AERCO

INSTRUCTION No. HE-101

AERCO INTERNATIONAL, INC., NORTHVALE, NEW JERSEY 07647, U.S.A.

INSTALLATION, OPERATION, and MAINTENANCE INSTRUCTIONS

HELITHERM HEAT EXCHANGERS

MODELS SW1A and SW1B

Printed in U.S.A.

TABLE OF CONTENTS

SAFETY PRECAUTIONS

Installing or operating personnel must, at all times, observe all safety regulations. The following warnings are general and must be given the same attention as specific precautions included in the instructions.

WARNING!

FLUIDS UNDER PRESSURE MAY CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT WHEN RELEASED.

SHUT OFF ALL INCOMING AND OUTGOING STEAM AND WATER STOP VALVES AND CAREFULLY DECREASE ALL TRAPPED PRESSURES TO ZERO (see Step OP8, Shutdown, under OPERATING PROCEDURES below) BEFORE PERFORMING ANY MAINTENANCE.

WARNING!

LIVE STEAM CAN CAUSE SEVERE BURNS.

NEVER SEARCH FOR LEAKAGE IN A LIVE STEAM SYSTEM BY "FEEL". USE A MIRROR OR OTHER SUITABLE POLISHED OBJECT.

PRINTED in U.S.A., MPG-1M-11/91

GENERAL INFORMATION

This instruction covers a HELITHERM Series A or Series B Steam to Water Heat Exchanger. Steam is the primary or tube side fluid. Water is the secondary or shell side fluid.

Series A Heaters differ from Series B in shell diameter and coil design only. Otherwise, both are alike functionally and in general design.

The number of coils included in a particular Heater is denoted by the last two digits in the Heat Exchanger Model No. That is, 01 = 1 coil, 03 = 3 coils, 06 = 6 coils, 10 = 10 coils, 15 = 15 coils, etc.

The Style designation for a Heat Exchanger denotes materials of construction for the various components. If this information is required, either see AERCO Product Specification HE-1 for Series A Heaters or HE-2 for Series B Heaters, or contact the nearest AERCO Sales Representative.

NOTE

The HELITHERM Heat Exchanger carries the standard AERCO warranty against defective material and workmanship. HOWEVER, AERCO cannot honor its warranty if the installer or user deviates in any way from the instructions and precautions included herein or makes any alteration of the equipment as originally furnished without the written approval of AERCO.

ACCESSORIES

Accessories normally required for an AERCO HELITHERM Steam to Water Heater are (see Figure HE-101-3):

Pressure Relief Valve (or Pressure and Temperature Relief Valve) -- mandatory

Spring-Loaded By-Pass Check Valve -- mandatory if a by-pass line is required for the application -- sized for each application *

Union Orifice -- mandatory (in special applications, a Float and Thermostatic Trap may be used in place of the Union Orifice) -- sized for each application *

Thermometer -- recommended for adjusting and checking the temperature control

Compound Gage -- recommended for checking the Heater operation

Any or all of these accessories may be furnished by AERCO along with the HELITHERM Heat Exchanger. If so furnished, drawings and/or instructions, as may be required, are included with the shipment.

An Over-Temperature Limit System may be furnished as an optional accessory. If so, instructions for the system are included in the shipment.

All other stop (shutoff) valves or check valves shown in Figure HE-101-3 are furnished by others.

* If not furnished by AERCO, contact the nearest AERCO Representative for sizing.

HEATER MODEL	NO. OF COILS	HEATER SURFACE SQ. FT.	DIMENSIONS, INCHES				WT. LBS.	
			A	B	E	G	DRY	WET
SW1A01	1	5	25-3/4	48-5/8	26	11-7/8	195	265
SW1A02	2	10	25-3/4	48-5/8	26	11-7/8	210	280
SW1A03	3	15	34-3/4	57-5/8	35	16-3/8	240	330
SW1A04	4	20	43-3/4	66-5/8	45	20-7/8	270	390
SW1A05	5	25	53-3/4	76-5/8	55	25-7/8	305	440

OPTIONAL 150 # SIDE FLANGES		
SIZE, INCHES	DIMENSIONS, INCHES	
	C	D
2-1/2	3-1/2	4-3/16
3	3-3/4	4-1/4
4	4-1/2	4-7/16
6	5-1/2	4-9/16

