

Standpipe Assemblies



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Caution: Before proceeding, follow any and all plant lock-out/tag-out procedures required. Any trips/alarms should be bypassed to prevent any false trips/alarms when servicing the equipment. Verify that all power is turned off to any applicable equipment. If under pressure, the equipment should be isolated, or the boiler should be shut down before proceeding with the installation. Open drain valve to eliminate any trapped pressure. All inspection and installation steps should be performed by a qualified technician and should be executed in accordance with all applicable national and local codes and plant procedures.

Only use a properly calibrated torque wrench to guarantee that the specified torque values are achieved. Make sure all bolting is clean and lubricated per the applicable Reliance IOM.

Unpacking and inspection

Upon receipt of the Boiler Drum Level instruments, examine the contents of the container(s) for damage. Report any faulty conditions as soon as possible to your carrier to avoid acceptance of damaged goods. Clark-Reliance will not be responsible for goods damaged in shipping or storage, or subsequent loss or damage due to improper storage or exposure as a result of damage to shipping containers. Submit a digital photo of any damaged equipment and container to Clark-Reliance, if possible.

Verify that all materials are present as recorded on the Packing List provided with each shipment. Report any discrepancies to Clark-Reliance immediately. Have the Clark-Reliance order number and shipping waybill available at the time of your call.

Handling

Your Clark-Reliance shipment has been carefully packed. However, the shipment may include spare parts, temporary water gages for “Boil-out” purposes, maintenance instructions, and engineering drawings.

Upon receipt of the order, the equipment and above items should be identified and verified against the packing list. Any documentation that has been provided should be directed to the appropriate personnel.

Care should be exercised as the items are uncrated. The shipment may contain fragile glass components. If any equipment appears to have been damaged from shipment, please contact your local Clark-Reliance representative or the factory immediately.



Storage

Clark-Reliance Boiler Trim products should be stored in a dry and sheltered area prior to installation. The equipment provided may consist of electrical items that are intended for either indoor or outdoor use. As a matter of good practice, dry storage will eliminate the potential for water damage. The temperature of the storage area should not exceed 150 degrees F. (65.5 degrees C) or drop below 32 degrees F (0 degrees C).

ASME Section I PG-60 Boiler Code Requirements Summary

Boilers operated at pressures of 400 PSIG and below shall be provided with one direct reading gage glass which must be kept in continuous service. Boilers operated at pressures of 400 PSIG and above shall be provided with two water gage glasses on the same horizontal lines. **Note:** When the gage glasses are not continuously visible to the operator, two Remote (Indirect) Reading Gages must be used to meet Section I requirements, along with one Direct Reading Gage Glass which may be valved-off [only when operating above 400 PSI (3 MPa)] but must be maintained in serviceable condition. The two Remote Level Indicators must operate independently and be continuously displayed. If operating below 400 PSI, 2 remote indicators are required when the gage glass (which must always be in service) is not continuously visible by the operator.

When shutoff valves are used in piping to a water column, they should be of a type to meet all national and local code requirements and must be locked open. The steam connection pipe should either be horizontal or slope from the drum down to the water column. The water connection pipe should be horizontal or slope from the column down to the drum. Provide for cleaning the piping by installing crosses with plugs, or blind flanges at all right angle turns.

Water columns shall be fitted with a drain valve (3/4" pipe size minimum), with a suitable connection to a safe independent point of discharge. The gage glass shall be fitted with a drain valve, with a suitable connection to a safe independent point of discharge.

In PG-60.1, Section 1 of the ASME Boiler Code requires the lowest visible water level in a gage glass or Remote Level Indicator on water tube type boilers shall be at least 2" – 3" above the lowest permissible boiler water level, as determined by the boiler Manufacturer. Also, the visible range of the gage glass shall cover the full operating range of the boiler. PG-60.1.2 requires that a mechanism (pull chains) will be installed when either the lower or upper valve is more than 7 feet above the operating floor.

Note that Water Columns are considered to be a Standard Pressure Part as defined in PG-11 of the ASME Boiler Code. A Code stamp or outside inspector for manufacturing is not required.



