

Electra Steam, Inc.

P.O. Box 37 4407 Martinsburg Pike Clear Brook, VA 22624 USA Phone: 540-662-3811 Fax: 540-665-8101 email: <u>Sales@reimersinc.com</u> web: <u>www.reimersinc.com</u>

RLP 100k – 500kW Low Pressure and RHP 100kW – 500kW High Pressure Steam Boiler Models



Instructions Manual

2010 Reimers Electra Steam, Inc.

MODEL:

SERIAL #:

READ AND HEED FOR YOUR SAFETY

SHOCK AND BURN WARNINGS RLP AND RHP ELECTRIC STEAM BOILERS

You have just purchased a quality steam boiler designed to the ASME Boiler Code and registered with the National Board of Boiler Inspectors. Treat this industrial equipment with care and respect. It is safe when installed, maintained, and used properly. Read the instruction carefully, refer to the enclosed identification photo and contact the factory if you have any questions.

1.) ADJUSTMENTS:

All controls have been set at the factory and should require no adjustments. However, the boiler must be level.

2.) BLOWDOWN VALVES (19 and 20):

These are utilized to blow impurities from the boiler chamber. When opened, a large volume of hot water and steam is discharged. Ensure that these are properly piped for such discharge. State and local codes must be met as applicable.

3.) ELECTRICAL:

All wiring must be in accordance with the National Electric Code and any local codes that may apply. Wiring must be made by a competent certified electrician. Use copper wire only.

4.) GAUGE GLASS (1):

The gauge glass protector guard must be on at all times. When replacing glass be sure that the unit is not under pressure and is cool to touch. To do otherwise could cause scalding.

GAUGE GLASSES SHOULD BE REPLACED ANNUALLY DUE TO INTERNAL WEAR!

HOT: The valves and piping on this unit are hot when under pressure or heating up. Don't touch.

5.) INSTRUCTIONS:

Read instructions before installing or operating this steam boiler. These are provided as general guidelines.

6.) MODIFICATION/MISUSE:

This boiler has been designed and constructed in accordance with the ASME Boiler Code. Any modification or misuse can result in a dangerous situation. Reimers Electra Steam, Inc. is not liable for any product that has been modified or improperly used.

7.) PRESSURE GAUGE (7): The pressure gauge indicates the internal pressure of the boiler. It can fail. Periodically have your boiler inspector compare the gauge with a known gauge utilizing the test valve arrangement provided. Ensure that the boiler is cold, not pressurized and electrically disconnected.

8.) REGISTRATION:

Most states and cities require boiler registration and inspection. Check with your government authorities.

9.) REPAIR:

Repair of this unit must be attempted only by experienced personnel. Before commencing a repair, ensure that the boiler is cold, not pressurized and electrically disconnected. All standard electrical and steam safety precautions must be taken during testing.

10.) SAFETY VALVE (3):

The safety valve is designed to discharge hot steam when the set pressure is exceeded. Ensure that the discharge port is pointing toward the back of the unit away from the operator or any aisles. Test the safety valve periodically to ensure that it is operating properly. Test carefully at full pressure by lifting lever using pliers and "slapping" shut.

STEAM DISCHARGE CAN SCALD. ENSURE NO ONE IS EXPOSED!

11.) STEAM INSTALLATION:

Steam piping must be of black pipe, not galvanized. Work must be done by an experienced steam fitter. All state and local codes must be met as applicable.

12.) WATER:

Ensure that all electrical components are in a dry location, free from any possibility of water soaking. Electric foot switches must not be placed on a wet floor. They must be placed on dry surface not subject to steam or water.

LIMITED WARRANTY - STEAM BOILERS

Reimers Electra Steam, Inc. warrants the following products of its own manufacture against defects in materials and workmanship under normal use and service. This warranty is in lieu and excludes all other expressed or implied warranties or merchantability of fitness for any particular use. No person is authorized to extend the terms of this warranty or assume any other liability except by written statement signed by an officer of Reimers Electra Steam, Inc. Clear Brook, Virginia 22624.

