THE ALSTROM CORPORATION

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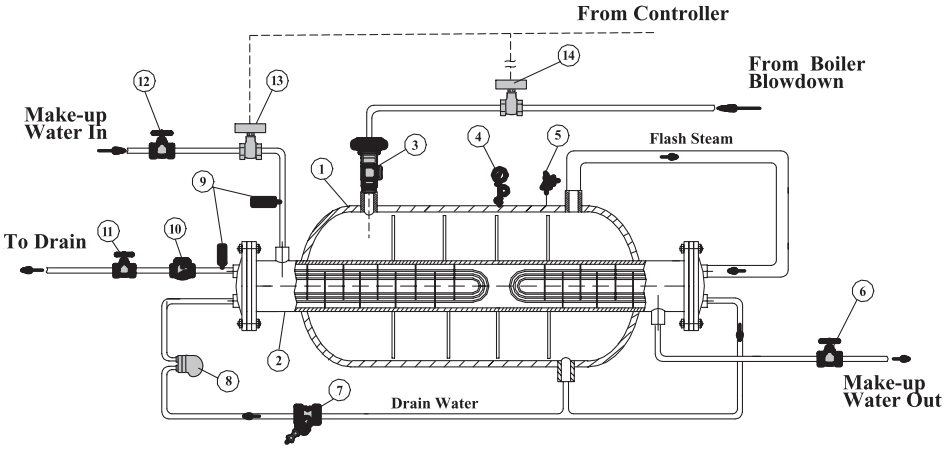
Blowdown Heat Recovery Package for Series "ALSTAR"

For Low Pressure Steam Boilers & Generators

United States Patent

- Saves energy and water in low pressure steam bo ilers and generators, with a small ratio of flash steam-to-drain water in the blowdown
- Easily installed in any new or existing steam generator system
- Recovers up to 94% of heat normally lost
- Permits a high level of heat recovery from drain water and flash steam at minimal cost
- Compact size for convenient placing
- Removable tube bundle for easy inspection and cleaning
- Quick return on investment by significant fuel savings

ITEM	DESCRIPTION
1	SEPARATOR
2	DOUBLE TUBE BUNDLE HEAT HEX
3	THROTTLING VALVE (OPTIONAL)
4	PRESSURE GAUGE
5	SAFETY VALVE
6	GATE VALVE
7	STRAINER
8	STEAM TRAP
9	THERMOMETER
10	CHECK VALVE
11	GATE VALVE
12	GATE VALVE
13	ELECTRONIC PROPORTIONING VALVE (OPTIONAL)
14	BLOWDOWN VALVE (OPTIONAL)



- Various materials and working regimes are offered
- Legs are supplied when specified
- Designed and manufactured according to ASME Code, Section VIII, Div. 1
- ASME U-1 form, stamp and N.B. number are provided upon request

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The Alstrom Packaged Blowdown Heat Recovery System saves energy and water in steam boilers and other steam generators. The packaged unit can be installed in any new or existing steam generator system requireing minimal piping.

Blowdown water enters the built-in flash steam separator, with segmental baffles where two phase flow is separated to flash steam and drain water. The heat transfer process occurs in the Alstrom Double Tube Bundle Heat Exchanger "TBD." Make-up water passes through the shell side of the heat exchanger. The heat energy of the blowdown water is transferred to the make-up water in three steps. The drain water flows through the tubes of the left tube bundle, providing the initial heating of make-up water. Flash steam in partially condensed on the external surface of the shell of the heat exchanger and further in the tubes of the right tube bundle, providing additional heatingg of make-up water. The Alstrom Blowdown Heat Recovery System recovers 94% and more of heat normally lost.
The shell and tubes of the Alstrom Double Tube Bundle Heat Exchanger "TBD" are fabricated from high quality 316 stainless steel, resulting in long lasting, trouble-free operation.

This simple stand-alone design permits a high level of heat recovery from drain water and flash steam at minimal cost. The actual sizing of the system and it's components depends on boiler performance, TDS concentration in make-up and boiler water, and the percentage of condensate returning to the boiler. The Alstrom Corporation offers OEM requirements for the product series are welcome.

For Optimal selection, please provide the following date:

BOILER DATA				
PRESSURE PSIG	TDS PPM	EFFICIENCY %	HOURS IN OPERATION PER ANNUM	HP OR LBS/HOUR

MAKE-UP WATER DATA	
TEMPERATURE DEG. F	TDS PPM

RETURN CONDENSATE-TO-STEAM RATIO %

OPTIONAL BLOWDOWN DATA (USE THIS OPTION ONLY WHEN COMPLETE DATA IS NOT AVAILABLE)				
BOILER PRESSURE PSIG	MAKEUP WATER TEMPERATURE DEG.F	MAKE-UP WATER FLOW RATE GPM	BLOWDOWN WATER FLOW GPM	HOURS IN OPERATION PER ANNUM