TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS LIST)

FOR

TANK, HOT DIP, DIRECT
MODEL SS-581-IM
(D. C. COOPER CO.)
(NSN 3426-00-273-0673)

HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 1981

Technical Manual
No. 9-3426-101-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *10 September 1981*

Operator's, Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts List)

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or If you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299.

A reply will be furnished direct to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this equipment is issued.

Manufactured by: D. C. Cooper Co.
1467 So. Michigan Avenue
Chicago, IL 60605

Procured under Contract No. DAAA09-79-C-4499

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

Page

INSTRUCTIONS FOR REQUISITIONING PARTS

NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

1 - Manufacturer's Federal Supply Code Number - 14562

2 - Manufacturer's Part Number exactly as listed herein.

3 - Nomenclature exactly as listed herein, including dimensions, if necessary.

4 - Manufacturer's Model Number - SS-581-IM

5 - Manufacturer's Serial Number (End Item)

6 - Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.

7 - If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.

Complete Form as Follows:

(a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number -14562 followed by a colon and manufacturer's Part Number for the repair part.

(b) Complete Remarks field as follows:

Noun: (nomenclature of repair part)
For: NSN:
Manufacturer: D. C. Cooper Co.
1467 So. Michigan Avenue
Model: Chicago, IL 60605
Serial: (of end item)

Any other pertinent information such as Frame Number, Type, Dimensions, etc.

INSTALLATION INSTRUCTIONS

The following procedure should be followed in installing tank at location:

(1) Carefully move crated tank into position and remove crating, etc.

(2) Spot tank in position and install.

(3) With combination starter in "OFF" position, connect power source of 200 Volt, 60 Hertz, 3 Phase.

(4) Connect drain line.

