

Reliance® SG800 Series Steel Water Gage Valves





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<u>Note</u>: Design variations in Steel Water Gage Valves necessitate "typical" illustrations, but basic elements are similar in function and appearance.

STORAGE and HANDLING

The Reliance® Steel Water Gage Valves meet or exceeds all applicable specifications when shipped from the factory. The equipment should be stored in an area protected from the elements and corrosive fumes, in a secure manner where they can neither fall, nor be struck by other objects. Avoid placing any objects on the valves or Boil-out Kit (if furnished) at any time. 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).

Unpacking and inspection

Upon receipt of the Boiler Drum Level instruments, examine the contents of the container(s) for damage. Care should be exercised as the items are uncrated. The shipment may contain fragile glass components. 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.

Important:

Before proceeding, follow any and all plant lock out - tag out procedures required. If under pressure, the equipment should be isolated, or the boiler should be shut down before proceeding with the installation. Open drain value 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.

INSTALLATION OF NEW SG SERIES WATER GAGE VALVES:

Models and connection information:

Model No.	Vessel Connections	Ball Check Lower	Ball Check Upper	Union	Gage Connection	Max. Pressure
SG854	3⁄4" MNPT	No	No	No	¾" O.D. Nipple	1500 PSI
SG855	3⁄4" MNPT	Yes	Yes	Yes	¾" O.D. Nipple	1500 PSI
SG854F-300	3⁄4" MNPT	No	No	No	3⁄4"-300# R.F. Flange	605 PSI
SG854F-600	3⁄4" MNPT	No	No	No	3⁄4"-600# R.F. Flange	1135 PSI
SG854F-900	3⁄4" MNPT	No	No	No	3⁄4"-900# R.F. Flange	1500 PSI
SG860	¾"-900# R.F. Flange	No	No	No	¾" O.D. Nipple	1500 PSI
SG861	¾"-900# R.F. Flange	Yes	No	No	¾" O.D. Nipple	1500 PSI
SG861U	¾"-900# R.F. Flange	Yes	Yes	No	¾" O.D. Nipple	1500 PSI
SG885	¾"-600# R.F. Flange	Yes	No	No	¾" O.D. Nipple	1135 PSI
SG885U	¾"-600# R.F. Flange	Yes	Yes	No	¾" O.D. Nipple	1135 PSI
SG886	3⁄4" MNPT	Yes	No	No	¾" O.D. Nipple	1500 PSI



When mounting Steel Water Gage Valves, make sure they are mounted in exact alignment, especially when tubular glass is used during Boil-out procedures. Any angular or offset misalignment of the valves will strain the tubular glass and may cause early failure. When installing the armored type gage glass, any misalignment could cause a leak from the packing cartridge that may result in damage to the valve or gage glass. When mounting the gage glass or tubular glass in vertical mounting applications, the overall length of the gage should be 3 ¼" less than the valve centers.

When mounting water gage valves and a gage glass directly to the vessel, the valve centers must be secured to prevent movement which could result in leakage around the gage glass nipple packing. Use of a Tie Bar with U-bolts, water column, or Standpipe to keep the water gage valve centers from expanding is recommended.

Installing the valves:

The valve set contains two valves: an upper and a lower. The lower valve has a $\frac{1}{2}$ " FSW/FNPT drain connection and must be installed on the lower connection to guarantee proper operation of the valves and gage glass.

Reliance steel water gage valves typically are furnished with three types of vessel connections:

- 1) 3⁄4" Male NPT
- 2) Flanged
- 3) Female Socket Weld
- If furnished with male NPT connections, coat the threads with a pipe joint compound such as TYTE-UNYTE® Thread Sealing Compound or equal. Assemble the upper and lower valves on to the vessel connections making sure there is no angular or offset misalignment of the valves. Note that the valves may be seal welded to the connections if needed. This is normally recommended for installations that operate over 900 PSIG. Welding is to be done by ASME Section IX qualified welders and with approved welding procedures and Section II approved welding materials. Note: When field welding any Water Gage Valves or Isolation valves, it is recommended that the valve be in the open position in order to dissipate heat properly.
- If the valves are furnished with female socket weld connections, care must be taken the valves are oriented so there
 is no angular or offset misalignment. Welding is to be done by ASME Section IX qualified welders and with approved
 welding procedures and Section II approved welding materials.
- Flanged valves must be assembled to the mating flanges with the proper gaskets, studs, and nuts that are used for the flange size, class, and flange face. The studs should be lubricated with high temp copper based anti-seize lubricant or equal. Tighten the fasteners to the recommended torques value that is associated with the flange size and class.

