Bradlee Boilers Ltd

Instruction Manual for starting up Bradlee Hire Boiler from Cold

To be read in conjunction with Bradlee Boiler guide to Commissioning Boilers Document Ref: HM001

1. Ensure that all services are correctly connected and all three phase motors will run in the correct direction. Ensure that there is an adequate air supply to the burner and the exhaust is not restricted.
2. Close blow down valve under Boiler.
3. Close Main stop valve.
4. Open air cock.
5. Switch on main isolator on panel, POWER light will be illuminated and alarm bells will ring.
6. Mute alarm with push button.
7. First and second low lights will stay on because boiler is empty of water.
8. Press START / RESET button.
9. Switch feed pump to AUTO.
10. Boiler will fill with water, as level rises first and second low lights will become extinguished.
11. When first low light is extinguished press START / RESET push button again.
12. When water reaches working level feed pump will stop.
13. Level in sight glass should show between 1/2 and 2/3 full
14. Switch burner to ON, burner light will be illuminated and burner will start pre-fire cycle.
15. Burner will fire.
16. Check fuel pressure on oil fired units, reading should be between 10-14 Bar depending on type of Burner.
17. Fire the Boiler for intervals of 10 mins on and 10 mins off until the steam pressure gauge shows 50 psig. During this period blow boiler down to maintain correct working water level.
18. Close the air cock, the Boiler is now ready for use.
19. The pressure may be increased to the required working pressure by continuous firing and the stop valve opened slowly to service

Guide to Commissioning Boilers

1. ***Siting***
a: The Boiler must be placed on a flat level surface.
b: Fuel tank and water tank are to be raised to give a positive supply to the fuel and water pumps.
c: Ensure that the Flue gasses are not obstructed.
d: Adequate weather protection to be given to the equipment.

2. ***Connecting Services***
a: Check that the correct power supply is used.
b: Pipework between the fuel tank to pump filter and water tank to water pump is not to be reduced. Avoid any bends or restrictions.
c: Check the fuel supply is the correct grade.
d: Any water softening equipment **MUST** be connected into the system,

3. ***Operating Pre Run Checks***
a: Check water supply to softener, water is soft and the feed tank is full.
b: Prime the water pump.
c: Check the fuel supply to burner.
d: Prime the fuel pump.
e: Check power supply and motor direction.

Operating checks
Low Fire
1. Fire the boiler, blow down 1/2" of water at 3 minute intervals until working pressure is reached. This will circulate the heat in the shell. Close air cock as required.
2. When at working pressure - Put Boiler on **Auto / High / Low**
3. Blow down the Gauge Glasses and main Boiler blow down 4 hourly Boiler blow down - Blow 1" of water.
4. When the Boiler is off hired - open the blow down and empty.

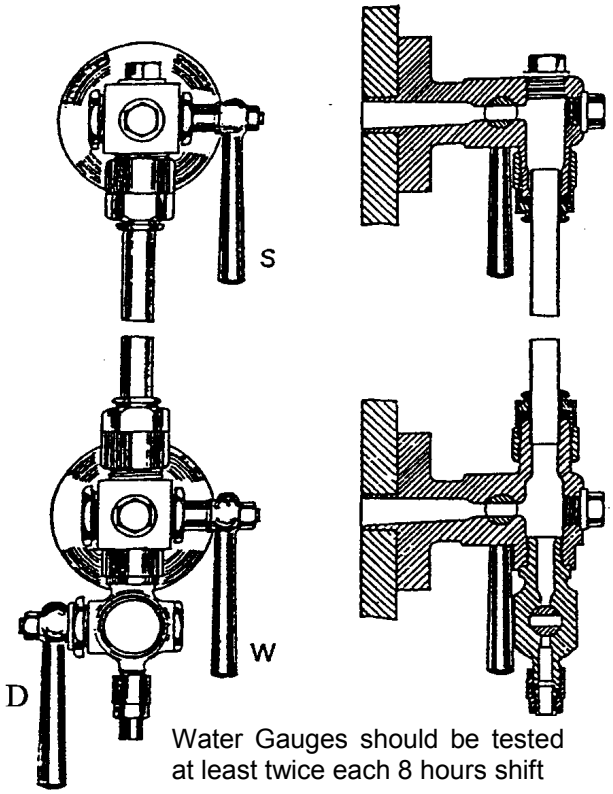
Maintenance and Testing of Water Guages

It is Dangerous to operate a steam boiler unless the water gauge or gauges are in good order and the true level of the water within the boiler can be observed at all times. Personnel in charge of boiler plant should be familiar with the operation and testing of the water Gauges.

Testing water Gauges directly attached to Boiler

The objects of testing are to ensure that there is a clear steam way at the top and also a clear water way at the bottom.
With ordinary water gauges the procedure is as follows
Open the drain cock (D) allowing a clear blow through of steam and water. Close the steam cock (S). There should be a clear blow through of water , thus testing the water passage. Open the steam cock (S) and close the water cock (W). There should be a clear blow through of steam., thus testing the steam passage. Close the drain cock (D) , thus allowing the water gauge to first be filled with steam. Open the water cock (W) and allow the water to return to the proper level in the glass. Check that all cocks are set correctly.

