



INVITATION FOR BID

LAUNDRY STEAM SERVICE REPIPING

**RESPONSES ARE DUE NO LATER THAN
NOVEMBER 14, 2018 AT 2:00 PM
AND SHALL BE ADDRESSED TO:**

Steve Arsenault, Assistant Director of Facilities
5 Nursing Home Drive
Unity, NH 03743
sarsenault@sullivancountynh.gov

Sullivan County seeks bids from well qualified firms for:

Project Description: The County has purchased four (4) new dryers that require repiping of the steam system that feeds the dryer units as detailed in the attachments and existing conditions. The current piping size is $\frac{3}{4}$ " inch feeding the system and needs to be increased to 1" per manufacturer's recommendations. Project construction will need to coordinate to reduce impact on the working laundry operations, and the laundry facilities are location in the Department of Corrections which has additional security requirements.

Project Information: Additional information about the requirements and this Invitation to Bid, including setting up an appointment to tour the project, can be provided by Steve Arsenault who can be reached at 603-542-9511, extension 227 or sarsenault@sullivancountynh.gov. All requests for information and tours of the project must be completed by Thursday, November 8th.

Bidding Requirements:

Responses to this Invitation for Bid must include the following information:

- Contractor's contact information and name of person with the authority to act on behalf of the Contractor.
- Detailed proposed fee detailing the cost of materials and labor for the work to be performed.
- Include all cut sheets on any proposed equipment including manufacturer's warranty.
- Include anticipated start date after award of contract and estimated time to complete the scope of services.

Contractors are expected to familiarize themselves with the site and scope before submitting a bid. The submission of a bid shall be deemed to represent that a contractor has reviewed and is satisfied with the conditions to be encountered in performing the work. Contractors must determine for themselves as to the methods and quantities of materials necessary. No allowances will be made for loss of anticipated profits or unanticipated expenses due to any errors or inaccuracies in the estimated quantities or project expenses incurred by the contractor.

Contractors are expected to be thoroughly familiar and comply with applicable laws, rules and regulations pertaining to the work required as part of this project, including but not limited to federal and state laws regarding worker safety, building codes, and licensing requirements.

Contractors shall assume all costs and expenses associated with the preparation and submission of a bid.

Prices: Prices are to remain in effect for a period of ninety (90) days from submission and are to remain firm once project is awarded to the successful Contractor.

Project Award: It is anticipated that the Board of Commissioners will award this project during a regular public business meeting generally held the first or third Monday of each month. The following factors will be considered as the basis for award of the bid, with priority to be determined solely by the County:

1. Contractor Qualifications, Experience, Reputation and References
2. Compliance with Invitation for Bid Requirements
3. Ability to Meet Service Requirements
4. Contract Cost
5. Exclusions and Limitations
6. Warranty
7. Location of Business

Sullivan County reserves the right to accept or reject any bids and to waive any minor bid defects bid as may be in the County's best interest, and to request additional information from any bidder prior to issuing a notice of award or soliciting new bids. The County reserves the right to award the project as one or more contracts, to reject any and all bids in whole or in part, and to waive any informality or technical defects if, in Sullivan County's sole judgment, the best interest of Sullivan County will be served.

Agreement: The successful contractor will be required to comply with all terms and conditions as set forth in this IFB and County's Agreement (Attachment A), except as may be specifically exempted by the County in writing, and to execute a written contract using the attached Agreement. Failure to execute a contract within 14 days of written notification from the County may constitute cause for cancellation of the bids acceptance and award.

Sullivan County is aware of the time and effort required to prepare responses and invites contractors to let us know of any bidding requirements that are unclear and/or create difficulty in responding.

