



INSTALLATION INSTRUCTIONS

COLEMAN RECREATIONAL VEHICLE ST-200 CIRCULATING AIR FURNACE MODEL 4312

TABLE 1

MODEL NO.	TYPE	RATING AT SEA LEVEL BTUH*		GAS CONN. SIZE	VOLTS	AMPS
		INPUT	OUTPUT			
4312-719 4312-729	MATCH PIEZO	12,000	9,000	3/8 SAE	12VDC	1.5
4312-819	MATCH				115VAC OR 12VDC	.3
4312-829	PIEZO		1.5			

*ANSI For elevations above 2,000 feet, reduce input rate 4% for each 1,000 feet elevation above sea level.

*Canada Approved for elevations 0 - 4500 feet.

NOTICE

These instructions are intended for the use of qualified individuals specially trained and experienced in installation of this type equipment and related system components.

Installation and Service personnel are required by some States to be licensed. Persons not qualified should not attempt to install this equipment nor interpret these instructions.

CLEARANCES

Minimum clearance to combustibile surface. Zero on top, bottom and rear. Minimum of 3/4 inch clearance on both sides.

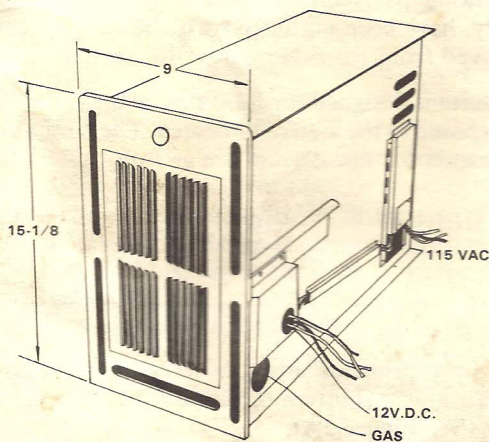
For additional clearance from furnace front panel to combustibile material, see Figure 2.

For furnace dimensions, see Figures 1 and 1A.

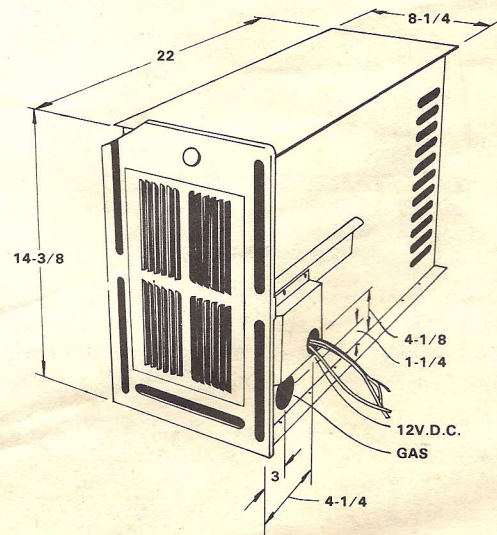
GENERAL INSTRUCTIONS

This furnace is design certified by the American Gas Association for installation in mobile homes and recreational vehicles and by the Canadian Gas Association for installation in mobile housing and recreational vehicles.

Primarily, it is designed for use in motor homes and recreational vehicles. The furnace is of the direct vent system design with a single heat exchanger of drawn steel welded together. The burner designed for use with LP gas, is of aluminized steel construction with slotted ports.



(Dimensions same as Fig. 1A)
115VAC/12VDC Model
Figure 1



12VDC Only
Figure 1A

INSTALLATION INSTRUCTIONS

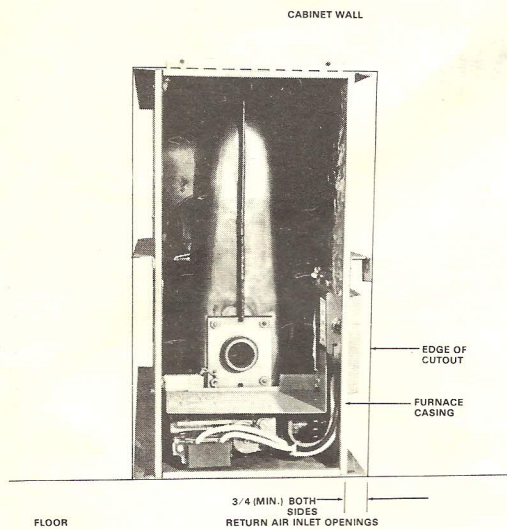


Figure 2

These units feature 100% safety shut-off gas controls and match or piezo electric ignition. Depending on the model code, it may be operated from 115 V.A.C. or 12 V.D.C. power source as shown below:

