DIRECT-FIRED VAPORIZER
TEMPERATURE CONTROL VALVE RETROFIT
3/20/03

PURPOSE

The purpose of these instructions is to describe the steps necessary to replace existing Robertshaw model 110 temperature control valves with the new style Robertshaw valve (AES part number TEM0003-00-3).

This procedure applies to vaporizer models:

AE-50, AE-50G, AE-50F, AE-50GF
AE-80, AE80G, AE-80F, AE-80GF
AE-120, AE-120G, AE-120F, AE-120GF

PROCEDURE FOR TEMPERATURE CONTROL VALVE REMOVAL

Parts needed:

None

Tools needed:

11/16" or adjustable wrench
7/16" or adjustable wrench
3/8" or adjustable wrench
Temperature control valve tool (or other device to remove temperature control valve)

1) Shut down the vaporizer and bleed any contained LPG to a safe location. It is imperative that no pressure be present inside the vessel when performing these procedures.

2) Disconnect the thermocouple and pilot fuel connections from the temperature control valve. Be careful not to damage these connections, as they will be re-connected to the new valve.

3) Disconnect the fuel inlet tubing from the temperature control valve at the left side of the valve, and from the compression tee at the entrance to the cabinet at the regulator discharge. Remove and discard the tubing.

4) Disconnect the burner fuel connection from the burner inlet at the bottom of the vaporizer, and from the fuel outlet connection at the bottom of the temperature control valve. Remove and discard the tubing.

5) Unscrew and remove the temperature control valve from the vessel. Discard the temperature control valve.

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PROCEDURE FOR INSTALLING NEW TEMPERATURE CONTROL VALVE

Parts needed (refer to drawing *TC VALVE RETROFIT PARTS*):

Temperature control valve retrofit kit

- New Robertshaw temperature control valve assembly with valve (AES part number TEM0003-00-3), bulb and capillary, compression spring, mounting bracket, and inlet/outlet Parker elbows [drawing item 1]
- ¼" slotted square-head plug [drawing item 2]
- Thermowell assembly [drawing item 3]
- Two (2) self-tapping screws [drawing item 4]
- Burner tubing assembly [drawing item 5]
- Fuel tubing assembly [drawing item 6]
- Two (2) compression nuts [drawing item 7]
- Two (2) compression fitting ferrules [drawing item 8]

Tools needed:

8" adjustable wrench
11/16" or adjustable wrench
7/16" or adjustable wrench
3/8" or adjustable wrench
5/16" nut driver
High-temperature (180°F) thread sealing compound or tape

Refer to drawings *NEW RS TEMP CONT INSTALLATION DETAIL* and *NEW RS ASSEMBLY SECTION*

1) Turn the Parker elbow at the burner inlet [installation drawing item 1] ¼ turn to the right.

2) Insert the thermowell into the ¾" coupling on the vessel [installation drawing detail A and assembly section drawing]. Use a suitable thread sealing compound and wrench-tighten.

3) Attach the burner tubing to the Parker elbow at the burner inlet [installation drawing item 1] and hand-tighten the compression fitting. The tubing should be vertical and straight.

4) Set the fuel outlet Parker elbow of the temperature control valve on the burner tubing [installation drawing item 2] and hand-tighten the compression fitting. The valve should be facing outward with the temperature adjustment knob on top.

5) Attach the fuel tubing to the inlet Parker elbow of the temperature control valve [installation drawing item 3] and hand-tighten the compression fitting. On regular and F series models (twin-stage pressure regulator), the Parker elbow should turn upward. On G and GF models (two-stage pressure regulators), the Parker elbow should turn downward.

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6) Attach the fuel tubing to the compression tee at the entrance to the cabinet (regulator discharge) [installation drawing item 4] and hand-tighten the compression fitting. On regular and F series models, this connection is above the temperature control valve. On G and GF models, this connection is below the temperature control valve.

7) Insert the bulb with spring into the thermowell [installation drawing detail A and assembly section drawing].

8) Place the ¼" slotted plug onto the temperature control valve capillary, and screw the plug into the thermowell [installation drawing detail A and assembly section drawing], compressing the spring.

9) Gently push the temperature control valve back against the heat shroud so that the bracket comes in contact with the shroud. Drive two self-tapping screws through the holes in the bracket into the shroud [installation drawing detail A] to secure the valve to the unit.

10) Re-connect the pilot tubing and thermocouple connections [installation drawing detail A] to the temperature control valve and wrench-tighten.