Sequence of Operation.
1: Open Drain Cock (D)
2: Close Steam Cock (S)
3: Open Steam Cock (S)
4: Close Water Cock (W)
5: Close Drain Cock (D)
6: Open Water Cock (W)
7: Check that all cocks are set correctly



Water Gauges should be tested at least twice each 8 hours shift

The Authorised attendant should systematically test the water gauges several times a day and should be provided with suitable protection for the face and hands, as a safeguard against scalding in the event of breakage of glasses

Water Gauge Glass Guards

The water gauge glass guard should be kept clean. When the guard is being cleaned in place, or removed for cleaning, the water gauge should be temporarily shut off. Make sure there is a satisfactory water level before shutting off the gauge and take care not to touch or knock the water gauge glass. After cleaning , and when the guard has been replaced , the water gauge should be tested and the cocks set in the correct positions.

Maintenance

The water gauge should be thoroughly overhauled at each annual survey. Lack of maintenance can result in hardening of packings and seizure of cocks. If a cock handle becomes bent or distorted special care is necessary to ensure that the cock is set to full open. A damaged fitting should be replaced or repaired. Water gauge glasses often become discoloured due to water conditions, also they become thin and worn due to erosion. Glasses, therefore, should be renewed at regular intervals. A stock of spare glasses and cone packings should always be on hand.
Remember that if the **Steam passages are choked** a false high water level may be given in the gauge glass. After the gauge has been tested a false high water level may still be indicated.
If the **Water Passages are choked** a false high or low water level may show in the glass. After the glass has been tested it will remain empty for a time unless the actual water level is dangerously high.
If the water gauge is connected to a hollow column, when testing the water gauge steam connections, any cock on the connected steam pipe should be closed with the water gauge steam cock and when testing the water guage water connections,any cock on the connected steam pipe should be closed with the water gauge steam cock the
Water Gauges should be Well Illuminated

Standard Terms & Conditions
for the Hire of Shell Type Boilers

1. Hire Rates are based on a minimum period of 1 week or as otherwise stated in our official quotation.

2. Hire charges commence from the date of despatch from our Lye works and payment to be made on receipt of our invoice.

3. A Minimum of 24 hours notice is to be given by the customer for the termination of hire.

4. The customer is responsible for the offloading and loading of our equipment on site unless otherwise agreed in writing.

5. The customer is responsible for ensuring free access on site for transport and crane and for a level hardstanding suitable for accepting the operational weight of a Boiler.

6. Delivery and collection charges will be in accordance with the rates specified in out original quotation.

7. In the event of Boiler failure for whatever reason Bradlee Boilers Ltd must be contacted before any involvement from a third party.
Visits requested by the customer during the hire period will be charged to the customer in all cases where evidence is available to show that the failure occurred due to any other reason other than where such visits are occasioned by design, manufacture, workmanship faults or any other reason occasioned by the actions or default of.

7a. The responsibility for failure will be determined at the time of our visit and written agreement will be required by the customers representative.

8. The customer is to arrange for a competent qualified engineer to be available to carry out all daily maintenance procedures as instructed by our commissioning engineer.

8a. Bradlee Boilers service Department will accept emergency breakdown calls between 0800 hrs - 1800 hrs Monday to Friday. For extended holiday periods, i.e Christmas/New Year the customer can apply for emergency telephone numbers of the duty service engineer.

8b. A Full 24 hour emergency service is not available except by prior written agreement and will only cover periods of up to three days duration in each case.

9. The customer is responsible for the provision of fuel, water treatment chemicals and electrical supplies to our Boiler Unless otherwise agreed in writing.

10. For Burners requiring pilot ignition the customer is responsible for the supply of natural gas or bottled gas supplies.

11. Feed water treatment is the responsibility of the customer using a recognised national companies treatment system. The customer is responsible for any damage to the Boiler and for descaling deposits within the waterways caused by incorrect water treatment.

12. A copy of the insurance certificate will be supplied with each Boiler.

Standard Terms & Conditions
for the Hire of Shell Type Boilers (Continued)

12a The customer is to insure through their own insurance company for:

1. Loss or damage to our plant by fire, explosion, frost, or theft.

2. Damage to property belonging to the customer or for which he is responsible.

3. Legal liability for damage to property belonging to the customer or for which he is responsible, directly consequent upon and solely due to explosion collapse or damage to the plant.

4. Legal liability for injury to any person or persons other than the customer and his or her employee.

5. The hirer does indemnify Bradlee Boilers Ltd against direct or consequential losses or third party liability suffered by Bradlee Boilers Ltd. We Bradlee Boilers Ltd cannot hold ourselves responsible in any shape or form for losses either direct or consequential as a result of our activities.

13. The customer is to provide adequate protection from the weather and to accept full responsibility for any failure in this respect.

