

# 14 FLASH ECONOMIZER

## Continuous Blowdown Heat Recovery System for Boiler Surface Blowdown.

Most boiler manufacturers and water treatment companies recommend boiler water TDS be maintained at certain levels. The purpose of continuous blowdown is to continuously take boiler water from 4"-6" under the surface where the TDS is at its highest concentration so that it can be replaced with fresh water. While continuous blowdown is the best way in controlling these solids in the boiler the heat lost to drain over time can be tremendous. Penn Continuous Blowdown Heat Recovery Systems can recover 90% or more of this heat normally lost. Two stages provide the heat recovery. The first is the flash area where the high pressure condensate flashes to a low pressure steam use such as a feedwater heater or deaerator. In the second area is a heat exchanger that transfers the remaining heat to the make-up water.

- **Complete System** frame mounted with the necessary controls in a vertical design to save valuable boiler room space.
- **ASME Code** rated flash chamber with a tangential inlet and a centrally located vent providing 97% quality steam.
- **Ease of Maintenance** because of the flanged vertical drop down coil section and external controls.
- **Multiple Boilers** can use a single system even if at different pressures. Unit operates at lower venting pressure.



## Flash Economizer Selector Chart AHR & AHRB Models.

Delivered Horse Power Or Boiler size Lbs per hour	SELECTOR CHART AHR AND AHRB (Percent Blowdown)									
	10%	9%	8%	7%	6%	5%	4%	3%	2%	1%
23,188 hp/800,000 #/hr.										16
20,290 hp/700,000 #/hr.									28	14
17,391 hp/600,000 #/hr.									24	12
14,493 hp/500,000 #/hr.								30	20	10
11,594 hp/400,000 #/hr.								21	16	8
8,696 hp/300,000 #/hr.						30	24	18	12	6
5,797 hp/200,000 #/hr.				28	24	20	16	12	8	4
2,899 hp/100,000 #/hr.	20	18	16	14	12	10	8	6	4	2
2,647 hp/90,000 #/hr.	18	16	14	13	11	9	7.2	5.4	3.6	1.8
2,319 hp/80,000 #/hr.	16	14	13	11	9.6	8	6.4	4.8	3.2	1.6
2,029 hp/70,000 #/hr.	14	13	11	9.8	8.4	7	5.6	4.2	2.8	1.4
1,739 hp/60,000 #/hr.	12	11	9.6	8.4	7.2	6	4.8	3.6	2.4	1.2
1,594 hp/50,000 #/hr.	10	9	8	7	6	5	4	3	2	1
1,159 hp/40,000 #/hr.	8	7.2	6.4	5.6	4.8	4	3.2	2.4	1.6	0.8
870 hp/30,000 #/hr.	6	5.4	4.8	4.2	3.6	3	2.4	1.8	1.2	0.6
580 hp/20,000 #/hr.	4	3.6	3.2	2.8	2.4	2	1.6	1.2	0.8	0.4
290 hp/10,000 #/hr.	2	1.8	1.6	1.4	1.2	1	0.8	0.6	0.4	0.2

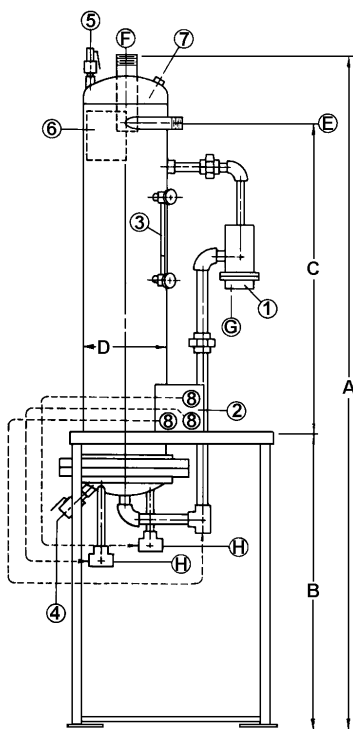
### HOW TO USE CHART

1. Go across the top of chart to percent of continuous blowdown for the boiler or boilers.
2. Go down the left of chart to the boiler size or combined size of the boilers.
3. Read gallons per minute of continuous blowdown. This value should be equal to or less than the model number of the Economizer. For example 7% continuous blowdown on 100,000 Lbs./Hr. Boiler is 14 GPM. Use model AHR20 Economizer.