INSTALLATION AND MAINTENANCE PROCEDURES FOR ELECTRIC IMMERSION HEATERS

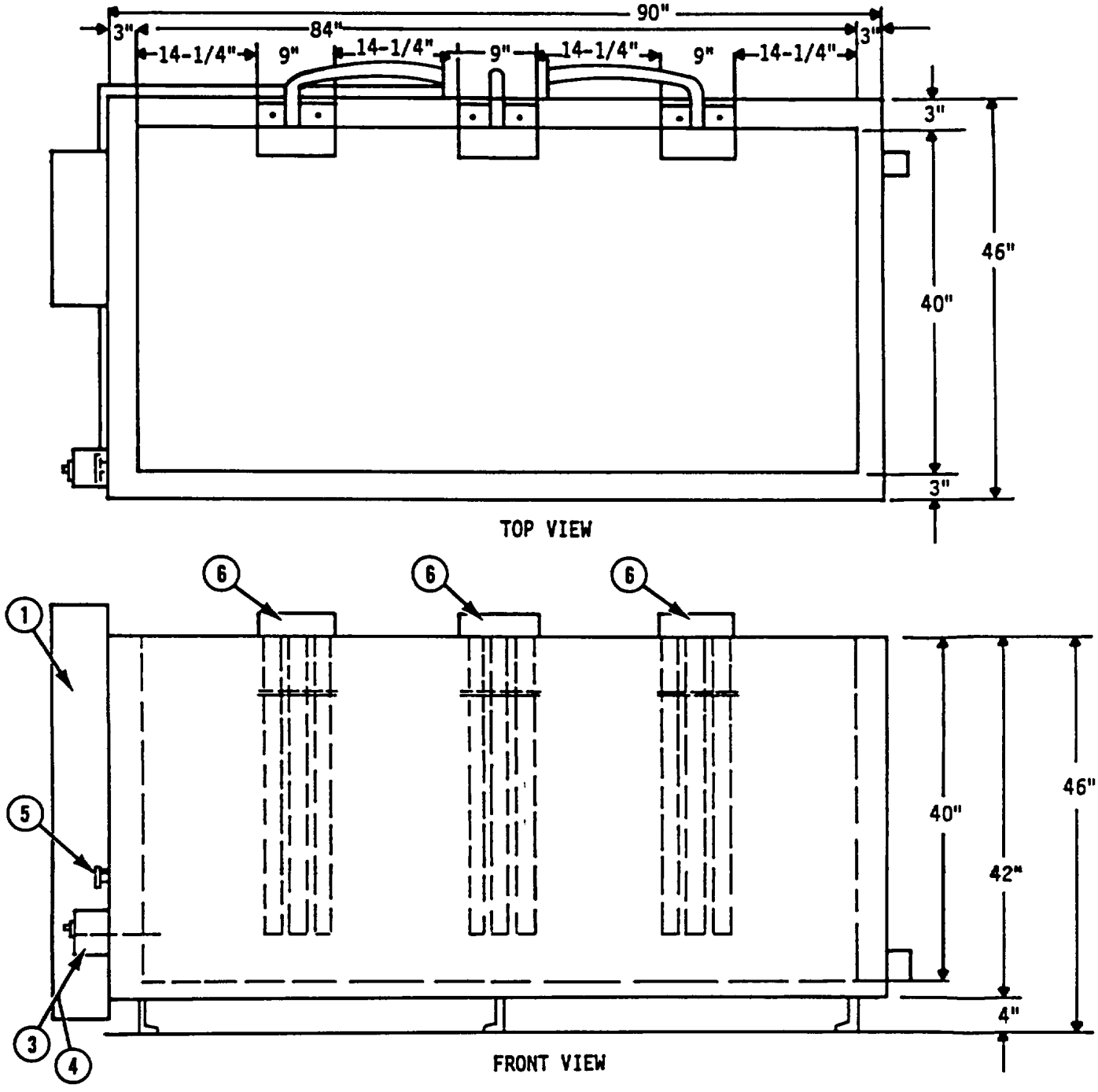
- **Quartz heaters are extremely fragile and should be handled with care.**
- **Upon receipt, heaters should be checked for visible defects. Each heater has been carefully inspected before it leaves the factory however, sometimes damage occurs in shipping. If this happens report damage immediately to the carrier.**
- **Voltage indicated on nameplate should agree with the line voltage.**
- **Sheath material should be compatible with your solution.**
- **Metal heaters should be insulated from ground to prevent plating or depleting of the metal sheath. At no time allow the heaters to come in contact with electrodes or energized work.**
- **Three feet of flexible conduit cable is furnished with each heater. This conduit should not be cut. Keep cable end out of the fume and vapor area as either of these entering the end of the conduit can cause damage to the heater.**
- **Pressure is relieved through the end of the conduit cable as quartz heaters cycle, therefore it is important that the end not be sealed.**
- **Do not remove quartz heaters from solution until they have sufficiently cooled -approximately 15 minutes.**
- **Do not allow the solution level to fall below the minimum immersion depth.**
- **Keep your heaters clean by gently scraping or chemically cleaning them. Do not hammer the heater sheath. They will operate more efficiently and last longer if kept clean.**
- **Do not allow sludge or sediment to build up around the bottom of the heater.**