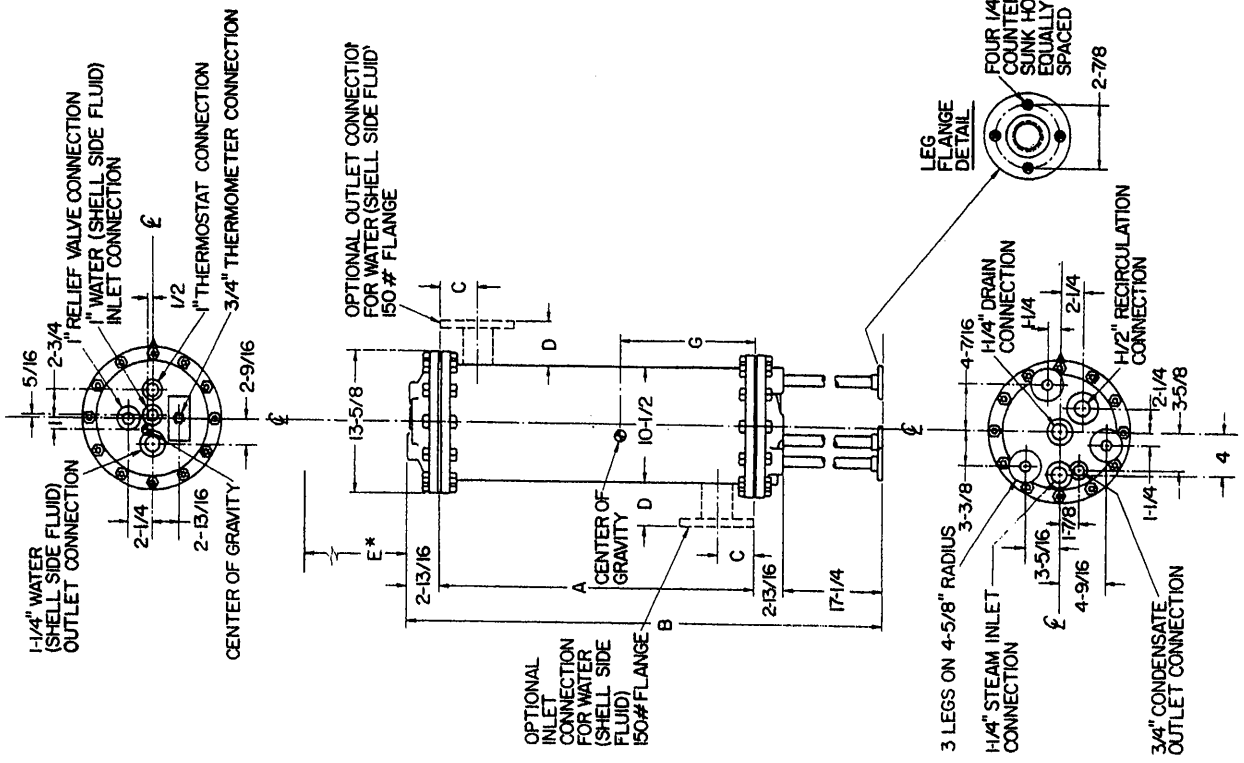

Figure HE-101-1 -- Dimensions for L SW1A AERCO HELITHERM Heat Exchanger

HEATER MODEL	NO. OF COILS	HEATER SURFACE SQ. FT.	DIMENSIONS, INCHES				WT. LBS.	
			A	B	E	G	DRY	WET
SW1B04	4	20	24-3/4	48-3/8	26	11-3/8	350	490
SW1B05	5	25	29-3/4	53-3/8	30	13-7/8	380	540
SW1B06	6	30	33-3/4	57-3/8	35	15-7/8	410	600
SW1B07	7	35	38-3/4	62-3/8	40	18-3/8	440	650
SW1B08	8	40	42-3/4	66-3/8	45	20-3/8	480	700
SW1B09	9	45	47-3/4	71-3/8	50	22-7/8	510	750
SW1B10	10	50	51-3/4	75-3/8	55	24-7/8	540	800
SW1B11	11	55	56-3/4	80-3/8	60	27-3/8	570	850
SW1B12	12	60	60-3/4	84-3/8	65	29-3/8	610	900
SW1B13	13	65	65-3/4	89-3/8	70	31-7/8	640	950
SW1B14	14	70	69-3/4	93-3/8	75	33-7/8	670	1000
SW1B15	15	75	74-3/4	98-3/8	80	36-3/8	700	1050

