**********IMPORTANT NOTICE**********

MODEL C120

As of January, 1982 the microcomputer inside the C120 control has been programmed to offer several new features. These C120's may be identified by date code 8202 (and later) stamped next to the model number. Earlier controls had no date code. In addition, the C120 now offers greater flexibility in choosing the storage reference sensor used for the space heating function.

1. NEW FEATURES AVAILABLE (must be factory ordered)

- o -2S Second differential output ("AUX 1" - "STORAGE" sensors)
  -2P
- o -2SA Second differential output (uses "AUX 1" - "AUX 2" sensors)
  -2PA
- o L Recirculate freeze protection -(available on output only)
- o -2F Drain-down freeze protection
- o W Woodstove over temperature protection. Output 2 turn off when "AUX 1" reaches 210°F. Prevents cool storage water from being pumped into an overheated stove.

2. SPACE HEATING REFERENCE SENSOR

The C120 control logic compares the "STOR MIN" threshold to a sensor mounted on the storage tank. Depending on your control model, this sensor may be connected to either "AUX 1" or "AUX 2".

"AUX 2"	All C120's with **no** second output All C120's with **no** "A" option in output 2 (e.g. C120-1S-2S-3I-4B, C120-1S-2F-3D-4D) See Figure 1 and 2 for typical system
"AUX 1"	All C120's with "A" in output 2 (e.g. C120-1S-2SA-3I-4B) See Figure 3 and 4 for typical system

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REV B

TYPICAL SYSTEM - Two sources of heating, one tank

C120-1S-2S-3I-4B

(NOTE: "AUX 2" sensor is referenced for space heating)