11) Wrench-tighten all compression fittings. This will lock all the tubing ferrules in place.

12) Test all connections for leaks before placing the vaporizer back in service.

VALVE OPERATION / VAPORIZER STARTUP PROCEDURE

Parts needed:

Vaporizer with new Robertshaw temperature control valve (AES part number TEM0003-00-3) installed

Tools needed:

None

1) Ensure that the vapor outlet manual valve is closed, the automatic igniter module (if equipped) is turned OFF, the black manual valve dial on top of the temperature control valve is in the OFF position, and the manual fuel valve is CLOSED.

2) Slowly OPEN the manual valve at the inlet of the vaporizer to introduce liquid LPG into the vessel.

3) Slowly OPEN the vaporizer manual fuel valve.

4) Turn the green temperature dial on top of the temperature control valve to the LO position.

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5) Turn the manual valve dial located on top of the temperature control valve counter-clockwise to the PILOT position.

6) Depress and hold the manual valve dial and push the piezo igniter several times until the pilot burner lights. On units with automatic ignition, turn the igniter module ON. If the pilot fails to light within a few seconds, turn the manual valve dial clockwise to the OFF position. Wait at least two minutes for any accumulated gas to dissipate before attempting to relight the pilot.

7) Once the pilot is lit, keep the manual valve dial depressed for a few seconds until the thermocouple heats up.

8) Release the manual valve dial and turn counter-clockwise to the ON position.

9) Set the temperature dial to 8. The burner should begin cycling automatically.

VALVE OPERATION/VAPORIZER SHUTDOWN PROCEDURE

Parts needed:

Vaporizer (in operation) with new Robertshaw temperature control valve (AES part number TEM0003-00-3) installed

Tools needed:

None

1) Turn the black manual valve dial located on top of the temperature control valve clockwise to the OFF position. This will shut down the vaporizer burner.

2) CLOSE the manual valve at the vaporizer inlet.

3) Bleed all LPG contained in the vaporizer to a safe location. Failure to completely bleed the contents of the vessel could result in relief valve discharge if the inlet and outlet valves are closed.

4) CLOSE the manual valve at the vaporizer vapor outlet.

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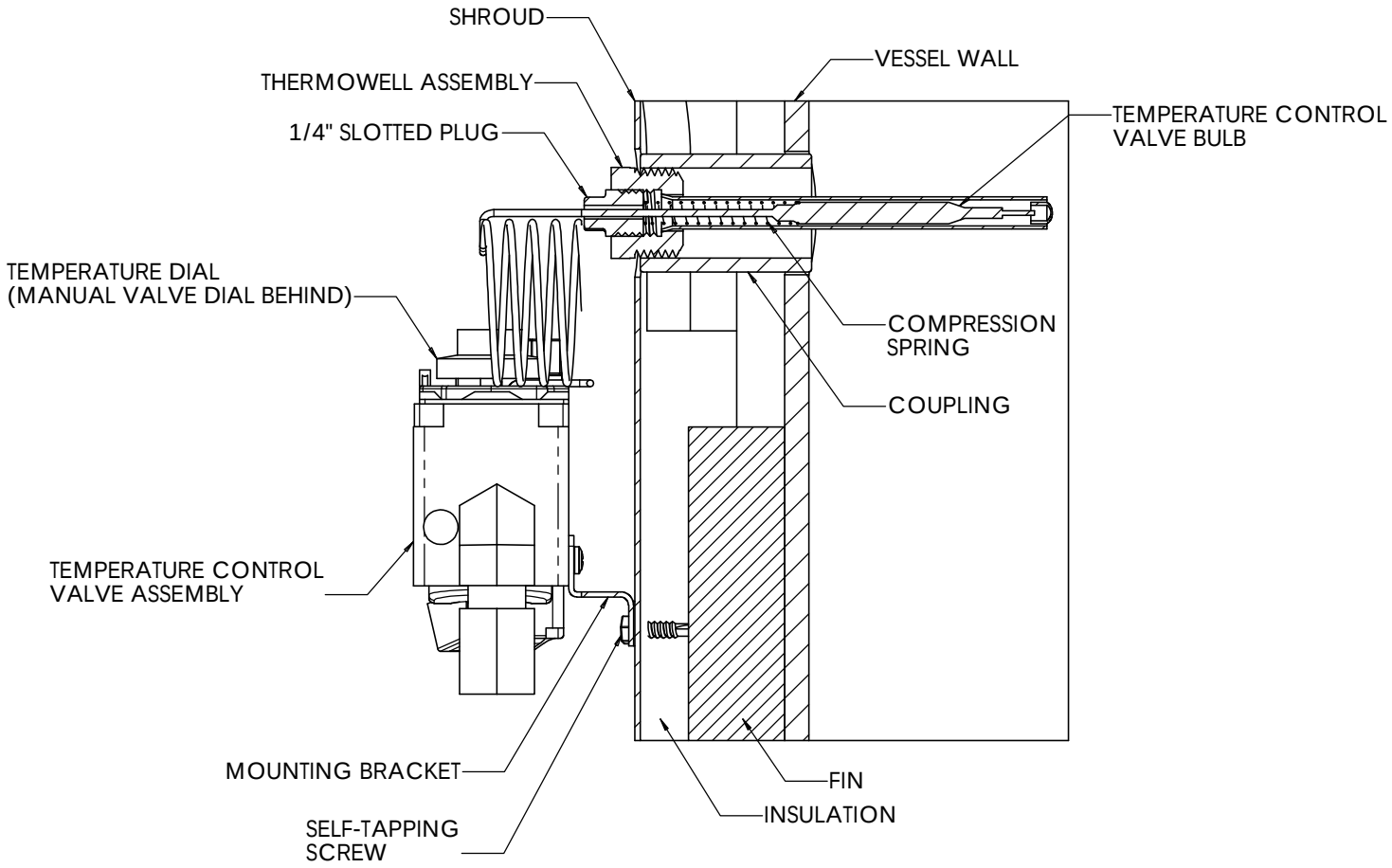
REVISIONS