14. The Boilers in our quotation are based on a equivalent evaporation from at 212oF and is an expression of the thermal rating converting the variables of feed water temperature and steam conditions to an accepted standard. It is the customers final responsibility to ensure that the boilers offered in our quotation are of adequate capacity when the site feed water temperature and pressure conditions are taken into consideration.

Important Notice to all Users of Steam Raising Plant and Associated Equipment hired to them by Bradlee Boilers Ltd

Statutory Instrument No 2169
1989
Health & Safety
The pressure systems and transportable gas containers regulations 1989

Part III
Pressure Systems

Your Attention is drawn to the section relating to operation 11-2 which states:

The user of a pressure system shall ensure that it is not operated except in accordance with the instructions provided in respect of that system.

Statutory Instrument
No 2169 1989

The Pressure systems and transportable gas containers regulations 1989

Steam Raising Plant and Associated Equipment
Hired By Bradlee Boilers Ltd

In Accordance with the requirements of the above regulations part III (Pressure systems) Section II (Operation) it is the responsibility of the plant owners to provide for any person operating the system adequate and suitable instructions for:

(a) The safe operation of the system

and

(b) The action to be taken in the event of an emergency.

It is therefore important that the following information is made available to all users of Bradlee Boilers Ltd Equipment.

Instructions for the safe operation of the System

1. Condition of Plant Suitable for Safe Operation
When taking delivery, ensure that the equipment is sound and in good order and had not suffered any damage during Transit. Damage to water level sight glasses, safety valves and similar equipment can result in unsafe operation of the plant.
(**If in doubt notify the owners immediately)**

2. Siting
Steam Boilers rely on correct water levels for safe operation. Ensure that the boiler is placed on a level and stable standing. Temporary standing should not be affected by any subsequent climatic conditions i.e high rain falls.

3. Electricity Supply
Ensure the correct electricity supply is available and that the requirements of suitable neutrals and earths are complied with. It is recommended that all electrical supply connections be carried out by fully qualified personnel and that the installation be in strict accordance with the necessary electrical safety standards. All three phase motors must be checked for correct rotation.

4. Fuel Supply
The Quality of Fuel should be in accordance with that specified by the owners and all feed pipes and tanks to be installed in such a manner to prevent fire or hazards to operating personnel.

5. Commissioning
Commissioning must be carried out in strict accordance with the owners instructions and any defects notified immediately. As supplied the equipment is in good order and safe to operate, however it is the responsibility of the user to ensure that correct and safe commissioning is carried out and subsequent day to day operation is safe and without hazard. Should the user be unable to accept such responsibility the owners must be informed immediately

6. Normal Operation
Detailed operational instructions are supplied with each item of equipment and the plant should be operated in accordance with these.

On no account operate at higher pressures then the working pressure shown on the Plant

In relation to the safe operation of steam boilers particular attention must be paid to water level sight glasses and water level controls.

7. Water Level Sight Glass Gauges
Details relating to the correct operation and maintenance of these items is supplied with the boiler and should be strictly adhered to.

It is important that water gauges are tested at least once every 24 hours and where shift working is in progress every shift

8. Water Level Controls

Details relating to the testing of this equipment is supplied with the Boiler

It is Important that the water level is lowered every 24 hours and the controls tested to ensure continued safe operation of the boiler. Any defect should be notified to the owners immediately.

9. Records

When possible it is recommended daily records be kept relating to plant operation particularly in relation to safety tests carried out.

Such information will show trends relating to a change of operation or any possible faults developing within the plant. The keeping of such records helps to enforce the discipline of daily testing and greatly assist if problems occur.

10. Associated Documentation

The following documents should be read in conjunction with these notes.

1. Guide to Commissioning Boilers
2. Instructions for starting up Bradlee Hire Boilers from Cold.
3. Maintenance and testing of water gauges.
4. Testing of water level controls.
5. H.S.E Guidance note PM5
6. Standard terms and conditions for the hire of shell type boilers
7. The action to be taken in the event of an emergency

The Action to be Taken in the Event of an Emergency

1. Disconnect Equipment from Electricity Supply
2. Disconnect or Isolate Equipment from Fuel Supply
3. Keep Personnel away from hazardous area
4. Inform owners as soon as possible giving as much information as possible

Test Procedure for Checking Bradlee Type Boiler Water Level Controls

The following tests should be carried out under normal steaming conditions

1. Switch the feed pump OFF

2. Open blow down valve and allow water level to drop with burner firing.

3. When water level reaches first low level burner will be extinguished and first low level indicator light will be illuminated together with audible warning press mute button to stop bell.

4. Allow water level to fall down to second low level when second low level indicator light will be illuminated, together with audible warning - press mute button to stop bell.

5. Close blow down valve.

6. Switch feed pump to **Auto** and observe rising water level. when water recovers above first second low - light will extinguish

7. Continue to observe rising water level, when water recovers above first low - light will extinguish and burner will refire.

8. Continue to observe rising water until normal working level is reached when pump will automatically stop.

9. Press Reset Button.

10. Boiler will now be returned to normal operation.