HEATERS ARE FURNISHED WITH GROUND WIRE

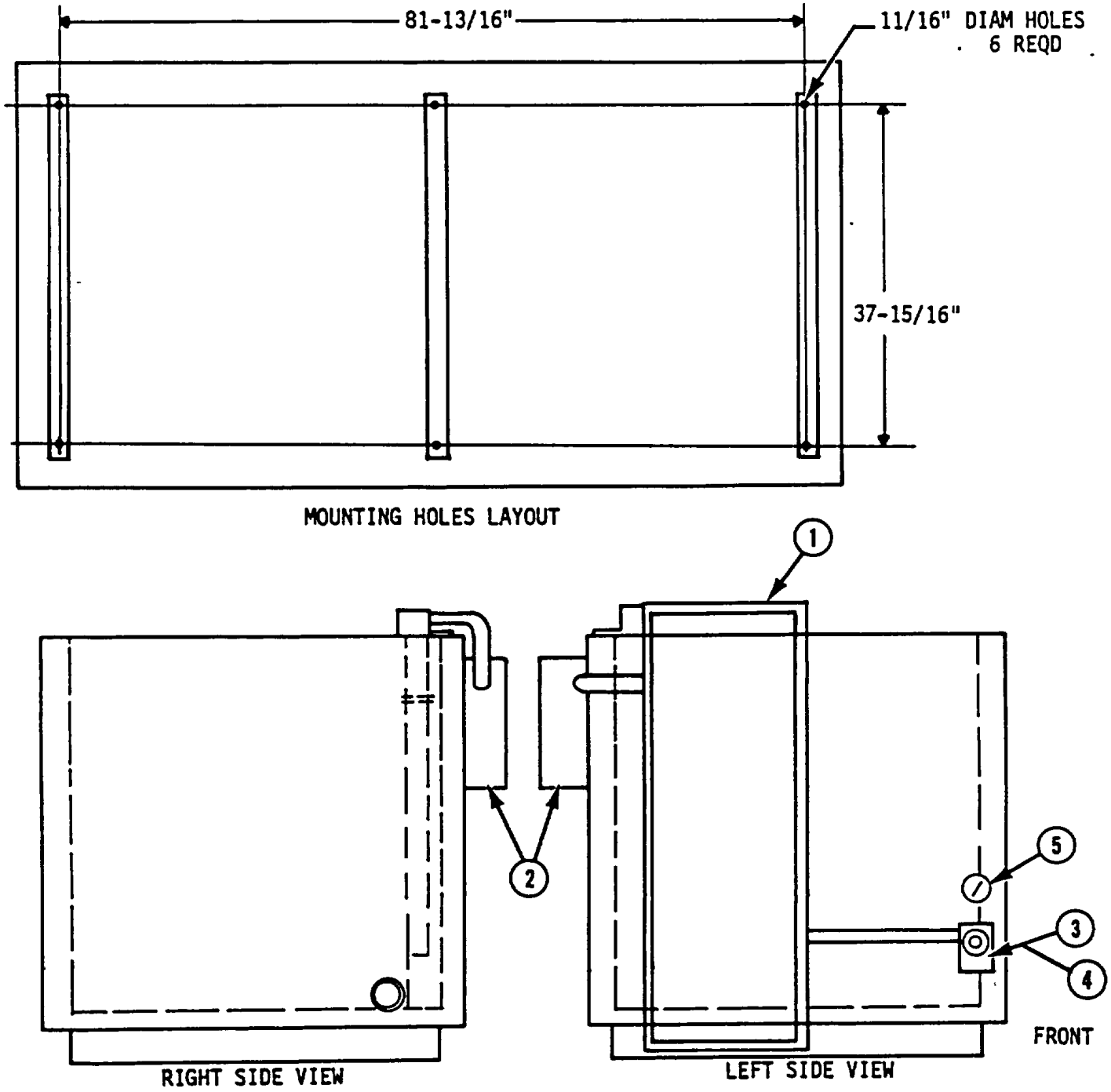
GENERAL DESCRIPTION

Unit is a modified standard Cooper heated tank, with stainless steel heaters totalling 48,000 Watts for 230 Volts, 60 Hertz, 3. Phase, A.C. Power. The tank is insulated on bottom and four sides with 3" of fiberglas, held in place by 14 ga. sheet metal exterior, welded in place. Total weight of tank less contents is 1500 pounds. Three channel supports are provided. A detailed specification describing this equipment is enclosed.

