

BOILER FEED SYSTEMS



Boiler Book
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Cleaver-Brooks boiler feed systems help maintain peak efficiency and prolong the life of boilers where investment in a deaerator cannot be justified. Consisting of one or more feed pumps and a corrosion resistant receiver tank, the system automatically supplements condensate with makeup water to replace system losses. Cold water is heated by mixing with hot condensate and pumped to the boiler on demand.

FEATURES AND BENEFITS

All Pumps Deliver the Required Capacity at 210 °F:

- Guaranteed pump performance.

All Pumps Have Mechanical Seals (Standard):

- Reduces maintenance when compared to packing type seals.

Specifically Designed for Compatibility With Cleaver-Brooks Boilers:

- Quick, accurate equipment selection.
- Single source responsibility.
- Proven performance.

Provides Additional Storage Time and Handles Volume-Swings in Condensate Return:

- Feedwater tank collects intermittent condensate returns and supplies water at a relative constant volume.
- Minimizes problem from unpredictable condensate flow rates.

Boosts Condensate Return Pressure:

- Acts as a collecting point for low pressure and gravity returns.
- Allows the introduction of returns to a high pressure vessel.

Accepts Gravity Returns:

- Vessels are vented to atmosphere, providing no pressure resistance that would inhibit gravity return.

Internal Pump Suction Vortex Breakers:

- Eliminates the problems of loss in NPSHA and cavitation associated with the creation of vortices within pump suction piping.

PRODUCT OFFERING

Selection of Boiler Feed Systems is based on boiler size, pump requirements (flow, pressure, hp), and water storage requirements (tank size). Contact your local Cleaver-Brooks authorized representative for detailed component sizing information.

When equipped with an automatic steam preheater, feedwater temperature can be maintained at 210 °F. At this higher temperature, oxygen and carbon dioxide are released, reducing corrosion problems in the boiler. Pre-heating is recommended if return condensate constitutes 50% or less of the feedwater required.

Cleaver-Brooks Packaged Feedwater Systems include pumps, control panel with magnetic starters, and necessary switches. Systems are available in simplex, duplex, dual and triplex arrangements. Custom arrangements are also available. Accessories include high temperature diffuser tube, automatic preheater, make-up valves, electrolytic corrosion inhibitor, ASME tanks, galvanized tank, high & low water alarms, and Warrick probes.

The receiver should be sized for a capacity sufficient to allow feed water for a minimum of 10 to 15 minutes of boiler operation at rated horsepower. The run time is essential because of unpredictable surges of condensate returns. Since 0.069 gpm is the theoretical rate of evaporation per boiler horsepower, the maximum tank size should be approximately 0.069 boiler hp x 10 minutes.

If it is known that the receiver will see 100% make-up with no returns, a five minute capacity tank can be substituted. The reduced storage capacity is acceptable, since the receiver will have a steady predictable load.

The receivers are manufactured as a non-code tank for venting to atmosphere. As an option, Cleaver-Brooks offers receivers constructed for ASME Section VIII, Division 1 of the ASME Pressure Vessel Code. When an ASME Code receiver is required, contact your local Cleaver-Brooks authorized representative for additional factors to be considered in this application. Coded tanks supplied will normally be furnished unlined because of possible increased operating temperature limitations.

Galvanized or stainless steel tanks are available as options.

Simplex Units

Simplex units include one pump set complete with TEFC motor coupled to a vertical multistage pump, one large receiver mounted on structural steel stand, make-up valve, gauge glass with shutoff valves, thermometer, and suction piping from receiver to pump with Y-type strainer and gate valve.

Duplex Units

Duplex units are similar to simplex units, but with two pumps and one receiver. Magnetic starters (where required) are mounted in a NEMA I enclosure, with manual transfer switch for standby pump.

Dual Unit

Dual units are similar to duplex units, except that receiver tank is sized for two boiler operation. Transfer switch is not required.

Triplex Units

Triplex units are similar to Dual units but with three pumps and one receiver.

Standard equipment:

Stand
 Boiler feed pump and motor
 Magnetic starter
 Suction shutoff valve
 Suction strainer

Gauge glass
 Internal float switch and solenoid make-up valve
 Thermometer
 Required tapings

Optional equipment

Preheating systems
 High temperature diffuser tube
 Manhole (standard with 270 gal. and larger tank)
 External float make-up valve
 Electric alternator
 Special electrical requirements
 ASME Code tank

Discharge pressure gauge
 Magnesium anode
 Galvanized tank
 Stainless tank
 High-low water cutoff
 Insulated
 Seismic construction

Tank Sizes

Model Number	Flooded Capacity (Gallons)
BFS-45	45
BFS-75	75
BFS-100	100
BFS-200	200
BFS-270	270
BFS-340	340
BFS-500	500
BFS-750	750
BFS-1000	1000
BFS-1200	1200
BFS-1400	1400
BFS-1800	1800
BFS-2200	2200

