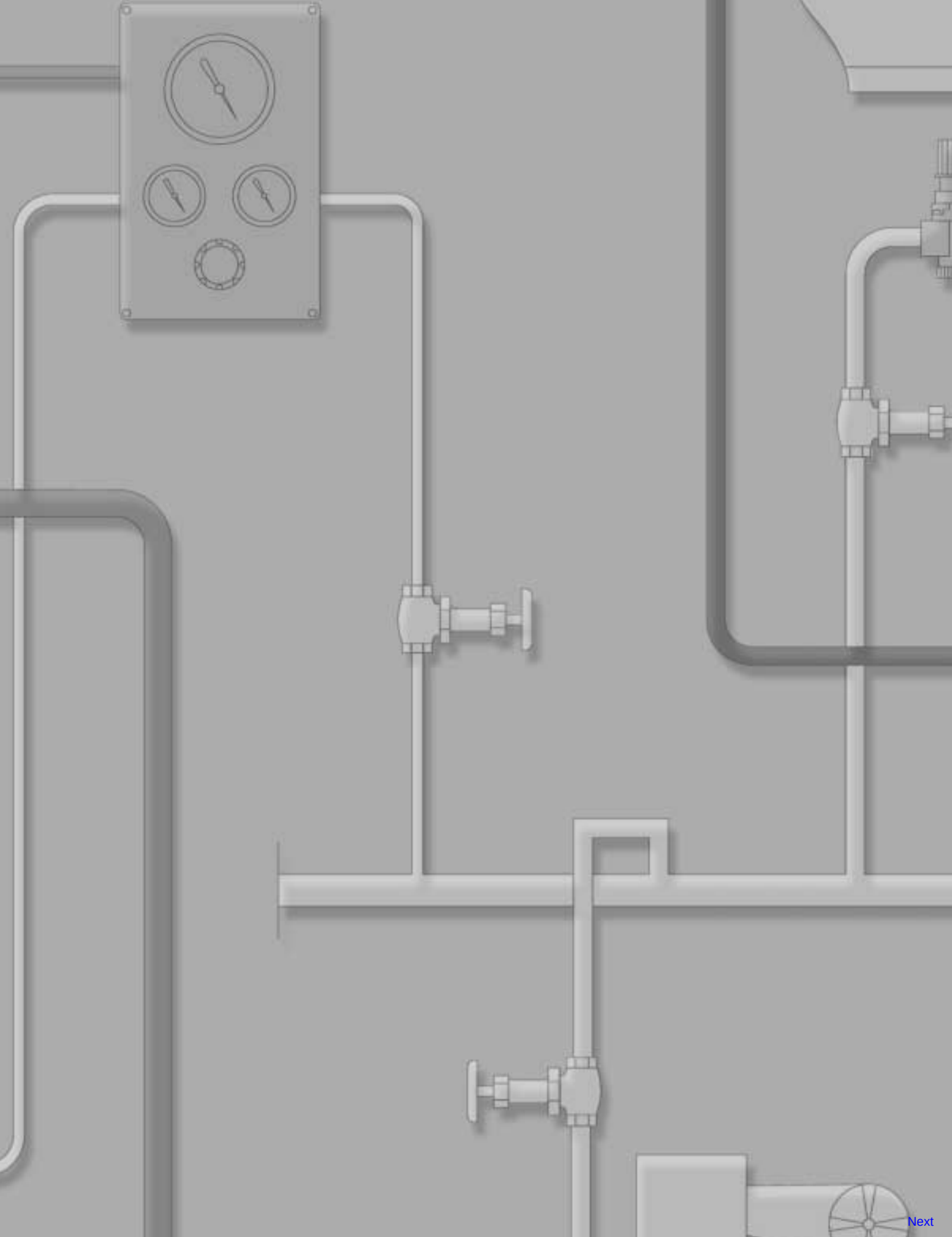
