



# BESTOBELLSTEAM

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## Delta Element Style Traps

### Installation & Maintenance Instructions for Bestobell Steam Delta Element Style Traps

**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.

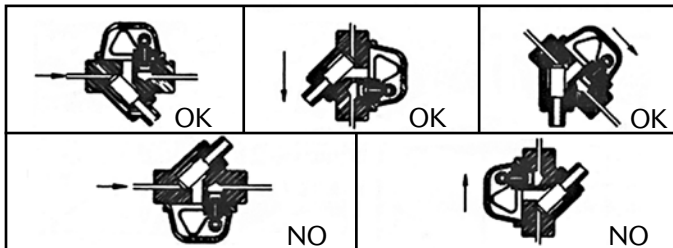
## Ideal Installation

Prior to installation:

- Blow out piping to remove any scale or dirt.
- 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.

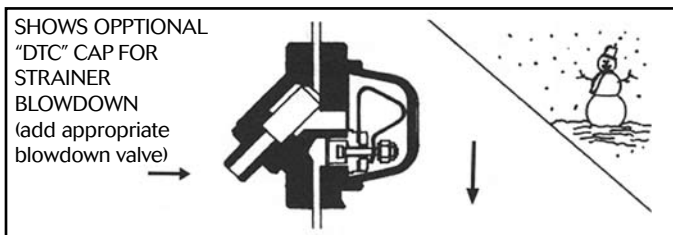
## Ideal Installation

### General Traps



Bestobell steam traps can be installed in most positions from horizontal to vertical with exceptions as illustrated. The flow arrow forged on the body or indicated on the nameplate must be in the direction of the flow; otherwise the trap will not operate because the integral check valve will not allow flow in reverse direction.

### Cold Climates



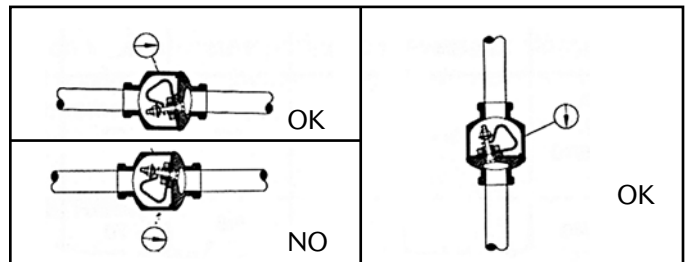
In cold climates, install in vertical piping with discharge downwards so as to be self-draining. For discharge to atmosphere, ensure that any tail pipe is short and full diameter to prevent downstream freezing. The trap and associated piping can be insulated without affecting trap operation in outdoor freezing conditions.

### Magnum Models

Single element Magnums can be installed as shown for general traps. **Multiple element Magnums must only**

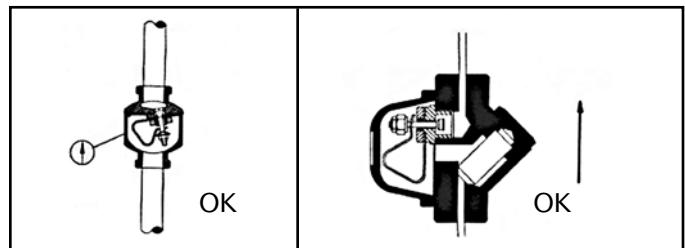
**be installed for vertical piping with downward discharge.** Consult distributor or factory for assistance.

### Sealed Trap Models DS12, TS12



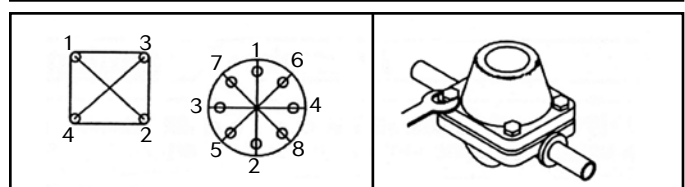
A sealed trap can be installed in any position. On a horizontal line, the flow arrow must be at the top (as shown). Flow through a sealed unit must be as indicated by the direction of arrow on body casting.

### Air Vent Service: For Traps Marked "AV"



If ordered, and identified by "AV" stamping, for air venting service, the Bestobell trap should be installed as shown above. Trap is to be mounted on vent connection located at upper foremost point of steam space.

