



**LILLY STEAM
TRAPS, INC.**



THE THERMOSTATIC STEAM TRAP

The purpose of any steam trap is to discharge, promptly, all condensate (as well as air and other non-condensable gases)... without discharging live steam. Since steam is a vapor formed when heat is added to water, it follows that it reverts back to water, or condensate, when heat is extracted. This condensate must be removed from lines and equipment as rapidly as possible, for hot water contains too little heat for efficient performance. Air, too, must be removed, since it lowers the temperature of the steam and acts as an insulator. All steam traps must be classified, broadly, under three types: thermostatic, thermodynamic, and mechanical. Thermostatic traps include bellows and differential metal-expansion designs.

The efficiency of an expensive piece of equipment can be reduced as much as 20% through sluggish drainage of condensate and failure to remove air. Proper selection of the right type and size steam trap assures uniform heating and higher temperatures, resulting in increased production.

For most heat-transfer applications, an intermittent-action trap is most efficient. Fast, intermittent valve action in the thermostatic bellows trap provides rapid drainage of condensate and venting of air.

Thermostatic Bellows Traps operate on two different principles: *Fail Close Design* - The bellows is partially filled with distilled water under high vacuum and is compressed by the pressure-difference. The valve is now open for discharge. When steam enters, vapor pressure inside the bellows equals trap pressure, permitting spring action of bellows to close the valve fast. As condensate collects, it takes heat from Bellows lowering internal pressure. Line pressure will then compress Bellows to open the valve and then discharge condensate. The valve opening automatically adjusts to load conditions from minimum on light loads to full lift at maximum load. If Bellows fails (seal lost at some point) Bellows will go to its relaxed position which will close the valve.

Fail Open Design - The Bellows is filled at its free length with a liquid having a lower boiling point than water. As assembled, the valve is normally open, when steam or very hot condensate enters trap, Bellows fill vaporizes to a pressure higher than line pressure, this forces the valve into the seat orifice to prevent any further flow. Opening of the valve is identical to Fail Close Design. If Bellows fails (seal lost at same point) Bellows will go to its relaxed position which will open valve.

LILLY BELLOWS THERMOSTATIC STEAM TRAPS

Maximum Capacity in Pounds per Hour

Condensate 10° F Below Steam Temperature

PSIG at Inlet	TRAP SIZE AND STYLE										
	1/2" & 3/4" L-200W	1/4" to 3/4" A & AHV	1" A & AHV	1/2" B & C	3/4" B & C	1" & 1-1/4" B & C	1-1/2" & 2" B & C	1/2" CS	3/4" CS	1" & 1-1/4" CS	1-1/2" & 2" CS
1	220	745	985	985	1460	1825	2760	985	1460	1825	2760
2	330	1050	1390	1390	2055	2575	3890	1390	2055	2575	3890
5	550	1650	2180	2180	3240	4050	6120	2180	3240	4050	6120
10	825	2325	3070	3070	4560	5700	8610	3070	4560	5700	8610
15	1030	2460	3255	3225	4825	6035	9125	3255	4825	6035	9125
20	1210	2825	3735	3735	5550	6925	10470	3735	5550	6925	10470
40	1750	3430	4525	4525	6705	8400	12700	4525	6705	8400	12700
50	1975	3815	5040	5040	7480	9350	14125	5040	7480	9350	14125
60	2160	4145	5480	5480	8140	10180	15390	5480	8140	10180	15390
80	2535	4530	5990	5990	8895	11115	16815	5990	8895	11115	16815
100	2825	5035	6645	6645	9865	12340	18660	6645	9865	12340	18660
125	3140	5535	7315	7315	10850	13565	20520	7315	10850	13565	20520
150	3425	5720	7560	7560	11225	14030	21235	7560	11225	14030	21235
175	3580	6085	8045	8045	11935	14920	22580	8045	11935	14920	22580
200	3650	6210	8200	8200	12165	15230	23015	8200	12165	15230	23015
225				8615	12770	15960	24190	8615	12770	15960	24190
250				8915	13225	16540	25055	8915	13225	16540	25055
300								9220	13685	17120	25915