Attachments

Attachment 1 – Sample Agreement

Attachment 2 – Scope of Work

ATTACHMENT 1
AGREEMENT for SERVICES

THIS AGREEMENT made as of the _____ in the year ____, by and between Sullivan County (hereinafter called the Owner) and _____ (hereinafter called the Contractor):

WITNESSETH; that the Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1. **WORK** - The Contractor shall perform _____ as specified or indicated Scope of Services (Attachment A) and Contractor's Proposal (Attachment B), together herein called the Work, for the duration of the contract time. The Contractor shall provide, at his expense, all labor, materials, equipment and incidentals as may be necessary for the expeditious and proper execution of the work.
2. **CONTRACT TIME** - The initial term of this Agreement shall commence on _____ and shall terminate on _____ (the "Term").
3. **CONTRACT PRICE and PAYMENT**- Upon completion of the work, Owner shall pay the Contractor a sum of _____ \$ _____ with term of net 30 days after invoice date. Project completion shall be defined as all materials being completely and permanently installed in accordance with the contract documents, including completion of a punch list, and the site being broom-clean and free from hazards. When work has been performed, Contractor shall invoice at intervals no longer than 30 days during term of this Agreement.
4. **TERMINATION FOR DEFAULT** – Should Contractor at any time refuse, neglect, or otherwise fail to supply a sufficient number or amount of properly skilled workers, materials, or equipment, or fail in any respect to prosecute the work in accordance with the schedule of completion approved by Owner, or fail to perform any of its obligations set forth in the Contract, Owner may, at its election, terminate the employment of Contractor, giving notice to Contractor in writing of such election.
5. **INDEMNIFICATION OF OWNER** – To the fullest extent permitted by law, the Contractor shall protect, indemnify, save, defend and hold harmless the Owner and its officials, agents, volunteers and employees from and against any and all liabilities, obligations, claims, demands, damages, penalties, causes of action, loss of services, compensation, costs and expenses, including but not limited to reasonable attorney and paralegal fees, which the Owner and its officials, agents, volunteers and employees may become obligated by reason of any accident, bodily injury, death of a person or loss of or damage to tangible property, which may in any way arise directly or indirectly in connection with or out of the services performed by Contractor or anyone directly or indirectly employed by Contractor or any other person or company retained in any way to carry on all or any portion of the services necessary to abide by the terms of the Agreement, including but not limited to any negligent, intentional, or wrongful act or omission by the Contractor or its officers, employees, or agents.
6. **INSURANCE** – The Contractor shall secure and maintain general liability coverage in an amount of not less than \$1,000,000 per occurrence and \$2,000,000 aggregate, vehicle liability coverage for bodily injury and property damage in an amount of not less than \$1,000,000 combined single limit, and workers compensation coverage as required by state law. Contractor shall furnish to the Owner a Certificate of Insurance and an endorsement prior to commencing work, demonstrating that the County and its officials, agents, volunteers and employees are named as an additional insured on the general liability and automobile liability insurance coverage.
7. Neither Owner nor Contractor shall, without the prior written consent of the other, assign, sublet or delegate, in whole or in part, any of its rights or obligations under any of the Contract Documents; and, specifically not assign any monies due, or to become due, without the prior written consent of Owner.

8. Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives, to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents.
9. Agreement between Owner and Contractor and may only be altered, amended, or repealed by a duly executed written notice.
10. The laws of the State of New Hampshire shall govern this Contract without reference to the conflict of law principles thereof.
11. Contractor will provide the required services and will not subcontract or assign the services without the Owner's written approval. Contractor will not hire any Owner employee for any of the required services without the Owner's written approval.
12. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, sexual orientation, national origin, physical handicap, age, height, weight, marital status, veteran status, religion and political belief (except as it relates to a bona fide occupational qualification reasonably necessary to the normal operation of the business).

IN WITNESS WHEREOF, the parties hereunto executed this AGREEMENT the day and year first above written.