OPTIONAL 150# SIDE FLANGES		
SIZE INCHES	DIMENSIONS, INCHES	
	C	D
4	4-1/2	4-7/16
6	5-1/2	4-9/16

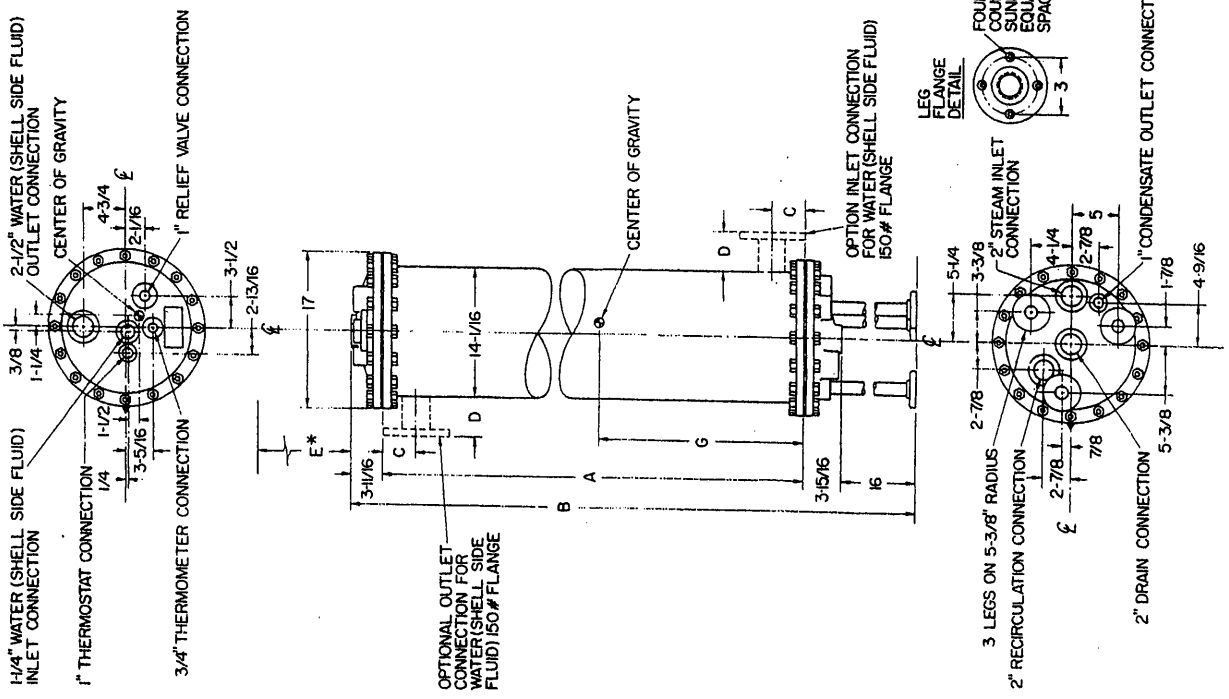

Figure HE-101-2 -- Dimensions for MODEL SW1B AERCO HELITHERM Heat Exchanger

NOTES

1. FOR ACTUAL LOCATIONS OF PIPING CONNECTIONS ON HEAT EXCHANGER HEADS, SEE THE ILLUSTRATION OR DRAWING SHOWING THE HEAT EXCHANGER DIMENSIONS.
2. TO FACILITATE MAINTENANCE, LOCATE UNIONS OR FLANGES IN ALL PIPING TO THE UPPSER HEAT EXCHANGER HEAD CLEAR OF THE OUTSIDE DIAMETER OF THE HEAD FLANGE SO THAT THE SHELL MAY BE REMOVED EASILY.
3. PIPING BETWEEN THE REGULATOR OR CONTROL VALVE AND THE LOWER HEAT EXCHANGER HEAD SHOULD BE AS SHORT AS POSSIBLE
4. THE EXTERNAL BY-PASS AND SPRING LOADED CHECKVALVE (SHOWN DOTTED) ARE REQUIRED ONLY WHEN THE SECONDARY FLOW (COLD WATER OR SHELL SIDE FLUID FLOW) EXCEEDS SPECIFIED LIMITS AS RECOMMENDED BY AERCO FOR SPECIFIC APPLICATIONS.
5. IT IS PREFERABLE THAT THE CONDENSATE BE PERMITTED TO DRAIN FREELY BY GRAVITY. WHERE THIS IS NOT POSSIBLE, CONSULT WITH AERCO TO DETERMINE THE ALLOWABLE BACK PRESSURE FOR THE APPLICATION.

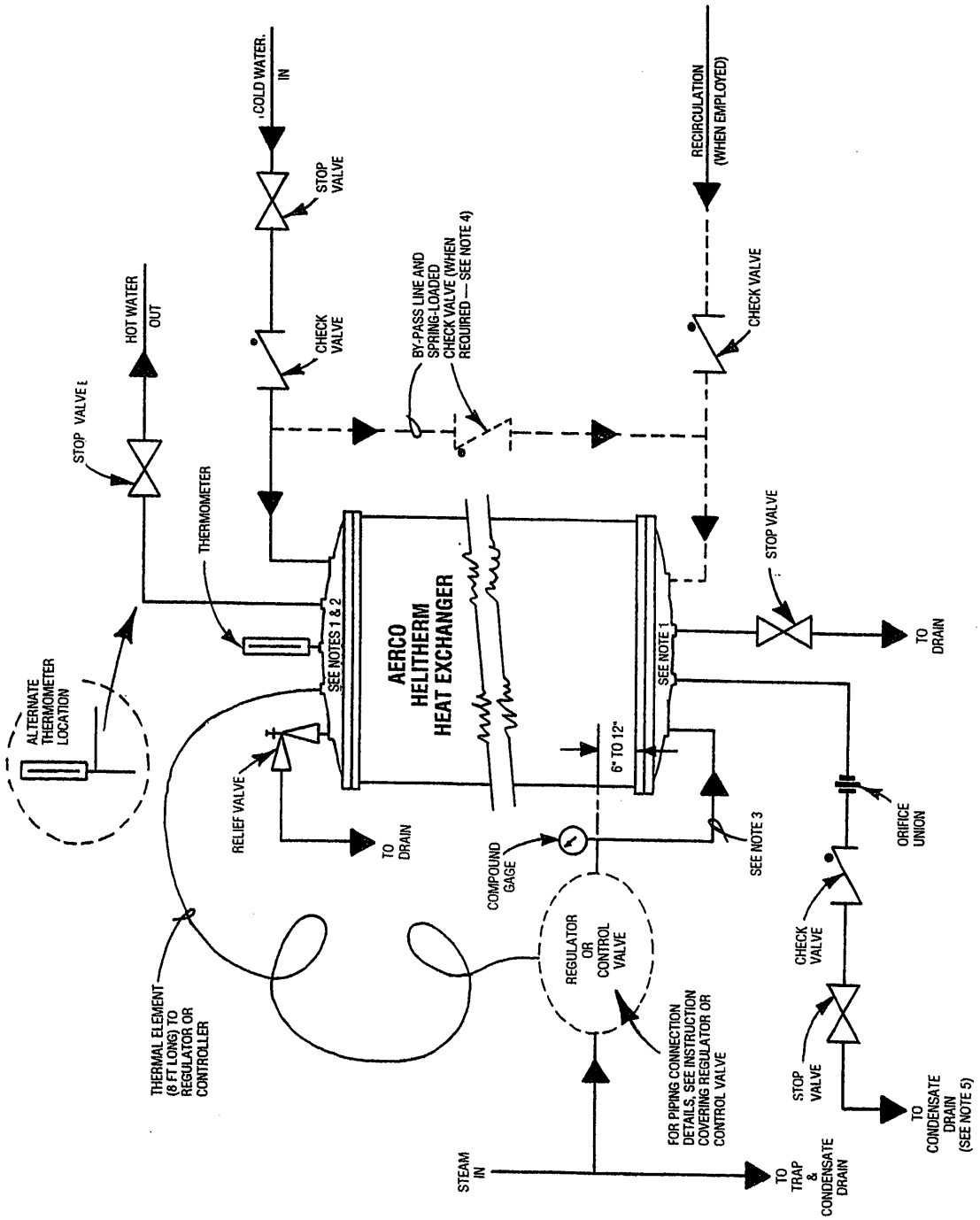

Figure HE-101-3 -- Piping nections for MODEL SW1A or SW1B

INSTALLATION

1. For all dimensions:

Model SW1A	Figure HE-101-1
Model SW1B	Figure HE-101-2

2. If possible, for easy in-place maintenance, locate the Heater where there is at least 2 feet clearance all around the Heater and where the head room clearance distance is at least equal to the dimension "E" given for the Heater Model.

