BESTOBELLSTEAM

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MAGNUM SERIES I & M

Installation & Maintenance Instructions for Bestobell Steam MAGNUM

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.

Read Instructions

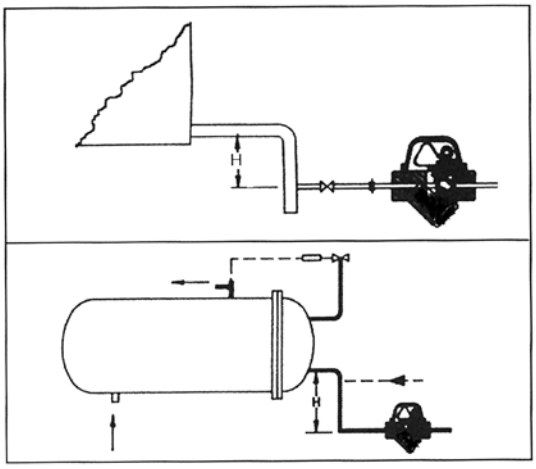
The Bestobell Steam **MAGNUM** Series of Delta Element steam traps will provide you with long, trouble-free service if they are correctly installed and maintained. These traps come in five operating differential pressure ranges, to as high as 320 psi. They offer exceptionally high condensate capacities both at start-up and during operation. They are designed for very large process steam equipment applications, and can be ordered in a wide variety of sizes. A few minutes of your time spent reading these instructions and installing the traps as suggested will save hours of trouble and downtime later.

Operation

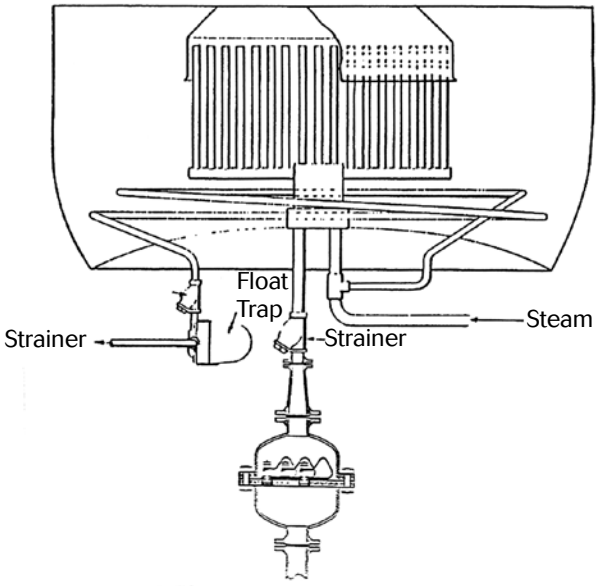
The Bestobell Steam **MAGNUM** Series of Delta Element steam traps feature a simple stainless steel thermostatic bimetal component, along with hardened stainless steel plug and stem parts which form the unique thermodynamic valve mechanism. In the MAGNUM Series, the number of elements within the trap body determines the capacity of the trap, thus tailoring the trap to the applications requirements. All Magnums utilize the Bestobell Steam Delta Element which provides rugged and dependable control to condensate discharge. See Bestobell Steam's Magnum Delta Element trap literature for complete details of operation.