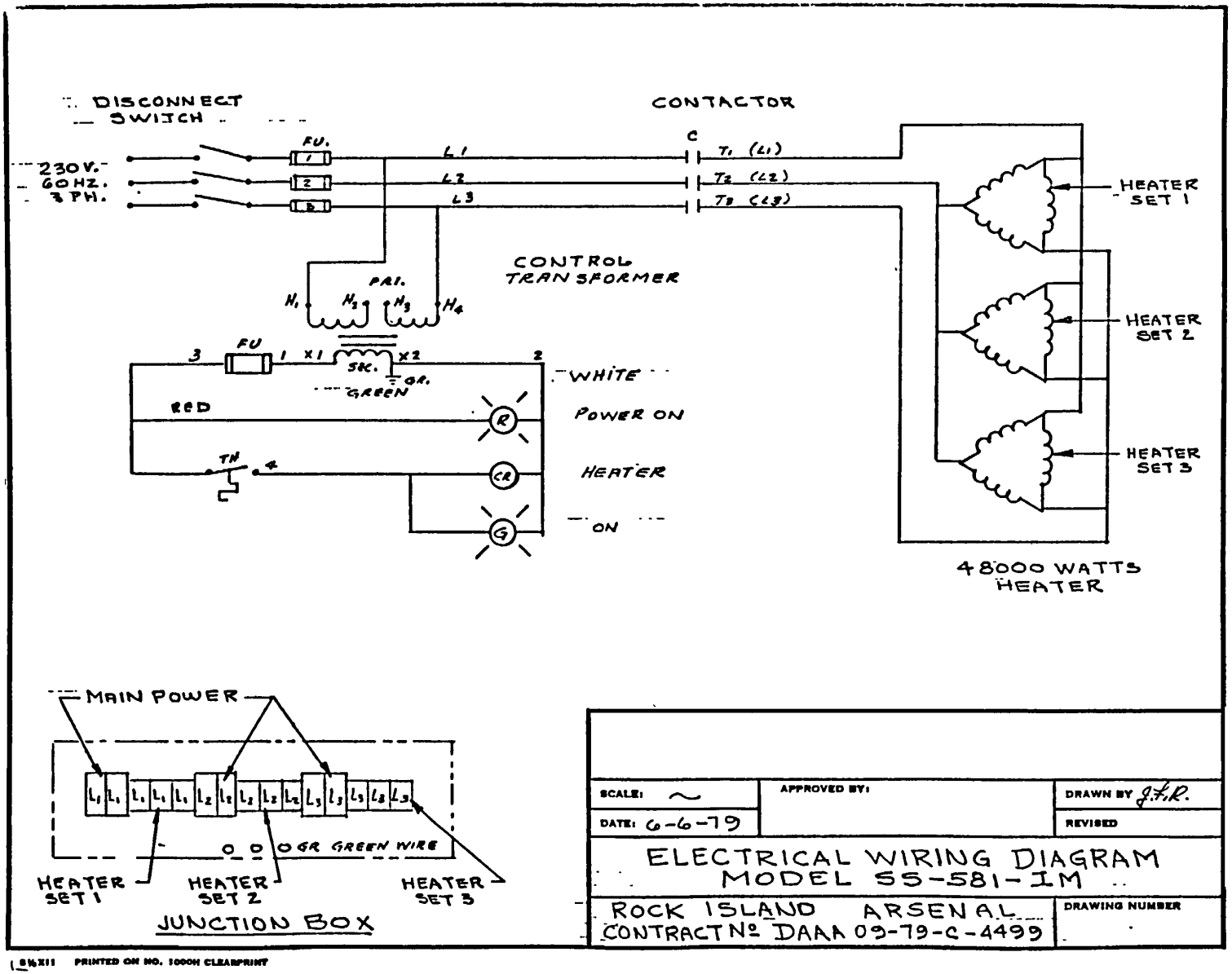
No special oils, lubricants, compounds, solutions or auxiliary equipment is required. Operating and maintenance instructions are provided in another section of this manual.



Schematic for model SS-581-IM (sheet 1 of 2).



Schematic for model SS-581-IM (sheet 2 of 2).



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OPERATING INSTRUCTIONS - MODEL NO. SS-581-IM

1. The tank is wired for operation on 230 Volts, 3 Phase, A.C., 48,000 Watts. Connect 230 Volt, 3 Phase line to main switch.

2. Throw in the main switch.

3. Set thermostat to desired temperature. Never turn thermostat higher than desired working temperature to be maintained, as nothing can be gained by intermittent changing of thermostat.

4. Be sure liquid is several inches above thermocouple pipe on inside rear of tank, as this holds the capillary tubing of the thermostat. With proper operation, thermostat should give years of service.