CONTRACTOR:

OWNER:

SULLIVAN COUNTY, NEW HAMPSHIRE

Board of Commissioners
 24 Main Street
 Newport, NH 03773

BY:

BY:

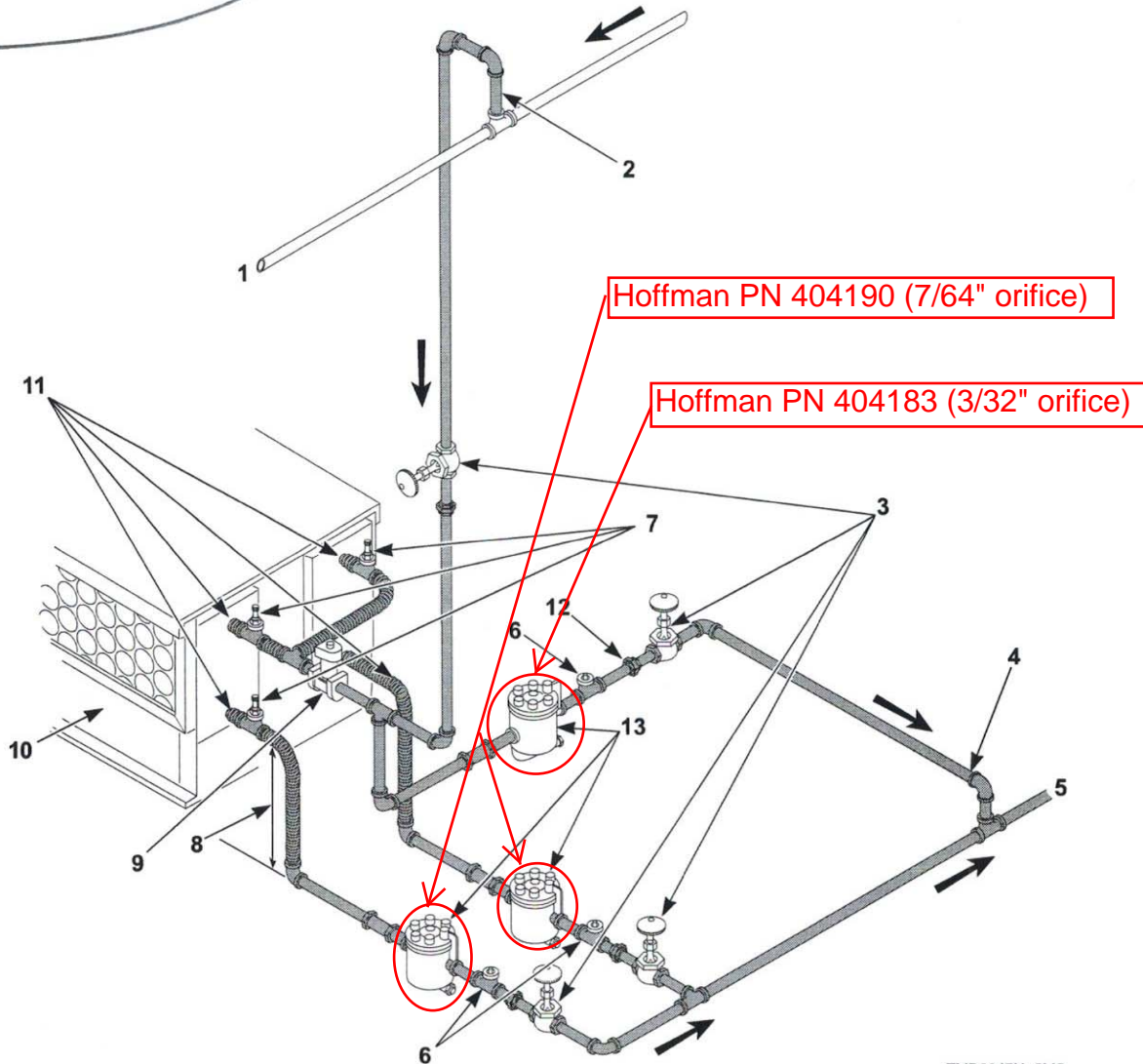
 Name:

 Name:

 Title:

 Title:

Duly authorized to enter into this agreement
 by vote of the Board of Commissioners on
 DATE



TMB2647N_SVG

NOTE: Refer to Table 11 for sizing of steam lines. Piping must also be sized accordingly for length of runs and number of elbows.