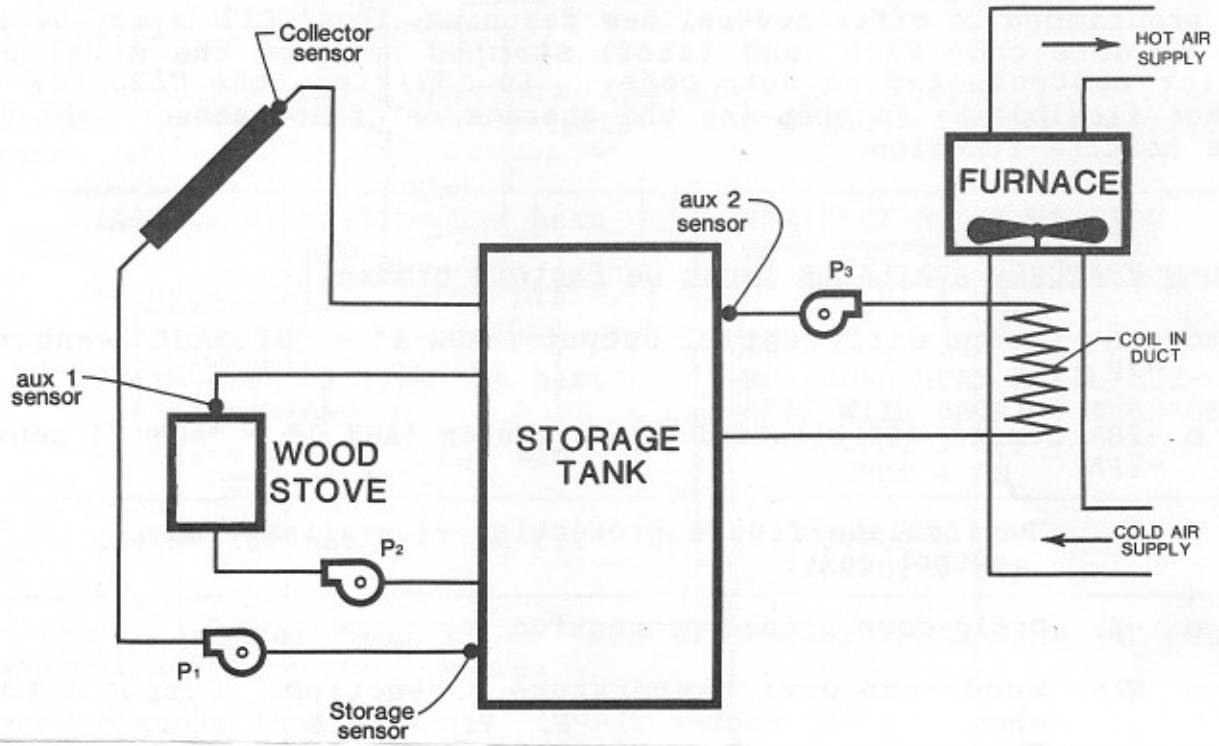
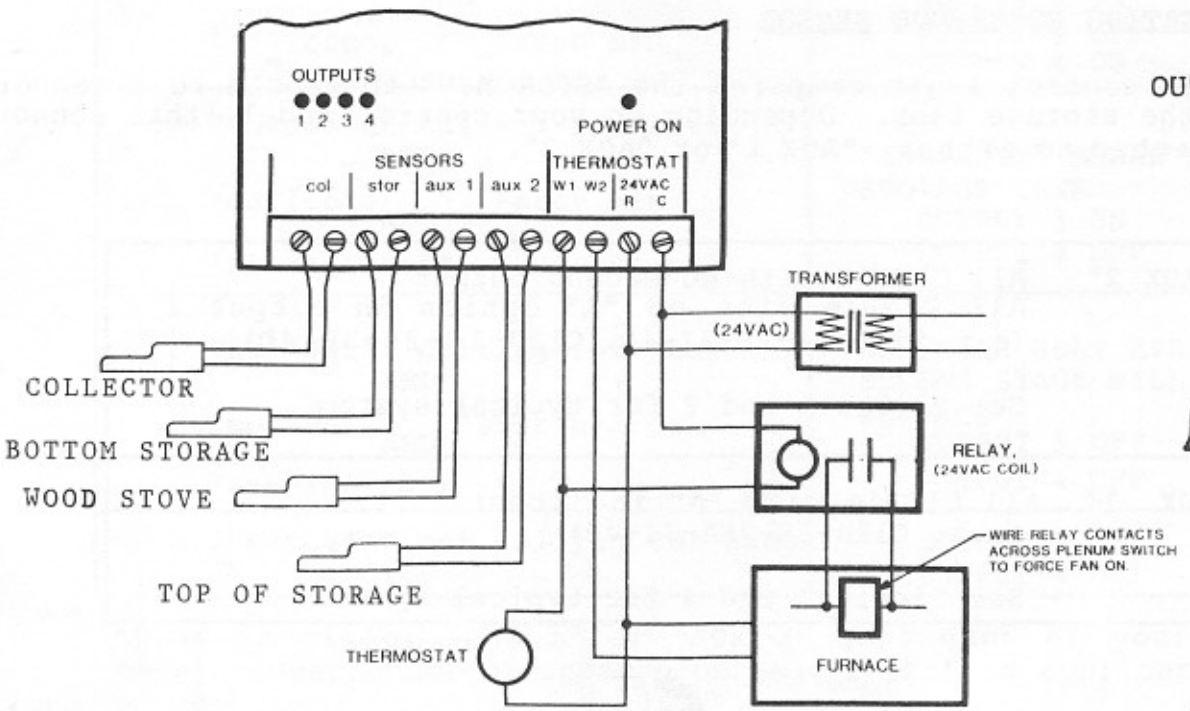