Initial Warm-Up

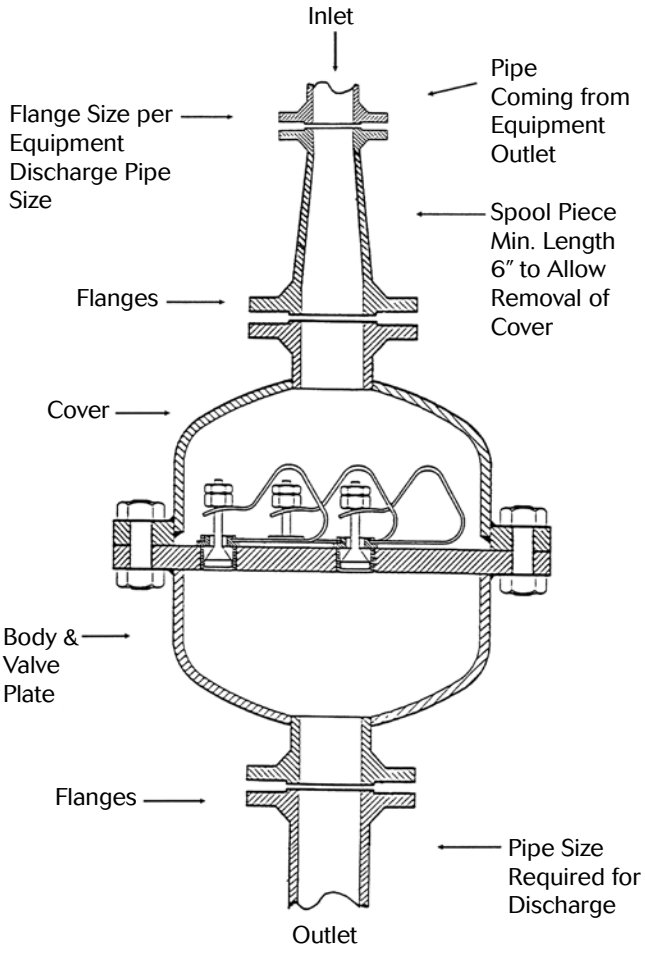
1. Blow down piping to remove any foreign material.
2. Verify that your Bestobell steam trap will meet system conditions by checking the nameplate for operating differential pressure and maximum pressure and temperature limits of the trap body.
3. Magnum Delta Element traps are selected based on condensate load, not pipe size. Verify that selection included a safety factor.
4. Pipe size and end connections should be selected based on the calculated flows through the return piping. The end connections of the multi-element Magnums can typically be ordered to make the return piping size.
5. Except for the "Single Element" versions these MAGNUM traps can only operate properly with the trap body arranged for vertical downward flow.
6. "Single Element" MAGNUM traps can be installed for vertical or horizontal flow. See the I&M sheet for "Bestobell Delta Element Style Traps" for installation suggestions.
7. Install trap in an accessible location for future checking and maintenance.
8. Isolation valves should always be installed on the inlet and outlets of the trap for service purposes.
9. High condensate rates, particularly at start-up, can cause vacuum conditions in the steam chamber. The addition of a vacuum breaker(s) is recommended to allow gravity drainage of condensate towards the trap.
10. For large Process and Heat Exchanger applications; these Magnum traps should be located off of a condensate collection pocket and below the condensate outlet of the equipment. See typical installation figures



Basic Installation



Brewery Kettle Example



Suggested Multi-Element Magnum Piping

Installation

1. Check that pipe threads are clean and free of shavings. Use proper thread sealant for steam service. Use proper gaskets matched to the flange rating on flanged trap versions.
2. Where possible, arrange the piping such that condensate flows to the trap by gravity.
3. Trap each piece of equipment separately.
4. Locate the trap at the lowest point, preferably below the equipment outlet.
5. On most applications, the trap should be a minimum of 12-24" below the equipment outlet. This drop acts as a reservoir for condensate level changes, and provides some hydraulic head.
6. Arrange piping and trap location to be easily accessible for inspection or repair.
7. It is highly recommended that flanged end connections be ordered and used on multi-element Magnums. Flanged connections allow easy removal of the entire trap, or easy repair/maintenance while in the line. See the recommended piping arrangement for flanged versions.
8. Install bypasses only if required for maintenance.
9. Shutoff valves, unions, and test "tee" after a trap should be installed to provide easier operation, maintenance, and testing.
10. Install an in-line strainer before models without built-in strainers.
11. Check all pipe sizes to prevent restricted flows, especially in condensate return lines. Undersized returns are a major cause of poor system performance.
12. Insulation after the trap is ideal, but do not insulate the trap.
13. Observe all applicable public and company codes and regulations concerning steam and condensate piping.
14. Refer to example illustrations for installation suggestions.

Operation

For all models of **MAGNUM** traps
When needed, the Bestobell Magnum trap can be readily overhauled, by replacing the Delta Element(s) as a complete assembly. A new factory replacement control element and gasket should always be used, as this will be correctly calibrated to restore your trap to its original efficiency.

1. Before removing the cover, the trap must be isolated from both live steam lines and condensate return lines, and internal pressure in the trap should be relieved via venting to atmosphere or by cooling the trap to ambient temperature.
2. Loosen and remove the cover bolts and cover. (Due to long service life between maintenance, the cover bolts may become rusted in position. A clearance is provided between the cover and body to allow the use of a hack saw for removal).
3. On multi-element Magnums note or make a sketch of