- 1. Supply
- 2. 12 in. [300 mm] Riser
- 3. Shut-Off Valve
- 4. Condensate Return Line from Supply Line
- 5. Return
- 6. Check Valve
- 7. Vacuum Breaker (Optional)
- 8. 18 in. [460 mm] Drop Recommended (not above outlet)
- 9. Solenoid Valve (Supplied with machine)
- 10. Steam Bonnet
- 11. Flexible Line
- 12. Union
- 13. Trap with Built-In Strainer

Figure 16

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.

Series B0 Inverted Bucket Traps

The Series B0 Inverted Bucket Traps are designed for a wide range of industrial applications including unit heaters, laundry and process equipment and steam line drip traps.

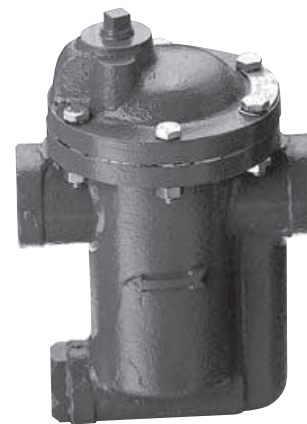
These cast iron inverted bucket traps operate efficiently for long periods of time to add solid energy savings by lowering replacement and labor costs. They are fully repairable for even bigger maintenance savings.

Typical Applications:

- Drip traps in steam lines
- Tracer lines
- Process equipment
- Steam cookers
- Steam kettles
- Steam heated vats
- Pressing machinery
- Unit heaters
- Commercial dishwashing

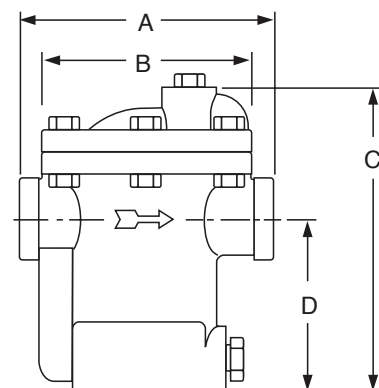
Features:

- Available in sizes 1/2" and 3/4" NPT
- Pressure ratings 20, 80, 125 and 150 psig (1.4, 5.5, 8.6, and 10.3 bar)
- Removable covers for easy in-line service
- Stainless steel internal components
- Resistant to moderate water hammer
- Optional built-in strainer to reduce the number of piping connections
- Maximum capacities to 690 lbs/hr (313 kg/hr)
- Maximum temperature 406°F (208°C)
- Maximum allowable pressure (vessel design) 250 psig (17.3 bar)
- Maximum operating pressure 150 psig (10.3 bar)



Materials of Construction	
Part	Specifications
Body and cover	Cast Iron
Valve Pin and Seat	Stainless Steel (Hardened)
Bucket	Stainless Steel
Lever Assembly	Stainless Steel
Strainer	Stainless Steel
Cover Gasket	Non-asbestos fiber
Cover Bolts	Grade 8

Dimensions in. (mm)



NPT Size	A	B (Dia.)	C	D
1/2 & 3/4	5 ¹ / ₁₆ (129)	3 ³ / ₄ (95)	6 ³ / ₁₆ (157)	3 ¹ / ₂ (89)

Capacities (Gross Ratings)

Series	Orifice Size in. (mm)	Seat Pressure psi (bar)	Differential Pressure psig (bar)													
			1/2 (.035)	1 (0.07)	5 (0.35)	10 (0.69)	15 (1.03)	20 (1.38)	30 (2.1)	40 (2.8)	50 (3.5)	60 (4.2)	80 (5.5)	100 (6.9)	125 (8.6)	150 (10.3)
			Capacities lbs./hr (kg/hr)													
B0	3/16 (4.7)	20 (1.4)	200 (91)	270 (122)	450 (204)	560 (254)	640 (290)	690 (313)								
	1/8 (3.2)	80 (5.5)	80 (36)	110 (50)	200 (91)	300 (136)	360 (163)	420 (190)	500 (227)	540 (245)	580 (263)	620 (281)	690 (313)			
	7/64 (2.8)	125 (8.6)		55 (25)	90 (41)	145 (66)	195 (88)	260 (118)	345 (156)	400 (181)	442 (200)	485 (220)	565 (256)	640 (290)	680 (308)	
	3/32 (2.4)	150 (10.3)			70 (32)	110 (50)	150 (68)	200 (91)	270 (122)	310 (141)	345 (156)	380 (172)	440 (200)	480 (218)	540 (245)	570 (259)

Ordering Information (Specify the part number on your order)

Model (A) units are basic.