ASME Section I Water Gage Requirements

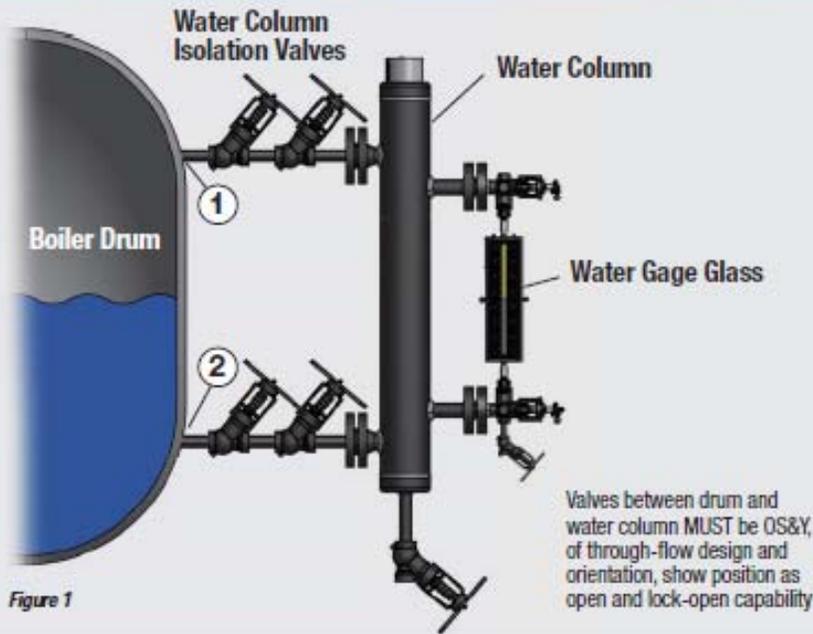


Figure 1

Boilers rated up to
400 PSI (3 MPa)
 MAWP (Maximum Allowable Working Pressure)



At Least One Direct Reading Gage Required
 (Gage Must be Kept in Continuous Service)

Boilers rated over
400 PSI (3 MPa)
 MAWP (Maximum Allowable Working Pressure)



Two Remote (Indirect) Level Indicators on Continuous Display for the Operator + One Direct Reading Gage are Required

or

Two Direct Reading Gages in Service and Continuously Visible to the Operator

or

One Gage Glass in Continuous Service with a Camera System and an Indirect Remote Level Indicator

Note: When the gage glass is not continuously visible to the operator, two Remote (Indirect) Reading Gages are used to meet Section I requirements, the Direct Reading Gage Glass may be valved-off [only when operating above 400 PSI (3 MPa)], but must be maintained in serviceable condition. The two Remote Level Indicators must operate independently and be continuously displayed. If operating below 400 PSI, 2 remote indicators are required when the gage glass (which must always be in service) is not continuously visible by the operator.

Please refer to Section I for all requirements. Contact your State Inspector and/or Insurance Inspector for further local and state requirements.

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Installing the Standpipe

If welding the Standpipe in place with Socket Weld or Butt Weld connections, use

- ASME Section I and II Code acceptable materials of construction
- Welding processes recognized by the applicable Code sections
- Also, visually inspect all Standpipe welds and it should be hydrostatically tested at 1-1/2 times the design pressure.

When using flange connections, use ASME Code acceptable bolting, the proper gaskets rated for the flange size and class, and the correct torque value for the flange size and class. Make sure the bolting is lubricated with Nickel based high temperature lubricant.

Refer to the proper IOM when installing any water gage valves and gage glasses.

Boil-out Gage Practice and Policy

On new boiler installations, it is common procedure to initially operate the boiler at a reduced pressure for a short time to 'cook out' foreign materials (pipe joint compound, grease, oil, flux, etc.) that remain in the drum or other pressurized parts of the system after the boiler has been constructed. During this boil-out period, most of the suspended or dissolved debris is flushed out with blow-down discharges. However, a small amount of residue is unavoidably deposited as a film on all internal wetted surfaces... including those of the water gage glass. This type of scum layer is nearly impossible to remove by blowing down the gage glass, particularly if the gage glasses are protected by mica shields, as they must be, in high pressure installations. As a practical matter, it is more expedient to employ an inexpensive temporary level gage, which can be discarded or returned after the boil-out procedure, rather than to use then rebuild the gage glass intended for regular service. For boil-out purposes on new boiler applications with Standpipe with Gage Glasses, Clark-Reliance provides a temporary level gage at no charge, under one of the following conditions:

- 1) When a Prismatic, Flat Glass, or Simpliport gage having $\frac{3}{4}$ " O.D. end nipples is supplied as part of a water column, and the boil-out pressure will not exceed 200 PSIG, Clark-Reliance automatically will furnish for temporary boil-out service the following parts at no charge:
 - 1 pc. – $\frac{3}{4}$ " O.D. tubular glass gage cut to the proper length
 - 2 pcs. – Rubber packing rings (*)
 - 1 pc. – Low visibility shield (so that low vision in the tubular glass gage is the same as in the gage glass that will be used for regular service).

At the conclusion of the boil-out procedure, all of the above parts should be discarded. When the gage having stainless steel nipples is installed, it is essential that the appropriate (non-rubber) packing rings are used, to assure durable sealing of the stainless steel nipples.

- 2) When a gage glass having flanged connections is supplied as part of a water column, and the boil-out pressure will not exceed 200 PSIG, Clark-Reliance will furnish the following parts at no charge:
 - 1 set – VB991 gage valves with $\frac{1}{2}$ " MNPT connections
 - 1 pc. $\frac{5}{8}$ " O.D. tubular glass gage cut to the proper length



1 pc. – Low visibility shield.

The boil-out gage valves should be temporarily installed in the ½” FNPT “Test” connections in the flanges of the regular water gage shut-off valves, which are on the water column. This equipment may be discarded after the boil-out has been completed.

3) On installations like the above, but where the boil-out pressure will exceed 200 PSIG, consult Clark-Reliance to discuss options for an appropriate temporary use gage.

* Bronze valves are supplied with Neoprene packing rings. These are to be used for the boil-out procedure. Steel valves are supplied with packing cartridges and separate rubber packing rings (to be used for boil-out).

Blowdown Procedure

The importance of proper cleaning and maintenance of the Standpipe and the water gage glass, or sight glass, cannot be stressed enough. The water column must be kept clean to ensure the water level in the gage glass accurately represents the water level in the boiler. Note that the frequency and method of blow-down may affect service life and performance of the water column and gage glass.

The water gage glass on a boiler enables the operator to visually observe and verify the actual water level in the boiler. However, if not properly cleaned and maintained, a gage glass can seem to show that there is sufficient water when the boiler is actually operating in a low or low water condition. A stain or coating can develop on the inside of the glass where it is in contact with boiling water. After a time, this stain gives the appearance of water in the boiler, especially when the glass is completely full or empty of water.

Users must consider proper blow-down procedures, in order to keep the water piping clean, even if the probes remain clean for extended operational periods. By simply opening the drain valve to conduct a blowdown, this does not ensure flow thru the water piping between the drum and the equipment, even when the water in the Standpipe is pushed out the drain connection with steam. The risk of blockage in the steam piping is low. The risk for sediment build-up in the water piping is greater. Therefore, periodic blowdowns are suggested on a quarterly to monthly basis. The frequency can be determined by the user and plant rules. The user may also consider their water quality as an influencing factor to determine the blowdown frequency. After performing the blow-down procedure, if the water level does not return to normal promptly, the connecting piping may be partially clogged and have to be cleaned.

Clark-Reliance suggests the following blow-down procedure:

1. Close both the steam and water valves between the boiler drum and the Standpipe or water gage.
2. Open the drain valve fully on the bottom of the Standpipe or water gage.
3. To clean the water piping, slowly open the water valve (lower valve) to allow a flow of water to pass through the line and out the drain. This will flush the water line and help keep sediment from collecting and causing a blockage in the line.
4. Allow the water to flow through the line for 20 seconds.
5. Close the water (lower) valve.