3. Assemble the legs and floor flanges (shipped with the Heater) to the lower Heater head.

4. Mount the Heater upright. It is suggested that the floor flanges be secured to the floor. However, another means for securing the Heater may be used. (The use of piping to the Heater for securing the Heater is not recommended unless the piping includes ample provision for expansion.)

5. Make the piping connections in accordance with Figure HE-101-3 and per the following:

   a. Do not use cement or red lead in making up pipe joints.

   b. For connection sizes and exact locations, see Figure HE-101-1 or HE-101-2 depending on the Heater Model. Also, note that the connections are identified on the Heater heads.

   c. Locate the unions or flanges in all piping to the upper Heater head clear of the outside diameter of the head flange so that the Heater shell may be removed easily.

   d. Include all of the stop and check valves shown in Figure HE-101-3. <u>The condensate check valve is mandatory</u>.

   e. Piping between the Regulator or Control Valve and the lower head should be as short as possible, with the Regulator or Control Valve mounted 6 to 12 inches above the lower head flange. Include a compound gage as shown. Also, include sufficient unions to allow easy removal of the Regulator or Control Valve.

   f. If the Regulator or Control Valve is larger than the Heater steam inlet connection, use the larger size piping and reduce to the Heater inlet size as close to the Heater connection as practical. If the Regulator or Control Valve is smaller than the Heater connection, expand the piping to the Heater connection size immediately following the Regulator or Control Valve.

   g. Include the external by-pass line if required (see Note 4 in Figure HE-101-3).

   h. Include an orifice union (unless otherwise approved by AERCO) in the condensate drain line. See Note 5 in Figure HE-101-3.

6. Install the required relief valve in the upper Heater head and pipe it directly to a convenient floor drain. Install the thermometer in the upper Heater head or in the hot water outlet piping as shown in Figure HE-101-3.

7. After the Regulator or Controller have been installed, assemble the thermal element into its proper connection (marked "Thermostat") in the upper Heater head.

8. Before making final connections, blow out all piping thoroughly.

9. It is recommended that, after all piping connections have been made, the Heater be field insulated (unless, of course, the Heater has been furnished already insulated).

PRINCIPLE OF OPERATION

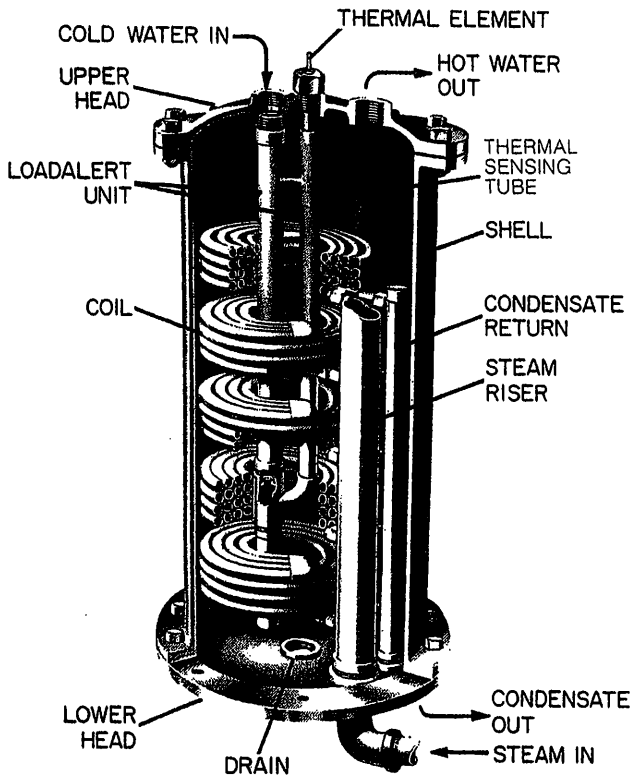

Figure HE-101-4 -- HELITHERM Heat Exchanger Cut-Away Showing Principal Parts

The AERCO HELITHERM Heat Exchanger (Heater) consists of three principal parts (see Figure HE-101-4):

1. Shell with upper and lower heads
2. Coils, Steam Riser, and Condensate Return
3. LOADALERT Unit

Cold water (secondary fluid) enters the Heater through the inlet connection in the upper head, flows downward through the cold water leg of the LOADALERT Unit (Figure HE-101-5), and is discharged into the shell below the level of the lowest coil. The water then flows upward through the shell, passing over the coils (heating surfaces), and is discharged through the hot water outlet connection.

Steam (primary fluid) enters the steam inlet connection in the lower Heater head and is fed through the steam riser to the inlet of each coil unit. Condensate leaves through the outlet of each coil, enters the condensate return, and leaves the Heater through the condensate outlet.

As noted above, the water being heated (secondary fluid) flows through the Heater shell from bottom to top. In addition, heated water, being of less density than cold water, migrates to the top of the shell by convection. These actions result in the hottest water being at the top of the Heater -- at the Heater outlet and at the hot water inlet of the LOADALERT unit (see Figure HE-101-5).

The flow of cold water, entering the Heater and flowing down through the cold water leg of the LOADALERT unit through the orifice, aspirates hot water down through the hot water leg, and pushes cold water through the by-pass and into the hot water leg.

The thermal element "reads" the average temperature of water in the hot water leg at any given moment and signals the steam flow Regulator or Control Valve to open or close as necessary to maintain the required Heater outlet temperature. With no demand or load on the Heater, the thermal element "reads" only the temperature of the water at the Heater outlet and, if the water is at the required temperature, it signals the steam flow Regulator or Control Valve to close.

