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LITERATURE NUMBER MPD 33377

Atwood®
Comfort Control System
(ACCS)

ENGLISH, FRANCAIS (et Canada)

•Installation •Operation •Maintenance

Effective 3/13/02

POWER SUPPLY REQUIREMENTS	
Low Voltage DC Supply (12 VDC Battery Connection)	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 (117 VAC Line Connection)	operating voltage: 117 VAC nominal operating frequency: 50 / 60 Hz No internal fuse protection provided
GENERAL	
Operating & Storage Temp.	operating: +32°F to +122°F (0°C to 50°C) storage: -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)
CONNECTIONS	
Inputs	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
Furnace Outputs	Standard furnace: 2 wires, switched 12 VDC / max 1A * 2-Stage Furnace: 1 wire*
A/C Outputs	9-pin AMP type connector: (2-stage A/C) compressor: 117 VAC 60 LRA / 12 FLA fan: 117 VAC 1/3 HP 6-pin AMP type connector: (3-stage A/C / 2-stage H/P) compressor: 117 VAC 65 LRA / 12 FLA fan: 117 VAC 1/3 HP
H/S Output	3-pin AMP type connector: 117 VAC - 15 A * can share a single 6-pin connector
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:
 1. Between Zone Control Module in Zone 1 and Command Center
 2. Between Zone Control Module in Zone 1 and Zone Control Module in Zone 2, and
 3. Between Zone Control Modules for each additional Zone up to a total of four zones.

- **FURNACE WIRE** - Provide two (2) 22 gage 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 22ga minimum wire between the furnace and the Zone Control Module in each zone. For identification, blue wire is recommended.
- **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 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 cause compressor damage to result, likely voiding your warranty on that appliance.

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, you may need to provide a remote sensor 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.

1. Be sure all electrical power is disconnected from the furnace, air conditioner and power supply.
2. 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.
3. 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.

4. 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.

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

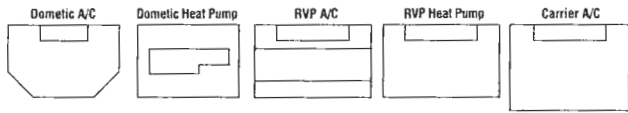
separate the fins, between two tubes at a downward angle. This creates a "pocket" for the sensor. Insert the sensor as deep as you can and verify it is secure with a light tug.

COMMUNICATION CABLE INSTALLATION

Cables may be purchased pre-assembled from Atwood. If installer is assembling the cables, use (8) wire, 22ga flat cable and RJ-45 connectors. Assemble connectors as shown in FIG 5. Keep grey wire to right, connector tab down.

LOCATING THE ZONE CONTROL MODULE

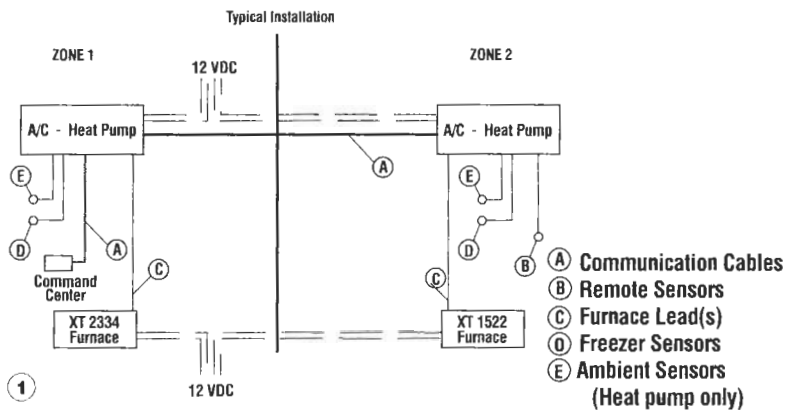
TOP VIEWS OF ROOF OPENINGS



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.



