carrier® heat pump is being
  installed, it is required that you replace the ambient sensor provided
  by the manufacturer with an Atwood supplied sensor. The Atwood
  sensor is manufactured with a specific thermister compatible with
  the Atwood Comfort Control System. Failure to use the Atwood
  Ambient Sensor could result in compressor damage, likely voiding
  the warranty on that appliance. See Load Shed and AGS Options for
  more information.

#### **COMMAND CENTER INSTALLATION**

The Command Center features an integrated thermister that allows the device to act as a thermostat in the zone in which it is installed. If the Command Center is installed in a specialized enclosure or control center with other devices, a remote sensor will need to be provided for that zone (must be purchased separately).

To install the Command Center as a thermostat for that specific zone, follow the following guidelines:

- Locate 48" to 54" above the floor on an interior wall. Pick a dry area where air circulation is good. Exterior wall location must have a 3/4" spacer between the Command Center and the exterior wall.
- 2. Be sure all electrical power is disconnected from the furnace, air conditioner and power supply.
- Do not install the Command Center where there are unusual heating conditions: such as direct sunlight, heat producing appliances (television, radio, wall lamp, etc.) or a furnace or air conditioner supply register.
- 4. Attaching the Command Center Fig 2. Separate the body from the back plate by gently squeezing the top and bottom. Pull the RJ-45 communication cable through the square hole in the back plate. Attach the back plate to the wall at the desired mounting location. NOTE: The design of the Command Center is such that you must take care to mount it in a horizontal position for best appearance. The upper right and bottom left edges are the only horizontal planes on the perimeter of the back plate. Use them for line or sight to horizontal.
- 5. Plug the RJ-45 connector into the Command Center PC board and snap the cover onto the back plate Fig 3.

#### REMOTE SENSOR INSTALLATION

Carefully curl the end of the remote sensor around your finger creating a "pig tail" appearance. Insert the sensor into the cap and snap into the "catch" provided inside the cap. Attach the cap to the wall with two screws provided FIG 4.

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NOTE: Assure risk of thermister falling into wall cavity is minimized. NOTE: Follow the Command Center installation guide for location and recommendations.

#### FREEZE SENSOR INSTALLATION

Insert the freeze sensor in the lower fin area of the evaporator coil in a spot between two tubes. To provide a spot for insertion, gently separate the fins, between two tubes at a downward angle. This creates a "pocket" for the sensor. Insert the sensor as deep as you can and verify it is secure with a light tug.

#### COMMUNICATION CABLE INSTALLATION

Cables may be purchased pre-assembled from Atwood. If installer is assembling the cables, use (8) wire, 22 gauge flat cable and RJ-45 connectors. Assemble connectors as shown in Fig 5. Keep grey wire to right, connector tab down. NOTE: Com 5 round ethernet cable may be used, **provided** it is not crossover terminated. IT MUST BE PARALLEL.

#### LOCATING THE ZONE CONTROL MODULE

TOP VIEWS OF ROOF OPENINGS



#### ZONE CONTROL MODULE INSTALLATION

#### FURNACE CONNECTIONS (INCLUDING HYDRONIC SYSTEM)

- Standard Furnace Connect two thermostat wires from furnace to the blue and brown wires on the Zone control Module with wire nuts. The wires can be switched either color (no special polarity).
- 2-stage furnace Connect one blue wire on the furnace to the blue wire on the Zone Control Module with a wire nut. The brown wire is not used and may be tapped off.

#### LOAD SHED - OPTIONAL

 50 AMP Load Shed - Connect the yellow 18 gauge minimum lead from the zone module to the Intellitec System. This lead carries the signal from Intelletec to the zone and is a signal for the zone module to shed the compressor load.

**AGS - OPTIONAL** - Connect the violet 18 gauge (minimum) zone module wire to the Xantrex Controller to provide a signal to start the generator.

#### 12 VDC CONNECTION

Attach the 12 vdc supply to the Zone Control Module. (red is positive and black is negative), with wire nuts.