Model (S) units have built-in strainer.

NPT Model Number	BSPT Model Number	Size in.	NPT Part Number	BSPT Part Number	Seat Differential Pressure Rating psi (bar)	Body Design Pressure psi (bar)	Weight lbs. (kg)
B0020A-2	B0020A-2J	1/2	404180	404131	20 (1.4)	250 (17.3)	7 (3)
B0020S-2	B0020S-2J	1/2	404184	404135	20 (1.4)	250 (17.3)	8 (3)
B0080A-2	B0080A-2J	1/2	404181	404132	80 (5.5)	250 (17.3)	9 (3)
B0080S-2	B0080S-2J	1/2	404185	404136	80 (5.5)	250 (17.3)	10 (3)
B0125A-2	B0125A-2J	1/2	404182	404133	125 (8.6)	250 (17.3)	11 (3)
B0125S-2	B0125S-2J	1/2	404186	404137	125 (8.6)	250 (17.3)	12 (3)
B0150A-2	B0150A-2J	1/2	404183	404134	150 (10.3)	250 (17.3)	13 (3)
B0150S-2	B0150S-2J	1/2	404187	404138	150 (10.3)	250 (17.3)	14 (3)
B0020A-3	B0020A-3J	3/4	404188	404139	20 (1.4)	250 (17.3)	15 (3)
B0020S-3	B0020S-3J	3/4	404192	404143	20 (1.4)	250 (17.3)	16 (3)
B0080A-3	B0080A-3J	3/4	404189	404140	80 (5.5)	250 (17.3)	17 (3)
B0080S-3	B0080S-3J	3/4	404193	404144	80 (5.5)	250 (17.3)	18 (3)
B0125A-3	B0125A-3J	3/4	404190	404141	125 (8.6)	250 (17.3)	19 (3)
B0125S-3	B0125S-3J	3/4	404194	404145	125 (8.6)	250 (17.3)	20 (3)
B0150A-3	B0150A-3J	3/4	404191	404142	150 (10.3)	250 (17.3)	21 (3)
B0150S-3	B0150S-3J	3/4	404195	404146	150 (10.3)	250 (17.3)	22 (3)

Supply Lines

Coil Outlets

Inverted Bucket Steam Traps

Series B

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.

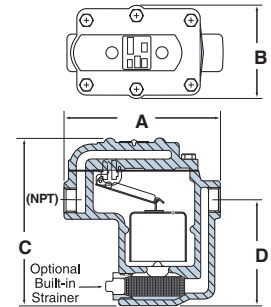
Series B

Series B1

- Available in sizes 1/2" and 3/4" NPT and BSPT
- Meets Mil specification WW-T-696-E Type I, Style B, Class 1-7
- Removable covers for easy in-line service
- Erosion resistant covers
- Stainless steel internal components
- Resistant to moderate water hammer
- Optional built-in thermic vent for faster heating
- Optional built-in strainer to reduce the number of piping connections
- Maximum capacities to 1700 lbs/hr. (771 kg/hr.)
- Maximum temperature 406°F (208°C)
- Maximum operating pressure 250 psig (17.3 bar)