* NOTE: L200WR (3/16" Orifice) = 0.63 x L200W Trap Capacity

EFFECT OF BACK PRESSURE ON STEAM TRAP CAPACITY

Back Pressure as Percent of Inlet Pressure	20	25	30	40	50	60	70	80	90
Percent Reduction of Trap Capacity	0	0	2	5	12	20	30	40	55

MODEL L200W

APPLICATIONS

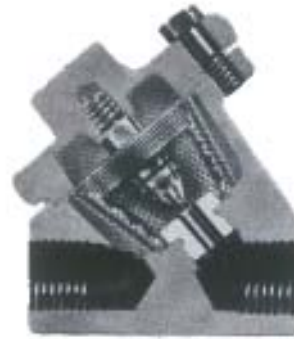
L-200W Series Thermostatic Steam Traps are designed for a wide range of services including plating tanks, platen presses, unit heaters, sterilizers and various types of cooking and laundry equipment. They are also widely used as air vents for receivers, water heaters and mechanical traps. They are suitable for use on super-heated steam because the trap closes on saturation temperature, and superheated steam cannot reach the trap. The L-200WR Thermostatic Steam Traps are designed for light load applications such as tracer lines and drip legs.

DESIGN FEATURES

Less maintenance is inherent in the design simplicity of these models. All parts, the bellows, valve and seat, body, and cover, are top quality materials. They are precision-assembled into a steam trapping unit of exceptional efficiency, a trap that functions on just a few degrees temperature differential between steam and condensate to open the trap for fast, positive discharge.

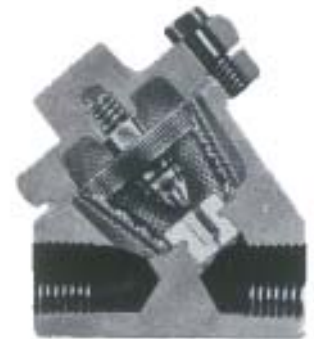
CONSTRUCTION

In addition to simplicity of design, they are exceptionally rugged in construction. Forged steel body and cover withstand rugged service. Hardened stainless steel valve and valve seat are lapped together for tight positive shut-off. These traps are available with socket weld connections when specified.



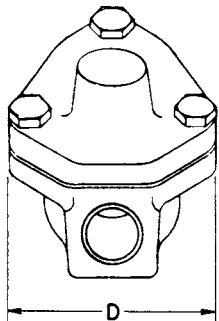
MODEL L-200W

*Full Flow Orifice For Maximum Capacity



MODEL L-200WR

*Reduced Orifice For Maximum Steam Savings
 *Fail Open Welded Stainless Steel Bellows
 *Resistant to Hydraulic Shock
 *Stainless Steel Internal Strainer

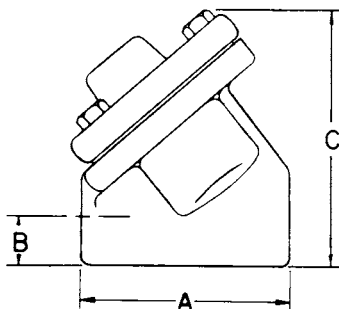


**MODEL L-200W
 MODEL L-200WR**

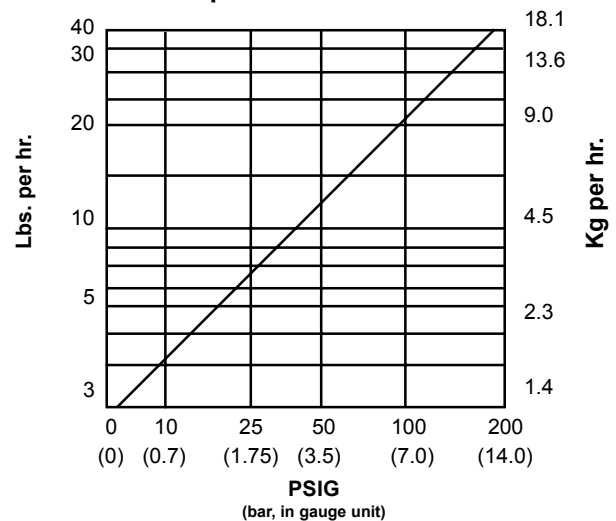
For pressures from vacuum to 200 psig. Maximum temperature in trap: 500° F with stainless steel bellows.

