

Steam Boilers Optional Equipment

Condensate Return Systems

Chromalox condensate return systems are used wherever condensed steam can be collected for reuse in the boiler. Significant energy can be saved by returning hot condensate to the boiler for feed water. The condensed water is free from corroding minerals and contains a substantial amount of heat energy which does not have to be replenished.

CAUTION — When a condensate system is used, a vacuum breaker must always be installed on the boiler to prevent the boiler from flooding during shut down.

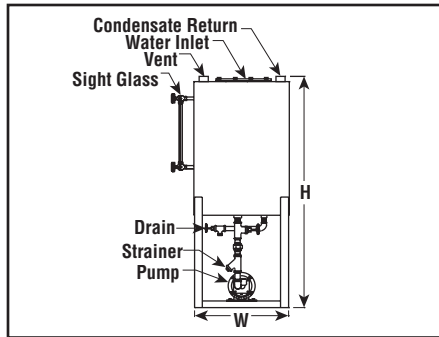
Low and Medium Pressure Condensate Return Systems (150 psig maximum). Chromalox condensate return systems (except model HPCS 3003) are designed for use with steam boilers operating up to 150 psig steam pressures. The condensate systems consist of an 11 gauge steel tank, motor, pump, float valve, sight glass and associated plumbing. A 1/2" inlet is located on the tank for connection to a local water supply for make up water. A "vent" is located on the top of the tank and is open to the atmosphere. The "return" connection is plumbed to the trapped condensate return line from the process.

The condensate tank has an internal ball check valve, a float and float arm which mechanically opens a valve, allowing make up water to enter the tank as the original supply is depleted. The outlet of the pump is plumbed to the boiler water inlet check valve. The pump motor is wired to the boiler feed water control or motor starter. No further adjustments and/or plumbing are required other than plumbing the condensate tank drain and drain valve to a proper waste connection.

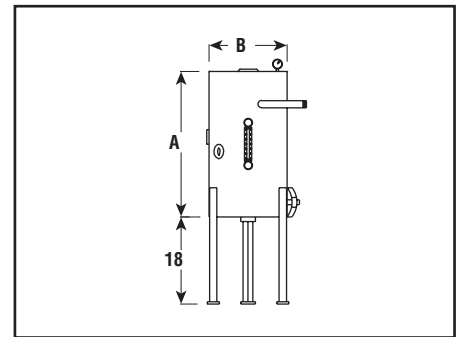
High Pressure Condensate Return Systems (250 psig maximum). The Chromalox HPCS3003 high pressure (250 psig maximum) condensate return system is specifically designed for use with the CHPES-6 through 180 kW boilers whenever condensate is to be returned for reuse.

The high pressure condensate return system consists of a 30 gallon tank with an internal make up water float valve, a 3 Hp three phase motor (motor voltage will match the boiler's voltage), a special high-pressure pump and a sight glass. A motor starter and fuses can be supplied as an option. Installation requires wiring and field plumbing to the boiler with minimum 1/2" NPT piping rated at 250 psig.

ES38038V Condensate Return System



CBS-1 Blow Down Separator — Dimensions (Inches)



Condensate Return System Selection

For Use On	Storage Tank Max.		Motor			Dimensions (In.)			Model	Stock	PCN	Wt. (Lbs.)
	Gal.	psig	Volts	Ph	Hp	L	W	H				
CES 6 -100	26	110	115/230	1	1/3	14-1/2	14-1/2	48	ES38083V	NS	109372	125
CES 135 -180	33	130	115/230	1	1/2	14-1/2	14-1/2	54	ES38084V	NS	109399	240
CHS 150 - 300	33	150	115/230	1	3/4	14-1/2	14-1/2	54	HS38019V	NS	—	260
CHS 360 - 810	46	150	230/460	3	3	14-1/2	14-1/2	66	HS38031V	NS	—	310
CHS 945 -1215	50	150	230/460	3	5	20	50	40	HS38039H	NS	—	365
CHS 1320 -1620	Contact Factory for Recommendations											
CHPES 6 -180	30	235	230/460	3	3	34-1/4	41-1/2	21	HPCS3003H	NS	109428	310
CSSB 6 -180	Stainless steel boilers require de-ionized water. Contact your Local Chromalox Sales office.											

Stock Status: S = stock NS = non-stock

To Order — Specify model number of condensate system, boiler model number, volts, phase, kW, PCN if applicable, and quantity.

Note —

A. Connections (NPT): Pump Out = 1", Tank Return = 1-1/4"

B. All motors can operate on 208V. Systems for boilers larger than 810 kW have horizontal tanks. Use ES38084V for all CES boilers with 135 psig trim.

Blow Down Separators

Many state and municipal boiler codes do not permit discharge of boiler blow down directly into city sewers. Chromalox blow down separators separate liquid from vapor during blow down and prevent the dangerous discharge of live steam down city drains. The separator accepts water and flash steam from the boiler blow down, reducing temperatures and pressures to safe levels for subsequent discharge to the sewer.

The separator is kept half full of cold water before each blow down. The design utilizes a water seal at the outlet which permits the system to introduce cold water from the bottom to mix with the hot water and boiler steam blow down inside the separator. Flash steam is absorbed by the cold water and allowed to pass to the outside through a vent. Chromalox blow down separator CBS is built and stamped to Section VIII of the ASME Code.

Blow down separators require only plumbing from the boiler blow down, hook-up to a cold water supply line and connection to a drain. No electrical connections are required. Order options include a 0 - 30 psig pressure gauge, 0 - 200°F temperature gauge and a water sight glass gauge assembly.

Blow Down Separator Selection

Boiler	Boiler kW	DIM.		NPT		PCN	Wt. (Lbs.)
		A	B	Inlet	Outlet		
CBS	6 - 200	24	16	1	1-1/2	109250	230
CBS	201 - 500	36	24	1	2-1/2	—	260
CBS	501 - 1000	48	36	1-1/4	3	—	290
CBS	1001 - 1620	72	42	1-1/2	3-1/2	—	320

Vacuum Breaker Systems

After boiler shut down, the steam inside the vessel condenses as the shell cools. This creates a vacuum which will siphon water into the boiler from the water feed or condensate return system, flooding the boiler. A vacuum breaker permits outside air to enter into the shell to relieve the vacuum, thus preventing excess water from being drawn into the vessel. The vacuum breaker consists of a valve with a spring loaded disc and associated piping, factory plumbed to the boiler. They can be used on all Chromalox boilers.

Vacuum Breaker Selection

Model	Use With Boiler	Max. Pressure (psig)	PCN
ES89369	CES	150	109479
ES89369SS	CSSB	150	—
HPES 89369	CHPES	300	109760