WARRANTY PERIOD

The pressure vessel, electrical and mechanical components are warranted for one year from date of shipment from Reimers Electra Steam, Inc. in Clear Brook, VA 22624.

LIMITATIONS

Products must be installed, used and maintained in accordance with our instructions, including reasonable and necessary maintenance by the user. Users are responsible for the suitability of the products to their application. There is no warranty damage resulting from improper installation, abuse, power failure, fire, flood, lightening, improper water, misuse, improper specification, misapplication or other operating conditions beyond our control or parts that are normally expendable in usual course of operation.

Claims against carriers for damage in transit must be filed by the buyer. Reimers liability, if any, will not exceed the price of Reimers products claimed to be defective.

Components manufactured by any supplier other than Reimers shall bear only that warranty made by the manufacturer of that product and service for that warranty shall be the responsibility of that manufacturer and not Reimers.

REMEDY

Claims under this Limited Warranty must be made by obtaining a Return Authorization Number from our office (PHONE: 540-662-3811,FAX: 540-665-8101) and returning defective part, freight prepaid to: Reimers Electra Steam, Inc., 4407 Martinsburg Pike, Clear Brook, Virginia 22624.

Defective items will be repaired or replaced as necessary within a reasonable time without charge, other than incidental charges such as freight prepayment. Such repair or replacement within a reasonable time is the exclusive remedy available from Reimers Electra Steam, Inc., under this Limited Warranty.

CONSEQUENTIAL DAMAGES

Reimers Electra Steam, Inc., is not liable for labor costs incurred in the removal, reinstallation, or unauthorized repair of product, or for damages of any type whatsoever, including incidental and/or consequential damages.

THIS WARRANTY SUPERSEDES ALL PREVIOUS WARRANTIES.

1. Installation

REIMERS ELECTRA STEAM, INC. boilers are heated by one or more immersion type heating elements. Automatic controls are provided to maintain pre-set operating pressure and proper water supply. Safety features include automatic low water cutoff, automatic pressure control, safety valve and visible water level gauge. Each boiler is manufactured in accordance with ASME I Power Boiler Code Standards and is individually inspected and stamped by an authorized National Board Insurance Inspector. All boilers are registered with the National Board of Boiler and Pressure Vessel Inspectors.

NOTE:

ASME DATA PLATE IS LOCATED ON END OF PRESSURE VESSEL BEHIND LABEL STAMPED WITH NATIONAL BOARD NUMBER OF UNIT.

When boiler is received, make sure it has not been damaged in shipment.

1.1 Location

Place the boiler in a level position, close to the equipment which it is to supply. This will insure minimum heat losses and allow more economical piping arrangements. All steam lines should be insulated.

Important: If it is necessary to install the boiler in a confined area, leave the following clearances for servicing.

- a.) Allow 46" clearance at element ends (FIG. 1) for servicing Models RHP-100 thru RHP-200.
- b.) Allow 50" clearance at element ends (FIG. 3) for servicing Models RHP-225 thru RHP-500
- c.) Allow clearance for servicing electric panel (FIG. 7) as follows:

Electric boiler spacing is dictated by NFPA-70, Table 110.26 as follows:

Nominal Voltage	Minimum Clear Distance			
To Ground (Volts)	Condition 1	Condition 2	Condition 3	
0 – 150	3ft (914mm)	3ft (914mm)	3ft (914mm)	
151 – 600	3ft (914mm)	3.5ft (1.07m)	4ft (1.22m)	

Note: Where the conditions are as follows:

Condition 1 — Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials. **Condition 2** — Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 — Exposed live parts on both sides of the working space.