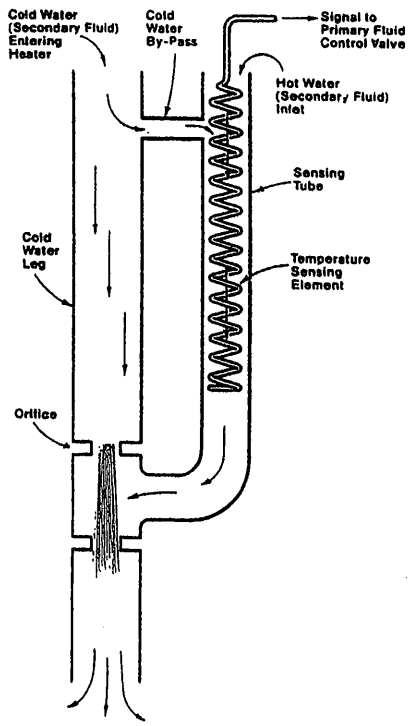

Figure HE-101-5 -- LOADALERT Unit Schematic

However, the moment that there is a demand for hot water (an increase in load), entering cold water mixes with the hot water in the LOADALERT hot water leg, cooling the thermal element so that it signals the Regulator or Control Valve to open. The need for heat flow (steam) to the Heater elements (coils) is satisfied at once and the Heater outlet temperature does not fall below that required.

The LOADALERT Unit, therefore, as its name implies, is constantly alert to load conditions and changes, as well as changes in the temperature of the entering cold water, and provides feed-forward temperature control at all times.

OPERATING PROCEDURES

OP1. With all the connecting piping cleaned out, all connections made per Figure HE-101-3, and the thermal element in place in the upper Heater head, open the stop valve in the cold water inlet line and hold the relief valve in the upper Heater head open to allow air to come out (otherwise an air pressure pocket will be built up and the Heater will not fill). When water flows out of the relief valve, the Heater is full.

OP2. If the Heater installation includes a Temperature Limit System, temporarily set the system's temperature switch to its high temperature limit. If there is no Limit System, proceed with step OP3.

OP3. Open the stop valve in the hot water outlet line. Open a hot water faucet or faucets in the building or process to insure a flow of water through the Heater. For best results in adjusting the temperature control, a water flow of 10% to 25% of Heater rating is desirable.

OP4. Slowly open all shutoff valves in the steam input line.

OP5. Follow the instructions furnished with the Temperature Regulator or the Temperature Controller and Control Valve:

a. Introduce steam to the Heater.

b. Adjust the Temperature Regulator or Controller until the outlet hot water is being held steady at the desired temperature.

c. Close the hot water faucet or faucets opened in step OP4. Open any shutoff valves in the recirculation line, if included in the Heater installation.

OP6. If the Heater installation includes a Temperature Limit System, adjust it to its proper setting in accordance with instructions furnished with the Limit System.

OP7. The Heater installation is now set for operation. No further operating procedure is necessary unless or until further temperature control adjustment may be required. If so, repeat step OP5.

OP8. To SHUT DOWN the System:

a. Close all shutoff valves in the steam input line (including any in a Limit System, if included in the Heater installation).

b. In this order, close the stop valves in:
(1) the hot water outlet line,
(2) the recirculation line, if any, and
(3) the cold water inlet line.

c. If the system includes an Accumulator, do not shut off the cold water until the Heater has cooled down. If the system is allowed to cool while shut down, the Heater liner might collapse due to formation of a vacuum.

OP9. For DRAINING THE HEATER, see the instructions included below under ROUTINE MAINTENANCE.

OP10. To START UP again, with the shell filled per step OP1 above, open shutoff or stop valves in the following order:

(1) Stop valve in the cold water inlet line

(2) Any shutoff valve in a recirculation line, if any

(3) Stop valve in the hot water outlet line

(4) Shutoff valves in the steam input line

OP11. After each startup, check the temperature control. If necessary to make any adjustment, proceed per steps OP3 through OP5 above.

ROUTINE MAINTENANCE

The constant flexure of the coils under varying load conditions automatically provides a descaling action and prevents a buildup of brittle scale. A periodic blowdown (draining) is required to remove accumulated solids.

After the first 3 months of initial operation, drain the Heater as outlined below. Examine the water being drained.

a. If the amount of solids appears to be heavy, set a schedule to drain the Heater every 3 months.

b. If the amount of solids appears to be light, set a schedule to drain the Heater every 6 months.

c. Even if the amount of solids appears to be very light, drain the Heater at least once each year.

d. Also, see TROUBLESHOOTING and CORRECTIVE MAINTENANCE below. If descaling by thermal shock is required, schedule that procedure in ROUTINE MAINTENANCE.

DRAIN THE HEATER as follows:

RM1. Close all shutoff valves in the steam inlet line (also in the Temperature Limit System if included in the Heater installation).

RM2. In this order, close the stop valves in:
(1) the hot water outlet line
(2) the recirculation line, if any
(3) the cold water inlet line

RM3. Carefully open the relief valve on the upper Heater head to relieve pressure in the Heater shell. If water continues to flow from the relief valve, one of the water shutoff or stop valves either leaks or is not shut off tight. This must be remedied until there is no more flow through the relief valve.

RM4. With the relief valve being held open (to prevent creating a vacuum), open the drain valve and drain the Heater completely.

RM5. To refill the Heater and place it back into service, close the drain valve and proceed per steps OP1, OP10, and OP11 under OPERATING PROCEDURES above.

Check the temperature control at least once every 3 months. Make any necessary adjustments per steps OP3 through OP5 under OPERATING PROCEDURES above.