Series B1

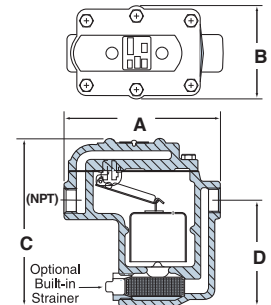


Series B2

- 3/4" NPT and BSPT
- Meets Mil specification WW-T-696-E Type I, Style B, Class 1-7
- Removable covers for easy in-line service
- Erosion resistant covers
- Stainless steel internal components
- Resistant to moderate water hammer
- Optional built-in thermic vent for faster heating
- Optional built-in strainer to reduce the number of piping connections
- Maximum capacities to 2620 lbs./hr (1188 kg/hr.)
- Maximum temperature 406°F (208°C)
- Maximum operating pressure 250 psig (17.3 bar)



Series B2



Materials of Construction	
Part	Specifications
Body and cover	Cast Iron 30,000 psi tensile
Valve Pin and Seat	Stainless Steel (Hardened)
Bucket	Stainless Steel
Lever Assembly	Stainless Steel
Cover Bolts	Grade 5 Steel

Dimensions in. (mm)

Series	Size	A	B	C	D
B1	1/2, 3/4	6 ¹⁵ / ₁₆ (177)	3 ¹³ / ₁₆ (97)	7 ¹ / ₄ (184)	4 ³ / ₈ (111)
B2	3/4	6 ¹⁵ / ₁₆ (177)	3 ¹³ / ₁₆ (97)	9 ¹ / ₁₆ (230)	6 ⁷ / ₈ (158)

Series B BEARTRAP®

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.

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)
B1	Capacities lbs./hr (kg/hr)																		
	.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)	

Steam Traps

Selecting and Sizing Steam Traps

Selecting the proper steam trap is important in effective operation of steam systems. Steam traps are automatic valves that open to pass condensate and close to prevent the flow of steam. The functions of a steam trap in a steam system are to:

- Vent air from the system so steam can enter
- Hold steam in the system until the steam latent heat is removed
- Drain condensate from the system as it is formed after the latent heat is removed.

Removing condensate from piping helps prevent erosion and water hammer. Removing condensate from heat exchangers is required to make room for new steam for the heating process.

There are many types of steam traps. The [Steam Trap Selection Guide Chart](#) points out system conditions that may be encountered and suggests the trap type(s) that may best handle the requirement. Several types of traps may be used for a specific application.

Factors to consider in selecting the type of trap include:

- Constant or modulating condensate load
- Constant or fluctuating pressure
- Speed of air venting required
- Trap location

TRAP SIZING

1. Determine the maximum condensate load (capacity) requirement for the trap by one of the following:
 - Referring to the manufacturers' specifications for the system equipment.
 - Approximating condensate loads using the "General Usage Formulas".
 - Using the "CalcLoad" Load Calculator available through "Steam Specialty Component Selector" on the Hoffman Specialty website or ESP-Plus.
2. Determine the available steam inlet pressure at the trap (This pressure could be different than supply pressure at boiler.)
3. Determine the outlet pressure (backpressure) at the trap discharge. (Pressure against the outlet can be due to static pressure in return line or due to lifting to an overhead return).
4. Determine the pressure differential across the trap. (inlet pressure - outlet pressure = differential pressure).

5. Determine a Safety Factor. The Safety factor will depend on accuracy in determining condensate load, inlet and outlet pressures. Recommendations:

- Float & Thermostatic Trap 1.5 to 2.5
- Bucket Trap 2 to 4
- Thermostatic Trap 2 to 4
- Thermodisc Trap 1 to 1.2

6. Multiply normal maximum condensate load (as determined above) by Safety Factor.
7. Use the Capacity Tables for the selected type of trap to determine the trap model number.
8. Use Ordering Information Charts to determine the part number.

Guidelines:

- The trap seat rating must always be higher than the maximum inlet pressure at the trap.
- When a modulating control valve controls the inlet to equipment, select a trap size with a pressure rating greater than the maximum inlet pressure at the trap.
- Trap capacity should be checked at the minimum differential pressure to assure complete condensate removal under all possible conditions.