(a) *Dead-Front Assemblies*. Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on non-electrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

- d.) Ensure access to the gauge glass and blow-down valve.
- e.) Proper location of this boiler with regard to combustible and noncombustible surfaces and materials is coded on the boiler name plate. The following decoding sketch and description is provided for the user information:

RLP and RHP				Dimension In.			
Models	А	В	D	ΕL	E _R	F	G
	24	A6	6	6	6	С	-

Description of dimensions and symbols

A – Clearance above top of boiler

B – Clearance from front of boiler

 $\ensuremath{\text{Prefix}}\ensuremath{\,\text{C}}$ indicates suitability for closet or alcove installation

Prefix A indicates suitability for alcove but not for closet installation

D – Clearance from back of boiler

EL – Clearance from left side of boiler

 $\ensuremath{\text{ER}}\xspace$ – Clearance from right side of boiler

F – Indicates type of flooring: "NC" for noncombustible floor / "C" for combustible floor. Numeral indicates minimum clearance below suspended units to combustible floor



1.2 Water Supply

On models with pump and/or solenoid valve, connect incoming water supply to strainer on intake side of solenoid valve. On models furnished with condensate return tank, connect water line to makeup valve located at tank end. RL and RHP steam boiler models require four (4) gallons of feed water per hour for each 10 kW of electric heating capacity of the boiler. Lines should be of adequate size and meet local plumbing codes.

In order to ensure long term trouble-free boiler operation, we recommend that the water used as boiler feed water to be tested for hardness. If the water in your area is harder than 1grain (17mg/L), use a water softener. The main cause for premature heating element failure in electric steam boilers is water hardness. If severe corrosion during inspection of the pressure vessel becomes evident, additional tests of your boiler feed water must be performed. A water analysis should be performed by a qualified and recognized water treatment company located in your area.

Recommended levels for boiler feed water:

WATER PROPERTY	MAX. LIMIT
Total hardness	17 mg/L
Dissolved Oxygen	0.04 mg/L
Total Iron	0.1 mg/L
Total Copper	0.05 mg/L
рН	> 8.5
Specific Resistivity	25kΩ * cm

Recommended levels for boiler water (water inside pressure vessel when boiler operating)

PROPERTIES	MAX. LIMIT
Total Alkalinity	350 mg/L
Total Dissolved Solids	3500 mg/L
Total Suspended Solids	300 mg/L
рН	10.5 - 12



Do not add any chemicals to the boiler feed water unless specifically recommended by a qualified and recognized water treatment company.

1.3 Steam Outlet

Connect steam line of sufficient size from steam outlet valve (4) to the user's equipment.

1.4 Condensate Return

If the condensate is to be returned by gravity (no tank) in a closed system, the load discharge should be at least 2 feet above the boiler level so that the weight of the condensate will actuate the check valve. When applicable, install steam return lines at sufficient height to allow a pitch of 2 inches for every 10 feet of pipe length.

Note: For condensate return systems (with tank), see special sheet.

1.5 Safety Valve

If it is required that discharge piping be installed from the safety valve (3), the pipe should not be smaller than the valve outlet and should be rigidly supported so as not to place weight on the valve itself. Important: No valve in this line!

1.6 Electrical

Install a fused disconnect switch near the boiler. It should be fused not less than 20% above the nameplate rating. Connect the power supply from the disconnect switch to the terminals in the boiler control panel. A copy of the wiring diagram is in the control panel. <u>Important:</u> Electrical connections to the boiler control panel (FIG. 7) should be made by a qualified Electrician. All wiring must comply with local electrical codes.

2. Operation

- a.) Close the boiler drain valve (19 /20).
- b.) Open gauge glass valves (1).
- c.) Open steam line valve (if one has been installed) slightly. This will allow the boiler to be filled without producing back pressure.
- d.) Turn on main water supply.
- e.) Open hand valve on boiler and allow water to fill to the lower nut on gauge glass and close valve.
- f.) Open valve between pump and boiler
- g.) Turn on control circuit and power. Turn power switch on the boiler control (9) to the ON-position. After approximately 2 seconds, the "REFILLING"-light should turn on and water should now enter the boiler and automatically stop at the proper level. Caution: Do not allow pump to run dry.
- h.) Check pressure control (5a, 5b and 6) settings. These were set at the factory, if your required pressure was known before shipment. Some models are furnished with pressure controls that have mercury switches. These can be seen through the transparent cover of the switch. A plumb is mounted inside the case and can also be seen through the case. Be sure these pressure switches are leveled, or the pressure readings will be off. All boilers are equipped with three pressure controls. The pressure control (5a) is the auto-recycle operating control set by the factory 10% below the safety valve setting. The second control (5b) is the backup for the operating control. It has manual reset function, which means that if it trips, it locks out the power to the heating elements. Only after reducing the boiler pressure below the setting of this control and in addition pressing the "HIGH PRESSURE" reset switch on the boiler control (9) will restore normal boiler operation. The third control (6) is a proportioning control set to the actual operating steam pressure. It operates in conjunction with the step control (11) which switches the heating elements on/off as needed to maintain pressure (See the attached step controller Instruction Manual).

