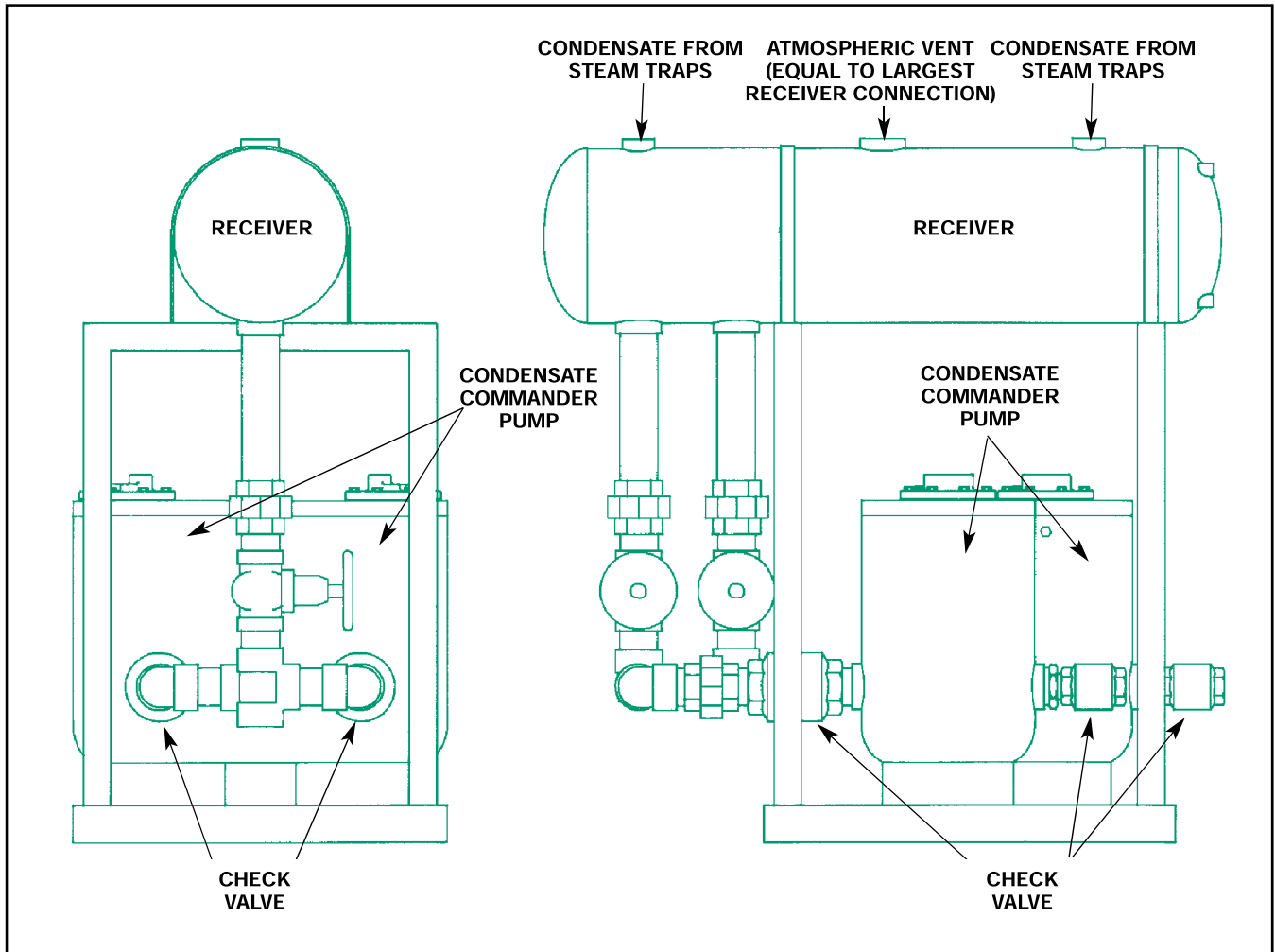


# CONDENSATE COMMANDER PUMP SKID MOUNTED SYSTEM

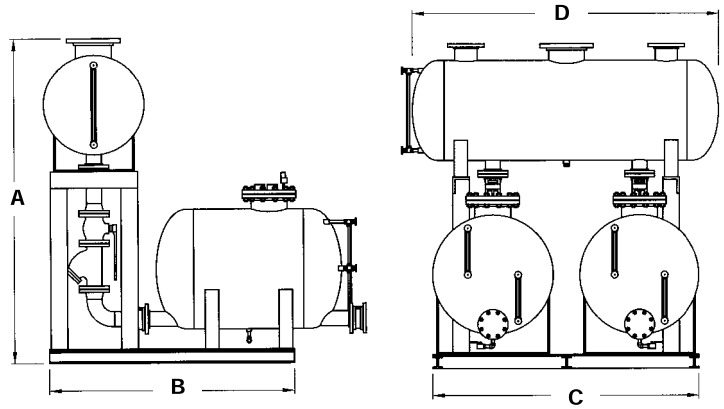
Where the condensate load exceeds the capacity of one Condensate Commander Pump, multiple pumps may be used in tandem. Skid mounted units may be simplex (one pump), duplex (two pumps), triplex (three pumps) or quadruplex (four pumps). The units are equipped with a receiver, Condensate Commander Pump(s) and all necessary piping fully connected and ready for use.



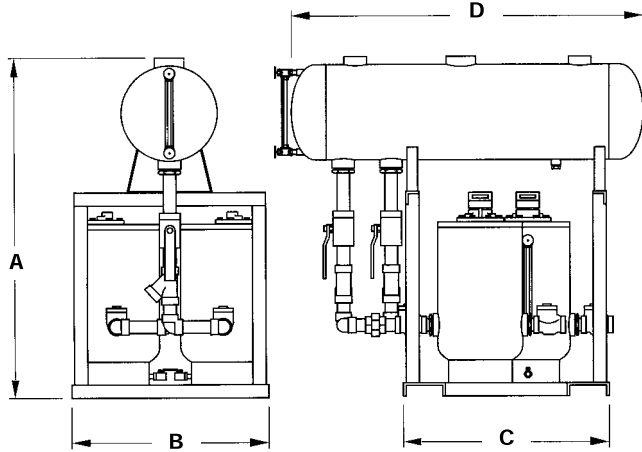