FIGURE 1: PLUMBING SCHEMATIC



OUTPUT 1 = P_1
2 = P_2
3 = P_3
4(W2) = FURNACE

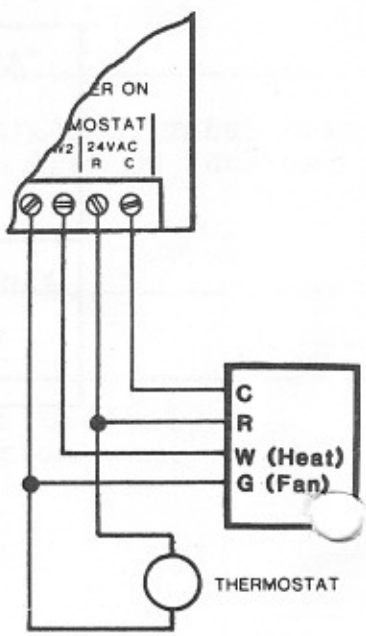


FIGURE 2: ELECTRIAL SCHEMATIC

TYPICAL SYSTEM: Two independent differentials

C120-1S-2SA-3I-4B

(NOTE: "AUX 1" Sensor is referenced for space heating)

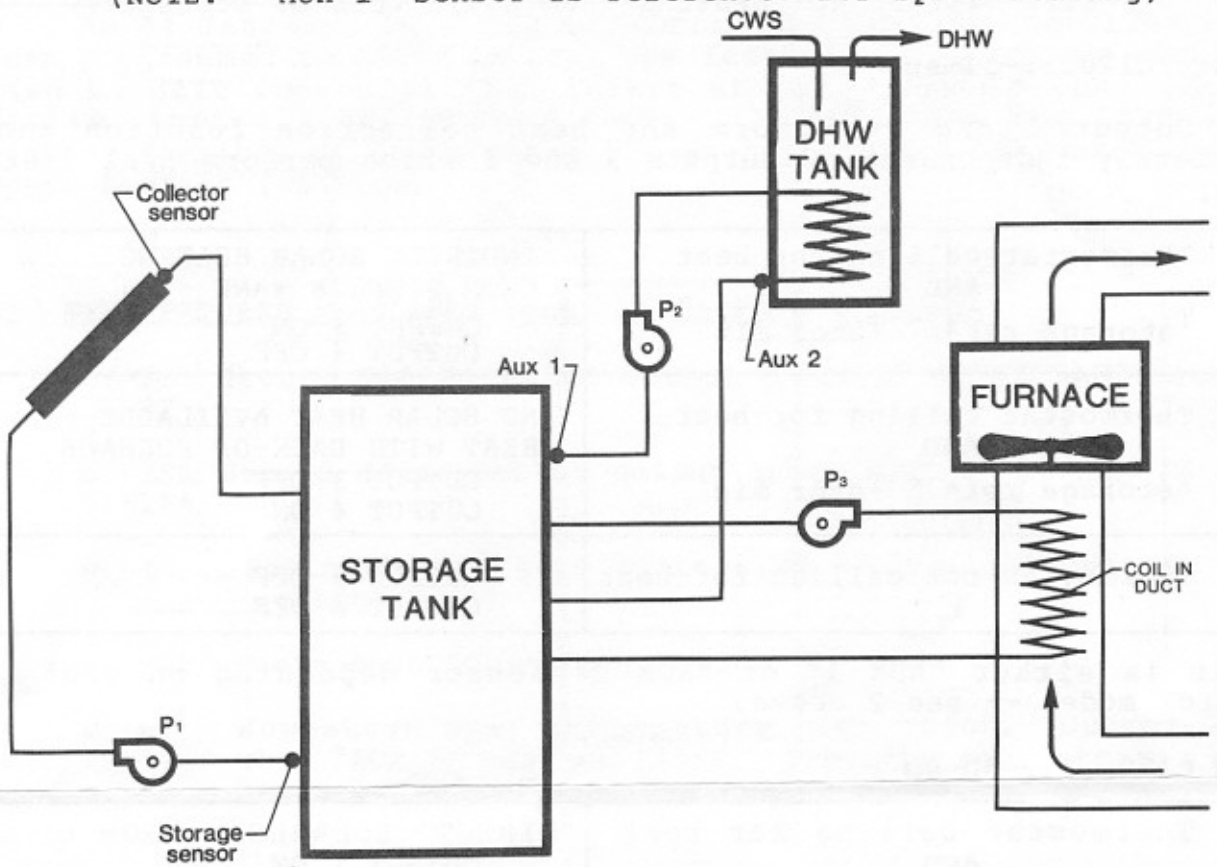


FIGURE 3: PLUMBING SCHEMATIC

OUTPUT 1 = P_1
2 = P_2
3 = P_3
4 = FURNACE

