

# BOILER FEED SYSTEM

## SYSTEM SELECTION PROCEDURE

1. Determine if a simplex, duplex, triplex, or quadraplex is required for the project.
2. From the data listed in the Capacity Selection Table-1, select the GPM capacity of the pump(s). If one pump feeding is more than one boiler, add the total connected boiler horsepower load.
3. Determine the required pump discharge pressure in PSI of the pump(s) by taking into consideration:
  - Boiler maximum operating pressure in PSI \_\_\_\_\_
  - Add the static lift requirement from the pump centerline to the boiler inlet in PSI. (ft. x .433 = PSI) \_\_\_\_\_
  - Add friction loss through pipes, valves, and fittings in PSI \_\_\_\_\_
  - Add 5 PSI to the sum of the above \_\_\_\_\_
  - This is the required pump discharge pressure in PSI (+) \_\_\_\_\_
4. Determine the receiver size; the standard is a minimum of one gallon storage per total connected boiler horsepower. If the steam runs are extremely long, consideration should be made to increase the size of the receiver to two gallons storage per boiler horsepower. For unusual applications, consult factory or boiler manufacturer.
5. Determine the piping arrangement to be used from the BFS Piping Arrangements Table-2.
6. Select the boiler feed system from Selection Table-3.
7. Confirm required electrical characteristics and control modifications.

**TABLE 1: CAPACITY SELECTION**

Boiler Selection	Pump GPM	Evap. Rate GPM	Steam (SQ./FT.)	BTU/HR (1000s)	Steam (LBS/HR)
15	3	1	2,068	502	517
30	6	2	4,136	1,040	1,034
50	10	3.5	6,900	1,674	1,725
75	15	5	10,348	2,510	2,587
100	21	7	13,800	3,348	3,450
150	31	10.5	20,700	5,022	5,175
200	42	14	27,600	6,696	6,900
300	63	21	41,400	10,044	10,350
400	84	28	55,200	13,392	13,800
500	105	35	69,000	16,740	17,250
750	158	52.5	103,500	25,110	25,875
1000	210	70	138,000	33,480	34,500

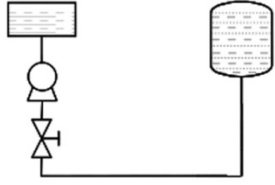
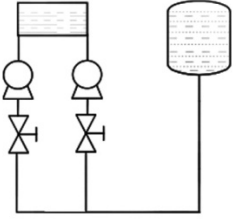
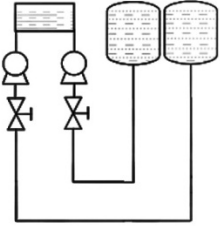
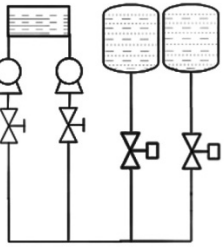
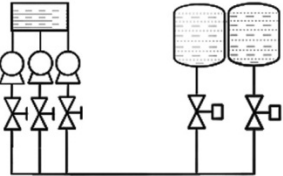
Pump Capacity is based on 3-1 ratio

***SPECIFY WITH CONFIDENCE, SPECIFY PENN PUMP SYSTEMS***

# BOILER FEED SYSTEM

## SERIES BFS

**TABLE 2: BFS PIPING ARRANGEMENTS**

No.	Scheme	Boiler Feed Unit	Pump Capacity	Remarks	Electrical Options
1		Simplex	Single	One pump; One boiler; No standby pump.	
2		Duplex	Single	Two pumps; One boiler; One pump is standby	For equal operation of pumps: manual transfer switch or automatic alternation is recommended.
3		Duplex	Single	Two pumps; Two boilers; One pump per boiler; No standby pump	
4		Duplex	Double	Each pump capacity is sufficient for two boilers. Feed water valves are required.	For equal operation of pumps: manual transfer switch or automatic alternation is recommended.
5		Triplex	Single or Double	One pump standby. Feed water valves are required.	Manual transfer switch is recommended for standby pump to be activated for either boiler.

1. A check valve must be installed on each pump discharge.
2. Careful consideration should be given to provide standby operation and sufficient receiver capacity.
3. For boiler connection details, refer to the boiler manufacturers information and piping diagrams.
4. Electrical controls shall be coordinated with boiler water level controller and feed water valve requirements.