### SIZING CHART

MODEL NO.	BLOWDOWN	MAKEUP	MODEL NO.	BLOWDOWN	MAKEUP
AHR-3	3 GPM	9 GPM	AHRB-3-15	3 GPM	15 GPM
AHR-6	6 GPM	12 GPM	AHRB-6-30	6 GPM	30 GPM
AHR-10	10 GPM	20 GPM	AHRB-10-50	10 GPM	50 GPM
AHR-20	20 GPM	40 GPM	AHRB-20-100	20 GPM	100 GPM
AHR-30	30 GPM	60 GPM	AHRB-30-150	30 GPM	150 GPM

## Flash Economizer Dimensions:



### SPECIFICATION PRINT (Dimensions are in Inches)

MODEL	A	B	C	D	E	F	G	H
AHR 3	96	44	42	8-5/8	1	2-1/2	1	3/4
AHR 6	110	49	50	10-3/4	1-1/2	3	1	3/4
AHR 10	93-3/4	45	37-1/4	16	1-1/2	4	2	1-1/4
AHR 20	140	68	60	18	1-1/2	6	2	1-1/2
AHR 30	172	77	84	18	1-1/2	6-8	2	1-1/2
AHRB 3-15	97	46	40	10-3/4	1	2-1/2	1	1
AHRB 6-30	111	53	46	12-3/4	1-1/2	3	1	1-1/4
AHRB 10-50	106	51	43	16	1-1/2	4	2	1-1/2
AHRB 20-100	140	68	60	18	1-1/2	6	2	2
AHRB 30-150	132-1/2	67	51-1/4	24	1-1/2	6-8	2	2-1/2

### NOZZLE SCHEDULE

E. Continuous Blowdown Inlet

G. Condensate Drain

F. Steam Vent

H. Cold Water Inlet and Outlet

## Flash Economizer Suggested Specifications.

Furnish and install as shown on drawings, a Penn Flash Economizer MODEL NO. (AHR or AHRB) \_\_\_\_\_ as manufactured by the Penn Separator Corp. Brookville PA.

The Flash Economizer shall be capable of handling \_\_\_\_\_ #/hr. continuous blowdown and \_\_\_\_\_ gpm make-up at a boiler operating pressure/pressures of \_\_\_\_\_ psig. flashing to low pressure deaerator, feedwater heater or other low pressure use at \_\_\_\_\_ psig.

The Flash Economizer shall consist of the following components and accessories:

1. Vertical Flash Separator section with threaded connections for the tangential inlet with a stainless steel wear plate, blow-down drain, recovered steam vent, and tank cleanout connections as well as couplings as required for accessories.
2. Vertical coil-type heat exchanger made of (copper or stainless steel) with steel threaded connections for make-up inlet, outlet, and openings for remote thermometer bulbs.
3. Flanged bottom section with drop out coil design for easy cleaning and maintenance.
4. Balanced float trap with all working parts constructed of stainless steel and removable seats, located externally on the Flash Economizer and back vented to maintain a constant level in the tank.
5. Thermometer gauge panel showing temperatures of the make-up inlet, make-up outlet, and blowdown water to drain.
6. A safety relief valve set at 150 psig., a Michigan site level gauge, and tank clean out valve.
7. Optional Accessories shall include a high level alarm switch, multi-boiler manifold, flow control or blowdown valves, pressure gauge, and a sample cooler with pipping.

All the above components shall be mounted on a table base with four angle iron floor supports and pads in such a manner that will allow gravity flow of the blowdown water through the system. The finished system shall be painted with a blue enamel exterior.

The Flash Economizer shall be designed and constructed in accordance with the latest ASME Code Sec. VIII, Div. 1. requirements for a unfired pressure vessel for 150 psig MAWP.