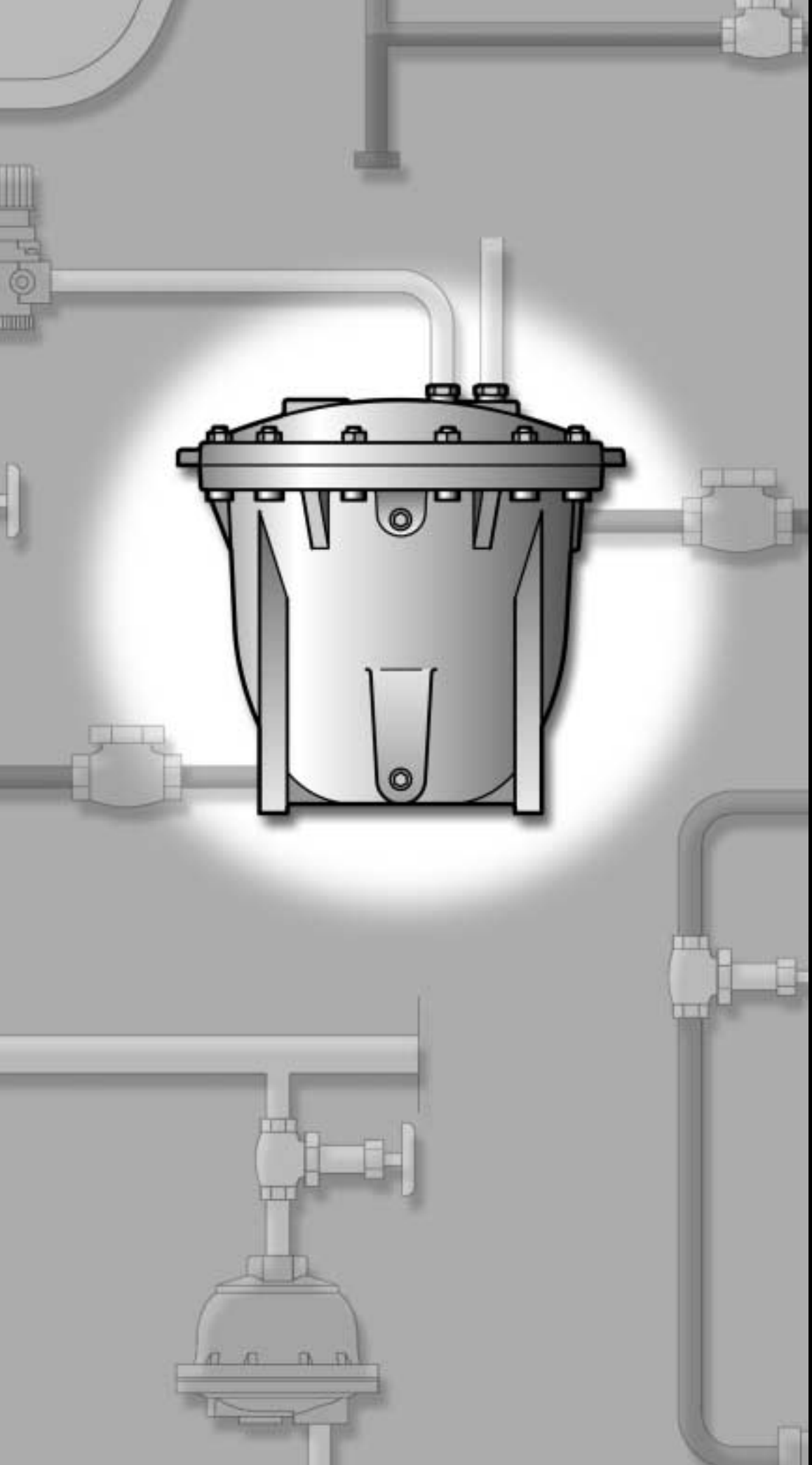


