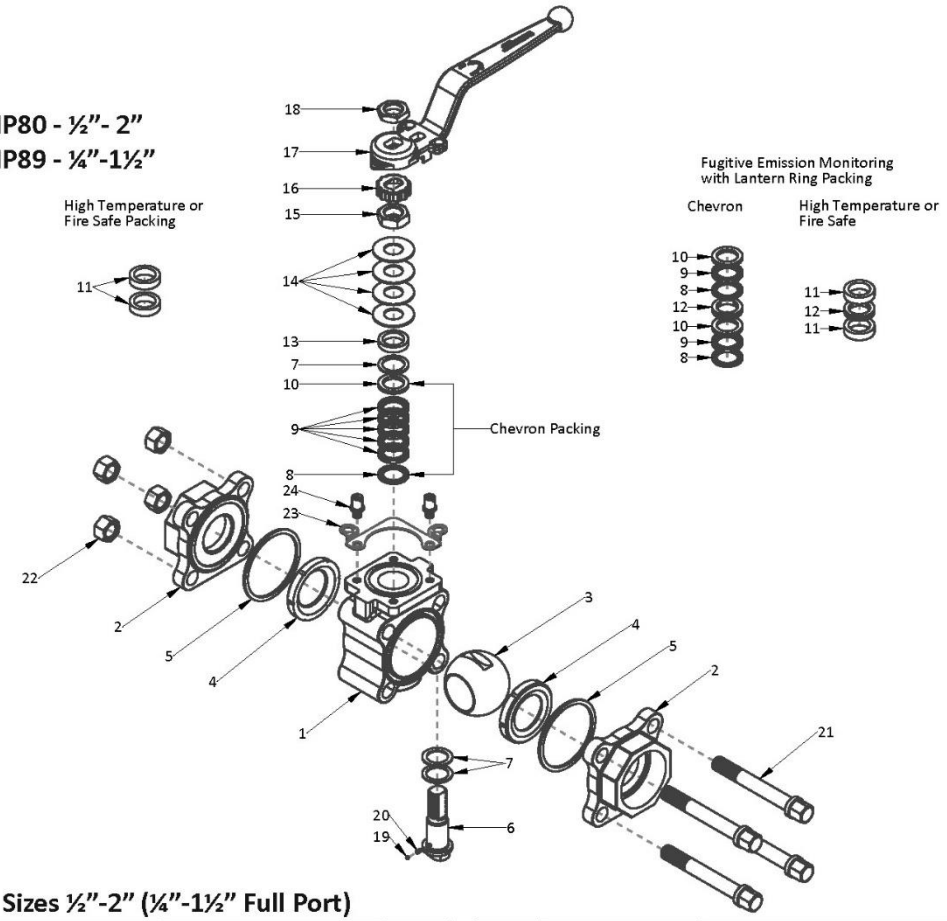
Series HP80/HP89 IOM

INSTALLATION, OPERATION AND MAINTENANCE FOR SHARPE® SERIES HP80/HP89 HIGH PERFORMANCE HIGH PRESSURE STANDARD / FULL PORT THREE-PIECE BALL VALVE

It is the responsibility of the customer to determine the suitability of Sharpe® valves products in their particular application.
Disclaimer: Supplier shall not be liable or responsible for omissions or errors in its bulletin

Sharpe® Series HP80/89

Series HP80 - ½"- 2"
Series HP89 - ¼"-1½"