Inverted Bucket Trap Operating Pressure Selection:

- Bucket traps are offered with various orifice sizes that determine the maximum operating pressure rating.
- A trap with a lower seat pressure rating has a larger sized orifice than a trap with a higher seat pressure rating. The larger orifice provides a larger condensate rating. When the actual operating pressure is higher than the seat rating, the pressure differential across the seat will prevent the trap from opening. Thus, an inverted bucket trap must be selected for the maximum differential pressure that will be encountered by the trap.
- Trap Capacity Tables show trap capacities at lower differential pressures than the trap rating. This allows selection of a trap at various operating points. A trap with a higher seat pressure rating may be used at lower pressure differentials. However, the capacity rating at that pressure differential will be less than the same size trap with a lower seat pressure rating.

Steam Traps (continued)

Selecting and Sizing Steam Traps (continued)

Lifting Condensate to Overhead Return

Condensate must be lifted in applications where the trap is installed below the return line.

Guidelines:

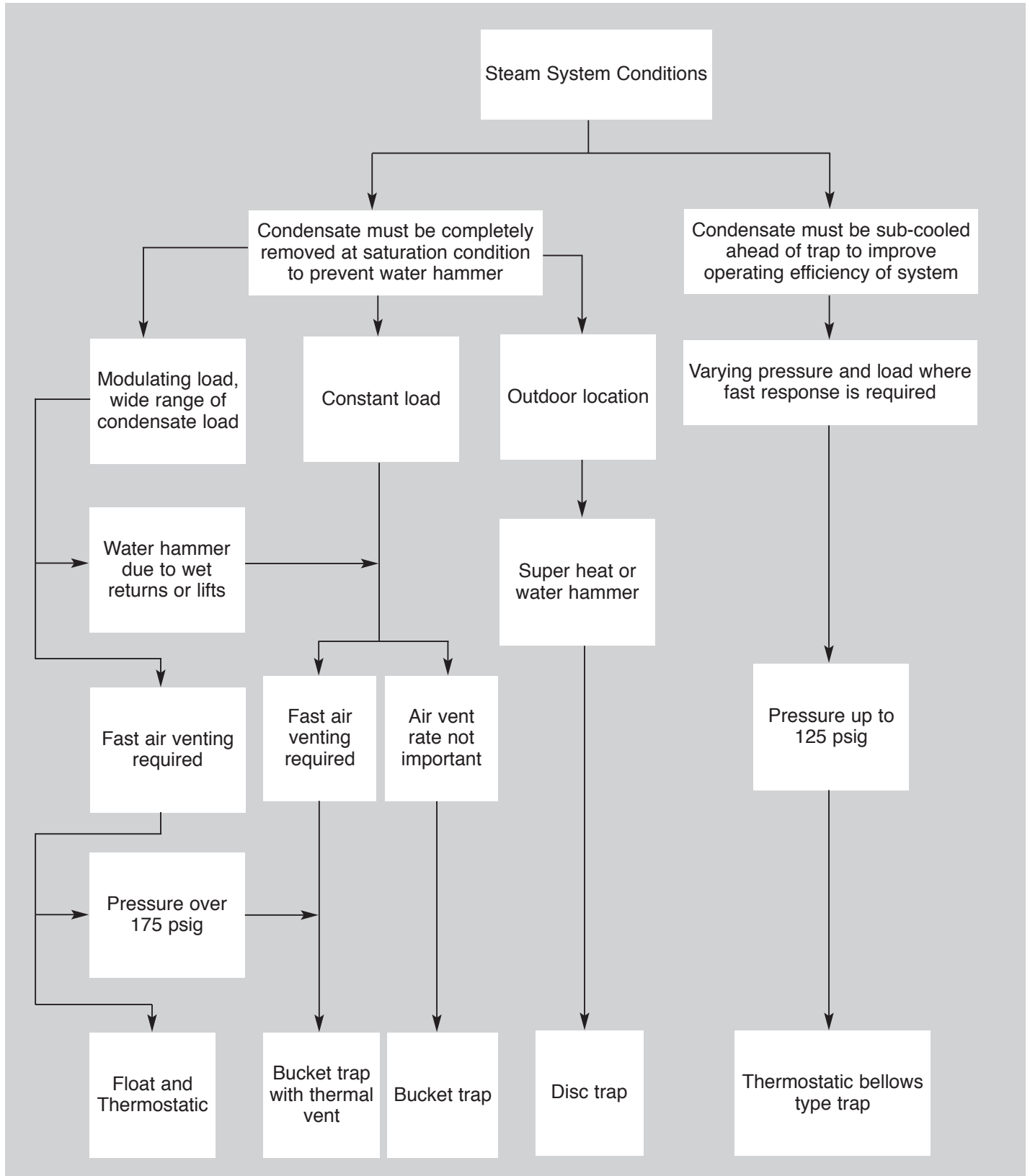
- Steam pressure at the trap inlet lifts the condensate. Differential steam pressure across the steam trap of 1 psi (0.07 bar) will lift condensate 2 ft. (0.6 m).

