BESTOBELLSTEAM

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# TT2/TT3 Series

*Installation & Maintenance Instructions for Bestobell Steam TT2/TT3 Series Total Trap® Stations*

Warning: Bestobell Steam products must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation may cause system failure or a general hazard. Prior to servicing equipment, disconnect, shut off, drain and/or bypass all pressurized fluids.

## Please Read These Instructions

The Total Trap® 2 & 3 Series will provide you with long, trouble-free service if it is correctly installed and maintained. A few minutes of your time spent reading these instructions may save hours of trouble and downtime later.

## Ideal Installation

1. To protect the trap from grit, scale, metal chips, and other foreign matter, ALL pipelines and piping components should be blown out and thoroughly cleaned before the trap is installed.
2. In preparing welded connections, care should be exercised to prevent debris, fluids or compound from getting into pipe lines.
3. The flow arrow on the trap body must be pointed in the direction of flow. Ideally, the trap should be installed in the lowest horizontal line of downcomer piping to provide for maximum drainage of condensate and to obtain a faster response by the disc trap.
4. The trap should be installed horizontally with disc trap cap on top. The outlet of the blowdown valve on the bottom of the trap should be connected to blowdown piping to adequately route high temperature/pressure steam away from personnel and other equipment that could be damaged. The vent on the back of the trap should similarly be oriented away from personnel and other equipment that could be damaged.
5. Piping should be the same material and sized appropriately for the hub end connections. Inlet and outlet piping should be the same size.
6. A full-ported shutoff valve upstream is recommended to allow isolation for servicing. A shutoff valve downstream will protect against back flow from the return line during servicing. Alternately, the isolation valves built into the trap can be used to adequately isolate the disc trap assembly for maintenance purposes provided the trap is isolated upstream and/or the system is in a cold iron state, i.e. shutdown.
7. The downcomer piping should be sloped to and from the trap to ensure adequate flow and freeze protection.

## Start and Initial Warm-Up

1. Fully open the inlet and outlet isolation valves.
2. Fully close the freeblow/vent, strainer blowdown, and bypass valves.
3. Slowly apply system pressure to steam trap and bring system up to operating conditions per customer usual start-up procedures.

## Caution!

**The strainer blowdown valve achieves maximum sealing properties when heated up. A slight amount of steam leak-by during start-up from the blowdown valve may be noticed until the valve packing heats enough, at which point leak-by should cease.**

## Maintenance

## Warning!

**Hot discharge from the trap may cause severe burns. Shut off steam supply and make sure that the trap is cool to the touch before conducting maintenance or inspection.**

## Caution!

**Do not remove the flush plug above the steam inlet hub unless the system is shut-down, the trap is cool to the touch, and the intent is to clean the disc trap assembly through back flushing. If debris has not been allowed to enter the steam system, cleaning of the disc trap assembly and removal of the flush plug should not be necessary.**

1. The trap can be maintained without disturbing the piping connections. Ensure that the trap is isolated - upstream and downstream - before attempting any maintenance involving disassembly of the disc trap. ALLOW THE TRAP TO COOL BEFORE DISASSEMBLY.

2. The disc trap can be cleaned without disassembly. Once the system is shutdown and the trap is cool to the touch, remove the flush plug above the inlet hub with a 1/4" Allen wrench. Open the freeblow valve and close all other valves. Flush the disc trap using high pressure water in the reverse direction by connecting the water supply to the vent port and flushing out the flush port plug. The disc trap may also be flushed with high pressure air (not to exceed 200 psig). Apply Grafoil tape and reinstall flush plug (refer to torque values below).
3. If the disc trap must be disassembled, see the Disc Trap Disassembly Procedure below. Dirt and deposits can cause erratic operation. If the disc trap cannot be fully cleaned via flushing, the disc trap cap, disc and cartridge can be removed for inspection, and sealing surfaces can be wiped with a cleaning solvent. Periodic cleaning of the disc and cartridge will facilitate trouble-free performance. DO NOT USE ABRASIVES / CORROSIVE MEDIA FOR CLEANING. If the disc surface is scratched or worn, replace with a new factory-lapped disc. Only the disc and cartridge seat are subject to wear. Both the disc and cartridge can be replaced if necessary; however, a slight disc and seat wear can be corrected by resurfacing on a lap plate in a straight line, back and forth direction, for 20 - 30 seconds.
4. If large quantities of air and other non-condensable gases are suspected at equipment start-up, venting via the freeblow valve may reduce the time it takes for the disc trap to achieve steady state operation.
5. Periodically use the strainer blowdown valve to blow down the internal strainer of debris. Routine blowdown will prevent dirt and debris from entering the disc trap.
6. The Total Trap has been properly assembled, correct valve torques applied, hydro- and leak-tested at high pressures, so no steam leakage should be observed. If steam leakage is detected around the valve packing, use a 7/8" open end wrench to loosen the packing lock-nut, make minor tightening adjustments of the packing until leakage ceases, and then retighten the packing lock-nut. Similarly, if steam leakage is detected around the valve bonnet seating surfaces with the body, use a 1 1/8" open end wrench to make minor tightening adjustments to the valve bonnets until steam leakage ceases.