REV.	DESCRIPTION	DATE	APPROVED



ALTERNATE ENERGY SYSTEMS

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MATERIAL: AS NOTED | FINISH: N/A

DESCRIPTION:
NEW R-S ASSEMBLY SECTION

TOLERANCES ARE:
FRACTIONS ±1/32"
DECIMALS ±0.005"
ANGLES ±0.05°
OR AS NOTED

APPROVALS	BY	DATE
DRAWN	JPR	03/21/03
APPROVED	WH	03/21/03
REVISION 0		

SHEET NAME: Sheet1

SHEET SIZE A | SCALE 1:2 | DWG #: TEM0003-00-3 ASSY SECT | Sheet 1 of 1

REVISIONS

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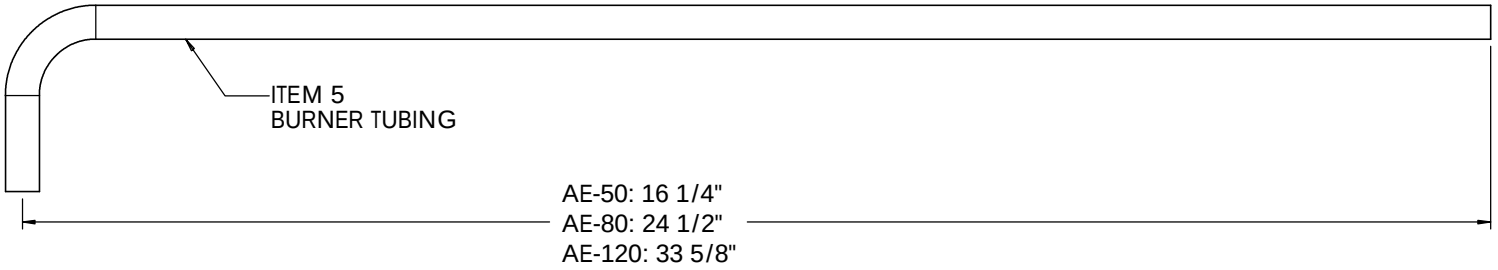