6. Crack open the steam valve (upper shutoff valve) and allow a gentle rush of steam to pass through the probe column or water gage. The steam should not pass through for longer than 20 seconds.
7. Close the steam valve.
8. Inspect the water gage to ensure that all foreign matter is flushed from the glass or mica. If the gage is not visually clean, repeat steps 6 and 7. If the gage glass is visually clean, close the steam valve.
9. Close the blow-down valve and open the steam and water valves, slowly bringing the equipment back to a normal operating level.
10. Water should enter the gage glass quickly when the blow-down valve is closed. This will indicate that the line flows freely.

Refer to IOM R500.E156D for further details or see the video at <http://www.relianceboilertrim.com/blowdown-procedure/>

Recommended Maintenance and Annual Inspections

The Standpipes themselves require little or no maintenance. Regarding any recommended maintenance procedures or annual inspections for the gage glasses and water gage valves, we suggest the equipment should be inspected on an annual basis, or more often depending on plant rules, for contaminated gage glasses and for any leakage that may occur.

Caution: Before proceeding, follow any and all plant lock out - tag out procedures required. Verify that all power is turned off to the probes. If under pressure, the equipment should be isolated, or the boiler should be shut down *before* proceeding with the installation. Open drain valve to eliminate any trapped pressure. All inspection and installation steps should be performed by a qualified technician and should be executed in accordance with all applicable national and local codes.

Hot Torque Procedure

When a new piece of equipment, whether a Gage Glass or a Probe type device is installed, the hot torque procedure must be performed when specified. This ensures that all bolting and components are properly seated for optimum performance. This procedure must also be performed after any maintenance is done to the equipment. Only the affected components, such as the installation of a new probe or glass kit, need to be hot torqued. Note that P4000/P4100 Series Simpliports and FSB type probes do not require a hot torque.

All work must be done by a qualified technician. All plant rules and procedures must be followed, including any lock out / tag out requirements. Verify that all alarms and trips have been by-passed on probe columns before any maintenance is performed, to prevent any false alarms or wiring hazards.



The hot torque procedure should be performed as follows:

- 1) Isolate the gage glass or probe device from any pressure.
- 2) Fully open the drain valve to evacuate any built up pressures and to allow the contained steam and water to escape during equipment warm up.
- 3) Slowly open the steam valve to allow a gentle rush of steam to flow through the equipment. This should take approximately 5 –10 minutes. The observer should see the High Temperature lubricant “sizzling” and smoke emanating from the gage on the column. This is an indication that the equipment has reached operating temperatures.
- 4) When the equipment has been properly heated, close the steam valve. The drain valve must remain open to allow any residual steam or pressure to escape.
- 5) Immediately re-torque the equipment to the correct values stated in the applicable instruction manual. There should be movement of 1/8th of a turn or more.
- 6) If there is no movement of the bolting, the equipment was not heated properly. Repeat the procedure.
- 7) Once the hot torque procedure is completed, close the drain valve, and the equipment can be put back into service. Carefully check for any leaks in the equipment and verify proper operation of all illumination or other accessories.

Other Reference IOMs

R500.E221	Bronze Water Gage Valves
R500.541	Steel Water Gage Valves
R500.E153	Prismatic Gage Glasses
R500.E153	Flat Glass Gage Glasses
R500.E241	Simpliport Gage Glasses
R500.E235	DuraStar LED Illuminators for Flat Glass Gage (Ordinary Location)
R500.E245	Simpliport 180 LED Illumination (Ordinary Location)
R500.E239	Hot Torque Procedure
R500.E156	Blowdown Procedure

Warning: If this equipment is used in a manner not specified by Clark-Reliance, the protection provided by the equipment may be impaired. Only replacement parts manufactured by Clark-Reliance should be used to ensure safety and reliable operation. The use of non-Clark-Reliance parts will void the factory warranty and any agency approvals.

Order genuine Clark-Reliance replacement parts at: <http://parts.clark-reliance.com> or contact your local Clark-Reliance Representative.

Any additional questions should be directed to your local Clark-Reliance Representative, or to the Factory: Phone: (440) 572-1500 or email at RelianceAppEng@clark-reliance.com.

Visit our resource library at www.RelianceBoilerTrim.com for other IOMs, drawings, product catalogs, and videos.