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# BOILER FEED SYSTEM

## SERIES BFS

**TABLE 3: BFS SELECTION TABLE**

Model Number	Boiler HP	Pump GPM	Pump Discharge Pressure: PSI	Motor HP 3450 RPM	Receiving Tank Cap. Gallons	Pump Discharge Size
BFS - 1520 1530 1540 1550	15	3	20 30 40 50	½ ¾ ¾ 2	70 24" x 36"	1 ¼" 1 ¼" 1 ¼" 1"
BFS - 3020 3030 3040 3050	30	6	20 30 40 50	½ ¾ ¾ 2	70 24" x 36"	1 ¼" 1 ¼" 1 ¼" 1"
BFS - 5020 5030 5040 5050	50	10	20 30 40 50	½ ¾ 1 2	70 24" x 36"	1 ¼" 1 ¼" 1 ¼" 1"
BFS - 7520 7530 7540 7550 7560 7580	75	15	20 30 40 50 60 80	½ ¾ 1 ½ 2 3 5	116 24" x 60"	1 ¼" 1 ¼" 1 ¼" 1" 1" 1"
BFS - 10020 10030 10040 10050 10060 10080	100	21	20 30 40 50 60 80	¾ 1 1 ½ 2 3 5	116 24" x 60"	1 ¼" 1 ¼" 1 ¼" 1" 1" 1"
BFS - 15020 15030 15040 15050 15060 15080	150	31	20 30 40 50 60 80	¾ 1 1 ½ 2 3 5	220 30" x 72"	1 ¼" 1 ¼" 1 ¼" 1" 1" 1"
BFS - 20020 20030 20040 20050 20060 20080	200	42	20 30 40 50 60 80	1 1 ½ 2 2 5 5	220 30" x 72"	1 ¼" 1 ¼" 1 ¼" 1" 1" 1"
BFS - 30020 30030 30040 30050 30060 30080	300	63	20 30 40 50 60 80	1 ½ 2 3 3 5 7 ½	317 36" x 72"	1 ¼" 1 ¼" 1 ¼" 1" 1" 1"

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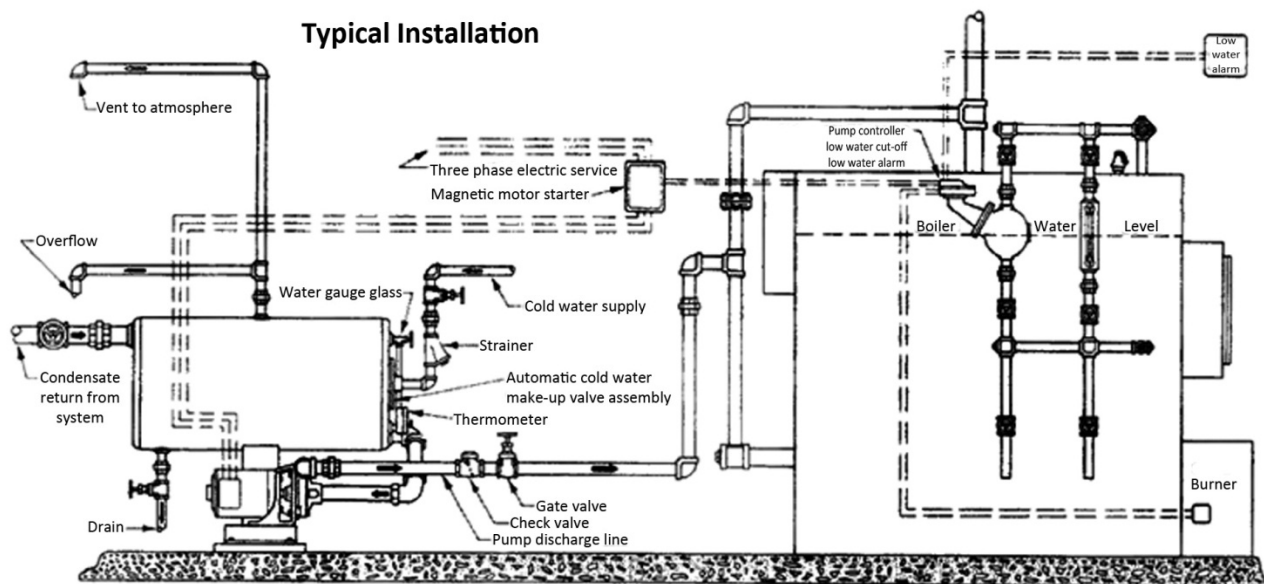
## SERIES BFS

**TABLE 3: BFS SELECTION TABLE (CONTINUED)**

Model Number	Boiler HP	Pump GPM	Pump Discharge Pressure: PSI	Motor HP 3450 RPM	Receiving Tank Cap. Gallons	Pump Discharge Size
BFS – 40020	400	84	20	1 ½	564 48" x 72"	1 ½
40030			30	3		1 ½
40040			40	5		1 ½
40050			50	5		1 ¼"
40060			60	5		1 ¼"
40080			80	7 ½		1 ¼"
BFS – 50020	500	105	20	2	564 48" x 72"	1 ½
50030			30	3		1 ½
50040			40	5		1 ½
50050			50	5		1 ¼"
50060			60	7 ½		1 ¼"
50080			80	7 ½		1 ¼"
BFS – 75020	750	158	20	3	1002 48" x 128"	1 ½
75030			30	5		1 ½
75040			40	5		1 ½
75050			50	7 ½		1 ¼"
75060			60	10		1 ¼"
75080			80	15		1 ¼"
BFS – 100020	1000	210	20	3	1002 48" x 128"	2"
100030			30	5		2"
100040			40	7 ½		2"
100050			50	10		2"
100060			60	10		2"
100080			80	15		2"

Selections are 3450 RPM; for larger systems and higher discharge pressures, please consult factory.

### Typical Installation



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