Next



Condensate Recovery Equipment

Armstrong

Armstrong®
Intelligent System Solutions™
STEAM • AIR • HOT WATER

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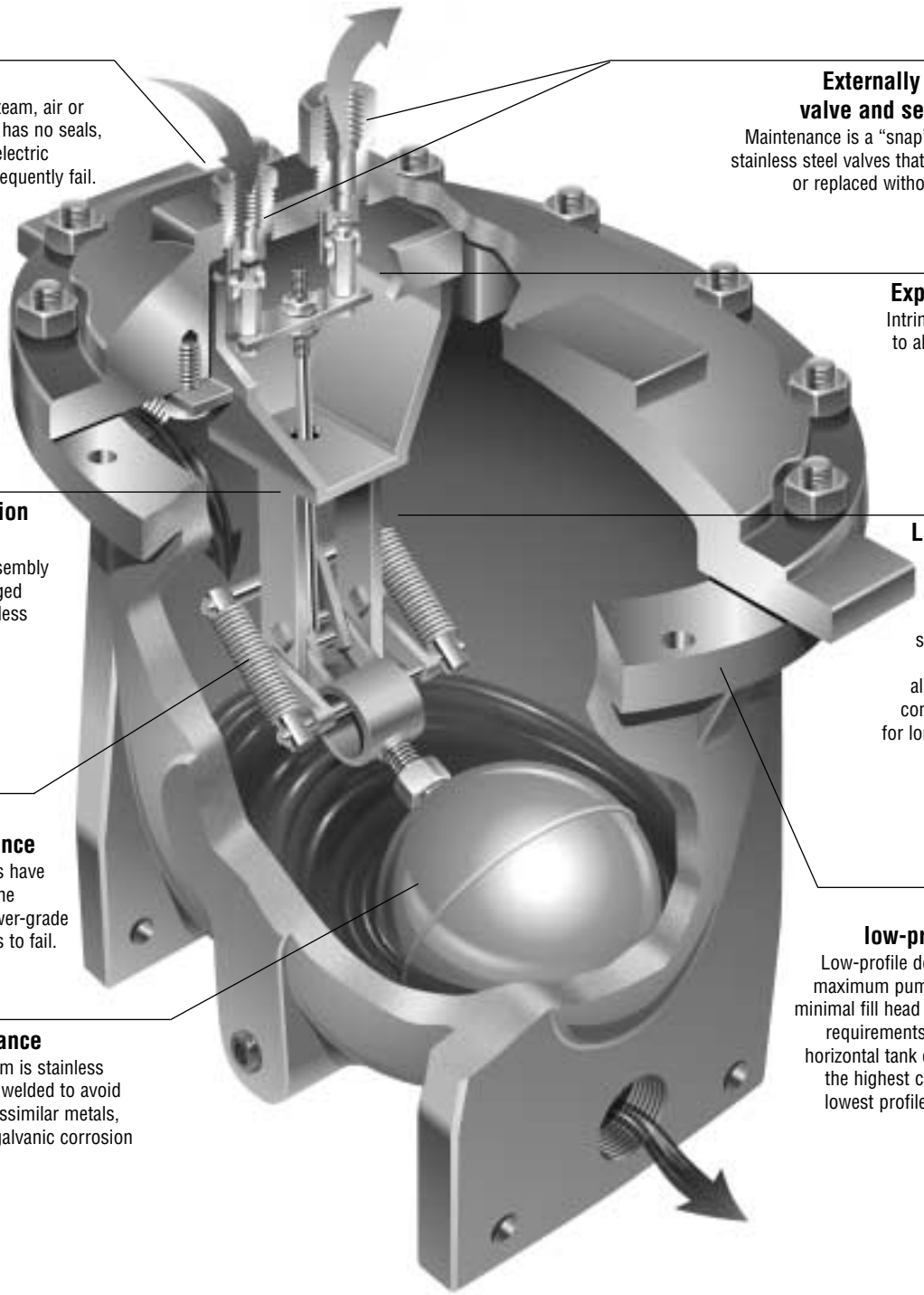
Inside Advantages

Mechanical condensate pumps operate with a spring-assisted float mechanism, which means the springs themselves are a major wear point. Armstrong pumping traps have large-diameter Inconel X-750 springs, which provide superior corrosion resistance and longer service life than those in competitive models. For other inside advantages, see below.

Notice the difference in spring design from the industry standard spring set (left) and the Armstrong Inconel spring set.



Non-electric
Utilizes inexpensive steam, air or gas for operation and has no seals, motors, impellers or electric components, which frequently fail.