PIPE SIZES: 1/2" - 3/4"

Installed horizontally or vertically. Straight through female pipe thread inlet and outlet. Freeze-proof when installed vertically. For capacities see Page 2.



**Maximum Steam Loss
 in Fall Open Position**



Graph is based on trap discharging to atmosphere and no load present. Backpressure and load will reduce steam loss.

TRAP MODEL	PIPE SIZE	VALVE ORIFICE	DIMENSIONS				WEIGHT
			A	B	C	D	
L200W	1/2" & 3/4"	1/4"	3	11/16"	3-5/8"	2-7/8"	3 lbs

MODELS A and AHV

APPLICATIONS

Types A and AHV are for small and medium size items of equipment with low and medium steam requirements, such as process and storage tanks, sterilizers, and various types of cooking and laundry equipment. Also applicable as automatic air vents for mechanical traps, return traps, receivers and water heaters. Type AHV traps applicable where it is necessary or desirable to have all piping run horizontally or vertically, or close to a floor, wall or pillar.

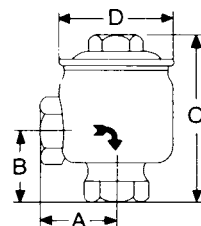
CONSTRUCTION MATERIALS

Bronze construction. Valves and seats are hardened stainless steel. Bellows are hydraulically formed from seamless tube, heliarc-welded to end fittings. Silver-brazed sealing plug. Stainless steel bellows recommended for all applications.



TYPE A

For pressures from vacuum to 200 lbs. Made in five pipe sizes:
 $\frac{1}{4}$ " - $\frac{3}{8}$ " - $\frac{1}{2}$ " - $\frac{3}{4}$ " - 1"
 Maximum temperature 425° F inside trap.
 Horizontal inlet and vertical outlet.
 Freeze-proof.
 For capacities see Page 2.

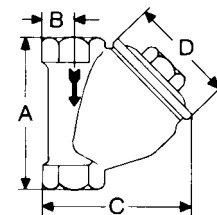


Bellows Material	Pipe Size	Valve Orifice	Dimensions				Weight
			A	B	C	D	
A-13	1/4"	5/16"	2-3/8"	2"	4-3/8"	3"	3.4 lbs
A-23	3/8"	5/16"	2-3/8"	2"	4-3/8"	3"	3.4 lbs
A-33	1/2"	5/16"	2"	1-5/8"	4-3/16"	3"	3.3 lbs
A-43	3/4"	5/16"	2"	1-7/8"	4-7/16"	3"	3.3 lbs
A-53	1"	3/8"	2-13/16"	2-13/16"	4-15/16"	3-7/16"	4.8 lbs



TYPE AHV

For pressures from vacuum to 200 lbs. Made in five pipe sizes:
 $\frac{1}{4}$ " - $\frac{3}{8}$ " - $\frac{1}{2}$ " - $\frac{3}{4}$ " - 1"
 Maximum temperature 425° F inside trap.
 Straight-through inlet and outlet.
 Freeze-proof when installed vertically.
 For capacities see Page 2.



Bellows Material	Pipe Size	Valve Orifice	Dimensions				Weight
			A	B	C	D	
AHV-13	1/4"	5/16"	4-3/4"	3/4"	3-7/8"	3"	3.2 lbs
AHV-23	3/8"	5/16"	4-3/4"	3/4"	3-7/8"	3"	3.2 lbs
AHV-33	1/2"	5/16"	4"	3/4"	3-7/8"	3"	3.1 lbs
AHV-43	3/4"	5/16"	4-1/4"	7/8"	4-1/4"	3"	3.6 lbs
AHV-53	1"	3/8"	5-5/8"	1"	4-9/16"	3-7/16"	5.3 lbs

MODELS B, C and CS

APPLICATIONS

Types B, C and CS are recommended for the individual drainage of unit heaters, pipe coils, steam mains, high pressure drips, blast coils, dry kilns, jacketed kettles, hot water heaters, driers of all kinds, and many other types of steam-using industrial units of process work. Type B has two outlets, suitable for either horizontal or angle piping. Types C and CS drain completely when cold, and cannot freeze.