how the bimetals are arranged within the body

4. Loosening the bimetal locknut enables insertion of an opened wrench under the bimetal to free the valve seat. Unscrew the valve seat from the body.
5. Before installing the new element/valve assembly, clean the valve seating face on the body with a wire brush. Inspect to ensure that all gasket seating surfaces are undamaged.
6. The replacement element assembly is factory preset. It is vital that, during installation, the adjusting nut and locknut on the spindle are not disturbed.
7. Unscrew the bimetal locknut to allow a wrench to be placed between the bimetal and body for tightening of the seat into the body. Install the gasket(s) on the base, and screw the valve seat into the body and tighten to the torque valves shown in the *Torque Table*.
8. Move the bimetal into the original position that you marked or noted when the cover was removed. This ensure clearance between elements and the cover. Tighten the bimetal locknut to secure the bimetal in correct position.
9. Before replacing the cover, clean the cover gasket faces thoroughly and insert an appropriate replacement cover gasket.
10. Replace the cover and bolts with the bolt heads on the cover side and hand-tighten the nuts. Torque the cover bolts in three steps: initially to 35%, then 70% and finally to the full values shown in the Torque Table below. At each step tighten in the diagonal pattern.

Trap Model	Valve Seat Torque, lb-ft	Cover Bolts, Torque, lb-ft
Magnum 3 or 6 single element only	80	25
Magnum 10, 16 or 25 single element only	65	110
All multi-element Magnums		
Small Body (12″ dia)	80	80
Medium Body (18″ dia)	80	160
Large Body (22″ dia)	80	280

Figure 1

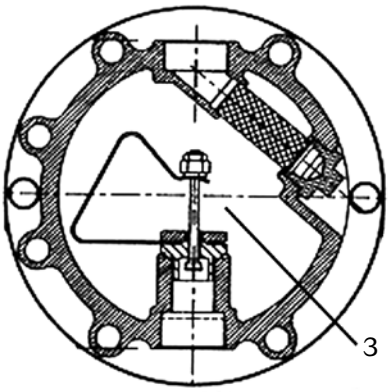


Figure 2

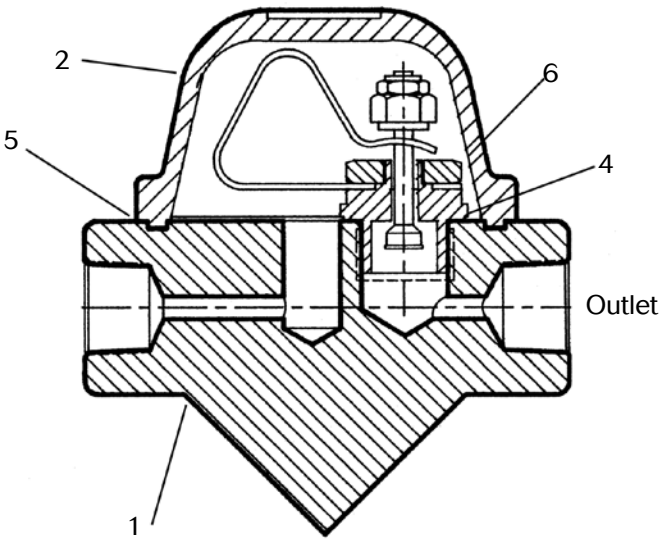
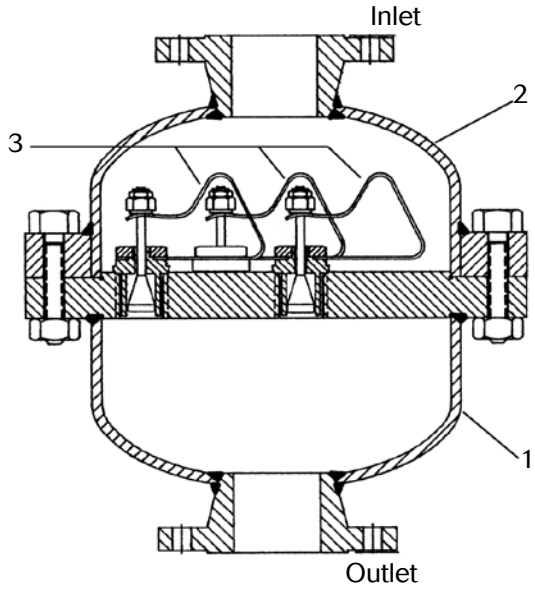


Figure 3



Illus. #	Components	Material
1	Body	Ductile Iron, Magnum 3 or 6, single element (Fig. 1 only) A105 Carbon Steel, Magnum 10, 16 or 25 single element style (Fig. 2 only) Fabricated Carbon Steel, all multi-element Magnums (Fig. 3)
2	Cover	As above, except Carbon Steel covers for Mag 3 or 6 single element
3	Control Element Assembly	Stainless Steel
4	C/E Gasket	Grafoil
5	Cover Gasket	Grafoil
6	Bimetal Locknut	Stainless Steel

Maintenance

For all models of **MAGNUM** traps.

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