3. Maintenance

3.1 Boiler

All boilers, whether electric, gas or oil fired, must be blown down periodically to remove minerals, scale and other foreign matter which accumulate inside the pressure chamber. Water chemistry is generally responsible for most of these deposits. When water is naturally soft, or has been softened chemically, blow downs are required less frequently than in the case when hard water is used.

Another factor affecting these deposits is the amount of condensate that is returned to the boiler. Since condensate is essentially clean distilled water, it contains very few impurities. If a large part of the condensate is being returned and little make-up water is used, the boiler need not be blown down as often as when little or no condensate is returned to the boiler.

Although electric resistance element boilers are generally recognized to have a high tolerance to bad water compared to other types of boilers, we recommend that you consult your water treating company for their recommendation on boiler water treatment, if your application of this boiler will require large amounts of

make-up water. If you do not have a water treatment company, we suggest you contact Betz, Dearborn Chemical, Nalco, Permutit or one of the other established companies in your area. If it is not practical to work with one of these companies, we suggest the following blow-down procedure:

3.2 Blowdown

Blow-down is an essential part of boiler operation. It is the very best preventive maintenance you can give your boiler and will add years of life to your unit. The following blow-down schedule should be established and adhered to:

In areas where water is soft, or has been treated:

- a.) If little or no condensate is returned, blowdown once a day.
- b.) If a large part of the condensate is returned, blowdown once every week. In a closed circuit heating system where no steam is being taken from the system a thorough cleaning annually is recommended.

In areas where hard water is used:

- a.) If little or no condensate is returned to the boiler, blowdown at least once a day.
- b.) If a large part of the condensate is returned, blowdown once every week.
- c.) Where boiler is being used for humidification or similar application and supplied with 90 to 100% raw water, blowdown at least twice a day.

To Blowdown:

- a.) Develop a steam pressure of approximately 10 P. S. I.
- b.) Shut off power to the boiler
- c.) Open drain valve (19/20) wide and empty the boiler

3.3 McDonnell-Miller Low Water Cutoff Control

Your McDonnell-Miller Low water control should be blown down at least once a month by opening the valve provided and drain water until it clears. This must be done while the boiler is under pressure.

3.4 Heating Elements

The heating elements should be removed, inspected and cleaned, if necessary, periodically. The first inspection should take place three (3) months after the boiler is put in operation. Condition of the elements at this time will determine frequency of future inspections.

To clean heating elements:

- a.) Shut off main power supply(s) and release pressure.
- b.) Remove shell wrapper end caps. Disconnect wires and withdraw elements (8) after removing the retaining bolts.
- c.) Using a stiff brush, remove scale and foreign matter.

3.5 Automatic Controls

For information on individual controls, special detailed sheets are enclosed.

3.5 Safety Valve:

The safety, or pop-off valve (3), should be tested by manually lifting the valve periodically to make certain it is in proper working condition. Low pressure valves (15 PSI) should be tested once a month.