#### 115 VAC CONNECTION

Route the cable through the connector, attaching hot to black, neutral to white, and ground to green.

### SETTING THE DIP SWITCHES AND CONNECTING THE SENSORS

See FIG 7a - Also found on the cover of the Zone Control Module.

- Each zone must have the switches set for that particular zone. Identify
  what appliances are in the zone and set the switches for that configuration
- If switches 2 and 3 are off, the software assumes the module is in zone
  1. The command module senses temperature.
- Make sure the correct sensor is plugged into the correct position. zone 1
  will only have a freeze sensor in the top position FIG 7b. Zones 2, 3, and 4
  will have a freeze sensor plugged into the top position and a remote sensor plugged into the middle position FIG 7a.
- If the appliance is a heat pump it will have three sensors plugged in (except RVP). EXAMPLE: If the appliance is a heat pump in zone 1, it will have a freeze sensor and an ambient sensor plugged into the top and bottom positions respectively.

Note: If the ACCS Fails to operate the installed appliances, perform the following steps in the order stated.

- Turn the system "OFF". (The slide switch on the command center, thermostat.)
- 2. Determine the appliances in each zone. (Furnace, standard or 2-stage -- A/C or A/C with Heat Pump, heat strip option).
- 3. Check all the zone modules and assure the DIP Switches are set properly for the appliance configuration in that zone.
- 4. Check to assure all the zones are wired properly.
- 5. While depressing and holding the "M" (MODE) and "Z" (ZONE) buttons, turn the switch to the "ON" position.
- When the "Fr" (Factory Reset) appears on the LCD, release the two buttons and wait for the system to configure itself and commit the configuration to memory.
- 7. Operate and confirm all zones and functions operate correctly.

#### ERROR CODE MESSAGES

There are two (2) error code messages that may display themselves in the LCD window.\

1. Alternating "lb / current temperature", indicates that the battery level/power level is too low for the system to function properly. Correct the power or battery levels to a level that the system will operate (12 volts).2. "I" "I", these segments of the numbers in the LCD flashing indicate that the Command Center has a faulty thermistor and is not sensing the temperature correctly for operation. Replace the Command Center.

# Atwood Comfort Control System (ACCS) OPERATING INSTRUCTIONS

Your recreational vehicle is equipped with an Atwood Comfort Control System (ACCS). The ACCS is a state-of-the-art system used to manage the climate in your vehicle by controlling all the air conditioning and gas heating appliances from a single location.

The heart of the ACCS is the Command Center (CC). This module has four push buttons, one slide switch, and a liquid crystal display to identify the mode of operation. The system allows you to program the running of appliances in what are called "zones". Your vehicle will typically have one zone defined per air conditioner. The ACCS is capable of controlling up to four zones.

**LIQUID CRYSTAL DISPLAY:** The liquid crystal display (LCD) displays the current room temperature with set point in Fahrenheit or Celsius, mode of operation, and fan speed setting. The LCD identifies each zone with all activity in any particular zone.

**0FF/ON SWITCH:** To turn on the system, slide the OFF/ON switch to the ON position. The CC will enter a 10 second programming period and the letters "Pr" will display on the LCD. After the programming period, the CC will display the current settings for zone one.

**ZONE BUTTON:** Press the zone button once for the number of the zone being displayed to flash. The number will flash for five seconds. If the zone button is pressed again during this five seconds, the LCD will change, displaying the current settings for the next zone and the number next to the word ZONE on the LCD will change.

When the zone button is pushed or the CC has been sitting idle for more than five seconds, the LCD will display the room temperature for that zone.

MODE BUTTON: Decide which zone to program. Display the zone on the LCD. Push the MODE button twice to change the mode of operation. The first time you push the MODE button, the mode will not change. The current fan speed (AUTO, HIGH, MED, or LOW) will begin to flash and all available fan speeds will be illuminated on the LCD. (The number of available fan speeds is dependent on the system you have installed in your vehicle and the current mode of operation.) The second time you push the MODE button, the mode of operation will change to the next available mode. The modes can be any of the following: FAN ONLY, FAN ONLY COOL, FAN ONLY FURNACE, COOL, FURNACE, OFF, HEAT STRIP, OR HEAT PUMP. (The number of available modes is determined by the system installed in your vehicle.)