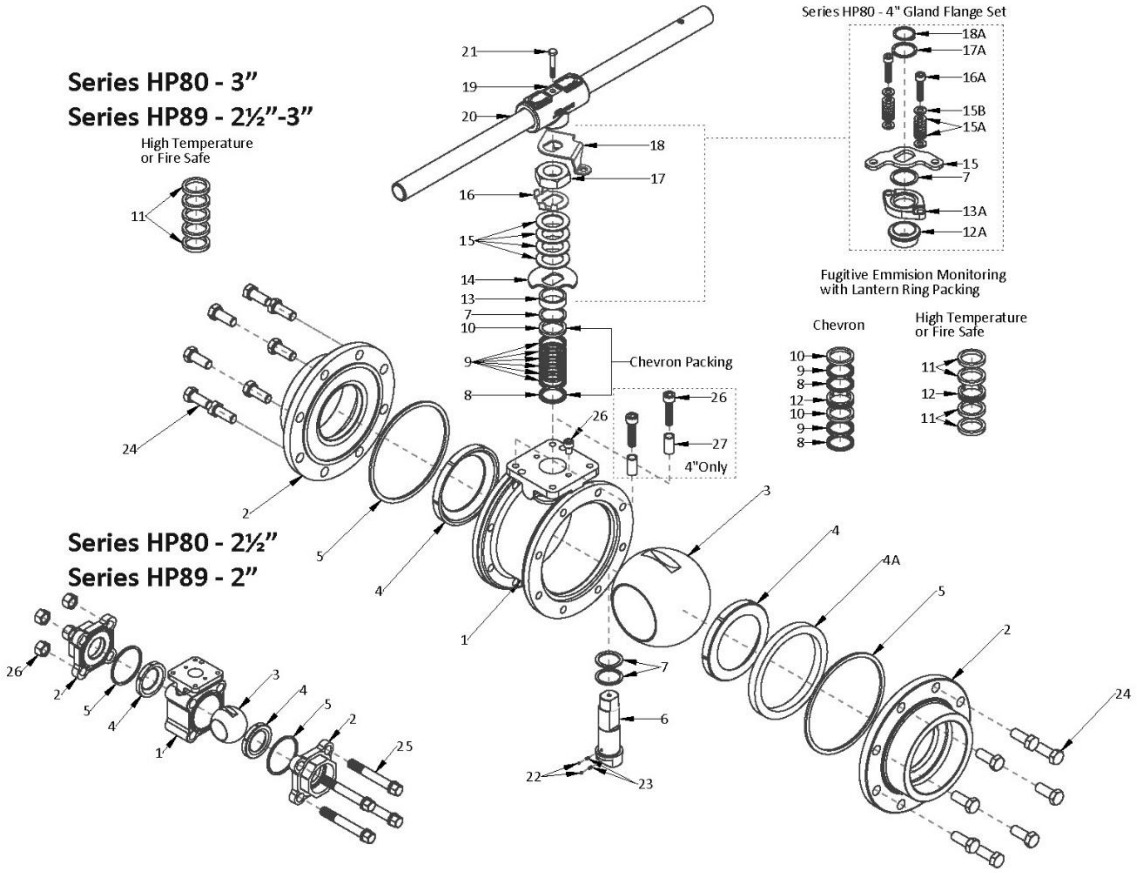
Sizes ½"-2" (¼"-1½" Full Port)

Item	Description	Material	Qty
1	Body	Carbon Steel 316 Stainless Steel	1
2	End Piece	Carbon Steel 316 Stainless Steel	2
3	Ball	316 Stainless Steel	1
4*	Seat	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
5*	Body Seal	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
6	Stem	17-4 PH	1
7*	Thrust Bearing	PEEK	3
8*	Stem Packing - Bottom	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
9*	Stem Packing - Middle	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
10*	Stem Packing - Top	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
11*	Stem Packing	Graphite	2
12	Lantern Ring	300 Series Stainless Steel	1

Item	Description	Material	Qty
13	Gland	300 Series Stainless Steel	1
14*	Belleville Washer	17-7PH	4
15	Packing Nut	300 Series Stainless Steel	1
16	Lock Tab	300 Series Stainless Steel	1
17	Handle	304 Stainless Steel ASTM A351 CF8	1
18	Handle Nut	300 Series Stainless Steel	1
19	Anti-Static Ball	300 Series Stainless Steel	2
20	Anti-Static Spring	Hard Drawn Stainless Steel	2
21	Bolt	A193 Gr B8	4
22	Nut	300 Series Stainless Steel	4
23	Lock Plate	300 Series Stainless Steel	1
24	Stop Pin	300 Series Stainless Steel	2

* These parts are used in repair kits

Sharpe® Series HP80/89



Sizes 2½"-4" (2"-3" Full Port)

Item	Description	Material	Qty
1	Body	Carbon Steel 316 Stainless Steel	1
2	End Piece	Carbon Steel 316 Stainless Steel	2
3	Ball	316 Stainless Steel	1
4*	Seat	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
5	Body Seal	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
6	Stem	17-4 PH	1
7*	Thrust Bearing	PEEK	3
8*	Stem Packing - Bottom	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
9*	Stem Packing - Middle	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
10*	Stem Packing - Top	Delrin®, Nova, Virgin PEEK, Graphite, Viton	2
11*	Stem Packing	Graphite	2
12	Lantern Ring	300 Series Stainless Steel	1
12A	Gland Positioning Ring	300 Series Stainless Steel	1

*These Part are used in repair kits.