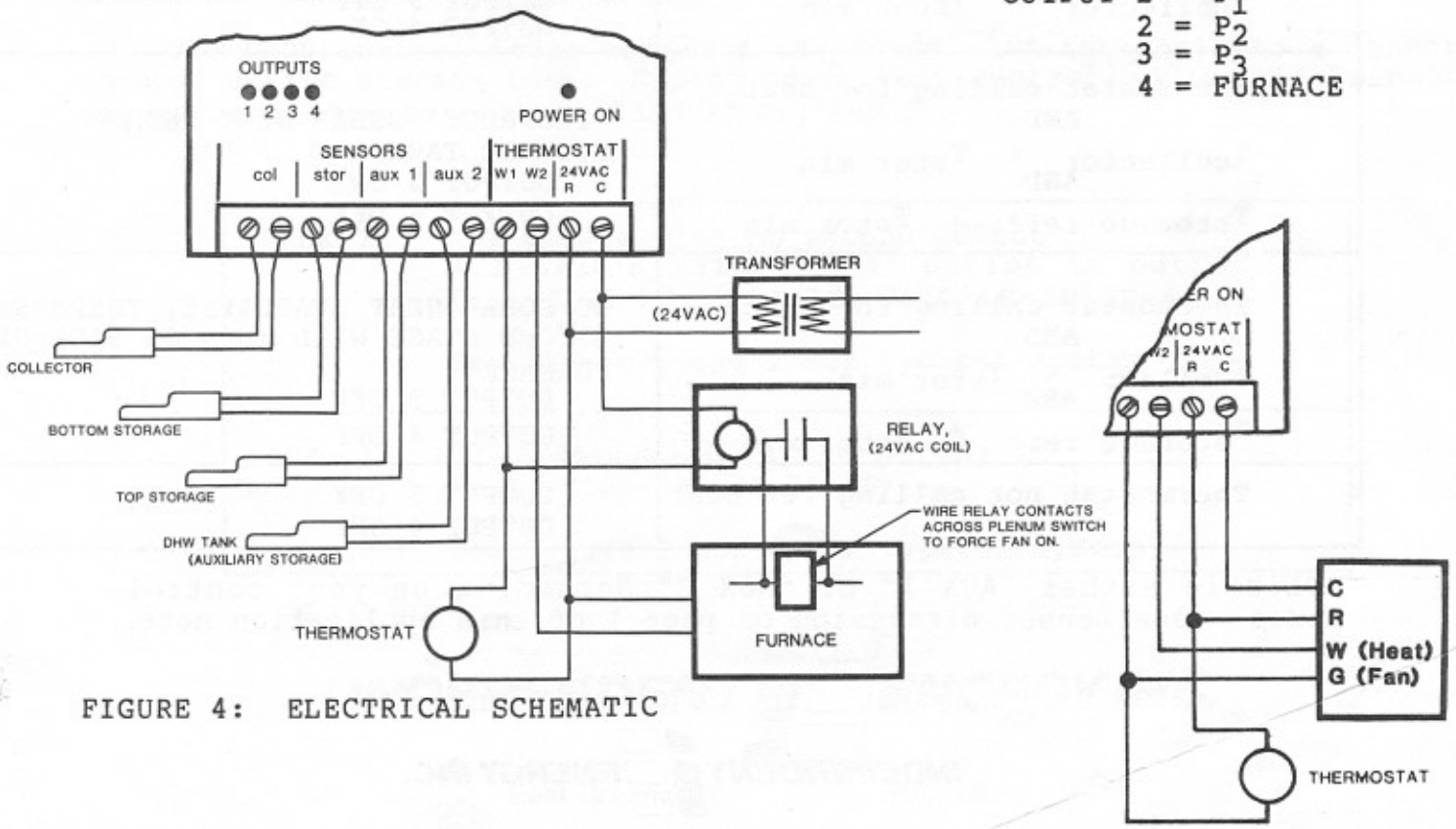


FIGURE 4: ELECTRICAL SCHEMATIC

3. SPACE HEATING LOGIC

C120's control logic falls into two basic types:

C120-....-3I-4B Space heating from storage only.
C120-....-3D-4D Heating from collectors or storage

TYPE: C120...-3I-4B

Output 1 and 2 perform the heat collection function and are completely independent of outputs 3 and 4 which perform heat distribution.