## Initial Warm-Up



As with all steam equipment, it is recommended that the external gasketed joints be retorqued after a warm-up/cool-down cycle. Torque the cover bolts in the diagonal sequences as shown. **Note: retorquing is essential after socket welding.**

*Wrench sizes and torque values for cover fasteners and strainer caps are shown in Torque Value Table.*

## Torque Value Table

| Model                             | Sizes inches (DN)        | Cover Fittings FT/Lbs (N-m) | Wrench Size in   | Strainer Cap Ft/Lbs (N-m) | Wrench Size in     | Valve Seat Ft/Lbs (N-m) | Wrench Size mm |
|-----------------------------------|--------------------------|-----------------------------|------------------|---------------------------|--------------------|-------------------------|----------------|
| DMR6                              | 1/2"-3/4"<br>DN15-20     | 120<br>(162,7)              | 1-1/4            | N/A                       | N/A                | 20<br>(27,1)            | 17             |
| 3A, 6A, 10, 22,<br>GM3/6/10, DM25 | 3/8"-3/4"<br>DN10-20     | 15<br>(20,3)                | 1/2              | 50<br>(67,8)              | 1-3/16<br>or 1-1/4 | 30<br>(40,7)            | 22             |
| 16/25/40                          | 1/2"-3/4"<br>DN15-20     | 30<br>(40,7)                | 5/8<br>11/16     | 70<br>(94,9)              | 1-3/8              | 30<br>(40,7)            | 22             |
| GM16/25                           | 1/2"-3/4"<br>DN15-20     | 30<br>(40,7)                | 5/8<br>11/16     | 70<br>(94,9)              | 1-3/8              | 35<br>(47,5)            | 27             |
| 16/25/40<br>GM3/6/10              | 1"<br>DN25               | 25<br>(33,9)                | 5/8<br>11/16     | 90<br>(122,0)             | 1-1/2              | 35<br>(47,5)            | 27             |
| 16/25 GM10                        | 1-1/4"-2"<br>DN32-50     | 110<br>(149,1)              | 1-1/8<br>1-1/4   | 170+<br>(230,5+)          | 2                  | 62<br>(84,1)            | 41             |
| GM3/6                             | 1-1/4"-1-1/2"<br>DN32-40 | 110<br>(149,1)              | 1-1/8<br>1-1/4   | 170+<br>(230,5+)          | 2                  | 65<br>(88,1)            | 41             |
| GM3/6                             | 2"<br>DN50               | 25<br>(33,9)                | 3/4<br>7/8       | 170+<br>(230,5+)          | 7/8" SQ            | 80<br>(108,5)           | 50             |
| DM64/100                          | 1/2"-1"<br>DN15-25       | 50<br>(67,8)                | 7/8              | 70<br>(94,9)              | 1-7/16             | 35<br>(47,5)            | 27             |
| 40/64/100                         | 1-1/2"-2"<br>DN40-50     | 85<br>(115,2)               | 1-1/4            | 170+<br>(230,5+)          | 2                  | 65<br>(88,1)            | 41             |
| DM160 DM320                       | All                      | 90<br>(122,0)               | 1-7/16           | N/A                       | N/A                | 35<br>(47,5)            | 27             |
| TM22 DM6/12<br>DM10E              | All                      | 12<br>(16,3)                | 1/4 allen<br>1/2 | N/A                       | N/A                | 20<br>(27,1)            | 17             |
| Multi-element<br>Magnums          | Small                    | 80<br>(108,5)               | 3/4              | N/A                       | N/A                | 80<br>(108,5)           | 80             |
|                                   | Medium                   | 160<br>(216,9)              | 15/16            |                           |                    |                         |                |
|                                   | Large                    | 280<br>(379,6)              | 1-1/8            |                           |                    |                         |                |
| Single Element                    | 1-1/2"-2"<br>DN40-50     | 110<br>(149,1)              | 1-1/4,<br>1-1/8  |                           |                    |                         |                |

Note: Where 2 wrench sizes are shown, one is bolt size, one is wrench size

## ReAssembly Precautions

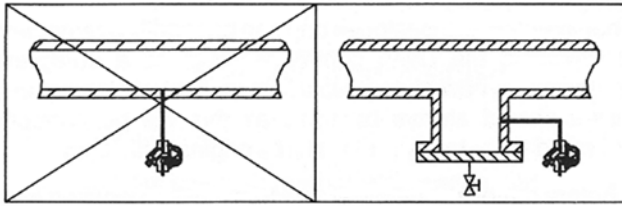
- Lubricate all bolts, strainer cap, and control element threads with anti-seize compound.
- Install control element gasket.
- Follow all instructions on back cover of this brochure, and always install new gasket.
- On bonnet-to-bonnet joint: bring bolts to hand tight.
- Torque to 100% of specified torque.
- Check bolt torques directly following the steam test.
- On DMR6 with copper gasket, torque to 50%, loosen and torque to 100%.