Item	Description	Material	Qty
13A	Gland (Size 4" only)	316 Stainless Steel A351 CF8M	1
13	Gland	300 Series Stainless Steel	1
14	Stop Plate	300 Series Stainless Steel	1
15	Belleville Washer	17-7 PH	4
15A	Belleville Washer	17-7 PH	16
15B	Washer	300 Series Stainless Steel	4
16	Lock Tab	300 Series Stainless Steel	1
16A	Gland Bolt	300 Series Stainless Steel	2
17	Packing Nut	300 Series Stainless Steel	1
17A	Retainer Spring	300 Series Stainless Steel	1
18	Packing Nut	300 Series Stainless Steel	1
18A	Retainer Lock	300 Series Stainless Steel	1
19	Wrench Block	304 Stainless Steel ASTM A351 CF8	1
20	Handle Pipe	Zinc Plated Carbon Steel/ Stainless Steel	1
21	Wrench Bolt	300 Series Stainless Steel	1
22	Anti-Static Ball	300 Series Stainless Steel	2
23	Anti-Static Spring	Hard Drawing Stainless Steel	2
24	Bolt	A193 Gr B8	4/16
25	Nut	300 Series Stainless Steel	4/NA
26	Stop Pin	300 Series Stainless Steel	2
27	Stop Pin Sleeve	300 Series Stainless Steel	2

Sharpe® ball valves have been designed and engineered to provide long lasting and trouble-free service when used in accordance with the instructions and specifications herein.

• General

- The following instructions only refer to Sharpe® standard valves as described in this document.
- Keep the protective covering in place until the moment of installation. Valve performance depends upon the prevention of damage to the ball surface. Upon removal of the covers, make sure that the valve is completely open and free of obstructions.
- When shipped, valves may contain a silicon based lubricant which aids in the assembly of the valve.

• Safety Precautions

- *Before removing valve from pipeline*: media flowing through a valve may be corrosive, toxic, flammable, or of a contaminant nature. Where there is evidence of harmful fluids having flowed through the valve, the utmost care must be taken. It is suggested that at least the following safety precautions should be taken when handling the valves. More precautions may be required, refer to the media's Safety Data Sheet for additional precautions.
    1. Always wear eye shields
    2. Always wear gloves and overalls
    3. Wear protective footwear
    4. Wear protective headgear
    5. Ensure that running water is easily available
    6. Have suitable fire extinguisher ready if the media is flammable
- By checking line gauges, ensure that no pressure exits on either the upstream or the downstream sides of the valve.
- Ensure that any media is released by operating the valve slowly to the half-open position.
- Ideally, the valve should be decontaminated when the ball is in the half-open position and then leave the valve in the fully open position.

OPERATION

- Sharpe® valves provide tight shut off when used under normal conditions and in accordance with Sharpe® valves published pressure/temperature charts.
- If these valves are used in a partially open (throttled) position, seat life will be reduced and is not recommended.
- Any media which might solidify, crystallize or polymerize should not be allowed to stand in the ball valve cavities unless regular maintenance is provided.

Manual Operation

- The type of handle which is fitted to valves sizes ½" to 2" standard port and ¼" to 1½" full port is a cast handle with integral stop.
- The type of handle which is fitted to valve size 2½" standard port and 2" full port is a cast wrench block with a handle pipe and a stop plate.
- Sharpe® valves have a ¼ turn operation.
    - It is possible to see when the valve is open or closed by the position of the handle:
        - When the handle is perpendicular to the pipeline the valve is closed.
        - When the handle is parallel to the pipeline the valve is open.

Remote Operation

- Where manual operation is not required, valves may be automated for remote operation, instrument control, etc. A range of Sharpe® valves pneumatic and electric actuators are available.
- Operation will be in accordance with Sharpe® valves installation, operation and maintenance instructions for the relevant actuator.

INSTALLATION

- Sharpe® Valves cannot anticipate all of the situations a user may encounter while installing and using the valve.
- The user must know and follow all applicable industry specifications and government regulations for the safe installation and use of these valves.
- Only qualified personnel or technicians who are trained for maintenance work and have read the instructions are to install the valve.

- Misapplication of the product may result in injuries or property damage of which Sharpe® is not liable for.

- Before installing the valves, the pipes must be flushed clean of dirt, burrs and welding residues, or you will damage the seats and ball surface.
- These valves should be installed using good pipe fitting practices.
- It is recommended to use a suitable joint compound or PTFE tape on pipe threads for ease of fit-up.

MAINTENANCE

• General

- Sharpe® valves are designed to have a long, trouble-free life.
- When necessary, valves may be refurbished, using a small number of components, none of which require machining.
- Sharpe® valves are designed for easy service and assembly in the field.
- The following checks should, however, help to extend valve life or reduce plant problems.