- 4312-719 12 V.D.C. MATCH LITE
- 4312-729 12V.D.C. PIEZO LITE
- 4312-819 12V.D.C./115 V.A.C. MATCH LITE
- 4312-829 12 V.D.C./115 V.A.C. PIEZO LITE

The vent assembly packages for use on the 4312 furnace are listed in chart below. The vent assembly is available in different lengths and the determination of which vent assembly package to use is dependent upon the distance from the rear of the furnace to the outer portion of the outside wall of the recreational vehicle (Figure 2A).

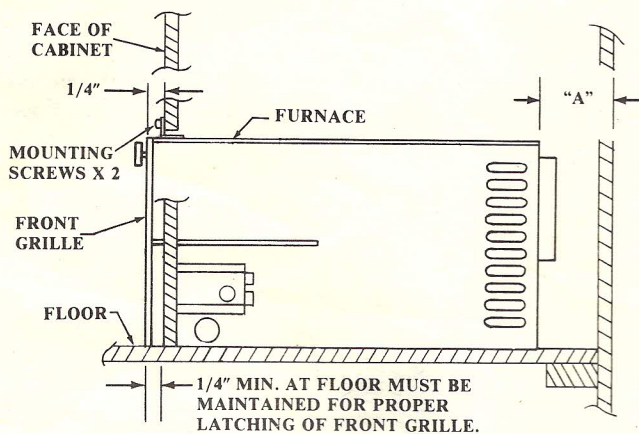


Figure 2A

Determine "A" dimension (back of furnace casing to outside of vehicle sidewall) and select the vent package according to the following chart.

PART NUMBER	DIMENSION "A"
4312-6301	1" to 3"
4312-6321	2" to 4"
4312-6311	3" to 6"

Each telescoping vent package is capable of expanding and contracting with the walls of the vehicle, eliminating the possibility of separation and resultant air leakage. Following the proper installation of the correct vent assembly package the vent assembly will provide safe and efficient passage ways for combustion air and flue gas.

The furnace is a front discharge system and has no provisions for ducting. The unit is listed as a Fan Type Direct Vent System WALL FURNACE.

Provisions for return air is thru slots in both sides of the front panel. Spacers of 3/4 inch width are secured to both sides of the outer casing to provide a path for return air to the rear of the furnace air inlet openings to the fan. The 3/4 inch minimum spacing on both sides of the furnace must be maintained in order for the furnace to operate properly. See Fig. 2 and 3.

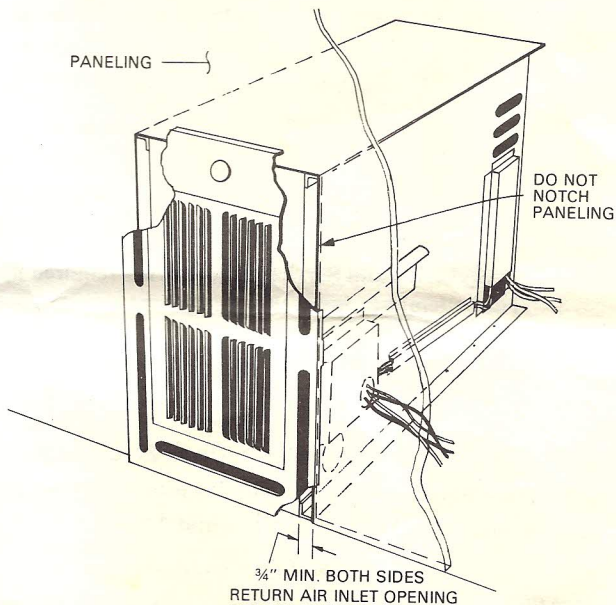


Figure 3

The compact design of the unit will permit installation in minimum space requirements, for example, under cabinets or built-in appliances.