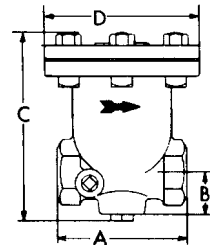
CONSTRUCTION MATERIALS

Types B and C of cast iron construction. Type CS furnished in cast steel. Stainless steel bellows recommended for all applications. Maximum temperature: stainless steel bellows 500°F. Suitable for use on superheated steam. Because the trap closes on saturation temperature, superheated steam cannot reach the trap. Temperature ratings shown are for actual temperature inside the trap, not at the steam main. All bellows are heliarch-welded (not soldered) to end fittings. Type CS available with socket weld connections when specified.



TYPE B

For pressures from vacuum to 250 lbs.
 Made in six pipe sizes:
 1/4" - 1/2" - 1" - 1 1/4" - 1 1/2" - 2"
 Maximum temperature 450° F inside trap.
 Horizontal inlet and horizontal or vertical outlet.
 Not freeze-proof. Pipe plugged drain connections furnished only when specified.
 For capacities see Page 2.

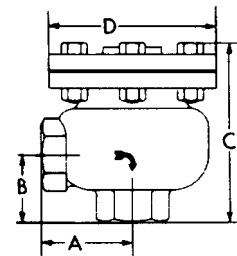


Bellows Material	Pipe Size	Valve Orifice	Dimensions				Weight
			A	B	C	D	
Stainless Steel							
B-33	1/2"	3/8"	3-7/8"	1-1/8"	5-7/8"	4-1/2"	7.0 lbs
B-43	3/4"	7/16"	4-1/4"	1-3/8"	6-3/4"	5-1/16"	10.3 lbs
B-53	1"	1/2"	5-1/2"	1-7/8"	7-11/16"	5-13/16"	15.6 lbs
B-63	1-1/4"	1/2"	5-1/2"	1-7/8"	7-11/16"	5-13/16"	15.3 lbs
B-73	1-1/2"	3/4"	7-1/4"	1-3/4"	9-1/16"	7-3/4"	33.6 lbs
B-83	2"	3/4"	7-1/4"	1-3/4"	9-1/16"	7-3/4"	32.4 lbs



TYPE C AND CS

Type C pressures from vacuum to 250 lbs. (cast iron).
 Maximum temperature 450° F inside trap.
 Type CS pressures from vacuum to 300 lbs. (cast steel).
 Maximum temperature 500° F inside trap.
 Made in six pipe sizes:
 1/4" - 1/2" - 1" - 1 1/4" - 1 1/2" - 2"
 Horizontal inlet and vertical outlet. Freeze-proof.
 For capacities see Page 2.



Bellows Material	Pipe Size	Valve Orifice	Dimensions				Weight
			A	B	C	D	
Stainless Steel							
C-33	1/2"	3/8"	2-5/8"	1-13/16"	4-15/16"	4-1/2"	8.3 lbs
C-43	3/4"	7/16"	2-3/4"	2-1/16"	5-7/16"	5-1/16"	11.1 lbs
C-53	1"	1/2"	3-1/2"	2-13/16"	6-1/16"	5-13/16"	17.8 lbs
C-63	1-1/4"	1/2"	3-1/2"	2-13/16"	6-1/16"	5-13/16"	17.5 lbs
C-73	1-1/2"	3/4"	5"	3-3/4"	8-3/8"	7-3/4"	39.1 lbs
C-83	2"	3/4"	5"	3-3/4"	8-3/8"	7-3/4"	39.0 lbs
CS-33	1/2"	3/8"	2-5/8"	1-13/16"	4-15/16"	4-1/2"	8.6 lbs
CS-43	3/4"	7/16"	2-3/4"	2-1/16"	5-7/16"	5-1/16"	13.0 lbs
CS-53	1"	1/2"	3-1/2"	2-13/16"	6-1/16"	5-13/16"	19.6 lbs
CS-63	1-1/4"	1/2"	3-1/2"	2-13/16"	6-1/16"	5-13/16"	19.3 lbs
CS-73	1-1/2"	3/4"	5"	3-3/4"	8-3/8"	7-3/4"	39.2 lbs
CS-83	2"	3/4"	5"	3-3/4"	8-3/8"	7-3/4"	38.4 lbs