MAINTENANCE

The equipment used on this tank are quality JIC components, designed and manufactured for long life. However, anything electrical will burn out in time; At any time when equipment does not work satisfactorily, the following should be done:

1. Test the fuses to see that proper voltage is going through the switch.

2. Check the contacts on switch to see if they are tight and make good contact.

3. Test the thermostat by turning knob back and forth, and listening for a clicking noise.

4. If the trouble has not been found, check the heaters. Remove the screws that hold the wires to the heater terminals, then test each heater separately.

INSTRUCTIONS

TO REPLACE THERMOSTAT AND ADJUST

1.) Remove knob.

2.) Loosen two screws on cover (or box) and remove cover.

3.) Remove two screws holding the thermostat mechanism.

4.) Remove thermostat unit, including capillary tubing.

5.) Insert new capillary tube. Install new thermostat mechanism and replace cover (or box).

6.) Replace knob.

7.) Test and adjust thermostat as per "Instruction for Testing and Adjusting Thermostat".

8.) If thermostat clicks when turned on an pilot light goes on, the thermostat is working. It is very important to set the temperature of the compound chamber at correct operating temperature.

9.) Watch the tank closely for the first few days of operation, and see that the thermostat goes off when the set temperature of the thermostat is reached. The temperature as indicated by the thermometer is correct. The thermostat can easily be recalibrated to the temperature of the thermometer.

IMPORTANT PREVENTIVE MAINTENANCE

PRIODICALLY CHECK THE HEATER LOADS FOR UNBALANCED LOADS, SHORTS OR GROUNDS.

A heater load not functioning properly for a long period will cause walls and bottom of tank to become warped and distorted, possibly causing leaks. Walls and bottom of tank may become so distorted that satisfactory replacement of heaters, carrier bolts and hold-down bars cannot be accompolished.

HEATER LOADS SHOULD ALWAYS BE FULL ON ALL PHASES. TAKE CURRENT READING ON EACH OF 3 PHASE LOADS.

FORMULAE:

Single Phase: $P = VI$

$$I = \frac{P}{V}$$

P = Watts
V = Volts
I = Amperes

.....

Three Phase: $P - V \times I \times \cos \varnothing \sqrt{3}$

$$V = \frac{P}{V \sqrt{3}}$$

P = Watts
V = Volts
I = Amperes
Cos ∅ = 1
3 = 1.73205

PARTS LIST

TANK METAL .FINISHING - STYLE B, TYPE V, CLASS 1

MODEL NO. SS-581-IM

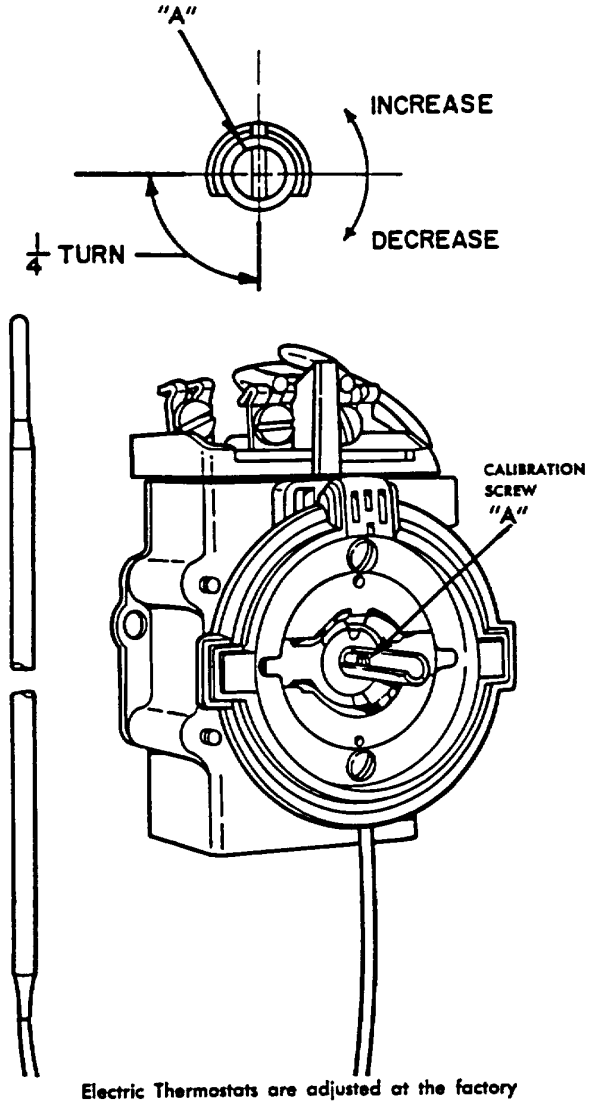
48,000 Watts, 230 Volts, 3 Phase, 60 Hertz, A.C.