The working parts of the furnace, called the heat unit assembly, have been mounted on a sliding tray which can be removed from the outer casing for service. See Fig. 5.

The furnace is designed for flush mount only with the front panel exposed to the area to be heated. The minimum space requirements for installation are as follows:

HEIGHT	WIDTH	DEPTH
14 ³ / ₈	*8 ¹ / ₄	22

IMPORTANT

Furnace must protrude thru cabinetry a minimum of 1/4" at top and 1/4" at bottom of furnace for front door to fit properly (See Figure 2A).

*Includes 3/4 inch spacers on both sides of casing.

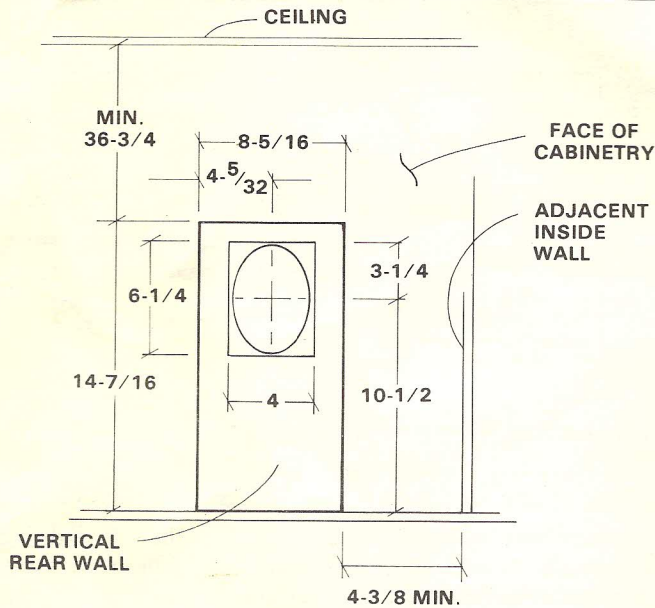


Figure 4

WARNING

IN CASE OF KITCHEN INSTALLATION, FURNACE SHALL BE ISOLATED FROM THE RANGE ENCLOSURE. OTHERWISE, OVEN PILOT OUTAGE MAY OCCUR OR WHEN THE RANGE BURNER IS OPERATING, THE FURNACE BLOWER COULD: (1) DRAW THE FLAME THROUGH THE AERATION BOWL OPENING, CAUSING INCOMPLETE COMBUSTION; (2) DRAW THE FLAME DOWN AND POSSIBLY MELT THE BURNER CAPS WHICH COULD THEN RESULT IN THE FURNACE BLOWER CIRCULATING THE PRODUCTS OF COMBUSTION THROUGH THE FRONT PANEL, EXPELLING FLUE PRODUCTS INTO THE VEHICLE. ALSO WHEN THE FURNACE IS INSTALLED IN A STORAGE AREA A SEPARATER MUST BE INSTALLED TO PREVENT STORED ITEMS FROM BLOCKING THE RETURN AIR OPENINGS TO THE FURNACE.

1. Select a location for the furnace on an outside wall as near the center of the vehicle as possible.
2. Position the heater inside the vehicle in the desired location with the furnace resting on the floor or on a durable shelf or platform if above floor installation and the oval vent opening at the rear of the furnace against the vertical outside wall. Mark the location of the oval vent opening on the vertical wall. If the final furnace installation is to be other than against the inside of this outside vertical wall, move the furnace to the desired location not more than 6" from the back edge of the furnace outer casing and the outside of the outer vertical wall. Remove the furnace and cut out openings for the vent. See Figure 4 for cut out dimensions of oval flue and cabinet.
3. Refer to Figures 2 & 4 and make certain the minimum clearances to ceiling and side walls are maintained as

shown. Secure unit with two screws at the top front and two screws at the bottom just inside the door. Or, the furnace can be secured by using the 4 holes provided in the outer flanges at the bottom of the furnace and/or the 4 holes provided in the outer flanges at the top of the furnace.