4. Trouble Shooting

Boiler Status	Quick Fix
Control voltage to boiler turned on, power switch on boiler control (9) turned on, but no lights lit on the front panel of the boiler control:	- Check circuit breaker or fuse of the wall outlet where the boiler control voltage circuit is hooked up to. If the circuit breaker is tripped or the fuse blown, check whether other appliances are plugged into outlets that are fed by the same circuit breaker/fuse. If that is the case, then plug those other appliances into outlets that are protected by other circuit breakers or fuses.
"Low Water" alarm light on boiler control panel (9) lit:	 Press the "Low Water" reset button Check Water Level. Water level must be visible in gauge glass. Ensure that the boiler is filled with tab water and not distilled water.
"High Pressure" alarm light on boiler control panel (9) lit:	 Press the "High Pressure" reset switch If the pressure gauge indicates steam pressure above the preset value, reduce pressure and press the "High Pressure" reset switch again.

If trouble shooting did not resolve problem, please contact our service technicians at: Phone: 540-662-3811 Email: <u>sales@reimersinc.com</u> LIVECHAT <u>www.reimersinc.com</u>

5. Parts List for Reimers Electra Steam, Inc. Boilers Models RLP & RHP 10 to 150 P.S.I. Steam Pressure

5.1 Models RLP & RHP 100 - 200



NOTE: When ordering parts give boiler Model and Serial Number and detail shipping instructions.

ITEM	PART	DESCRIPTION	BOILER MODEL
NO.	NO.		
1	02396	GAUGE SET STANDARD SHANK	ALL MODELS
	02003	GAUGE GLASS 10" X .625" PYREX	
	02006	GAUGE RUBBER WASHER FOR .625" GAUGE GLASS	
	02448	GAUGE BRASS WASHER FOR .625" GAUGE GLASS	
	02110		
2	02050	MM 150S PUMP CONTROL AND LOW WATER CUTOFE	RI P-100 – RI P-500
	02000	MM 157S PLIMP CONTROL AND LOW WATER CLITOFE	RHP-100 - RHP-500
	02040		
3	02408		
5	02400		
	02392		
	02020	VALVE SAFETT I 150 P.S.I. SWP	<u> </u>
-	00400		
4	02463	VALVE GLOBE 1.25" 150 P.S.I. SWP	RHP-100 – RHP-200
	02464	VALVE GLOBE 1.5" 200 P.S.I. SWP	RHP-100 – RHP-225
	02471	VALVE GLOBE 2" 150 P.S.I. SWP	RHP-225 – RHP-500
	03318	VALVE GLOBE 2.5" 150 P.S.I. SWP	RLP-150
5	04696	PRESSURE CONTROL 15 P.S.I. AUTO RESET	RLP-100 – RLP-500
	02297	PRESSURE CONTROL 150 P.S.I. AUTO RESET	RHP-100 – RHP-500
6	02498	PROPORTIONAL CONTROL 2-15 P.S.I.	RLP-100 – RLP-500
	02499	PROPORTIONAL CONTROL 5-150 P.S.I.	RHP-100 – RHP-500
7	02467	PRESSURE GAUGE 3.5" 30 P.S.I.	RLP-100 – RLP-500
	02048	PRESSURE GAUGE 3.5" 300 P.S.I.	RHP-100 – RHP-500
8	02191-A	HEATING ELEMENT 208V 36KW 3PH	NOTE 1
	0210171	HEATING ELEMENT 240/480V 36KW 3PH	NOTE 1
	02101	HEATING ELEMENT 208V/ 36KW/ 3PH	
	02102		
-	02193		
-	02194		
	02410		
	02400		
	02486	HEATING ELEMENT 5/5V 00.3KW 3PH	
	02714	HEATING ELEMENT 600V 36KW 3PH	NOTE 1
	02678	HEATING ELEMENT 600V 50KW 3PH	NOTE 1
	03360	HEATING ELEMENT 600V 66.3KW 3PH	NOTE 1
	02210	FLANGE GASKET 5" RING	
	02549	HEATING ELEMENT 240/480V 75KW 3PH	NOTE 1
	03230	HEATING ELEMENT 380V 100KW 3PH	NOTE 1
	02549-A	HEATING ELEMENT 415V 75KW 3PH	NOTE 1
	02548	HEATING ELEMENT 480V 100KW 3PH	NOTE 1
	02548-A	HEATING ELEMENT 415V 100 KW 3PH	NOTE 1
	02556	HEATING ELEMENT 575V 100 KW 3PH	NOTE 1
	003229	HEATING ELEMENT 600V 100KW 3PH	NOTE 1
	02570	FLANGE GASKET 6" RING	
	-		
9	20721	ELECTRONIC BOILER CONTROL	
10	02530	HEATING ELEMENT CONTACTOR 50A 120V 3PH	NOTE 2
- 10	02531	HEATING ELEMENT CONTACTOR 50A 240V/ 3PH	NOTE 2
	02530		NOTE 2
	02535		
	02040		
	02597		
	02598	HEATING ELEMENT CONTACTOR 93A 220V 3PH	NUTE 2
L	00000		
11	20802	STEP CONTROL WITH 4 HEATING STAGES	RLP & RHP-100
	20800	SIEP CONTROL WITH 6 HEATING STAGES	RLP & RHP-150 - 300
	20804	STEP CONTROL WITH 10 HEATING STAGES	RLP & RHP-350 - 500
12	02127	HEATING ELEMENT FUSE 250V 60A UL/CSA	NOTE 2