REF. NO.	QTY.	ITEM	DESCRIPTION
1	1	SAFETY SWITCH	A/B Combination Starter (Fuse) Nema 12, Size 4, #712-EJA-272.
2	1	JUNCTION BOX	Hoffman #A-1210CH, with panel.
3	1	THERMOSTAT BOX	Hoffman #A6040CH.
4	1	THERMOSTAT	Robertshaw #D-1, 100°-550°F.
5	1	THERMOMETER	Pico #GT-300R, 50°-500°F.
6	9	IMMERSION HEATERS	P.M.C. Model CSS-3-352, 16KW, 240 Volts, 3 Phase, over the side heaters (3 each heaters per set).

CALIBRATING ELECTRIC CONTROLS

MODELS
D - Series F - Series
E - Series H - Series

electric controls with center stem adjustment



All Electric Thermostats are adjusted at the factory and calibrated on precision instruments to control temperatures accurately. Adjustment or recalibration is not needed unless the thermostat has been mishandled in transit, or changed or abused when in service.

TO CHECK CALIBRATION

1. Use a test instrument or a good grade oven thermometer and place thermocouple or mercury thermometer in center of oven.
2. With thermostat dial in the OFF position, make certain OFF mark on the dial agrees with reference point of the bezel or panel; misalignment will affect calibration, then turn the dial to a medium temperature setting.
3. Allow oven to heat until control snaps "ON and OFF" thermostatically at least three times. This will allow oven temperature to stabilize and eliminate possible error resulting from initial oven temperature overshoot and/or undershoot.
4. After the control has cycled thermostatically three or more times, note the oven temperature when the electric unit snaps off, and the oven temperature when the unit snaps on. Recalibrate only if the average of these two temperature readings varies more than the number of degrees shown in table below for a given temperature range.

TO CALIBRATE

5. Turn control to OFF position and remove dial.
6. With screwdriver, turn screw "A", clockwise to decrease and counterclockwise to increase the temperature.
7. Because of the many temperature ranges available in electric thermostats $^{1}/_{4}$ turn of screw "A" has different values. The chart below shows the approximate value of $^{1}/_{4}$ turn of screw "A" when used on the respective temperature ranges.

TYPE THERMOSTAT	TEMP. RANGE IN DEGREES F.	RECALIBRATE WHEN OUTSIDE THESE LIMITS	$^{1}/_{4}$ TURN IN DEGREES F.
OVEN	200° to 550°F.	± 20°	35°F.
OVEN	300° to 650°F.	±-20°	35°F.
FRYER	200° to 400°F.	± 10°	18°F.
STERILIZER	100° to 200°F.	± 10°	12°F.
COFFEE URN	Boil 3-2-1-Hold	± 10°	12°F.
SPECIAL	60° to 250°F.	± 10°	16°F.
SPECIAL	100° to 300°F.	± 10°	18°F.

8. Replace dial.

After a calibration is made let the appliance operate until the temperature has stabilized, then recheck to determine whether or not the calibration has been corrected.

Note
For HUB TYPE electrics, see RT-329.

By Order of the Secretary of the Army:

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Chief of Staff

Official:

ROBERT M. JOYCE
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The Adjutant General

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