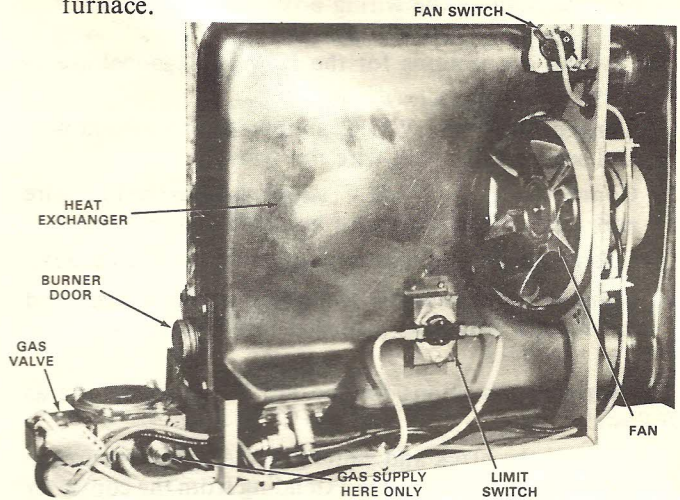


Figure 5

4. Install the vent terminal on the outside wall of the vehicle. (Refer to installation instructions packed with the vent package assembly to be used.)

INSTALLATION INSTRUCTIONS GAS PIPING INSTALLATION

The gas supply line to the furnace must be of adequate size to provide 11 inch water column gas pressure. This pressure must be maintained under maximum flow conditions with all gas appliances in operation. The allowable gas pressure at the inlet of the gas control valve is 11 inches W.C. minimum and 14 inches W.C. maximum. Tubing may be type "K" for LP gas (Bottle Gas). However, all installations must be made according to Installation of National Fuel Code, Z223.1-1974 Mobile Homes A119.1-1972, Recreational Vehicles, A119.2-1974, in Canada C.G.A. 10.1/CSA240.4 gas equipped recreational vehicles and mobile housing and C.G.A. B-149.2 Installation Code for propane gas burning appliances and equipment, and also be sure to check with local authorities for any other requirements concerning gas piping. Gas line hook-up is made through a hole provided at the lower right side of the furnace casing. *Do not hook up gas supply on lower left hand side of furnace casing.*

CAUTION
DO NOT TWIST GAS VALVE
DURING PIPING.

Local codes may require installation of an external manual shut-off valve. If required, the manual valve must be located outside the confines of the furnace casing.

After connections have been made, be sure all joints are checked with soap solution to detect leaks. This also should include a check of the furnace controls and piping. **NEVER CHECK FOR LEAKS WITH AN OPEN FLAME.**

INSTALLATION INSTRUCTIONS



ELECTRICAL INSTALLATION

A wiring box is furnished and is located directly behind the front panel on the right side of the casing. Wiring provisions may be made on the outside of the furnace. However, to gain access to the wiring box, merely remove two screws holding the wiring box lid.

The wiring connections for the 12 V.D.C. model are as follows:

1. Connect the (+) 12 V.D.C. supply lead to the red wire and secure wires with wire nut provided.
2. Connect the (—) 12 V.D.C. supply lead to the blue wire and secure wires with wire nut provided.
3. Insert all wire nut connections inside the wiring box.
4. Connect the thermostat leads to the yellow wires and secure with wire nuts provided. See Fig. 7.

The wiring connections for the 115 V AC model are as follows:

1. Connect the black and white 115 V AC supply wires to the black and white wires extending from the converter wiring box. Connect the mechanical ground to the green grounding wire extending from the converter wiring box. Secure all three connections with wire nuts provided in parts package.
2. Insert all three wire connections inside converter wiring box and secure with electrical cable connector. See Fig. 8.
3. All 12 VDC and thermostat connections same as for 12 VDC models shown above.