## Typical Duplex Condensate Commander Pump Skid Mount System

The skid mount systems are designed to provide a complete condensate collection and condensate pump unit ready to pipe. All necessary connections are in place. The filling head dimension has already been determined.

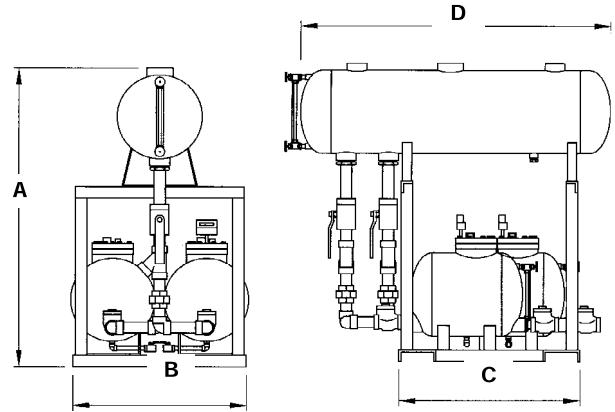
# CONDENSATE COMMANDER PUMP SKID MOUNTED SYSTEM



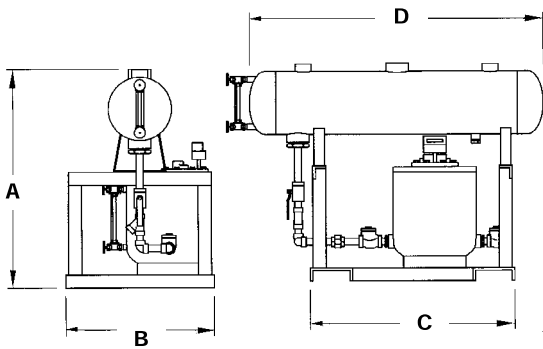
**BIG BOY**



**CLASSIC VERTICAL**



**CLASSIC HORIZONTAL**



**LITTLE BOY**

\*The layout for the Big Boy Simplex is the same as the Classic Horizontal.