Attaching the Operating Levers Tools required: 1/2" wrench

To set operating levers in the correct position, close the valve stems tight. Loosen the levers by removing the cap screws. Pull levers forward and turn, with right hand end down, until they are positioned 45° to horizontal centerline of valve. Push the lever back to engage the sprocket teeth at the nearest point to the 45° setting. If the levers do not line up, additional adjustment can be obtained by rotating the sprocket wheel 180° on the valve stem.

Attaching the Operating Chain and Pull Handles

Tools required: 1/4" wrench, pliers

Attach the chain to each side of the upper valve with the "S" hooks, which are included in the chain package. At this stage the levers should be parallel with each other. Attach the chain on the left side of the valve lever to the "S" hook on the lower valve. Insert the chain on the right hand side of the lever into the bronze locking fixture (Figure 1). Pull the chain tight between the two valves and tighten the locking screw. This is important in order to obtain full closure of both valves. If there is some slack in the chain on the left side of the valves, it has no adverse effect on the actuation of the valves for opening. Both chains should extend to a safe elevation below the water gage, usually one platform or 10 feet below. Be sure to have water gage valve-operating chains of equal length.







Each pull handle comes equipped with "S" hooks. Insert the free end of each "S" hook in the bottom link of the correct chain. The handle marked 'Open" is to be installed on the left-hand chain. The handle marked 'Closed' is to be installed on the right-hand chain. Close each hook onto the chain with pliers. Refer to IOM Form E207-A for additional instructions.

Maintenance:

Caution: Prior to any maintenance and disassembly of the water gage valves, first isolate the valves and be sure that the valves are relieved of all internal pressure, the temperature is ambient, and have been drained or purged of any water. Failure to do this may result in a sudden release of pressure and fluids, which could cause physical injury to personnel.

Repacking the valves:

1. Remove stem bushing locking set screw; loosen with a 5/32" hex wrench to clear bushing threads (Figure 2).



Stem bushing set screw

Figure 2

- 2. Remove stem, stem bushing, packing yoke, and <u>all</u> old packing material. Inspect packing chambers for pitting or steam cut. Polish as necessary with fine emery cloth. Replace valve if the chamber cannot be repaired with fine emery cloth.
- 3. Install new packing cartridge(s). Use SG854-4 stem packing cartridge for stem applications and SG854-5 nipple packing cartridge on valve models with nipple connections for the water gage.
- 4. Lubricate threads of stem. stem bushing, and cap screws with Molykote "G" high temperature lubricant, or equal. Install packing washer, yoke, stem, and stem bushing.
- 5. Retighten stem bushing locking set screw.
- 6. Replace yoke and cap screws lubricated with Molykote "G" high temperature lubricant, or equal and tighten with a 5/8" open-end wrench to avoid over-torqueing and binding the stem.
- 7. Crack open valves to allow gradual warm-up of gage glass for several minutes.
- 8. Close drain valve and further tighten packing yoke screws, if necessary, to stop leakage.
- 9. Open valves and check again for leakage once valves and packing have reachedfull operating temperature.



Repacking the seat:

- 1. Remove stem bushing set screw; loosen with a 5/32" hex wrench to clear bushing threads (Figure 2).
- 2. Remove stem, stem bushing, packing yoke, all old packing, and packing washer. Inspect packing chambers for pitting or steam cut. Polish as necessary with fine emery cloth. Replace valve if the chamber cannot be repaired with fine emery cloth.
- 3. Insert a 3/4" socket with an extension into the valve body, onto the valve seat and remove valve seat by rotating counterclockwise. Note: old style valves contain a separate valve seat and seat holder. Remove seat holder with a 1/2" socket extension.
- 4. Lift out seat and seat gasket. Dispose of the gasket.
- 5. Clean and lubricate threads of seat with Molykote "G" high temperature lubricant, or equal.
- 6. Install new seat gasket and new seat. Tighten seat using <u>40</u> ft.-lb.(54 newton-meters) torque.
- 7. Lubricate threads of stem, stem bushing, and cap screws with Molykote "G" high temperature lubricant, or equal. Install packing washer, yoke, stem, and stem bushing.
- 8. Repack stem as described above. Retighten stem bushing locking set screw. Be sure to check for leakage and re-tighten cap screws (if necessary) shortly after boiler is returned to service.

FIELD INSTALLATION OF LIVE LOADING KIT (RK-34) FOR SG800 SERIES WATER GAGE VALVES:

The RK-34 Live-Loading kit is available to improve the performance and service live of Clark-Reliance Steel Water Gage Valves that are already installed in the field. Live-loading offers a more leak-free valve, resists damage from vibration, pressure variances, time and service, and other wear factors.