## General Installation Guidelines

For top performance of any steam trap, the pipework must be designed to provide the best condensate flow possible to the steam trap. To achieve this, follow the general guidelines shown below:

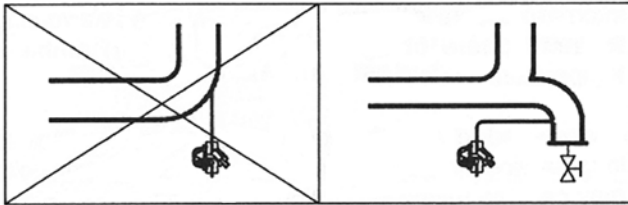
- Where possible, arrange the piping such that condensate flows to the trap by gravity.
- Trap each piece of equipment separately.
- Locate the trap at the lowest point, preferably below the equipment outlet.
- On most applications, the trap should be 2 to 5 lineal feet from the equipment outlet.
- Arrange piping and trap location to be easily accessible for inspection and repair.
- Bestobell traps have very high cold start-up capacities. Install bypasses only if required for maintenance.
- Shutoff valves, unions and test "tee" after a trap should be installed to provide easier operation, maintenance, and testing.
- Check all pipe sizes to prevent restricted flows, especially in condensate return lines. Undersized returns are a major cause of poor system performance.
- Insulation after the trap is ideal, but do not insulate the trap. Consult your local distributor for information on when piping before the trap should not be insulated.
- Observe all applicable public and company codes and regulations concerning steam and condensate piping.

# Application Guidelines



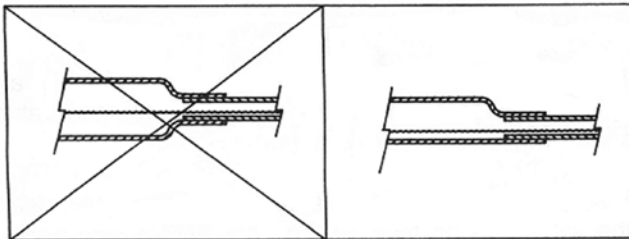
## Steam Mains

Steam mains should be drained every 150 (45,7 meters) to 250 (76,2 meters) feet or at each change of direction using a suitable pocket in the mains. Install on the side of the pocket to prevent dirt clogging. If pocket base is not removable, a blowdown valve should be fitted to remove dirt.



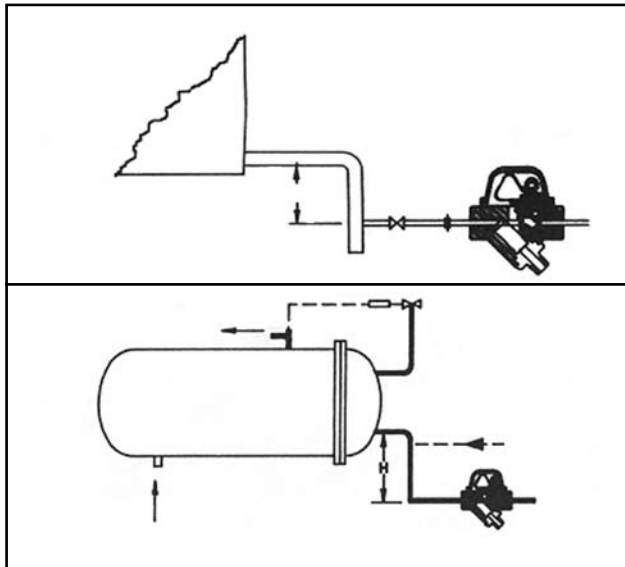
## Vertical Risers

Where steam mains rise vertically, pipework design should allow collection of condensate from both the horizontal and vertical sections.



## Drain Line Reducers

When installing a small trap on a large draining line – as on steam coils or branch line drainage – do not use a concentric reducers as this causes waterlogging of the larger lines and possible steam locking. Use an eccentric reducer with the small connection at the low point.

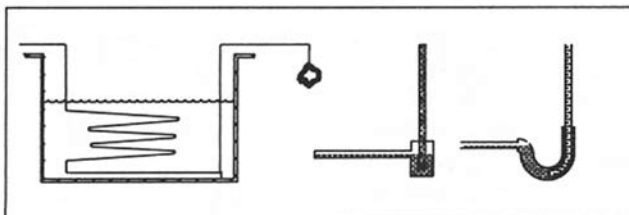


## Process Equipment

On process equipment, the trap should be installed below the outlet level. Full-size piping from the equipment outlet for a vertical drop of 1 (0,3 meters) to 2 (0,6 meters) feet provides a condensate accumulator and hydraulic head to assist discharge. (H).