Externally replaceable valve and seat assembly
Maintenance is a "snap" with hardened stainless steel valves that can be cleaned or replaced without cap removal.

Explosion proof
Intrinsically safe due to all-stainless steel construction of mechanism.

Wear and corrosion resistance
Mechanism frame assembly is constructed of rugged investment-cast stainless steel components.

Long life and dependable service
Simple float/spring operation and rugged all-stainless steel construction allow for long, trouble-free service life.

Stress chloride corrosion resistance
Inconel X-750 springs have higher resistance to the stress that causes lower-grade stainless steel springs to fail.

Compact, low-profile design
Low-profile design allows for maximum pump capacity with minimal fill head and floor space requirements. PT-300 Series horizontal tank design provides the highest capacity with the lowest profile on the market.

Corrosion resistance
Entire float mechanism is stainless steel. Float is Heliarc welded to avoid the introduction of dissimilar metals, which could lead to galvanic corrosion and float failure.

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Effective Condensate Management = Energy Savings

The most basic part of energy management is utilizing all valuable Btu within the steam system. Depending on the pressure, condensate exiting a trap contains approximately 20% of the heat energy transferred at the boiler in the form of sensible heat. Effective recovery of condensate reduces three tangible costs of producing steam:

- Fuel/energy costs associated with producing steam
- Boiler water make-up and sewage treatment
- Boiler water chemical treatment

These savings can be calculated using the attached savings form. Returning condensate saves money, energy and the environment. Pour money and energy savings back into your plant—not down the drain.

Condensate Recovery Savings Analysis

Location _____ Bldg _____

Energy costs will vary from plant to plant and regions of the world. Values shown are conservative. Complete this form using your facilities' numbers to determine annual savings in your plant by returning condensate. If some costs are not known, use the figures below for conservative estimates.

A) Condensate Load .....= **8,000 lb/hr**

B) Annual Hours of Operation .....= **7,200 hrs per year**

C) Total Water and Sewage Cost .....= **$.005 per gal**

c1) Untreated water and sewage .....= **$.002 per gal**

c2) Water treatment chemicals.....= **$.003 per gal**

D) Make-Up Water Preheating Requirements = **140 Btu/lb**

d1) Condensate Return Temperature .....= **200°F**

d2) Make-Up Water Temperature.....= **60°F**

E) Steam Cost .....= **$ 5.00/1,000 lb**

F) Annual Water Savings .....= **$ 34,532.00**

$$\frac{(A)8000 \times (B)7200 \times (C).005}{8.34 \text{ lb/gal}}$$

G) Savings for Preheating Make-Up Water.....= **$ 40,320.00**

$$\frac{(A)8000 \times (B)7200 \times (D)140 \times (E)5.00}{*1000 \times 1000}$$

H) Cost of Steam to Operate†

Armstrong Pump Trap .....= **$ 864.00**

$$\frac{3 \times (A)8000 \times (B)7200 \times (E)5.00}{1000 \times 1000}$$

I) Total Dollars Saved Annually (F + G - H) ..... = **$ 73,988.00**

J) Payback Period in Years .....= **.27 Years**

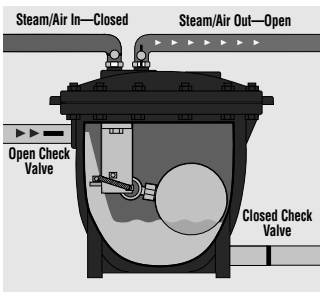
$$\frac{**(\text{cost of equipment/installation}) \$20{,}000}{(I)\ 73{,}988}$$

*Btu/lb from direct steam injection

**Estimated equipment and installation cost

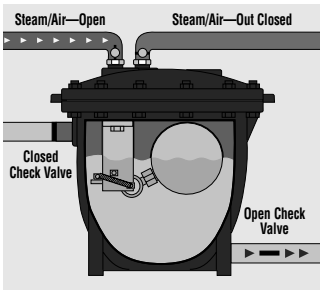
†Cost to operate in example assumes an "open" vented system. If pump trap is used in "closed loop" application, steam operation cost is negligible.