WARNING

Do not perform any high potential tests on this furnace. Testing has been done before leaving the factory. If vehicle Hi-Pot testing is required, disconnect the furnace before testing. If the furnace contains a power converter, DO NOT ATTEMPT TO CHECK IT OUT BY SHORTING TO GROUND. DO NOT DISCONNECT ANY POWER LEAD AND SHORT TO GROUND. Any shorting or arcing of the leads may damage furnace components.

Electrical installations shall be made in accordance with the National Electrical Code ANSI C1-1976 (Note: If an external electrical source is utilized, the appliance must be grounded in accordance with the National Electrical Code ANSI C1-1975). In Canada, CSA Standards Z240.6.1 Electrical Requirements for Mobile Homes, C22.2, No. 148/Z240.6.2 Electrical Requirements for Recreational Vehicles, and C22.1 Electrical Code. Local codes, where applicable, take precedence over these recommendations. Use a suitable connector to secure supply wires at the knockouts. Do not use wire size smaller than that indicated in Table 2.

TABLE 2

Recommended Wire Sizes	
Circuitry	Recommended wire size
115V AC 12V DC	No. 16 AWG* No. 14 AWG* Thermostat: 18 gauge solid or 16 ga. stranded copper with 2/64 insulation

*If wire length exceeds 20 feet from voltage source to furnace, use next size larger.

EXTERNAL FURNACE FUSING

The National Electric Code for **hi-voltage** (115 VAC) fusing of circuits covering this furnace is as follows:

Recreational vehicles with not more than 8 lighting receptacle outlets combined shall have one 15 ampere general purpose branch circuit to supply these outlets, provided the total rating of fixed appliances connected to this circuit does not exceed 600 watts.

The ANSI 119.2 code for **lo-voltage** (12 VDC) fusing of circuits is shown below. The wires shown cover wiring for this furnace. This furnace is equipped internally with 18 GA wire.

Wire Size	Ampacity	Wire Type
18 GA	6	Stranded only
16 GA	8	Stranded only
14 GA	15	Stranded or Solid

THERMOSTAT LOCATION

The thermostat should be located on an inside wall for best results. If necessary, the thermostat may be located on an outside wall. IF POSSIBLE, the thermostat in both cases should be located at least four feet from the floor. **DO NOT** locate the thermostat near a door or window, near heat source, such as lamps, etc., in direct sunlight or any surface subject to vibration during operation.

**THERMOSTAT HEAT ANTICIPATION
SHOULD BE SET AT .2 AMPS**

FURNACE LIGHTING INSTRUCTIONS (SEE FURNACE RATING PLATE)

NOTE

In the interest of gas conservation, it is recommended on extended pilot operation only, that the pilot be turned off.

It may be possible air will get in gas line in changing bottles; therefore, it will take longer to light pilot.



INSTALLATION INSTRUCTIONS

SHORT CIRCUIT CHECKOUT

If fuses are blown in the vehicle, a short is indicated and shall be checked by a qualified service person, applying the following procedures.

1. Turn off all appliances including furnace.
 2. Install an ammeter on the positive (+) lead of the battery. Amperage reading should be "0". If an amperage reading is noted, a short exists in the vehicle electrical system.
 3. Disconnect the red (+) DC lead at the furnace. If the amperage continues, the short is exterior to the furnace. If the amperage reading ceases, the furnace electrical system is shorted and should be checked.
 4. Refer to the Operation and Service Instructions for a complete checkout.
 5. The control compartment shall be kept clean.
-



WARNING THIS COMPARTMENT MUST BE CLOSED EXCEPT WHEN SERVICING.