Thermostat calling for heat **AND** $T_{storage\ ref*} > T_{stor\ min}$	INDIRECT SOLAR HEATING FROM STORAGE TANK OUTPUT 3 ON OUTPUT 4 OFF
Thermostat calling for heat **AND** $T_{storage\ ref*} < T_{stor\ min}$	NO SOLAR HEAT AVAILABLE-- HEAT WITH BACK-UP FURNACE OUTPUT 3 OFF OUTPUT 4 ON
Thermostat **not** calling for heat	OUTPUT 3 OFF OUTPUT 4 OFF

*This is either "AUX 1" or "AUX 2" sensor depending on your control model -- see 2 above.

TYPE C120-....-3D-4D

Thermostat calling for heat **AND** $T_{collector} > T_{stor\ min}$	"DIRECT" SOLARHEAT FROM COLLECTORS OUTPUT 1 ON OUTPUT 3 OFF OUTPUT 4 ON
Thermostat calling for heat **AND** $T_{collector} < T_{stor\ min}$ **AND** $T_{storage\ ref*} > T_{stor\ min}$	"INDIRECT" SOLAR HEAT FROM STORAGE TANK OUTPUT 3 ON OUTPUT 4 OFF
Thermostat calling for heat **AND** $T_{collect} < T_{stor\ min}$ **AND** $T_{storage\ ret*} < T_{stor\ min}$	NO SOLAR HEAT AVAILABLE, THERMOSTAT SECOND STAGE WILL TURN ON BACK-UP FURNACE OUTPUT 3 OFF OUTPUT 4 OFF
Thermostat **not** calling for heat	OUTPUT 3 OFF OUTPUT 4 OFF

*This is either "AUX 1" or "AUX 2" depending on your control model - see sensor discussion on page 1 of this application note.

I. E. SPEC. SHEET

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SYSTEM / CONTROL	FREEZE PROTECTION	DESCRIPTION
• SOLAR SPACE HEAT - INDIRECT → C-120-15AH(ADJ)-3I(ADJ)-4B	NONE (DRAIN DOWN OR RECIRC. NOT AVAIL)	DIFFERENTIAL FOR COLLECTOR LOOP, INTERFACE WITH THERMOSTAT TO HEAT FROM STORAGE (OUTPUT 3) OR TURN ON BACK-UP HEAT (OUTPUT 4). NEEDS ONLY SINGLE STAGE THERMOST SECOND DIFFERENTIAL NOT AVAILABLE
• SOLAR SPACE HEAT - DIRECT → C-120-15H-25A-3D(ADJ)-4D	NONE (DRAIN DOWN OR RECIRC IS AVAIL.)	DIFFERENTIAL FOR COLLECTOR LOOP, SECOND DIFFERENTIAL FOR D.H.W. HEATING FROM STORAGE, INTERFA WITH THERMOSTAT FOR DIRECT DIVERSION FROM COLLECTOR TO SPACE (OUTPUT 4 TO DIVERSION VALVE OR HEAT SPACE FROM STORAGE (OUTPUT 3), MUST BE USED WITH 2 STAGE THERMOSTAT