High condensate rates, particularly at start-up, can cause vacuum conditions in the steam chamber. The addition of a vacuum breaker allows gravity drainage of the unit due to the head. (H).

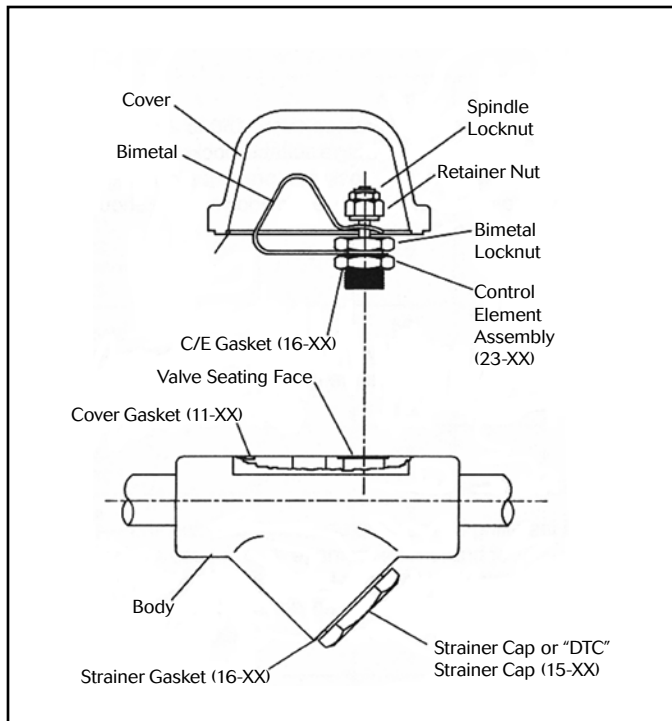
On temperature regulated applications, condensate should be collected locally and pumped back to the boiler to eliminate back pressure conditions.



## Lifting Condensate

Where condensate must be lifted before the trap, a siphon lift fitting must be used to ensure that only condensate is presented to the trap.

Note: flow rates based on discharge to atmospheric pressure, valid for back pressures of up to 20% of inlet pressure. Higher back pressures require setting of control element to obtain stated capacities. Consult factory for details.



## General Maintenance

Although the Bestobell steam trap is simple and rugged with only two moving parts, it is a mechanical device for which routine inspection and maintenance is needed.

The trap must always be isolated before any attempt is made to dismantle it.

Under normal operation, the only item that needs attention is the strainer which should be inspected periodically by removing the strainer cap and extracting the strainer screen. It should then be cleaned and replaced using a new strainer cap gasket.

Where plant conditions dictate frequent strainer cleaning, the fitting of a double threaded strainer cap (DTC) and a blowdown valve is recommended in place of the standard strainer cap to allow cleaning under operating conditions. When a blowdown valve is installed, it should be periodically opened for 3 to 5 seconds to blow out the sludge and dirt from the strainer.

## Replacing Element/Valve Assembly

When needed, the Bestobell trap can be readily overhauled, by replacing the Delta control element 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. Loosening the bimetal locknut enables insertion of an open-end wrench under the bimetal to free the valve seat. Unscrew the valve seat from the body.
4. 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.
5. The replacement element assembly is factory pre-set. It is vital that, during installation, the adjusting nut and locknut on the spindle **are not disturbed**.
6. 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 on the base, and screw the valve seat into the body and tighten to the torque values shown in the *Torque Value Table*.
7. Line up the bimetal with the inlet and outlet ports to ensure clearance once the cover is replaced, then tighten the bimetal locknut. (*Note: very small control elements may not have bimetal locknuts*).
8. Before replacing the cover, clean the cover gasketing faces thoroughly and insert an appropriate replacement cover gasket.
9. Replace the cover and bolts with the bolt heads on the cover side and hand-tighten the nuts. Torque the cover bolts in two stages: initially to 50% and finally to the full values shown in the *Torque Value Table*. At each stage tighten in the diagonal pattern shown on page 1.v

For maximum design pressure/temperature ratings, please review markings. Additionally, the maximum pressure ratings listed in Directive 97/23/EC, Annex II, Tables 6,7,8 and 9 for products as described in Article 3, Paragraph 3 also apply to this product.