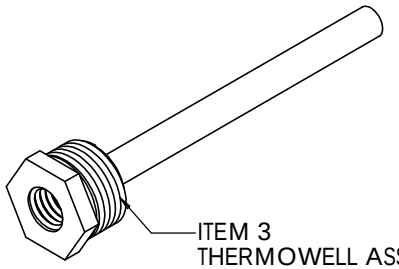

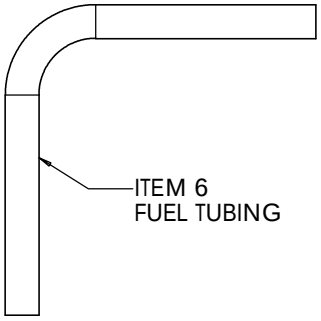

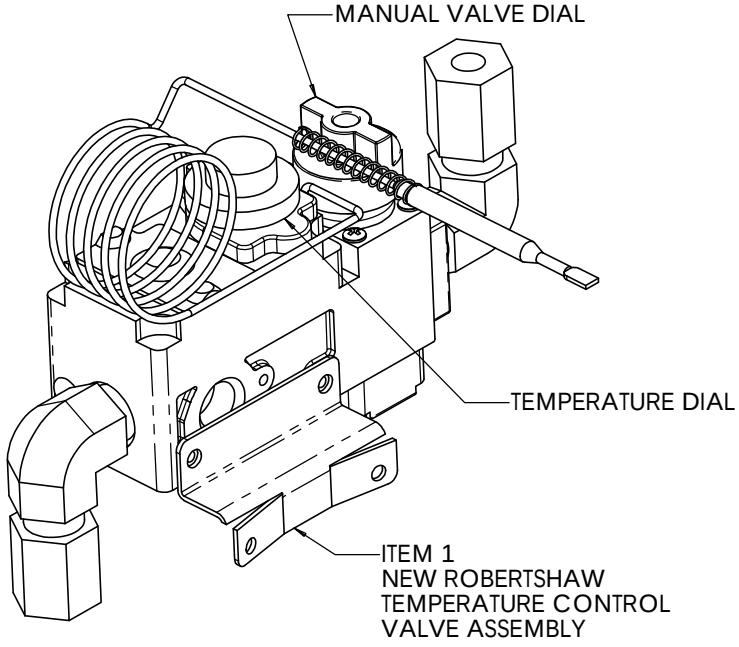

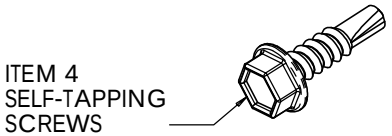

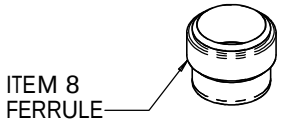

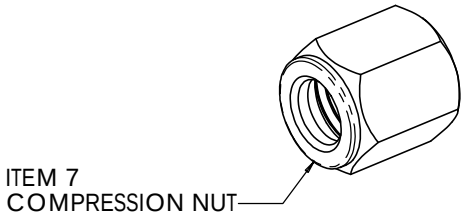

ALTERNATE ENERGY SYSTEMS

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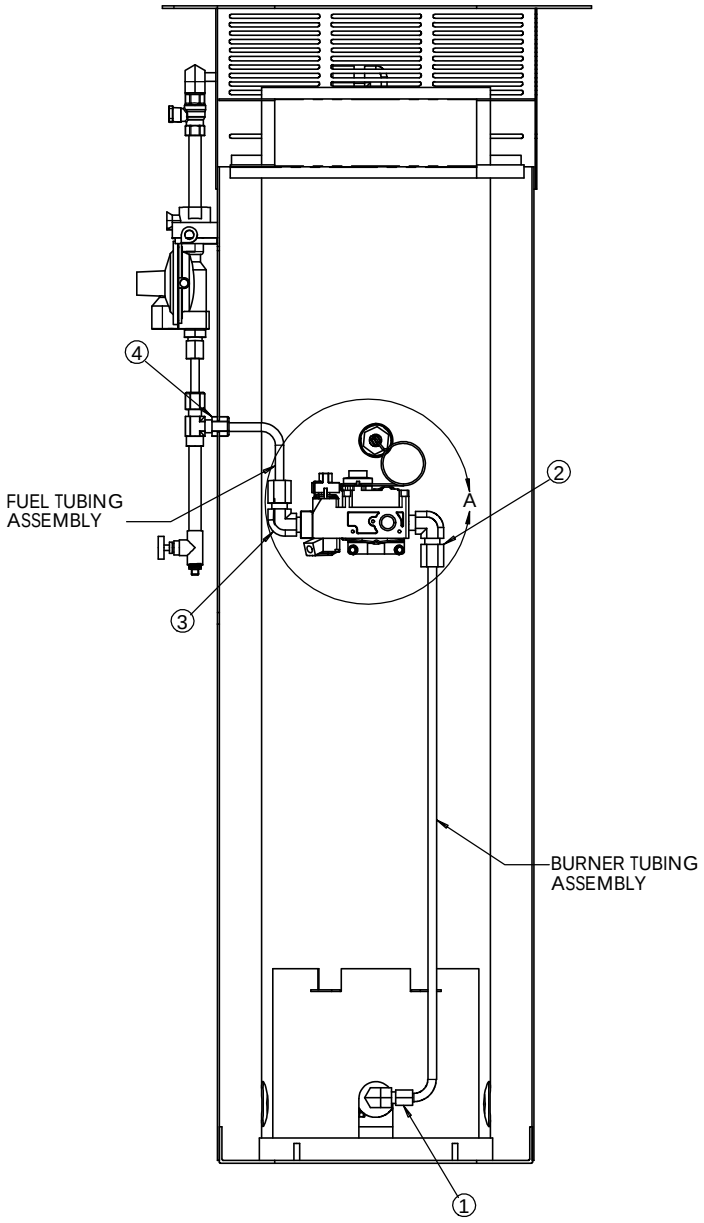
MATERIAL: NOTED | FINISH: N/A