12 VDC CONNECTION

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

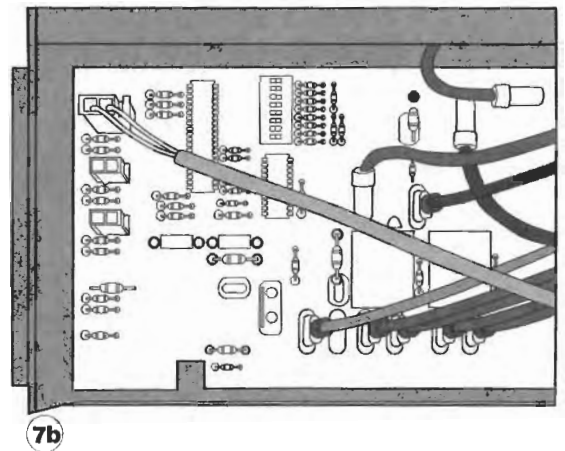
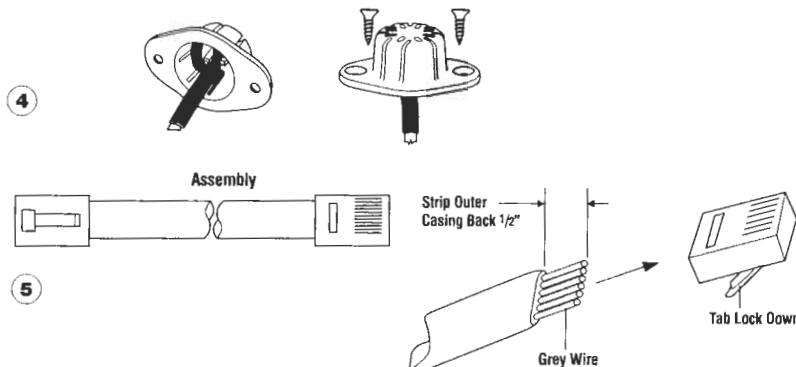
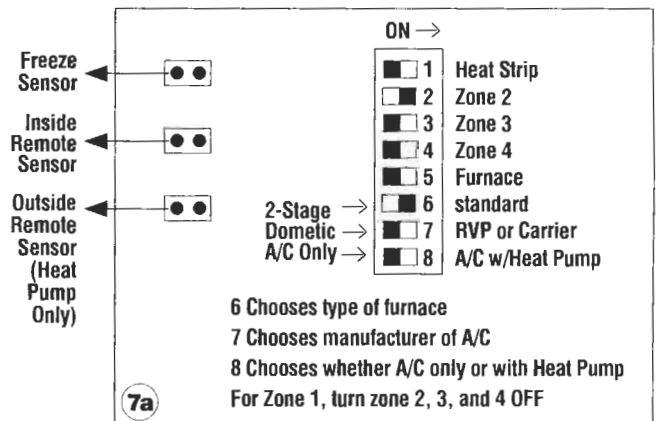
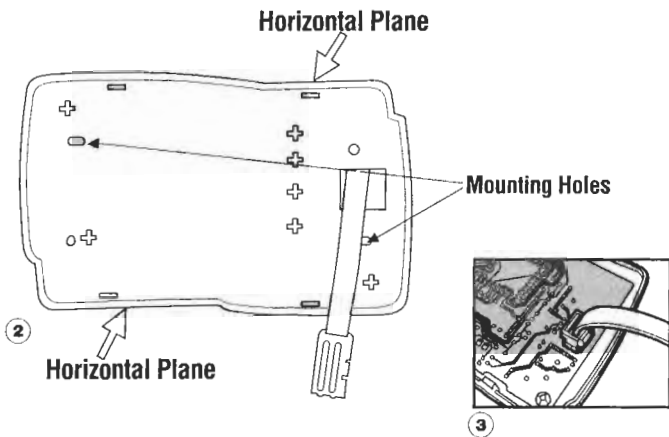
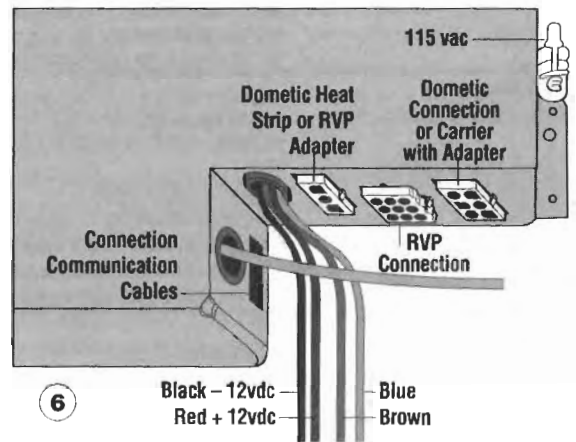
115 VAC CONNECTION

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, 3, and 4 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. 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.



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.

OFF/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 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. Choose 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.

RESETTING 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.
2. 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 medium 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.

* 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.

COOL: 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

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

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

HEAT STRIP, AUTO: The fan blower in the air conditioner is cycled on and off with the heat strip. The fan speed is LOW. Notice that the unit enters an auxiliary heat (AUX. HEAT) mode if the differential is too large for the heat strip to overcome.

HEAT STRIP, AUTO, AUX. HEAT: If the room temperature falls below the set point by more than 6°F, the unit will turn off the heat strip and turn on the gas furnace. AUX. HEAT will be illuminated on the LCD screen. The gas furnace will run in HIGH until the room temperature rises to 5°F below the set point. At that point, the gas furnace will turn off and the heat strip will begin to operate again. If this happens five times, the heat strip will be locked out for two hours and only the gas furnace will operate.

Auxiliary Heat is not available if there is no furnace present in that specific zone. Auxiliary Heat is only available if the fan speed is set to AUTO. If the fan speed is set to MED or LOW, the heat strip will continue to try to heat the room even if the temperature falls greater than six degrees below the set point.

HEAT STRIP, MED/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 heat strip will be cycled on and off to maintain the room temperature. Auxiliary Heat is not available in these fan speeds.

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)