For a detailed description of the operation of each specific mode of operation and fan speed, see the section entitled "MODES OF OPERATION."

**UP/DOWN BUTTONS:** The UP/DOWN button is used to change the fan speed and set point. While the current fan speed is flashing, and the available fan speeds are illuminated (as described above), change the fan speed by pressing the UP or DOWN button. Chose the fan speed (the LCD will stop flashing) and the available fan speeds will turn off after five seconds.

After 5 seconds, pressing the UP or DOWN button to recall the set point. The first time you press the UP or DOWN button, the words SET POINT will flash above the numeric digits and the digits will display the SET POINT temperature for that mode of operation and zone. The next time you push the UP or DOWN button, the set point will increase or decrease by one degree per push. The words SET POINT will stop flashing five seconds after you have chosen the desired set point and the LCD will display the room temperature for the current zone.

**APPLIANCE OPERATION INDICATOR (ACTIVITY DASH):** The small line below the number designating zone is turned on when there is an appliance active in a zone. This dash remains turned on for each zone regardless of what zone is currently being programmed.

**LOAD SHED INDICATOR:** A small dot will flash when Load Shed Option is used, this flashing dot indicates the compressor in that zone is temporarily suspended until such time as sufficient current is again available.

**RESTORE TO FACTORY SETTINGS:** The ACCS stores all the information for each attached zone so that if you turn the system off and back on again it will remember the mode of operation, fan speed, and set point. If you want to reset the memory to the factory settings (All zones off, all fan speeds low, all set points 68°F) simply perform the following steps:

- 1. Turn the system off.
- Press and hold both the ZONE and MODE buttons and turn the unit back on again.
- 3. Release the buttons when you see the LCD displaying "Fr" instead of "Pr." "Fr" stands for Factory Reset.

#### MODE OF OPERATION

FAN ONLY: This mode is only available if the zone is equipped with an Atwood Excalibur XT 2-Stage Furnace. The fan only mode is the best way to exchange the air throughout your vehicle because both the air conditioner and furnace fans are operated to maximize the amount of air circulation. The following table describes the operation with respect to a chosen fan speed.

FAN ONLY Fan Speed	Resulting Operation
HIGH	The air conditioner fan and furnace fan are run on high speed.
MED* (with 3 blower air conditioner)	The air conditioner fan is run on medi- um and the furnace fan is run on low.
MED* (with 2 blower heat pump)	The air conditioner fan is run on low and the furnace fan is run on high.
LOW	The air conditioner fan is run on low and the furnace fan is run on low.

<sup>\*</sup> Only available with three blower air conditioners or two blower air conditioners with heat pump.

**FAN ONLY, COOL:** In this mode both FAN ONLY and COOL are illuminated on the LCD. This mode runs the air conditioner fan only at the chosen fan speed (HIGH, MED, or LOW depending on the system installed in your vehicle).

FAN ONLY, FURNACE: This mode is only available if the zone is equipped with an Atwood Excalibur XT 2-Stage Furnace. The Excalibur XT 2-stage furnace is capable of running the fan without gas heating. The available fan speeds are HIGH and LOW.

**C00L:** This mode runs the air conditioner in cooling. The operation is different depending on what fan speed is selected.

**COOL**, **AUTO**: The fan blower in the air conditioner is cycled on and off with the compressor to maintain the set point temperature. The air conditioner selects the fan speed depending on the zone temperature differential between the set point and room temperature per the following chart:

Difference between SET POINT and Room Temperature	COOL, AUTO Fan Speed
0°F to 4°F	LOW
4°F to 8°F	MED (3-blower A/C only) HIGH (2-blower A/C)
Greater than 8°F	HIGH

**COOL**, **HIGH/MED/LOW**: Only those fan speeds available on the system installed in your vehicle will be available to choose from the ACCS. The fan blower in the air conditioner will remain on in the selected fan speed and the compressor will be cycled on and off to maintain the room temperature.

