Steam Trap Selection

Types of Steam Traps

	Thermostatic		Mechanical		Thermodynamic	Orifice
Type	Bellows	Bimetal	F & T	Bucket	Disc	Orifice
Condensate Discharge	Intermittent	Intermittent	Continuous	Intermittent	Intermittent	Continuous

- The optimum application of a trap is dependent upon the characteristics of the process and equipment with which it is used and its pattern of condensate discharge.
- The discharge capacity of a trap is determined by the pressure differential (trap inlet pressure minus outlet pressure) and the size of the orifice. Thermodynamic and Thermostatic traps (radiator and temperature modulating) have a fixed orifice size.
- Mechanical traps differ from the other types in that their orifice (discharge opening) must be selected to accommodate the maximum operating differential pressure.

Caution Failure to select the proper orifice may result in insufficient discharge capacity, waterlogging or locking of the trap.

Selecting a Steam Trap

It is important to select a product with the optimum capacity from the many types which are available. Use the following procedure to make sure the correct product is selected.

1 **Application** — Define the application and the type of service in which it will be used.

The conditions under which a trap must operate will differ according to where it it installed.

→ **Steam Trap Application Guide**

2 **Confirmation of Operating Conditions** — Check the maximum operating pressure, temperature, discharge rate and other conditions.

Do not oversize the trap. Select the smallest capacity trap, yet avoid undersizing and ensure safe, accurate operation given the conditions of inlet pressure, temperature and pressure differential under which it will operate.

→ **Check List for Confirming Operating Conditions**

→ **Discharge Rate Tables for Each Model**

3 **Maintenance Preference** — Confirm whether inline repair feature or maintenance free technology is desirable.

→ **Specification Tables for Each Model**

Check List for Confirming Operating Conditions

(A) Confirmation of Conditions

1.	What is the application?	
2.	Which trap is appropriate for the application?*1	
3.	What is the trap inlet pressure?*2	psig
4.	What is the outlet pressure?*2	psig
5.	What is the condensate load?	lb/Hr

(B) Selection

1. The required discharge capacity of the trap is ___ times*3 the amount of condensate generated.
2. Inlet pressure – Outlet pressure = Pressure differential.
3. Select a trap with a maximum operating pressure equal to or slightly above the inlet pressure to the trap.
4. Select a discharge rate for the pressure differential from the discharge capacity chart.

	Discharge	Product name	Pressure differential	Required discharge capacity
❑			psig	lb/H
❑				
❑				

5. The trap with the smallest discharge capacity greater than that required is the optimum trap.
6. Connection size ____ in
7. Connection Type

❑ Screwed ❑ Flanged (flange standard_____) ❑ Socket weld

*1. See tables for selection of a steam trap by application.

*2. If unknown, is condensate recovered? …… ❑ Yes ❑ No…(back pressure = 0 psig)

If condensate is recovered

① How many feet does the trap outlet rise?	ft.	x 0.5 =	psig
② What is the total pipe length from the trap to the recovery tank?	ft.	x 0.01 =	psig
③ What is the pressure of the condensate recovery tank? ……			psig
④ Add ①, ② and ③ ……{This is the outlet pressure (back pressure).} ① + ② + ③ =			psig

*3. Safety Factor

The margin of safety which is determined by the operating characteristics of each piece of equipment is referred to as the “safety factor.” The safety factor required will differ according to the type of trap (type of condensate discharge). The discharge rate table for each model shows the values for condensate discharge when the trap is fully open, and the maximum rated condensate load on the equipment should correspond to the value obtained by dividing this discharge rate by the safety factor (see Steam Trap Application Guide on opposite page).

Steam Trap Application Guide

This guide is designed to direct the user to a General Steam Trap Technology section. Once a technology is selected, additional details, regarding specific steam traps, can be found in the catalog under the Technology Selection tab.
These choices, in the Guide, are based on many years of steam trap manufacturing experience. The choices, however are not limited to these alone. Variations in individual systems (superheat, water hammer, insulation, etc.), as well as personal preference, should be taken into consideration.

Application		Thermostatic	Thermo-dynamic	Free Float	Inverted Bucket	Float & Thermostatic	Orifice	Minimum Safety Factor
Drip & Tracing								
Main Drip	to 30 PSIG	1		2	3	2	4	1.5:1
	to 300 PSIG	1	2	3	2	3	3	1.5:1
	to 650 PSIG	1	2			3	2	1.5:1
	to 2500 PSIG						1	1.5:1
Steam Tracing		1	2	2	2	2	3	1.5:1
Process								
Heat Exchanger	to 20 PSIG	2		1	2	1		2:1
	to 150 PSIG	1		1	2	1		2:1
	to 300 PSIG	1		1	2	1		2:1
	to 600 PSIG			1				2:1
Cooker/Reactor	to 15 PSIG	2		1	3	1		3:1
	to 60 PSIG	1		1	3	1		3:1
	to 150 PSIG	1		1	3	1		3:1
	to 600 PSIG	2		1				3:1
Pressing	to 100 PSIG	1		1	2	1		3:1
	to 300 PSIG	1	2	2	2			3:1
Reboiler		2		1	3	1		2:1
Rotating Cylinders		2*		1*	2		3	3:1
Sterilizer		1		2		2		2:1
Tank Heating	Storage	1		2		2		1.5:1
	Line Heater	1		2		2		3:1
Evaporator				1	2	2		2:1
HVAC								
Air Heating Coils	to 15 PSIG	2		1	3	1		2:1
	to 60 PSIG	2		1	2	1		2:1
	to 250 PSIG	2		1				3:1
Radiator		1					4	2:1
Unit Heater		1		1	2	1		2:1
Absorption Chiller		2		1	2	1		2:1

*Requires Steam Lock Release

KEY Blank = not recommended
1 = First Choice 3 = Third Choice
2 = Second Choice 4 = Fourth Choice