Dimensions							
Style	Config-uration	Receiver Gallons	Inches (mm)				Weight lb (kg)
			A	B	C	D	
Little Boy	Simplex	25	41 ½ (1054)	27 (686)	39 (991)	56 (1422)	435 (198)
Classic, Vertical	Simplex	25	58 ½ (1486)	27 (686)	39 (991)	56 (1422)	576 (262)
		65	64 ½ (1638)	27 (686)	39 (991)	66 ½ (1689)	635 (289)
Classic, Vertical	Duplex	65	64 ½ (1638)	36 (914)	39 (991)	66 ½ (1689)	1050 (477)
		80	66 ½ (1689)	36 (914)	39 (991)	68 (1727)	1095 (498)
Classic, Horizontal	Simplex	25	58 ½ (1486)	27 (686)	39 (991)	56 (1422)	596 (2713)
		65	64 ½ (1638)	27 (686)	39 (991)	66 ½ (1689)	655 (298)
Classic, Horizontal	Duplex	65	64 ½ (1638)	36 (914)	39 (991)	66 ½ (1689)	1095 (498)
		80	66 ½ (1689)	36 (914)	39 (991)	68 (1727)	1135 (516)
Big Boy	Simplex*	115	87 ¾ (2228)	50 (1270)	70 ½ (1791)	96 (2438)	1900 (864)
Big Boy	Duplex	250	97 ¾ (2482)	76 (1930)	80 (2032)	92 (2337)	3050 (1386)

# CONDENSATE COMMANDER PUMP PRIMER

The SPENCE Condensate Commander belongs to a class of pressure operated pumps primarily intended to move condensate or other fluids without the use of electricity. When compared to conventional electrical pumps, the Condensate Commander is particularly suited to pumping "difficult" media such as high temperature condensate and corrosive fluids. Pressure operated pumps and the Condensate Commander in particular enjoy a reputation of long life with very little required maintenance. Generally these types of pumps, by eliminating rotating seals, electrical motors, and impellers, last five to ten times as long as conventional electrical pumps while eliminating most of the standard maintenance.

- Returns hot condensate conserving boiler feed water chemicals and reducing fuel cost associated with reheating boiler feed water.
- Pumps without requiring electrical service.
- Pump design provides safe operation for hazardous or explosive environments.
- Operates on steam, compressed air or gas from 5 psig to 250 psig depending on model.
- Capacities to 48,000 lbs./hr.

## OPERATION

The Condensate Commander pumps by displacing fluid with steam or compressed gas. The float is connected to a linkage and spring that simultaneously actuates a motive valve and an exhaust valve. During the fill cycle the motive

valve closes while the exhaust valve opens, allowing condensate to fill the pump housing. When the float, rising with the entering fluid level, reaches the top of its stroke, the mechanism releases the spring, opening the motive and closing the exhaust valves. Steam or compressed gas then flows into the pump displacing the fluid. Check valves positioned at the inlet and outlet of the pump direct the fluid in the direction of the flow.

## CHARACTERISTICS

Flow capacity is dependent on several parameters. Bearing in mind that the Condensate Commander pumps in discreet, relatively consistent slugs of fluid, the total capacity will depend on how quickly the Commander cycles. Motive pressure available and resistance in the flow line are the obvious causative and limiting factors of capacity. Less obvious is the Cv of the check valves, pressure or head of the incoming fluid, resistance in the vent line, and characteristics of the motive gas used.

There is no "vacuum" side of a Commander pump. While there certainly is an inlet side, it is important to understand that the class of pumps the Condensate Commander belongs to does not draw or suck fluid into it. The media must flow by gravity into the pump.

The greater the pressure and/or head, the greater the Cv of the inlet check, and to a lesser extent the greater the Cv of the exhaust vent, the faster the fill portion of the cycle will complete. With the fill portion completed the

Commander mechanism will shut off the exhaust vent and open the motive valve. Steam or compressed gas will now displace the fluid contained in the pump housing. Factors controlling the speed of the discharge portion of the cycle include pressure of motive steam or gas, outlet check Cv, downstream backpressure, and potentially temperature of flow media and/or ambient conditions if steam is utilized as the motive gas. This last component is often overlooked, but the fact that steam will condense and reduce actual motive pressure could become significant in some applications.

## RECEIVER

Conventional electric condensate pumps typically require a receiver sized to allow condensate to cool and vent flash steam. This is necessary, as the suction side of the pump will lower pressure potentially allowing the hot condensate to boil as it is drawn past the impeller. This action, known as cavitation, will quickly erode the impeller. While the temperature of the flow media is generally not a concern it must be remembered that the Condensate Commander pumps in discrete cycles. While the Commander is expelling fluid the body is pressurized and cannot receive fluid. If fluid is draining to the Commander in a continuous fashion, a receiver sized to accommodate the maximum volume expected during the time required to discharge the commander must be utilized. Failure to do so will back condensate up and possibly increase pressure, potentially causing problems.

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