# Inverted Bucket Steam Traps

## Series B BEAR TRAP®

The Series B inverted bucket traps are designed for a wide range of industrial applications including steam mains, laundry and dry cleaning plants, food processing and those that require a lift in the discharge lines.

Part of the ESP PLUS EQUIPMENT SELECTION PROGRAM

For computer aided selection of steam specialties contact your local Hoffman Specialty Representative (see back cover for listing).

## How to Size Inverted Bucket Traps

### Trap Sizing

1. Determine the capacity required by referring to the manufacturer's specifications for your equipment or by using the Helpful Hints on the following page.

2. Determine the available initial steam inlet pressure.

3. Determine the outlet pressure at the trap discharge.

4. Determine the pressure differential across the trap. (Inlet pressure – outlet pressure = differential pressure)

5. Apply Safety Factor: multiply normal condensate load by 2.0.

6. Use the Capacity Tables to determine a model number.

7. Use the Ordering Information Charts to determine the part number.

### Lifting Condensate to Overhead Return

Condensate must be lifted in applications where the trap is installed lower than the return.

Guidelines:

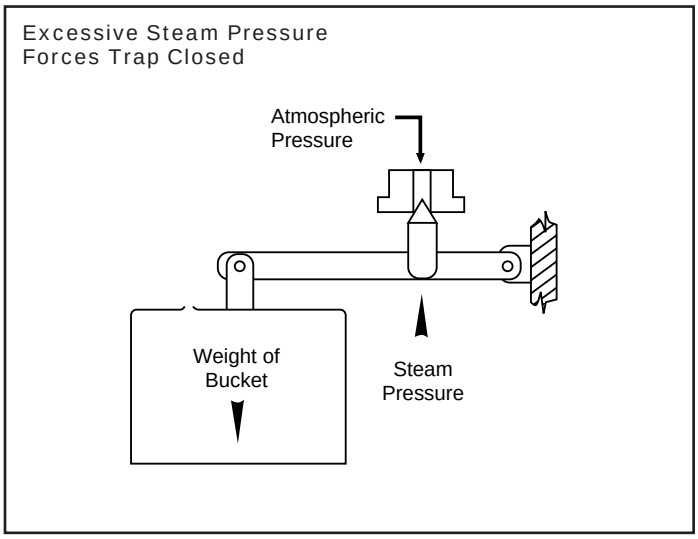
- The steam pressure at the inlet of the trap lifts the condensate. A steam pressure of 1 psi (.07 bar) across the steam trap will lift condensate 2.3 ft. (0.7m). Due to system pressure drop and friction, the lift factor must be limited to 2 ft. (0.6m) for every 1 psi (.07 bar) pressure at the trap.
- Do not return condensate to an overhead return if modulating control valves are installed. They will cause the inlet pressure to modulate to 0 psi (0 bar), resulting in no differential pressure to push the condensate. Use a Hoffman condensate unit to collect the condensate and pump it to the overhead return.

# How to Size Inverted Bucket Traps

## Steam Trap Operating Pressure Selection

Bucket traps are offered with various orifice sizes which determine the maximum differential pressure rating.

A low pressure seat and pin has a larger orifice size which provides a larger condensate rating than a high pressure seat. When actual operating pressure is higher than the seat rating, the pressure differential across the seat will prevent the trap from opening, thus the trap must be selected for the maximum pressure differential that will be encountered. The trap capacity tables show capacities at lower pressures to allow selection at various operating points. A high pressure seat may be used at lower pressure differentials, however, the capacity rating will be less than the same size trap with a low pressure rated seat.




Part of the ESP PLUS EQUIPMENT SELECTION PROGRAM

For computer aided selection of steam specialties contact your local Hoffman Specialty Representative (see back cover for listing).

## Helpful Hints

### Approximating Condensate Loads

Heating Water with Steam

Lbs./Hr. Condensate = $\frac{GPM}{2}$ x Temperature Rise °F.

Heating Fuel Oil with Steam

Lbs./Hr. Condensate = $\frac{GPM}{4}$ x Temperature Rise °F.

Heating Air with Steam Coils

Lbs./Hr. Condensate = $\frac{CFM}{900}$ x Temperature Rise °F.

### Conversion Factors

One Boiler Horsepower = 140 sq. ft. EDR or 33,475 Btu/hr. or 34.5 lbs./hr. steam at 0 psig

1,000 sq. ft. EDR yields .5 gpm condensate

To convert sq. ft. EDR to lbs. of condensate — divide sq. ft. EDR by 4

To convert lb/hr. to kg/hr. multiply by .454

.25 lbs./hr. condensate = 1 sq. ft. EDR

One sq. ft. EDR (Steam) = 240 Btu/hr. with 2 psig steam filling radiator and 70°F air surrounding radiator.

To convert Btu/hr. to lbs./hr.—divide Btu/hr. by 960

One psi = 2.307 feet water column (cold)

One psi = 2.41 feet water column (hot)

One psi = 2.036 inches Hg

To convert psi to bar multiply by .069

# Inverted Bucket Steam Traps (continued)

## Series B BEAR TRAP®

### How to Select

The trap capacity should be selected based on the minimum differential pressure between the inlet pressure and outlet pressure. The trap seat must be capable of opening against the maximum inlet steam pressure. When the traps are used on applications where the steam is controlled by a modulating temperature regulator, the trap is normally selected to handle the full condensate load including safety factor at 1/2 psi (.034 bar) differential pressure.