R-RED W-WHITE Y-YELLOW BL=BLUE

12V. D.C. SYSTEM SWITCH FAN SWITCH MOTOR T'STAT GAS VALVE LIMIT SWITCH LADDER WIRING DIAGRAM

ALL FACTORY INSTALLED WIRING IS STRANDED 16 & 18 GA. SINGLE CONDUCTOR 105°C THERMOPLASTIC INSULATED (125°C FOR ALL FAN CONTROL WIRING) U.L. & C.S.A. APPROVED. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE A.W.M. 4/64 INSULATION, 105°C WIRE. (125°C FOR ALL FAN CONTROL WIRING OR ITS EQUIVALENT.)

1971B064 (8-77) P.I. Rev. 1 LITHO U.S.A.

WARNING THIS COMPARTMENT MUST BE CLOSED EXCEPT WHEN SERVICING.

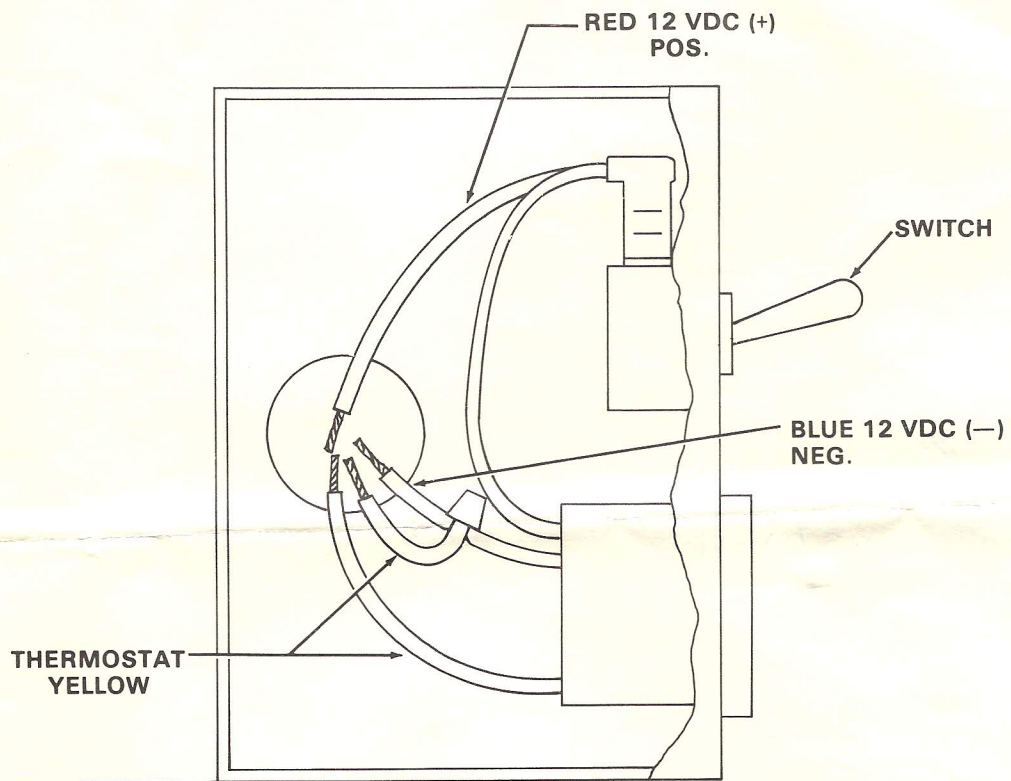
R=RED W=WHITE Y=YELLOW BL=BLUE OR=ORANGE

12VDC 115VAC SYSTEM SWITCH FAN SWITCH MOTOR T'STAT GAS VALVE LIMIT SWITCH CONVERSION WIRING DIAGRAM

ALL FACTORY INSTALLED WIRING IS STRANDED 16 & 18 GA. SINGLE CONDUCTOR 105°C THERMOPLASTIC INSULATED (125°C FOR ALL FAN CONTROL WIRING) U.L. & C.S.A. APPROVED. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE A.W.M. 4/64 INSULATION, 105°C WIRE. (125°C FOR ALL FAN CONTROL WIRING OR ITS EQUIVALENT.)