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE & REMEDY CORRECTIVE MAINTENANCE (CM) ITEM NO.
A. Heater does not maintain required temperature at rated capacity.	CM1, CM2, CM16, CM18, CM19, CM20, CM21
B. Heater overheats	CM1, CM6, CM8, CM12, CM17
C. Hot water outlet temperature fluctuates widely.	CM2, CM5, CM7, CM8, CM11, CM16, CM17, CM18, CM19, CM21
D. Insufficient water through Heater.	CM3, CM11
E. Excess condensate being returned from Heater.	CM19
F. Steam being discharged into condensate drain.	CM15, CM20, CM21
G. Pressure relief valve pops.	CM4, CM13, CM14
H. Loud banging in Heater or in steam or condensate piping (not to be confused with a normal clicking noise).	CM8, CM9, CM10

CORRECTIVE MAINTENANCE

Refer to TROUBLESHOOTING. The following are probable causes and remedies for incorrect action of the Heater.

CM1. Thermometer or gages read wrong. Check by replacing the thermometer and/or each gage with one which is known to be correct.

CM2. Steam pressure is too low. Check the supply pressure gage ahead of the Temperature (steam flow) Regulator or Control Valve. If the reading is low, adjust the steam supply pressure to that which is required. If there is a restriction in the steam supply line, the gage reading will drop excessively when the Heater calls for full steam even though the pressure appears to be normal when the load is light. If the steam supply pressure is correct, the compound gage pressure reading should reach design pressure for steam in the coils as the Heater temperature drops. If it does not, check the operation of the Temperature Regulator or Control Valve.

CM3. Water pressure is low. Check and correct, if necessary, the water pressure to the Heater.

CM4. Static pressure of water is too high. Make corrections necessary to bring the water pressure below that for which the relief valve is set.

CM5. Thermal element is in wrong location. The thermal element is to be inserted in the upper Heater head connection marked THERMOSTAT.

CM6. Inlet water is preheated too hot. Reduce the preheating to a temperature at least 10°F under the desired Heater outlet temperature.

CM7. Recirculation line is piped into the cold water line instead of into the Heater lower head. Change the connection to that indicated in Figure HE-101-3.

CM8. No check valve in the condensate drain line. Lack of this check valve can allow condensate (and live steam, if present) to be drawn back into the Heater from the condensate header. This can result in high back pressure, water hammer, and, if live steam is present, overheating. Install a check valve in the condensate drain line as indicated in Figure HE-101-3.

CM9. Steam line is not properly trapped. Install a trap as indicated in Figure HE-101-3.

CM10. Incorrect location of steam flow Temperature Regulator or Control Valve. The Regulator or Valve should be 6" to 12" above the Heater lower head flange, and the piping between the Regulator or Valve and the lower head connection should be as short as possible.

CM11. No cold water by-pass line to the bottom of the Heater (when required by operating conditions). Check the nearest AERCO Representative to determine the need for the by-pass line. Install same if necessary.

CM12. Leaking valve in by-pass line (if any) around the steam flow Temperature Regulator or Control Valve. Maintain the valve to shut tight.

CM13. Lack of expansion capability in the hot water system. Insert an expansion tank in the outlet hot water line near the Heater.

CM14. Insufficient shock absorbers. Insert shock absorbers (water hammer arresters) in both the cold and hot water systems as needed to eliminate shock waves.

CM15. Lack of or too large an orifice union. Check the hearest AERCO Representative for orifice size required and install the correct union in the condensate drain line as shown in Figure HE-101-3.

CM16. Condensate is backing up into the Heater because of a restriction in the condensate drain line such as an undersized orifice union or an undersized or faulty trap. Check the nearest AERCO Representative for orifice or trap size required. Make the necessary correction.

CM17. The steam flow Temperature Regulator or Control Valve does not close. Check the instructions for the Regulator or Valve.

CM18. The steam flow Temperature Regulator or Control Valve does not open. Check the instructions for the Regulator or Valve.

CM19. There is a leak in the Heater coil(s), steam riser, or condensate return. To verify a leak in the coils, etc., shut off the steam supply and break a connection in the condensate drain line. Condensate will drain from the coils initially, but the flow should stop after a few moments. If the flow continues, water is leaking from the pressurized shell side to the tube side of the Heater. Disassemble, inspect, repair, and reassemble the Heater as outlined below.

CM20. The Heater coils are scaled up. Descale the Heater by the thermal shock method in the manner outlined below.

CM21. The Heater is being utilized at a rate higher than its design capacity. Contact the nearest AERCO Representative for advice in remedying this problem.

DESCALING BY THERMAL SHOCK METHOD

Where, under certain conditions of continuous steady usage, the water is so hard or alkiline that normal flexure of the coils (see ROUTINE MAINTENANCE) and routine blowdown (draining the Heater shell) will not remove scale build-up on the coils, the heating surfaces (coils) may be thermally shocked, without damage to any part of the Heater, to dislodge scale solids.

Proceed as follows:

TS1. Drain the Heater per steps RM1 through RM4 under ROUTINE MAINTENANCE above. However, instead of holding the relief valve open in step RM4, remove the relief valve from the upper Heater head and then open the drain valve. Leave the drain valve open until step TS7 below.

TS2. Connect a source of cold water (for example a hose) to the relief valve connection.

TS3. Open the shutoff valve(s) in the steam inlet line and allow steam to the Heater. After about 30 seconds or until steam is blowing out of the condensate drain line, close the condensate drain line stop valve. Leave the steam valve open for about 2 minutes longer, then close the steam shutoff valve(s).

TS4. Inject a flow of cold water through the relief valve connection for about 2 minutes. Then shut off the water flow and open the condensate drain line stop valve.

TS5. Repeat steps TS3 and TS4 several times until the water coming from the Heater drain appears to be relatively free of solids.

TS6. Remove the cold water source from the relief valve connection. Open the stop valve in the main cold water inlet line and allow a complete flushing of the Heater shell.

TS7. After the Heater shell has been completely drained, close the Heater drain valve, replace the relief valve, and place the Heater back into operation per steps OP1, OP10, and OP11 under OPERATING PROCEDURES above.

TS8. If water conditions are so severe that thermal shocking does not remove scale deposits, contact the nearest AERCO Representative for advice.