Part of the ESP PLUS EQUIPMENT SELECTION PROGRAM

For computer aided selection of steam specialties contact your local Hoffman Specialty Representative (see back cover for listing).

### Capacities (Gross Ratings)

| Series | Orifice Size in. (mm) | Seat Pressure psi (bar) | Differential Pressure psig (bar) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1/2 (.035) | 1 (0.07) | 2 (0.14) | 5 (0.35) | 10 (0.69) | 15 (1.0) | 20 (1.4) | 30 (2.1) | 40 (2.8) | 50 (3.5) | 60 (4.2) | 75 (5.2) | 100 (6.9) | 125 (8.6) | 180 (12.4) | 200 (13.8) | 250 (17.3) |
| | Capacities lbs./hr (kg/hr) | | | | | | | | | | | | | | | | | | |
| B1 | .250 | 15 | 500 | 650 | 835 | 1145 | 1490 | 1700 | | | | | | | | | | | |
| | (6.4) | (1.0) | (227) | (295) | (379) | (519) | (676) | (771) | | | | | | | | | | | |
| | .187 | 30 | 260 | 345 | 460 | 680 | 905 | 1060 | 1200 | 1440 | | | | | | | | | |
| | (4.7) | (2.1) | (118) | (156) | (209) | (308) | (411) | (481) | (544) | (653) | | | | | | | | | |
| | .156 | 75 | 200 | 255 | 335 | 480 | 605 | 695 | 775 | 900 | 980 | 1070 | 1130 | 1200 | | | | | |
| | (4.0) | (5.2) | (91) | (116) | (152) | (218) | (274) | (315) | (352) | (408) | (445) | (485) | (513) | (544) | | | | | |
| | .125 | 125 | 115 | 150 | 195 | 275 | 355 | 410 | 460 | 530 | 595 | 640 | 690 | 745 | 830 | 920 | | | |
| | (3.2) | (8.6) | (52) | (68) | (88) | (125) | (161) | (186) | (209) | (240) | (270) | (290) | (313) | (338) | (376) | (417) | | | |
| | .094 | 180 | 80 | 105 | 140 | 205 | 275 | 320 | 360 | 425 | 480 | 520 | 560 | 620 | 705 | 780 | 930 | | |
| | (2.4) | (10.4) | (36) | (48) | (64) | (93) | (125) | (145) | (163) | (193) | (218) | (236) | (254) | (281) | (320) | (354) | (422) | | |
| | .070 | 250 | 28 | 40 | 55 | 90 | 125 | 150 | 175 | 215 | 250 | 275 | 305 | 340 | 400 | 450 | 570 | 600 | 700 |
| | (1.8) | (17) | (13) | (18) | (25) | (41) | (57) | (68) | (79) | (98) | (113) | (125) | (138) | (154) | (181) | (204) | (259) | (272) | (318) |
| B2 | .360 | 15 | 750 | 975 | 1255 | 1755 | 2280 | 2620 | | | | | | | | | | | |
| | (9.1) | (1.0) | (340) | (447) | (569) | (796) | (1034) | (1188) | | | | | | | | | | | |
| | .282 | 30 | 650 | 810 | 1005 | 1350 | 1700 | 1950 | 2130 | 2400 | | | | | | | | | |
| | (7.1) | (2.1) | (295) | (367) | (456) | (612) | (771) | (885) | (966) | (1089) | | | | | | | | | |
| | .250 | 75 | 490 | 600 | 740 | 980 | 1220 | 1340 | 1440 | 1600 | 1760 | 1910 | 2030 | 2170 | | | | | |
| | (6.4) | (5.2) | (222) | (272) | (336) | (445) | (553) | (608) | (653) | (726) | (798) | (866) | (921) | (984) | | | | | |
| | .203 | 125 | 350 | 450 | 580 | 830 | 905 | 920 | 1020 | 1180 | 1310 | 1430 | 1540 | 1680 | 1920 | 2100 | | | |
| | (5.2) | (8.6) | (159) | (204) | (263) | (376) | (411) | (417) | (463) | (535) | (594) | (649) | (699) | (762) | (871) | (953) | | | |
| | .156 | 180 | 200 | 255 | 330 | 460 | 580 | 675 | 740 | 840 | 930 | 1020 | 1090 | 1190 | 1350 | 1480 | 1725 | | |
| | (4.0) | (10.4) | (91) | (116) | (150) | (209) | (263) | (306) | (336) | (381) | (422) | (463) | (494) | (540) | (612) | (671) | (782) | | |
| | .141 | 250 | 180 | 235 | 305 | 430 | 540 | 620 | 680 | 780 | 870 | 940 | 1000 | 1100 | 1270 | 1415 | 1650 | 1740 | 1890 |
| | (3.6) | (17) | (82) | (107) | (138) | (195) | (245) | (281) | (308) | (354) | (395) | (426) | (453) | (499) | (576) | (642) | (748) | (789) | (857) |