C-120 #C-120-1SA-3I(ADJ)-4B APPLICATION SHEET

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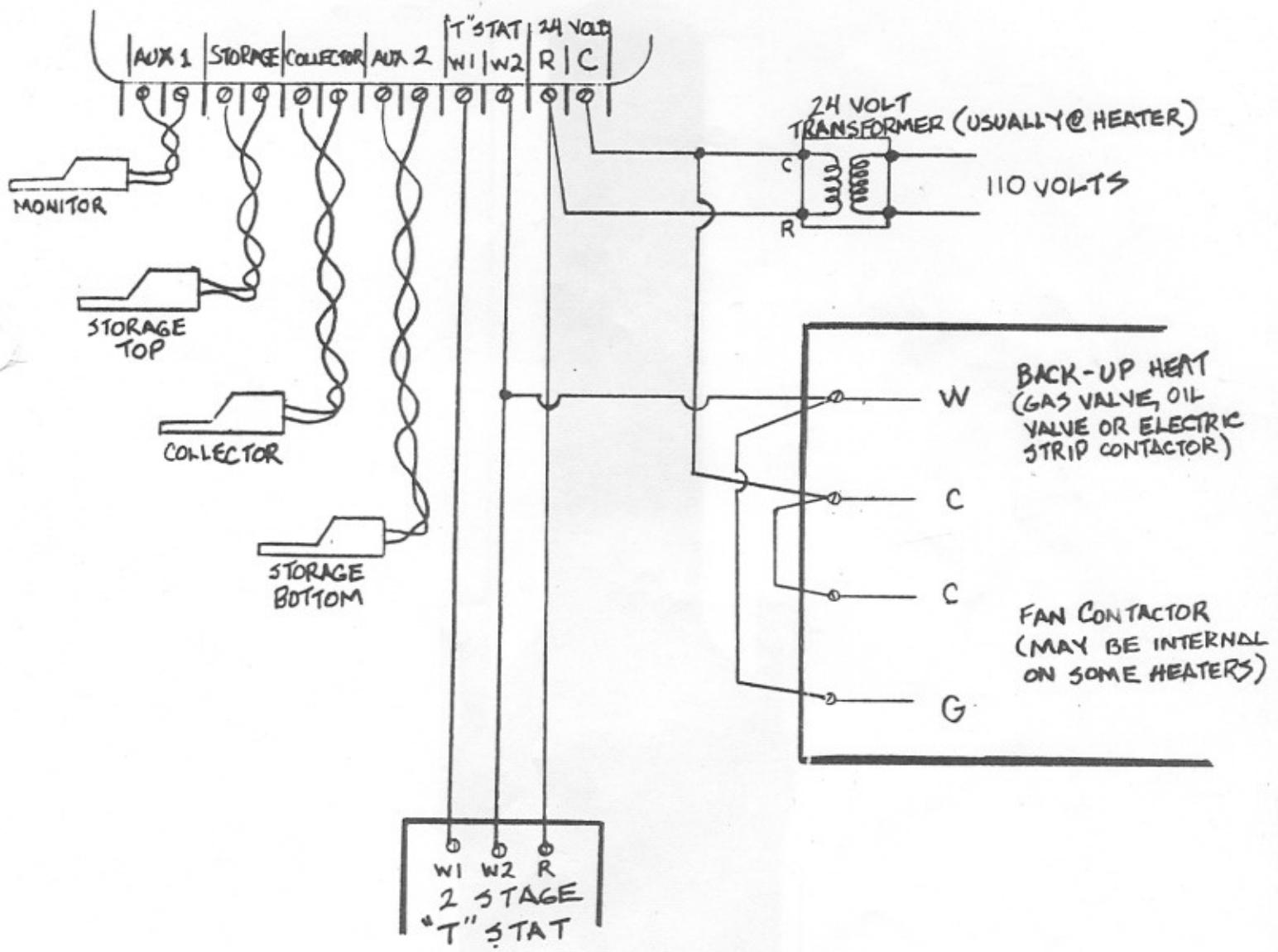
3I. INDIRECT

C-120-1SA-3I(ADJ)-4B



C-120 *C-120-1SH-2SH-3D(ADJ)-4D APPLICATION SHEET

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3D · DIRECT DIVERSION

C-120-1SH-2SH-3D(ADJ)-4D