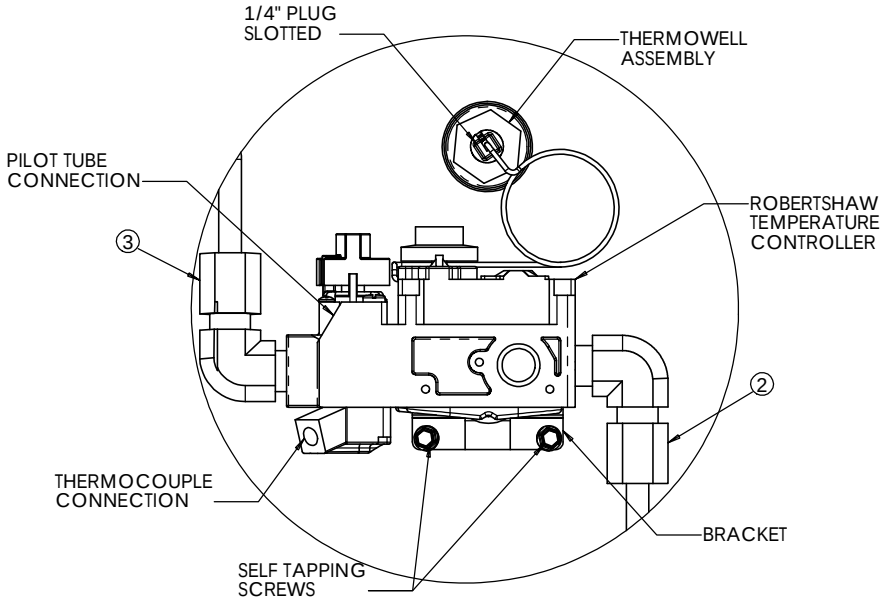
DESCRIPTION:
TC VALVE RETROFIT PARTS

TOLERANCES ARE:	APPROVALS	BY	DATE
FRACTIONS ±1/32"	DRAWN	JPR	03/20/03
DECIMALS ±0.005"	APPROVED	WH	03/20/03
ANGLES ±0.05°	REVISION 0		
OR AS NOTED	SHEET NAME: Sheet1		

SHEET SIZE A | SCALE 1:2 | DWG #: TC VALVE RETROFIT PARTS | Sheet 1 of 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED





DETAIL A
SCALE 1 : 3

ALTERNATE ENERGY SYSTEMS

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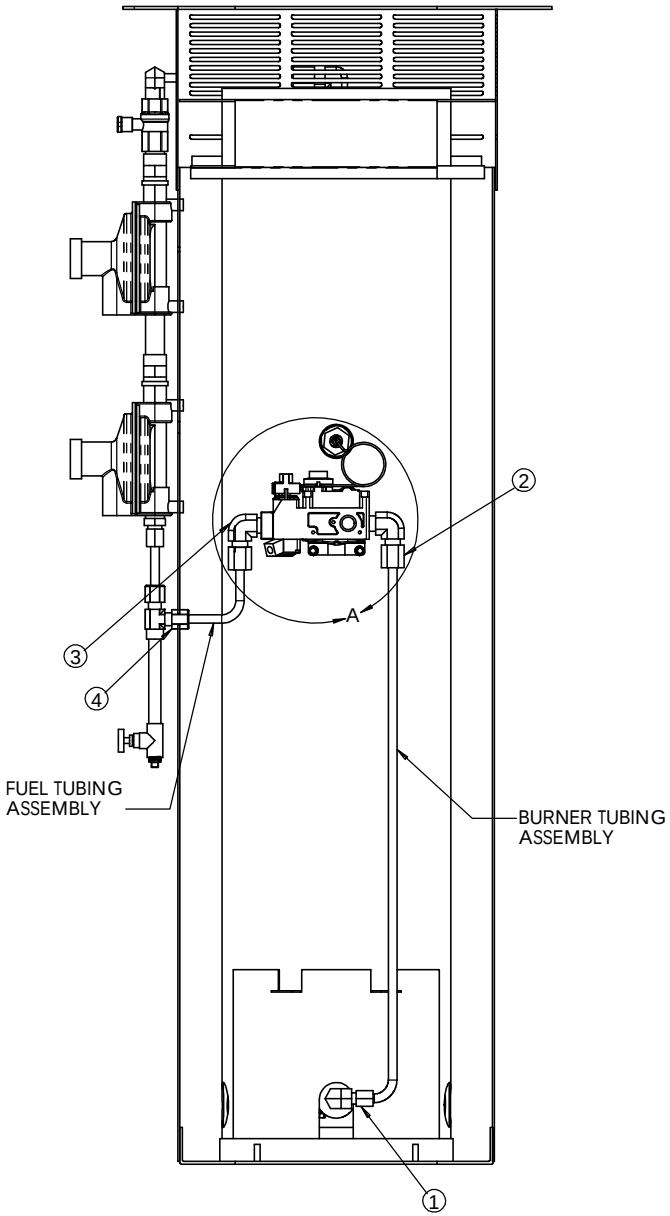
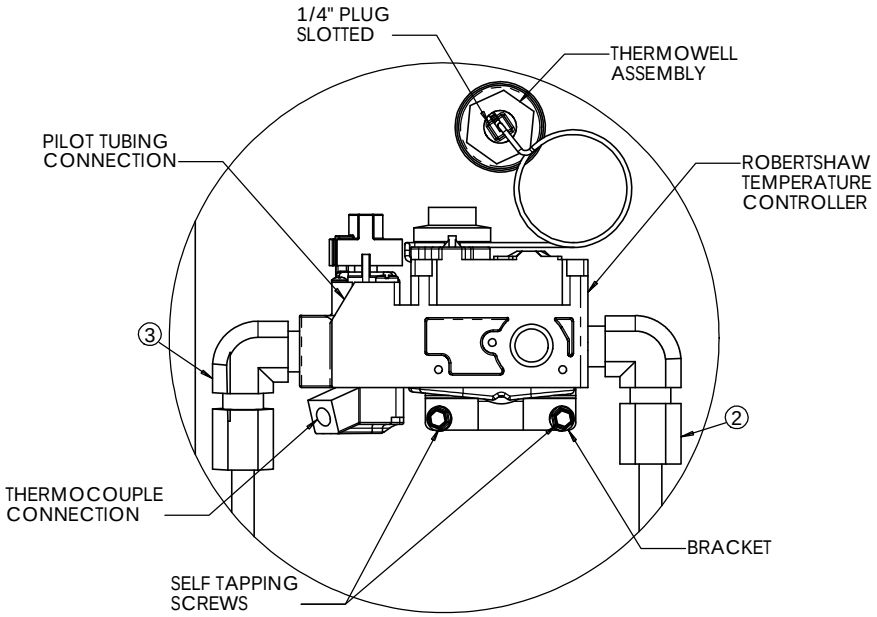
MATERIAL: AS NOTED	FINISH: N/A
DESCRIPTION: NEW R-S TEMP CONT INST DETAIL- STANDARD & "F" MODEL	

TOLERANCES ARE:	APPROVALS	BY	DATE
FRACTIONS ±1/32"	DRAWN	JPR	03/21/03
DECIMALS ±0.005"	APPROVED	WH	03/21/03
ANGLES ±0.05°	REVISION 0		
OR AS NOTED	SHEET NAME: Sheet1		

SHEET SIZE A	SCALE 1:8	DWG #: TEM0003-00-3 RTRFT	Sheet 1 of 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED





DETAIL A
SCALE 1 : 3

ALTERNATE ENERGY SYSTEMS

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MATERIAL: FREE MACHINING BRASS | FINISH: AS NOTED

DESCRIPTION:
NEW R-S TEMP CONT INST DETAIL, "G" & "GF" MODELS

TOLERANCES ARE:		APPROVALS	BY	DATE
FRACTIONS	±1/32"	DRAWN	JPR	03/21/03
DECIMALS	±0.005"	APPROVED	WH	03/21/03
ANGLES	±0.05°	REVISION 0		
OR AS NOTED		SHEET NAME: Sheet1		

SHEET SIZE A | SCALE 1:8 | DWG #: TEM0003-00-3 G RTRFT | Sheet 1 of 1