Pumping Trap Operation



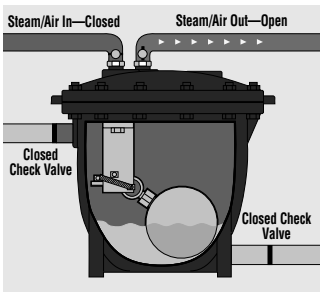
Filling

1. During filling, the steam or air inlet and check valve on pumping trap outlet are closed. The vent and check valve on the inlet are open.



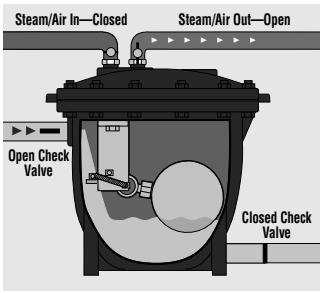
Begin Pumping

2. Float rises with level of condensate until it passes trip point, and then snap action reverses the positions shown in step one.



End Pumping

3. Float is lowered as level of condensate falls until snap action again reverses positions.



Repeat Filling

4. Steam or air inlet and trap outlet are again closed while vent and condensate inlet are open. Cycle begins anew.

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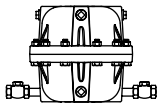
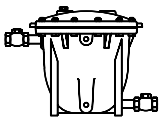
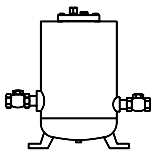
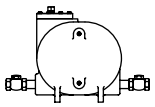
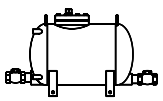
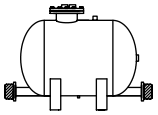
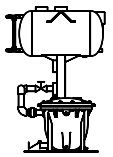
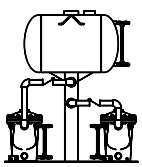
Illustration	Type	Connection Type	Max. Allow. Press. psig	TMA °F	Body Material	Mechanism Material	Model	Max. Oper. Press. psig	Capacity Range lb/hr	Connection Size				Located on Page
										1"	1-1/2"	2"	3" x 2"	
	**Series PT-100**	Screwed	150	450	ASTM A48 Class 30 Cast Iron	Stainless Steel Inconel X-750 Spring	PT-104	100	1,800	●				CRE-5
	**Series PT-200**	Screwed	150	450	ASTM A48 Class 30 Cast Iron	Stainless Steel Inconel X-750 Spring	PT-204 PT-206	125	2,400 3,700	● 	 ●			CRE-7
	**Series PT-400**	*Screwed	150	650	*Fabricated Steel 150 psi ASME Sec. VIII Design "U" Stamped	Stainless Steel Inconel X-750 Spring	PT-404 PT-406 PT-408 PT-412	125	3,600 5,500 7,400 12,200	●	 ●	 ●	 ●	CRE-9
	**Series PT-3500**	Screwed	150	450	ASTM A48 Class 30 Cast Iron	Stainless Steel Inconel X-750 Spring	PT-3508 PT-3512	125	9,900 14,500			● 	 ●	CRE-11
	**Series PT-300**	Screwed *150# ANSI Flanged *300# ANSI Flanged	150	650 500	*Fabricated Steel 150 psi ASME Sec. VIII Design "U" Stamped	Stainless Steel Inconel X-750 Spring	PT-308 PT-312	125	11,600 16,600			● 	 ●	CRE-13
	**Series PT-500**	*150# ANSI Flanged	150	500	*Fabricated Steel 150 psi ASME Sec. VIII Design "U" Stamped	Stainless Steel with Stainless Steel Springs	PT-516	150	80,000	4" x 4"				CRE-19
	**Series 100, 200, 400, 3500, 300 Packages**	Screwed *150# ANSI Flanged	150	450 or 650	Cast Iron Carbon Steel	Stainless Steel Inconel X-750 Spring	SPT-100 SPT-200 SPT-400 SPT-3500 SPT-300	125	See Pages CRE-15 Thru CRE-17	● ● ●	 ● ●	 ● ● ●	 ● ● ●	CRE-15 Thru CRE-17
	**Series 100, 200, 400, 3500, 300 Packages**	Screwed *150# ANSI Flanged	150	450 or 650	Cast Iron Carbon Steel	Stainless Steel Inconel X-750 Spring	DPT-100 DPT-200 DPT-400 DPT-3500 DPT-300	125	See Pages CRE-15 Thru CRE-17	● ● ●	 ● ●	 ● ● ●	 ● ● ●	CRE-15 Thru CRE-17

*Other connection type, receiver pressure vessel ratings and material type available upon request—consult factory.