• Stem Seal Adjustment:

- If leakage is evident from the stem packing area examine the disk springs for damage. If in good condition, tighten the packing nut until disk springs are firmly compressed, then back the nut off $^{1}/_{16}$" of a turn.
    - If not cured by simple means described above, necessitate dismantling valve
- If the disc springs are damaged, dismantle the stem down to the gland, fit new disk springs with their outer edges touching. Put the first spring concave side up and the second spring concave side down. Repeat that with the other two springs. Further maintenance necessitates dismantling of the valve.

• Leakage at Body Joint

- Check for tightness in the body connector bolts. If loose, tighten body bolts to the torque listed in Table 1 below.
    - Standard wrenches should only be used. Excessive force will only stretch or strip the bolts.
    - If there is still leakage, this will be due to damage to the body seal, and it will be necessary to dismantle the valve.

• In-Line Leakage

- Check that the valve is fully closed. If it is, leakage may be due to a damaged seat or ball sealing surface and it will be necessary to dismantle the valve.

• Leakage at Pipeline Joint

- Screwed valves: Test for tightness of screwed thread. If loose, tighten with standard wrench - excessive force will only damage the connection. Normal jointing materials should be used in the correct quantity
- Welded valves: Examine welds for leakage point.

• Refurbishing

Before disassembly of valves from the pipeline follow these instructions.

- Cycle the valve with the line pressure fully relieved before attempting to the remove the valve from the pipeline to insure pressure has also been discharged from the valve cavity.
- Bring the valve handle to the open position. Warning: trying to remove the valve body form the line in the closed position will damage the ball.
- With the valve in the open position, loosen all body bolts taking care that any leftover pressure or media has been evacuated.
- Remove the body bolts, so the valve body can be removed from between the end caps.
- Bring the body out from between the end caps and bring it to a clean space where it can be dismantled.
- Remove and discard the seat rings and body seals. Be careful not to damage the sealing surfaces.
- Support the ball to prevent it from falling out of the body and turn the handle to the closed position for its removal. Set the ball aside in clean secure area for reuse.
- To dismantle the stem assembly, first remove the handle nut and handle from stem.
- Using a wrench to prevent the stem from turning, remove the packing nut, disk springs and gland. It is normally not possible to remove the gland packing at this stage.

- Withdraw the stem through the body cavity and remove the thrust seals from the stem. Gland packing may now be removed from the top of the stem bore.
- Clean all components thoroughly and examine all seating/sealing surfaces. If the is build-up of solids which cleaning fluids will not remove, use a board, flat or blunt tool (do not scratch the machines surfaces).
- No eroded or corroded leak paths are permissible. If any are found, the part must be replaced.
- The ball must have no scratches across its seating surfaces and any damage to the port lip which will destroy the new seats – a damaged ball must not be reused, install a new ball.

• Rebuilding

Before rebuilding, check that all the correct components are available and that they are fit for re-assembling. When rebuilding, cleanliness is essential to allow long valve life and provide cost-effective maintenance.

- Lubricate the new stem thrust seals and packing, with appropriate lubricant.
- Fit the stem thrust bearing the to the stem and insert the assembly through body cavity into stem hole and push it up into body recess.
- Fit together the bottom, middle, and top stem packing to make it easier to assemble for the Nova option or just stack the graphite and insert the packing's into the body cavity on the stem.
- Fit the gland and disk springs. Put the first spring concave side up and the second spring concave side down. Repeat that with the other two springs.
- Using a wrench to prevent stem from turning, fit the stem nut and tighten to the torque figures in Table 1.
- Place the lock tab on the stem nut and adjust the orientation of the nut to align with lock tab.
- Operate the stem several times and re-adjust if needed. Overtightening will only reduce the life of the stem assembly.
- Now fit the handle and handle nut to the stem assembly and move stem into closed position – handle perpendicular to the pipeline.
- With the stem still in the closed position, the ball may be inserted into the body cavity by sliding the ball slot over the stem tang.