Installation steps are as follows:

- 1. Remove stem bushing locking set screw; loosen to clear bushing threads (Item G). Remove and discard the old cap screws and flat washers from the packing gland (Item E).
- 2. Remove the stem bushing (Item B) and the stem (Item A). Then remove the packing gland (Item E) and the stem packing cartridge (Item F).
- 3. Inspect packing chamber for pitting or steam cut. Polish as necessary with fine emery cloth. Replace valve if the chamber cannot be repaired with fine emery cloth.
- 4. Install the new packing cartridge (Item F) in the packing chamber. Then re-install the packing gland, stem and stem bushing. Tighten the stem bushing and install the lock screw.
- Lubricate both sides of the spring washers (Item H) and the cap screws (item C) with Molykote "G" high temperature lubricant, or equal. Install the washers and cap screws as shown in Figure 3. Note the orientation of the spring washers.
- 6. Tighten the cap screws evenly to guide the packing gland squarely into the packing chamber. Apply 10 ft-lbs of torque to each cap screw.
- 7. Cycle the valve several times to assure that the stem will operate smoothly. Reassemble the operating chains.



ITEM	QTY	DESCRIPTION	
Α	1	* Valve Stem	
в	1	* Stem Bushing	
С	2	Cap Screw	
D	4	Flat Washer	
E	1	* Packing Gland	
F	1	Packing Cartridge	
G	1	 Lock Screw 	
н	8	Spring Washer	

Indicates items not furnished in repair kit.

Figure 3



REPLACEMENT PARTS FOR SG800 SERIES VALVES

PART NO.	DESCRIPTION				
X174212	Washer (Formerly M40-10)				
SG754-2	Packing Yoke				
X172341	Hex Head Cap Screw (Formerly SG754-5)				
SG854-2	Stem Bushing				
	BG403R-2L Upper Lever				
	BG403R-2U Lower Lever				
RK-1D	BG403RS-1 Sprocket - (2)				
	X172120 Hex Head Cap Screw (Formerly BG403R-13) - (2)				
	X174130 Lock Washer (Formerly BG403R-14) - (2).				
	BG403R-16 "S" Hook - (4) required				
RK-1E	BG403R-18 Pull Handle, L.H. "Pull to Open"				
	BG403R-19 Pull Handle, R.H. "Pull to Close"				
	SG454-24 Hardened Hex Head Valve Seat				
	SG854-4 Stem Packing Cartridge				
PK-3P	SG754-3 Packing Washer				
INN-SIX	SG854-5 Nipple Packing Cartridge				
	SG854-1 Stem				
	X175500 Seat Gasket (Formerly E10-10)				
RK-3RBC	Same as RK-3R Except w/ SG454-25 Seat for models w/ Ball Checks (use Part No. RK-3R)				
	Live Loading Valve Stem Repair Kit Including:				
	SG854-4 Packing Cartridge				
RK-34	X173181 Cap Screws - (2)				
	X174211 Flat Washers - (4)				
	SG854-3 Spring Washers - (8)				
RK-49	Live Load Kit for Nipple Packing (NOTE: Must have adequate clearance for this option, Consult Factory)				
RK-50	Chain Wheel Conversion Kit for Lever activated Steel Valve Set				
SG454-24	Hardened Hex Head Valve Seat				
SG454-25	Seat for Upper SG800 Series Valves w/ Ball Check Feature				
X175500	Seat Gasket (Formerly E10-10) (NOTE: Replace Seat Gasket when replacing Seat)				
X173121	Set Screw for Locking Stem Bushing to Valve Body				
SG854-4	Stem Packing Cartridge (Grafoil)				
SG854-5	Nipple Packing Cartridge (Grafoil)				
SG455-3	Talpiece				
SG455-4	Talpiece Nut				
RK-3A	SG460-3 Flange Gasket - (2)				
	X173890 Stud (Formerly SG460-4) - (8)				
	P3596-2HA Hex Nut (Formerly SG460-5) - (16)				
SG460-3	Flange Gasket (for use w/ SG860 Series Valve to Water Column Flange Conn.)				
SG561-3	Ball, 1/2"OD				
SG885-2	Stem Packing Washer				
SG885-3	Ball Cage				
SG460-2	Flange (3/4"-900#RF)				
SG477-2	Flange (1/2"-2500#RTJ)				
SG885-6	Flange (3/4"-600#RF)				
WC650-9	Flange (Female 3/4"-900#) Welded to Column				
C82-17	Ball Check Plug Gasket				
	Valve Body (Upper or Lower) w/o Flanged Conns., specify model				
	Valve Body (Upper or Lower) w/ Flanged Conns., specify model				



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