SALES POLICY

Guarantee: The manufacturer guarantees its products to be free from defects in material or workmanship for a period of one year from date of shipment from its factory. Said guarantee will not apply if equipment is used in conditions of service for which it is not specifically recommended. The manufacturer is not responsible for damage or poor operating practice.

If any device is found unsatisfactory under the guarantee, the buyer should notify the manufacturer in writing and after receipt of shipping advice, buyer may return it direct to Lilly Steam Trap, Inc., carrying charges prepaid. Such equipment will be replaced or put in perfect operating condition, free of all charges except transportation, and the correction of any defects by repair or replacement by the manufacturer shall constitute fulfillment of all obligations to the purchaser. Manufacturer's Guarantee is void if unauthorized repairs are made to its apparatus, even though defective.

Manufacturer shall not be liable for consequential damage in case of any failure to meet the conditions of any Guarantee or Shipping Schedule, nor will claims for labor, loss of profits, repairs or other expenses incidental to replacement be allowed.



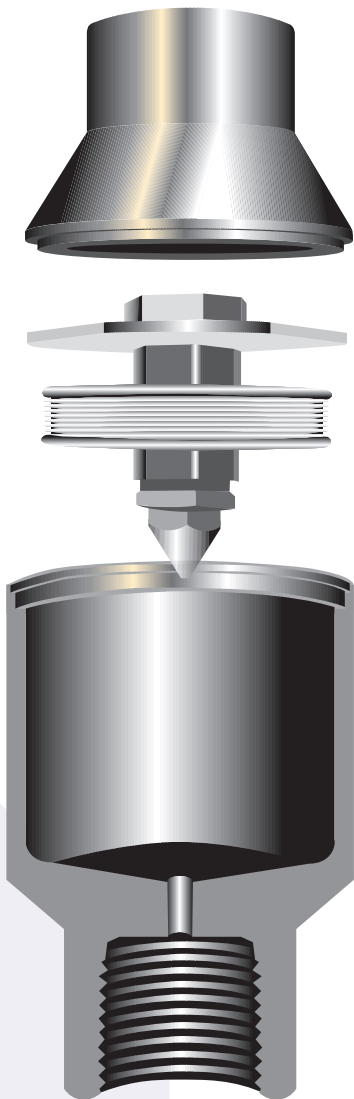
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Thermostatic Steam Trap, Model L500



L500 Operating Principle

Thermal actuator is filled at its free length with a liquid having a lower boiling point than water. As assembled, valve is normally open. When very hot condensate enters trap, thermal actuator fill vaporizes to a pressure higher than line pressure; this forces valve into seat orifice to prevent any further flow. As condensate collects, it takes heat from the actuator lowering internal pressure. Line pressure will then compress thermal actuator to open valve and discharge condensate. Valve opening automatically adjusts to load conditions from minimum on very light loads to full lift at maximum load.

Sealed Stainless Steel Body

Lightweight, compact, and corrosion resistant. No bolts or gaskets. Eliminates body leaks.

Temperature Sensitive Actuators

One moving part. Stainless steel, fail open, welded actuator form maximum corrosion, thermal and hydraulic shock resistance.

Thermal and Hydraulic Shock Resistant

Impingement plate plus welded construction prevents damage to actuator.

Valve and Seat

Long life. Hardened stainless steel valve and seat. Lapped as a matched set for water tight seal.