- Open the valve.
    - Note: the ball must be in the open position, since the closed ball protrudes beyond the body cavity and the ball will get damaged against the body connectors when the body is removed or rotated. Also, with the valve in the open position, the ball is retained by the stem tang and cannot fall out of the body cavity.
- Fit the seat rings to the body making sure that the contoured surface is on the ball side and the flat sides are on the body end side.
    - Note: a trace of silicon based lubricant or clean crease (such as petroleum jelly), if compatible with the future pipeline media, will ease in the rebuilding by holding the seat rings and body connector seals in place. Use no grease with abrasive additives.
- These valves, after initial installation, have body ends which form an integral part of the pipeline, and cannot be rebuilt without replacing them back into the pipeline.
- The valve must be installed back into the pipeline by sliding the body in between the ends making sure new body seals are installed into the seal grove in the body.
    - The pipeline should, however, be sprung apart sufficiently to clear the valve body and avoid damage to seat rings, body seals and body connector sealing face.
- Locate the body on the center of pipework, fit body connector bolts and nuts, and by tightening, pull together body and body connectors and tighten to the torque values listed in table 1.
    - Connector flanges will be metal to metal, standard wrenches should only be used – excessive force will only stretch or strip the bolts.
- It is recommend to pressure test the rebuilt valve inline before going back to full production use.

• Repair kits

- Repair kits are available from Sharpe® valves that contain all the soft parts as well as new spring washers.
- When ordering repair kits, please be sure to specify type and size of valve and seating material required.

- Where a valve needs repairing, rather than maintaining, it must be noted that only Sharpe® valves authorized spare parts should be used, and these include basic components such as bolts, screws, and nuts, etc.
- In addition to maintenance kits, spare parts available from Sharpe® valves are balls, stems, and glands. If additional parts are required, it is normally recommended that the complete valve be replaced.
- Parts from different series should not be interchanged. This it to ensure, so far as it is reasonably practicable, that the valve remains capable of being used for the purpose for which is was designed and constructed, without risk to health and safety of plant personnel.

• Installation of Sharpe® Welded end valves

- Only HP80/HP89 valves with peek seats and graphite or Viton body seals may be welded inline without disassembly following this procedure. Valves with Delrin® seats must be disassembled for welding pipe ends in line.
    - Valves that are disassembled must be reassembled using new body seals.

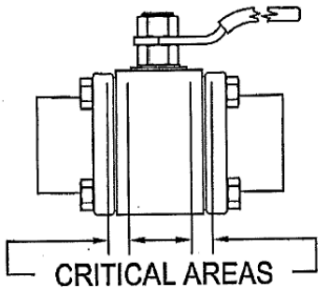
❖ Welding the valve in-place

- Be sure the ends of the pipe that are to be welded are clean to the bare metal. Any contaminates in the weld area could cause porosity in the weld.
- Valve must be in the fully OPEN position for the welding process and remain fully OPEN until cooled.
- Position the valve in your piping scheme, being sure you achieve the standard end gap from the end of the pipe to the end of the valve.
- Tack weld the valve in place taking care to monitor the temperature in the critical areas (see warnings below)
- Immediately cool all portions of valve and pipe so the parts are cool to the touch. Non oily shop air or air convection can accomplish this.
- Tightly wrap a damp cotton shop towel or cloth around the valve exposing only the ends needing welding and the handle.

- Alternate weld passes end to end allowing the valve and weld to cool between passes. Cool the valve and weld by using a damp cotton shop towel or cloth or by quenching with cool water until the entire valve and weld area is cool to the touch.
- Remove the cloth that is wrapped around the body of the valve.
- When cool retighten the body bolts to the torque values in table 1.
- It is HIGHLY recommended that the valve be flushed out while still in the open position after welding prior to any operating to prevent accidental damage to the seats from debris.
- When possible, perform a final seat test before placing valve in service.

❖ **WARNINGS:**

- Temperatures in the critical areas around the seats and seals must not exceed 350°F (300°F VITON®), as it will damage the integrity of the soft seats and seals. Monitor with Tempilstik® or pyrometer.



- Valves with Delrin® seats must be disassembled for welding pipe ends in line.
- Valves that are disassembled must be reassembled using new body seals.

❖ Tightening Torque Table 1

STEM NUT TIGHTENING TORQUE				
VALVE SIZE		THREAD	TORQUE (NM)	TORQUE (LBS.IN)
HP80	HP89			
½" - ¾"	¼" -½"	M10	9	80
1" - 1¼"	¾"-1"	M12	13	115
1½"-2"	1¼"-1½"	M18	30	265
2½"	2"	1"-14	60	530

BODY BOLT TIGHTENING TORQUE				
VALVE SIZE		THREAD	TORQUE (NM)	TORQUE (LBS.IN)
HP80	HP89			
½"	¼"	¼-20	9	80
¾"-1"	½" - ¾"	M8	19	165
1¼"	1"	M10	39	345
1½"	1¼"	M12	65	575
2"	1½"	M14	110	970
2½	2"	M20	300	2655