**FURNACE:** This mode operates the gas furnace. It is only available if the zone being programmed is equipped with a gas furnace. The operation is different depending on what fan speed is selected.

**FURNACE**, **(Zone equipped with standard furnace)**: The ACCS will control a standard furnace thermostat by cycling the furnace on and off to maintain the selected set point temperature. The only available fan speed with a standard furnace is HIGH.

FURNACE, (Zone equipped with an Atwood Excalibur XT 2-Stage Furnace): An Atwood Excalibur XT 2-Stage Furnace has more functions to choose from. With a 2-stage furnace, you can select between AUTO, HIGH, or LOW. HIGH and LOW to cycle the furnace (in high or low BTU) on and off to maintain the selected set point. The AUTO operation cycles the furnace on and off and selects what fan speed (BTU) to use depending on the differential between the set point and the room temperature per the following chart:

Difference between SET POINT and Room Temperature	FURNACE, AUTO Fan Speed
0°F to 4°F	LOW
Greater than 4°F	HIGH

**0FF:** When the selected zone is turned off, all connected appliances will shut down and LCD will display the room temperature for that zone.

**HEAT STRIP:** This mode is only available if the air conditioner is equipped with the Electric Herat Strip" feature. There are two (2) operating characteristics, one involving the furnace as an assist in certain conditions.

HEAT STRIP, AUTO: When the Command Center is set for "Heat Strip, Auto", the rooftop A/C blower operates on "Low" speed. In this mode, if the "Heat Strip" cannot keep up or reach within 50F. of the set point, the control will turn off the "Heat Strip" and "Low" blower, display "Aux. Heat" and turn the gas furnace on "High" to raise the temperature to within 50 of the set point. The control will then shut off the furnace and engage the "Heat Strip" and "Low" blower to continue heating. If this feature cycles five (5) times, the control will assume the "Heat Strip" cannot meet the set point and will lock out the "Heat Strip" for a period of two (2) hours during which only the gas furnace will operate on "High".

**HEAT STRIP, MED or LOW (selected speed):** If a specific speed, (when available with certain A/C systems) is selected in the "Heat Strip": mode (other than "Auto"), the "Aux.Heat" is not available. (The furnace will not engage at any time to assist the "Heat Strip" function, regardless of the ability of the "Heat Strip" to reach set point.) The furnace assist ("Aux.Heat") is only available in "Auto" mode.

Note: If "Heat Pump" is selected, and the requested set point is more than 5 degrees above ambient, the furnace will operate with the heat pump to assist the heat pump to bring the actual temperature within 5 degrees of set. The furnace will then shut off and allow the heat pump to continue the climb to the set point.

**HEAT PUMP:** This mode is only available with air conditioners that are equipped with an electric heat pump. The operation is different depending on what fan speed selected.

**HEAT PUMP, AUTO:** The fan blower in the air conditioner is cycled on and off with the heat pump. The fan speed is set to LOW.