Maintenance

None. Trap is sealed maintenance-free unit. Replacement traps costs less than repair costs of other more expensive in-line repairable traps.

Freeze Proof

Self draining when installed vertically.

Directional Discharge

Pipe thread erosion prevented by directing discharge to center of pipe.

Guarantee

Traps are guaranteed against defects in materials or workmanship –
Traps with Welded Actuator – 1 Year

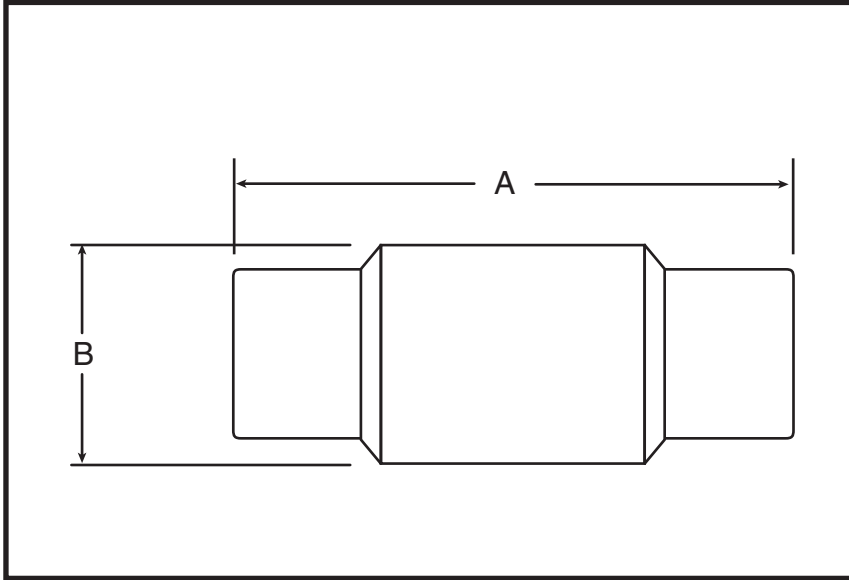
Additional features

Best air handling capability for fast start up and operation. Fastest response to condensate load or temperature changes. Broad application range. Selection of orifice and pipe sizes meet majority of condensate removal demands.



**LILLY STEAM
TRAPS, INC.**

Thermostatic Steam Trap, Model L500



Applications:

- L500** Unit Heaters
Air Vents
Cooking Kettles
Laundry Equipment
Other Process Equipment
Drip Legs
Platen Presses
Plating Tanks
Sterilizers

L500L Steam Tracing

Dimensions

NPT	Inch (mm)		Weight lb. (kg)
	A	B	
1/2	3-3/4 (94)	1-3/4 (44)	1.1 (0.45)
3/4	3-15/16 (100)	1-3/4 (44)	1.2 (0.54)

Maximum Capacity-lbs/hr 10°F Below Saturation (Kg/hr 5°C Below Saturation)																
Trap	Orifice Inch (mm)	PSIG (bar)														
		5 (0,34)	10 (0,7)	20 (1,4)	50 (3,5)	100 (6,9)	125 (8,62)	150 (10,3)	200 (13,8)	250 (17,2)	300 (20,7)	350 (24,1)	400 (27,6)	450 (31,0)	500 (34,5)	600 (41,4)
L500	1/4 (6)	550 (249)	825 (374)	1210 (549)	1975 (896)	2825 (1281)	3140 (1424)	3425 (1554)	3650 (1656)	3960 (1796)	4100 (1860)					
L500L	5/64 (2)	84 (38)	119 (54)	168 (76)	265 (120)	348 (158)	375 (170)	398 (181)	439 (199)	472 (214)	502 (228)	529 (240)	553 (251)	575 (261)	595 (270)	

1 Welded Thermal Actuator-Fail Open to 150 PSIG

2 Welded Thermal Actuator-Fail Open to 500 PSIG

Effects of back pressure on trap capacity										
Back pressure as percent of inlet pressure	10	20	25	30	40	50	60	70	80	90
Percent reduction of trap capacity	0	0	0	2	5	12	20	30	40	55

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