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Figure 6



12VDC ONLY

Figure 7

INSTALLATION INSTRUCTIONS

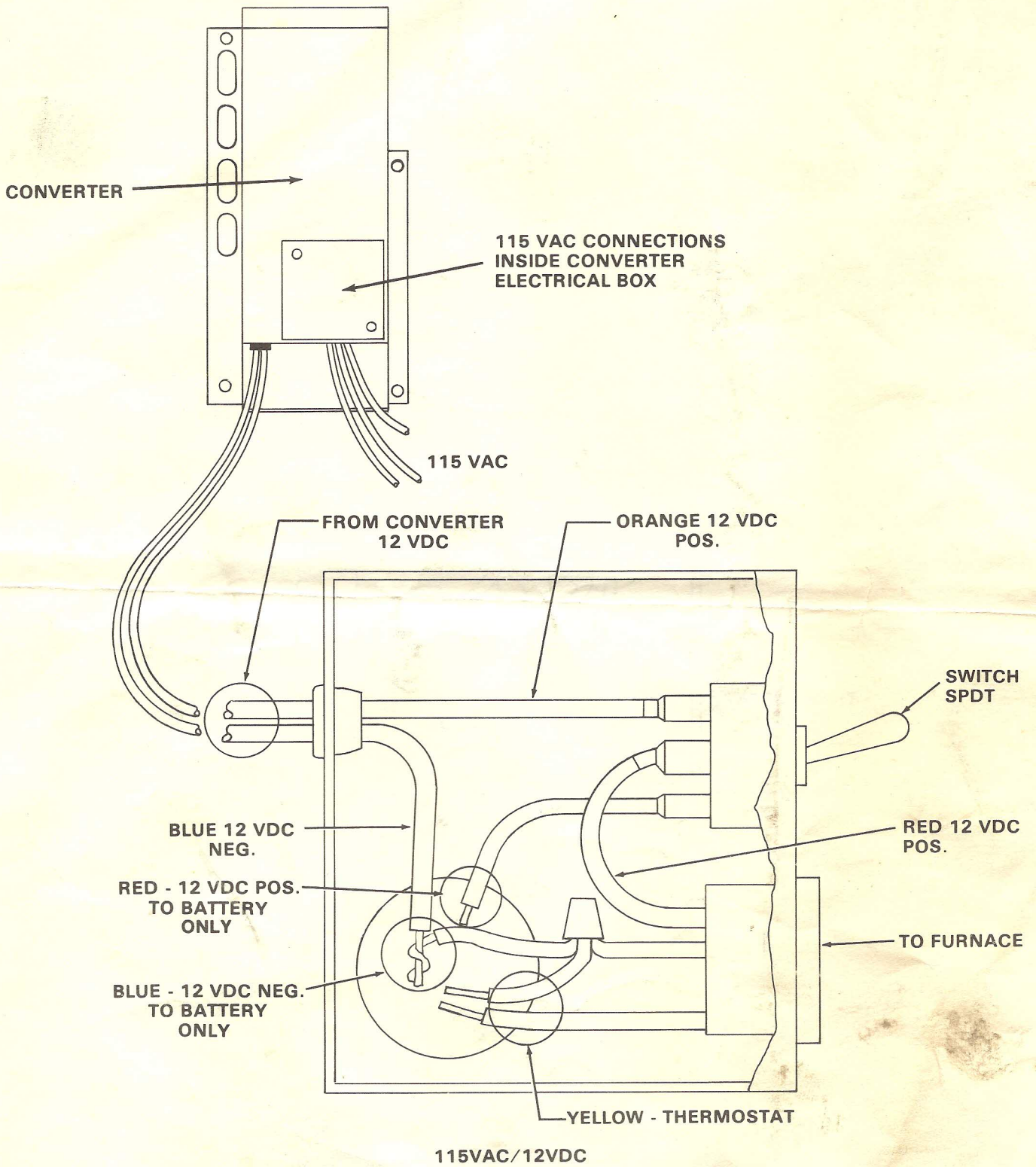


Figure 8

The Coleman Company, Inc.

250 NORTH ST. FRANCIS AVENUE
WICHITA, KANSAS 67201