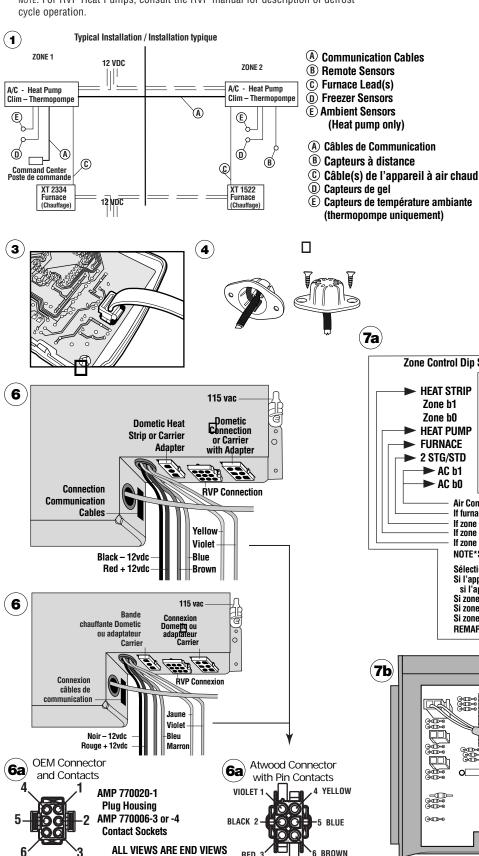
**HEAT PUMP, HIGH/LOW:** Only those fan speeds available with the current system will be available to choose on the ACCS. The fan blower in the air conditioner will remain on in the selected fan speed and the compressor will be cycled on and off to maintain the room temperature

HEAT PUMP, AUX. HEAT: The heat pump will continue to operate until the outside ambient temperature falls below 30°F. At that point, the heat pump is no longer efficient and it will be turned off and the gas furnace will be turned on to maintain the temperature. The words AUX. HEAT will be illuminated on the LCD. If the selected zone does not have a furnace, the heat pump will turn off and the heat strip will be turned on. If the zone does not have a heat strip, nothing will be turned on. A standard gas furnace will operate as described above by cycling on and off to maintain the set point temperature. If the selected zone is equipped with an Atwood Excalibur XT 2-Stage Furnace, it will operate in AUTO mode as described above. Operation will return to the heat pump and AUX. HEAT will turn off if the outside temperature rises above 38°F.

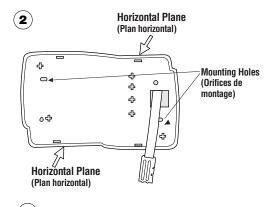
**HEAT PUMP, DEFROST:** The heat pump will continue to operate normally until the outside ambient temperature falls below 42°F. At that point, the heat pump will begin a defrost cycle that allows it to operate until the outside ambient temperature reaches 30°F. During the defrost cycle, the refrigerant flow in the air conditioner is reversed for 4-1/2 minutes and the word DEFROST is illuminated on the LCD. After this, the word DEFROST is turned off and the heat pump is allowed to run for 40 minutes. As long as the outside ambient temperature remains between 42°F and 30°F, the heat pump will run a defrost cycle every 40 minutes. This information is summarized in the following chart:

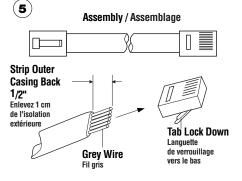
Outside Ambient Temperature	Heat Pump Operation
Greater than 42°F	Normal heat pump operation
Between 42°F and 30°F	4-1/2 minute DEFROST followed by 40 minutes of normal operation
Lower than 30°F	AUX. HEAT operation (if zone is equipped with a gas furnace)

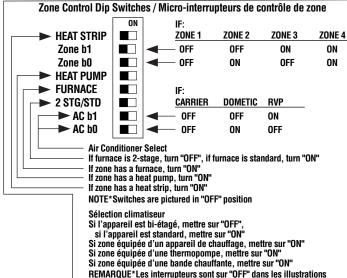
NOTE: For RVP Heat Pumps, consult the RVP manual for description of defrost