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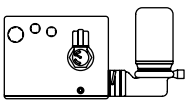
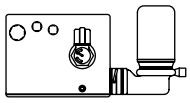
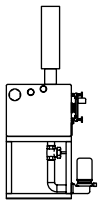
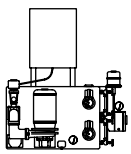
Pumping Trap ID Charts

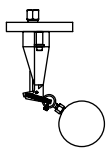
Electric Centrifugal Condensate Pump ID Chart

Illustration	Type	Sq. Ft. EDR	Pump Capacity GPM	Pump Disch. Press.	Motor HP	RPM	Disch. Size Inches	Inlet Size Inches	Receiver Cap. Gallons	Locate Page for Sizing
	**FPS Series**	8,000	12	Max. 20 psig	Simplex 1/3	3,500 RPM Only	3/4"	Simplex and Duplex 2"	FPS Series 7-1/2 - 35 (Steel)	CRE-29
	FPC Series	10,000	15							
	Simplex or Duplex	12,000	18		Duplex 1/3 or 3/4	Single Phase Only	1"		FPC Series 10 - 37 (Cast Iron)	
		20,000	30							
	**AFH-DS Series AFH-DC Series**	1,000 thru 100,000	2 thru 150	10 thru 90	1/3 thru 10	1,750 and 3,500	3/4" thru 2-1/2"	2" thru 4"	AFH-DS Series 15 - 128 (Steel)	Consult factory for proper sizing
	Simplex or Duplex					Single or Three Phase			AFH-DC Series 10 - 125 (Cast Iron)	
	**AFH-PES Series AFH-PEC Series**	6,000 thru 112,000	6 thru 112	10 thru 90	1/3 thru 15	3,500 RPM Only	3/4" thru 2"	2" thru 4"	Elevated AFH-PES Series 15 - 128 (Steel)	Consult factory for proper sizing
	Simplex or Duplex (Temp. to 212°F)					Single or Three Phase			Elevated AFH-PEC Series 15 - 125 (Cast Iron)	

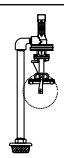
Vacuum Condensate Pump ID Chart

Illustration	Type	Sq. Ft. EDR	GPM Water Only	Rating at 5-1/2" HG Vacuum at 160°F Simultaneous		Pump Discharge Pressure	Motor HP	RPM	Discharge Size Inches	Locate Page for Sizing
				Water GPM	Air CFM					
	**AFH-LRV and AFH-LRV-S Series**	1,000 thru 65,000	7-1/2 thru 97-1/2	7 thru 65	3 thru 22	20 psig thru 30 psig	3/4 thru 7-1/2	3,500 or 1,750	1-1/4" thru 2"	Consult factory for proper sizing
								Single or Three Phase		

Non-Electric Steam/Air Powered Pump Retrofit Assembly

Illustration	Fits Competitors' Mechanical Pumps Listed Below								Page
	Spirax Sarco Models PPC & PPF	Watson McDaniel Models PMPC & PMP	Spence & Nicholson Condensate Commanders	Johnson Corporation Model LMSA	MEPCO/ Dunham Bush	ITT Domestic	Yarway	Clark Reliance	CRE-27

Stainless Steel Sump Ejector

Illustration	Type	Connection Type	Max. Allow. Press. psig	TMA °F	Body Material	Mechanism Material	Model	Max. Oper. Press. psig	Capacity Range gpm	Discharge	Steam Inlet	Located on Page
	Stainless Steel Sump Ejector	Screwed	175	150 Water	ASTM A351 CF8M	Stainless Steel Inconel X-750 Spring	Stainless Steel Sump Ejector	175	13	3/4" MNPT	1/2" NPT	CRE-34

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