DISASSEMBLY

See Figure HE-101-9 for Heater Model SW1A or HE-101-10 for Heater Model SW1B.

No special tools are required. However, a block and tackle, or ratchet or winch hoist, etc., is recommended for lifting off the Heater upper head and shell.

D1. Drain the Heater per steps RM1 through RM4 under ROUTINE MAINTENANCE above.

D2. Disconnect all external piping from the upper head. Remove the thermal element, being very careful not to damage the element capillary.

D3. Unscrew the studs holding the upper head to the shell.

D4. Lift off the upper head -- straight up -- being very careful not to hit the LOADALERT assembly against the coils. Remove the upper head gasket if it is damaged.

D5. Unscrew the studs holding the shell to the lower head.

D6. Lift the shell -- straight up -- being very careful not to touch or rub the shell against the coils. Remove the lower head gasket if it is damaged.

D7. Examine the coils, steam riser, and condensate return for obvious damage.

D8. Open the shutoff valve(s) in the steam inlet line to allow steam to the Heater. Any leak in the coils, steam riser, or condensate return will become visible quickly. Note where the leaks are and shut off the steam.

D9. If a coil must be replaced, use a 1-5/16" open end wrench to disconnect the unions holding the coils to the steam riser and condensate return. Be careful not to damage the spud threads (see Figure HE-101-7).

D10. If either the steam riser or condensate return must be replaced, it is recommended that the Heater be returned to the AERCO factory for the replacement. (AERCO has the proper factory setup, pressure testing equipment, ready access to any needed additional parts, and the expertise necessary to provide a guaranteed replacement.)

If, however, returning the Heater to the AERCO factory is impractical, field replacement may be made but cannot be guaranteed by AERCO. If this decision is made, proceed as follows:

a. Remove all coils per step D9 above. Examine each coil carefully to make sure that replacement at this time might not be advisable.

b. Remove the damaged riser or condensate return.

REASSEMBLY

See Figure HE-101-9 for Heater Model SW1A or HE-101-10 for Heater Model SW1B.

No special tools are required. A block and tackle, ratchet or winch hoist, etc., is recommended for lifting. A tool such as that shown in Figure HE-101-8 is suggested for spacing the Heater coils.

R1. If either the steam riser or condensate return must be replaced:

a. Use pipe joint compound or Teflon tape on the threads and screw the replacement steam riser or condensate return into the Heater lower head.

b. Turn the riser or return in leak tight, but carefully line up the spud centers with the raised indicators on the bosses in the head casting as shown in Figure HE-101-6.

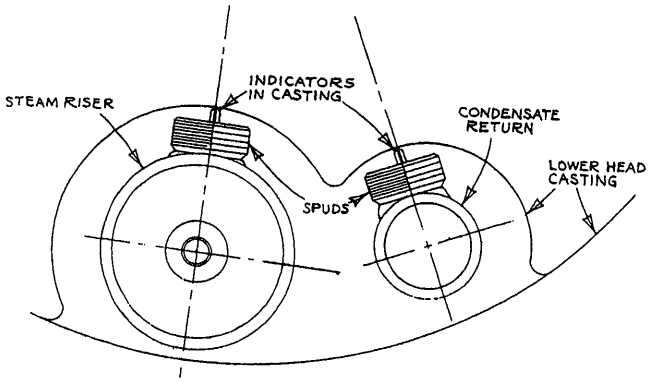

Figure HE-101-6 -- Alignment of Steam Riser and Condensate Return

R2. If a coil must be replaced:

a. See Figure HE-101-7. A coil gasket is required for each coil union in a Model SW1B Heater (see Figures HE-101-9 and HE-101-10 for the differences between Model SW1A and SW1B Heaters). It is recommended that coil gaskets be replaced whenever a coil is reassembled to a riser or return even though the coil itself is not being replaced. Snap the gasket into the riser or return spud.

b. Before attempting to assemble the coils to riser or return spuds, wrap each spud with Teflon tape and apply a lubricant (grease) to the back of the union nuts and shoulders on the coil tail pieces. Rotate the nuts to spread the grease.

c. Assemble the coil union to the condensate return first. Do not tighten. Assemble

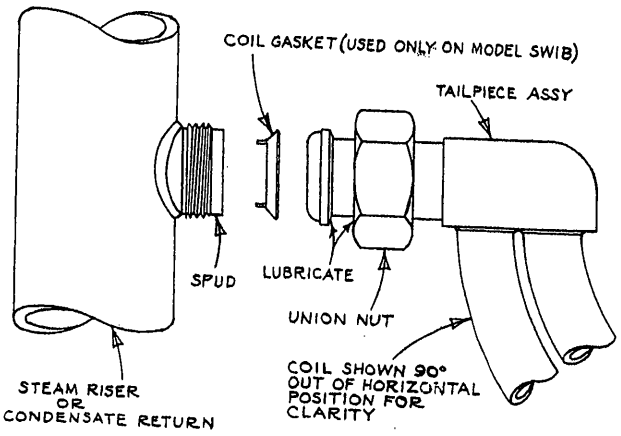

Figure HE-101-7 -- Assembly of Coil to Steam Riser or Condensate Return

the other coil union to the steam riser. Using a torque wrench, tighten both unions (to approximately 75 ft-lb) while holding the coil so that the turns of the coils remain perfectly horizontal, where they are brazed to the tailpieces, after tightening. NOTE: Never use a hammer on a wrench to tighten the union nut. Deformation and subsequent leaking may result.

d. Space the coil tubes evenly throughout the Heater, with each tube space at least 1/2" wide. It is especially important that no tubes rest on any coil unions. A spacing tool may be made up similar to that shown in Figure HE-101-8 (available from AERCO, Part No. 12523). Insert the tool flat between the coil tubes and twist the tool until the desired spacing is obtained.

e. Test for leaks per step D8 above under DISASSEMBLY.