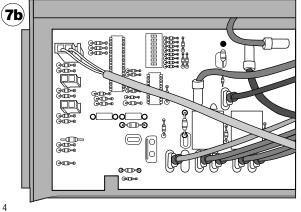


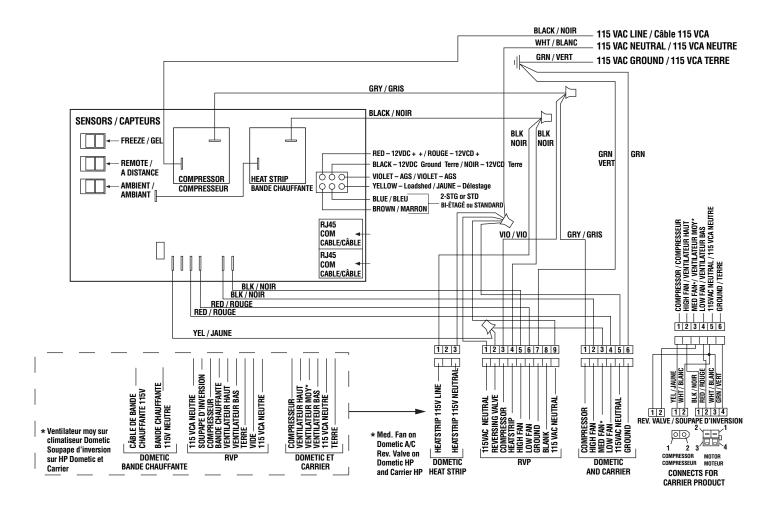
WIRE ENTERS FROM BACK











## ATWOOD MOBILE PRODUCTS - ACCS LIMITED WARRANTY

Atwood Mobile Products warrants to the original owner and subject to the below mentioned conditions, that this product will be free of defects in material or workmanship for a period of two years from the original date of purchase. Atwood's liability hereunder is limited to the replacement of the product, repair of the product, or replacement of the product with a reconditioned product at the discretion of Atwood Mobile Products. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, tampering or other causes not arising from defects in material workmanship. This warranty extends to the original owner of the product only and is subject to the following conditions:

- For two years from the date of purchase Atwood will repair or replace any part defective in material or workmanship. This warranty includes reasonable labor charges required to remove and replace the part.
   Service calls to customer's location are not considered part of these charges and are, therefore, the responsibility of the owner.
- 2. This warranty does not cover the following items classified as normal maintenance:
  - Adjusting voltage, loose wire connections, and/or thermostat sensor position.
  - Cleaning dust accumulation
- 3. In the event of a warranty claim, the owner must contact, in advance, either an authorized Atwood Service Center or the Atwood Service Department. Warranty claim service must be performed at an authorized Atwood Service Center (a list will be provided at no charge) or as approved by the Consumer Service Department, Atwood Mobile Products, 1120 North Main, Elkhart, IN 46514 USA. Phone: 574-264-2131.

- 4. RETURN PARTS MUST BE SHIPPED TO ATWOOD "REPAID". Credit for shipping costs will be included with the warranty claim. The defective parts become the property of Atwood Mobile Products and must be returned to the Quality Assurance Dept., Salt Lake City Operations, 1878 South Pioneer Road, Salt Lake City, Utah 84104 USA.
- 5. This warranty applies only if the unit is installed according to the installation instructions provided and complies with local and state codes.
- 6. The warranty period on replacement parts is the unused portion of the original warranty period.
- Damage or failure resulting from misuse (including failure to seek proper repair service), misapplication, alterations, water damage, freezing or not using genuine Atwood parts are the owner's responsibility.
- 8. Atwood does not assume responsibility for any loss of use of vehicle, loss of time, inconvenience, expense for gasoline, telephone, travel, lodging, loss or damage to personal property or revenues. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.
- 9. Any implied warranties are limited to (2) two years. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.
- Replacement parts purchased outside of the original system warranty carry a 90 day warranty. This includes the part at no charge and reasonable labor charges to replace it.

This control system is designed for use in recreation vehicles for the purpose of controlling heating and cooling appliances. Any other use, unless authorized in writing by the Atwood Engineering Department, voids this warranty.

# This manual has been provided courtesy of My RV Works, Inc.

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Over the years of running a mobile RV repair service, having a dedicated place to access service manuals for all the different appliances and components found on RVs was something that I always had a desire to create.

I hope this resource makes your RV repairs easier, as it has mine, but please be careful and follow proper safety practices when attempting to repair your own RV.

If in doubt, please consult with a professional RV technician!

DARREN KOEPP - OWNER, MY RV WORKS, INC.

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