## Disc Trap Disassembly Procedure

1. Carefully and slowly remove the disc trap cap, ensuring the disc is not lost during removal of the cap.
2. Remove the cap and disc and set aside in a clean area.
3. USING ONLY YOUR HANDS, remove the internal cartridge, being very careful to not lose or damage the o-rings which seal the bottom cartridge cavities to the raised sealing surfaces at the bottom of the disc trap port, or the outer o-ring used to provide sealing with the cap. Place the cartridge and o-rings in a clean area. The o-rings may be left attached to the cartridge. DO NOT USE PLIERS OR ANY OTHER TOOLS AS THEY MAY DAMAGE THE SEALING SURFACES OF THE DISC TRAP PARTS OR INTERNAL SURFACES OF THE TRAP.

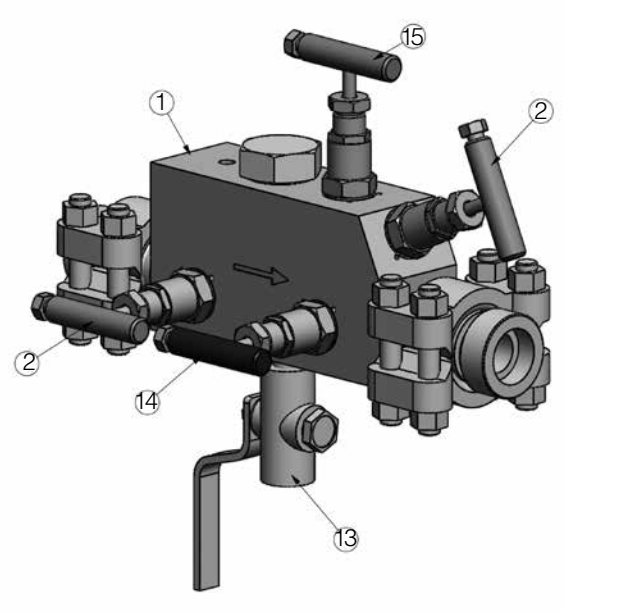
## Disc Trap Reassembly Procedure

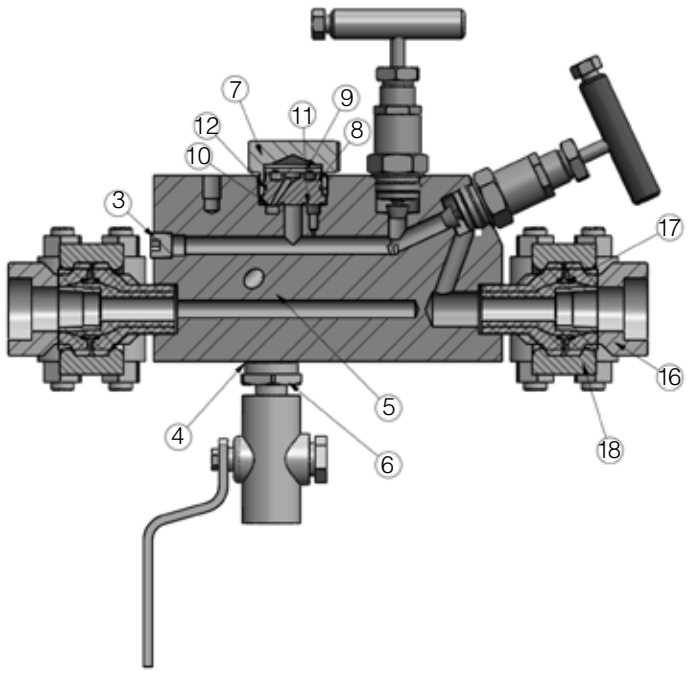
1. Carefully blow the disc trap port out of any debris using low pressure air. Clean disc trap parts as described in the maintenance section above.
2. Apply a small coating of Dow Corning 111 Valve Lubricant and Sealant Compound to the cartridge o-rings and insert into their respective grooves on the bottom of the disc trap cartridge, if necessary, ensuring they are seated correctly. The purpose of this compound is to ensure the o-rings are lubricated and remain in their grooves when the cartridge is turned upside down and inserted into the disc trap port in the trap body.
3. USING ONLY YOUR HANDS, carefully and slowly insert the cartridge into the disc trap port in the trap body ensuring the o-rings remain in place on the bottom of the cartridge. DO NOT USE PLIERS OR ANY OTHER TOOLS AS THESE MAY DAMAGE THE SEALING SURFACES OF THE DISC TRAP PARTS OR INTERNAL SURFACES OF THE TRAP.
4. Center disc on top of cartridge, groove side down.
5. Ensure the surface area around the disc trap port is clean of debris, lubricate the cap threads with Loctite Silver Grade Anti-Seize Compound, and carefully screw into place over the disc and cartridge.