- Do not return condensate to an overhead return if modulating control valves are installed. Modulating control valves may cause the inlet pressure to modulate to 0 psi (0 bar). This condition will result in no differential pressure to push the condensate into the overhead return. When this happens, condensate will back up into the steam chamber and result in water hammer. Use a Hoffman condensate unit to collect condensate

Steam Trap Criteria Comparison

CRITERIA	F&T	Inverted Bucket	Thermostatic	Thermodisc
Response to Load Changes	Fast	Moderate	Moderate	Slow
Air Venting	Medium/High	Low	High	Low
Thermal Efficiency	Medium/High	Medium	High	Medium
Primary Applications	Drip Legs Process Equip.	Drip Legs Process Equip.	Drip Legs Process Equip. Tracing	Drip Legs Tracing
Affected by Ambient Temperatures	No (Susceptible to freezing)		No	Yes (unless insulated)
Relative Cost	Medium/High	Medium/Low	Low	Low
Capacity	High	High	Medium	Low
Pressure Range	to 250 psig (17.3 bar)	to 250 psig (17.3 bar)	to 125 psig (8.6 bar)	to 600 psig (41.4 bar)
Size vs. capacity	Large	Large	Small	Medium
Ease of Maintenance	Moderate	Moderate	Very Easy	Very Easy
Orientation limits	Yes	Yes	No	No

Steam Trap Selection Guide Chart



Steam Traps (continued)

Steam Trap Application Guide

This application guide is designed to help in the selection of the type of steam trap for the type of application. The choices are based upon common usage. However, the

specific choice of trap type should be based upon variations in the individual system and personal preference. This chart should serve only as a guide.

APPLICATION	F&T	Inverted Bucket	Thermostatic	Thermodisc
Mains & Tracing Lines				
Steam Mains				
to 30 psig (2.1 bar)	2	3	1	
to 250 psig (17.3 bar)	1	2		3
to 600 psig (41.4 bar)				1
Steam Tracing Lines				
Critical	2	2	2	1
Non-Critical	2	2	1	2
HVAC				
Heat Exchangers				
to 20 psig (1.4 bar)	1	2	2	
to 125 psig (8.6 bar)	1	2	2	
to 250 psig (17.3 bar)	1	2		
Radiators			1	
Unit Heaters	1	2	1	
Air Heating Coils				
to 15 psig (1.0 bar)	1	3	2	
to 60 psig (4.1 bar)	1	2	2	
Absorption chiller	1	2	2	
PROCESS EQUIPMENT				
Process Vats	1			2
Tank Heating				
Storage Tanks	2		1	
Line Heaters	1		2	
Reboiler	1	2		
Rotating Cylinders	1	2		
Evaporators	1	2		
Sterilizer	1		2	
Pressing	1	2	1	
Cooker/Reactor				
to 15 psig (1.0 bar)	1	3	2	
to 60 psig (4.1 bar)	1	2	1	
to 150 psig (10.1 bar)	1	2		

KEY: 1 = First Choice
 2 = Second Choice
 3 = Third Choice
 Blank = Not Recommended