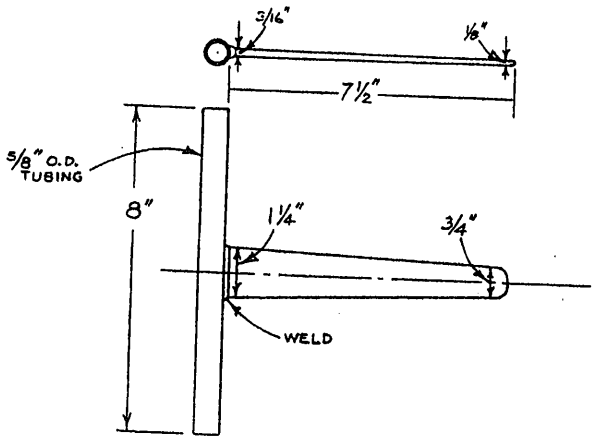

Figure HE-101-8 -- Coil Spacing Tool

ITEM NO.	QTY. REQ'D	DESCRIPTION
1	32	STUD
2	64	NUT
3	2	GASKET
4	1	STEAM RISER ASSY.
5	1	CONDENSATE RETURN ASSY.
6	1	LOADALERT® ASSY.
7	2 PER COIL	COIL GASKET
8	3	FLOOR FLANGE
9	3	LEG
10	1	LOWER HEAD ASSY.
11	A	COIL ASSY.
12	1	SHELL ASSY.
13	1	UPPER HEAD ASSY.
14	1	NAMEPLATE
15	4	DRIVE SCREW

A-NUMBER OF COILS REQUIRED IS INDICATED IN THE LAST TWO DIGITS OF THE MODEL NO., I.E.: SWIB04-4 COILS REQUIRED
SWIB05-5 " " ETC.
SWIB15-15 " "

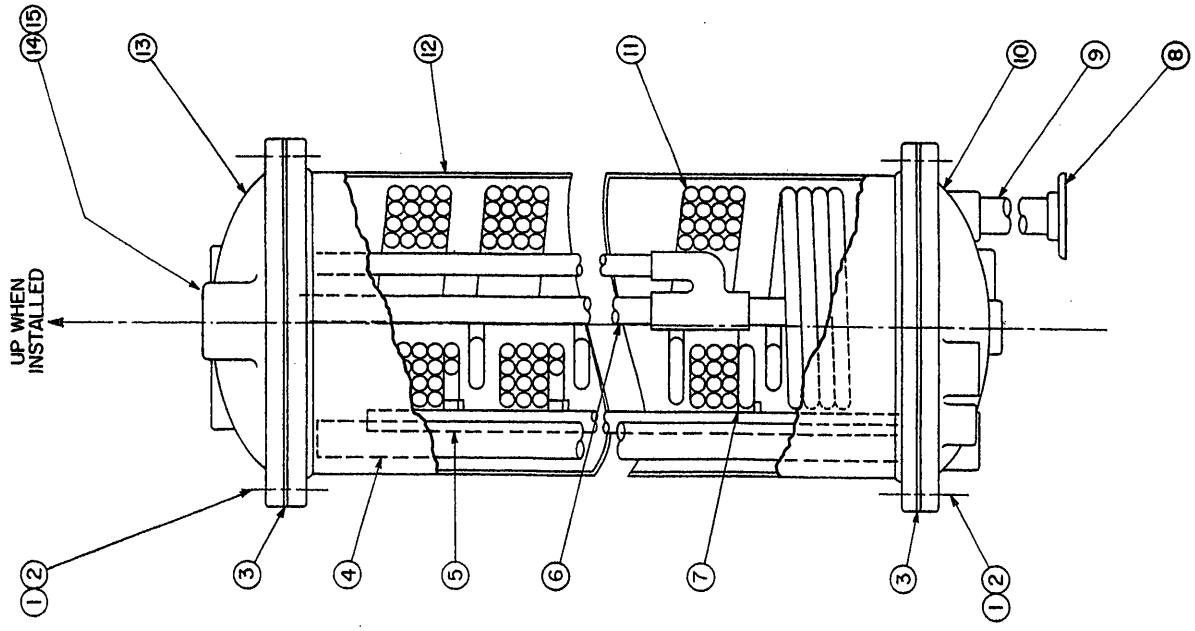

Figure HE-101-10 -- Assembly and Parts List for MODEL SW1B AERCO HELITHERM Heat Exchanger

RECOMMENDED SPARE PARTS

Quantity Per Heater	Item No.	Part Name	Shown in Figure No.
For any MODEL SW1A-PLUS Heater			
1	103	Temperature Switch	HE-107-12
1	110	Dial Thermometer	HE-107-12
1	112	Compound Pressure Gage	HE-107-12
1	120	Green Indicator Light	HE-107-12
1	121	Red Indicator Light	HE-107-12
2	57	Outlet Flange Gasket	HE-107-14
4	74	Head Gasket	HE-107-14
*	67	Coil Assembly	HE-107-14
For MODEL SW1A-PLUS Heater with Air-Operated Steam Control Valve			
1	102	Temperature Controller	HE-107-12
1	107	Air Solenoid Valve	HE-107-12
1	5	P&T Relief Valve**	HE-107-13
1	1	Water Solenoid Valve	HE-107-13
For MODEL SW1A-PLUS Heater with Self-Contained Steam Control Valve			
1	1	Water Solenoid Valve	HE-107-13
1	5	P&T Relief Valve**	HE-107-13
1	16	Steam Solenoid Valve	HE-107-13
1	--	Control Valve Thermal Element, AERCO Part No. 5144-1	HE-107-13

* Minimum of 2 to a maximum of the number in your largest Heater

** See Table B in Figure HE-107-13 for correct size and Part No. of P&T Relief Valve required