6. Tighten the cap until firmly seated to the torque value listed in the table below. DO NOT OVERTIGHTEN.
7. Pick up the trap with two hands and lightly shake, listening for the disc to rattle around inside the disc trap. This does not harm any components, and ensures the disc was not bound up on installation of the cap.

## Torque Values

| Part | Torque | Sealing Compound |
|---|---|---|
| Disc Trap Cap | 50 ft-lbs | Anti-Seize |
| Hex Valve Bonnets | 125 ft-lbs | Anti-Seize |
| Strainer Cap | 50 ft-lbs | Anti-Seize with Grafoil Gasket |
| Flush Plug | Wrench tight | Grafoil Tape |
| Blow Down Valve | Wrench tight | Grafoil Tape |

## Illustration and Parts List




| Item No | Part Number | Description | Quantity |
|---|---|---|---|
| 1 | 52045-318 | Body with Hubs | 1 |
| 2 | 07015-9201-1 | Bonnet Assembly (Red) | 2 |
| 3 | 10010-001-T1 | Flush Plug | 1 |
| 4 | 16-1 | Strainer Cap Gasket | 1 |
| 5 | 17-1 | Strainer | 1 |
| 6 | 55024-147 | Strainer Cap | 1 |
| 7 | 50514-144-H6 | Disc Trap Cap | 1 |
| 8 | 50055-144 | Disc Trap Cartridge | 1 |
| 9 | 50054-144 | Disc | 1 |
| 10 | 91920-732 | O-Ring | 1 |
| 11 | 93381-732 | O-Ring | 1 |
| 12 | 93382-732 | O-Ring | 1 |
| 13 | 50429 | Blowdown Valve | 1 |
| 14 | 07015-9201-2 | Bonnet Assembly (Blue) | 1 |
| 15 | 07015-9201-3 | Bonnet Assembly (Yellow) | 1 |
| 16 | △2 △3 △4 | △2 △3 △4 | 2 |
| 17 | 25-00175-912 | Seal Ring | 2 |
| 18 | 25-00575-751 | Clamp Assembly | 2 |

Notes:

1. Total trap designed and manufactured in accordance with ASME B31.1
△2 TT3-1: P/N 59119-136 (Buttweld Hubs)
△3 TT3-2: P/N 59105-136 (FSW Hubs)
△4 TT2-2: P/N 59125-136 (1" FNPT Hubs)
5. TT3: Body P/N 52045 (304SS) , no clamps or seal rings
6. TT2-1: Body P/N 52043 (304SS), non-modular unit
7. TT2-1A: Body P/N 52049 (316SS), non-modular unit
8. TT2-2: Body P/N 52071-318, 1" FNPT



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