	02129	HEATING ELEMENT FUSE 250V 80A UL/CSA	NOTE 2
	02130	HEATING ELEMENT FUSE 250V 100A UL/CSA	NOTE 2
	02135	HEATING ELEMENT FUSE 600V 40A UL/CSA	NOTE 2
	02518	HEATING ELEMENT FUSE 600V 50A UL/CSA	NOTE 2
	02136	HEATING ELEMENT FUSE 600V 60A UL/CSA	NOTE 2
	02138	HEATING ELEMENT FUSE 600V 80A UL/CSA	NOTE 2
	02137	HEATING ELEMENT FUSE 600V 100A UL/CSA	NOTE 2
13	02125	CONTROL CIRCUIT FUSE 250V 15A UL/CSA	ALL MODELS
14	02142	HEATING ELEMENT FUSE BLOCKS 250V 60A	NOTE 2
	02144	HEATING ELEMENT FUSE BLOCKS 250V 100A	NOTE 2
	02614	HEATING ELEMENT FUSE BLOCKS 600V 60A	NOTE 2
	02620	HEATING ELEMENT FUSE BLOCKS 600V 100A	NOTE 2
15	02140	CONTROL CIRCUIT FUSE BLOCK	ALL MODELS
16	02514	VALVE BALL .75" 200 P.S.I. SWP	RLP & RHP-100 - 200
	02515	VALVE BALL 1" 200 P.S.I. SWP	RLP & RHP-225 - 500
17	02371	VALVE CHECK .75" 200 P.S.I. SWP SPRING LOADED	RLP & RHP-100 - 200
		VALVE CHECK 1" 200 P.S.I. SWP SPRING LOADED	RLP & RHP-225 - 500
18	02067	VALVE CHECK .75" 200 P.S.I. SWP SWING	RLP & RHP-100 - 225
	03307	VALVE CHECK 1" 200 P.S.I. SWP SWING	RLP & RHP-250 – 500
19	02513	VALVE 1" Y 200 P.S.I. SWP	RLP & RHP-100 - 200
19	02642	VALVE 1.25" Y 200 P.S.I. SWP	RLP & RHP-225 - 500
20	02630	ELECTRODE PROBE FITTING	ALL MODELS
21	02301A	SOLENOID VALVE .75" NPT 120V AC	RLP & RHP-100 - 200
	02723	SOLENOID VALVE 1" NPT 120V AC	RLP & RHP-225 – 500
22	02228	PUMP ¾ HP 120/240V 1PH	RLP & RHP-100 - 225
23	03802	VALVE BALL .75" W/LATCH 200P.S.I. SWP	RLP & RHP-100 - 500

NOTE 1 – When ordering, specify voltage (V) and power (kW) of element . NOTE 2 – When ordering, specify model number of part.

5.2 Models RLP & RHP 225 - 500









