Screw pumps may be used with good economy for small capacities.

Since the capacity and pressure at which screw pumps will operate is almost infinite, we can only give some idea of their capacity. Efficiencies range from 60 to 70 per cent.

TABLE 1. DIRECT ACTING STEAM DRIVEN DUPLEX RECIPROCATING BOILER FEED PUMPS

Dia. of Steam Cyl. in Inches	Dia. of Water Cyl. in Inches	Length of Stroke in Inches	No. of Strokes per Min.	Discharge in Gallons		Equivalent Dia. of Single Cyl. Pump	Boiler H. P. Served Without Factor of Safety	Size Pipe, Inches			
				Per Stroke	Per Min.			Steam	Exhaust	Suction	Discharge
3	2	3	70	0.04	5.6	2⅞	80	½	¾	1¼	1
4½	2¾	4	60	0.10	12.0	4	180	½	¾	1½	1¼
5¼	3½	5	50	0.20	20.0	5	300	¾	1¼	2	1½
6	4	6	50	0.33	33.0	5⅝	480	1	1½	2½	2
7½	4½	6	50	0.42	42.0	6⅜	600	1½	2	3	2½
7½	5	10	40	0.85	68.0	7	1000	1½	2	3	2½
10	6	10	40	1.22	97.6	8½	1400	2	2½	4	3
12	7	12	35	2.00	140.0	9⅞	2000	2½	3	5	4

TABLE 2. HORIZONTAL DUPLEX PISTON PACKED POWER DRIVEN BOILER FEED PUMPS FOR 100 LB. WORKING PRESSURE

Size of Pump Cylinders in Inches		No. of Revolutions per Min.	Displacement Gallons		Boiler H. P. Served Without Factor of Safety	H. P. Required to Drive Pump	Pipe Sizes Inches	
Dia.	Stroke		Per Rev.	Per Min.			Suction	Discharge
2½	4	30	0.34	10.2	148	1.5	1½	1¼
3	4	30	0.49	14.7	213	4.0	2	1½
3½	5	30	0.83	24.9	361	3.5	2½	2
4	6	25	1.30	32.5	471	4.0	3	2½
8	10	20	8.69	173.8	2520	18.0	5	4

TABLE 3. RECIPROCATING SINGLE ACTING POWER DRIVEN TRIPLEX BOILER FEED PUMPS FOR 150 LB. WORKING PRESSURE

Size of Pump Cylinders in Inches		No. of Revolutions per Min.	Displacement Gallons		Boiler H. P. Served Without Factor of Safety	H. P. Required to Drive Pump	Pipe Sizes Inches	
Dia.	Stroke		Per Rev.	Per Min.			Suction	Discharge
1½	2	50	0.045	2.25	33	0.40	¾	¾
1¾	2½	50	0.078	3.90	57	0.65	1	1
2	3	40	0.122	4.88	70	0.80	1¼	1
2½	4	30	0.255	7.65	110	1.15	1½	1¼
3	4	30	0.367	11.01	160	1.40	1½	1¼
4	4	30	0.652	19.56	280	2.6	2	1½
4	6	25	0.978	24.45	355	3.10	2½	2
5	8	20	2.041	40.82	592	5.00	3	2½
6	8	20	2.938	58.76	852	6.00	3½	3
8	10	20	6.520	130.40	1891	14.00	4	3

CONDENSATION PUMPS

Condensation return pumps are generally of one of the following two types: (1) automatic pumps and receivers, (2) continuously operating non-automatic return pumps.

Automatic Pumps and Receivers

The volumetric capacity of receivers for electrically-driven pumps should be not less than three times the maximum minute volumetric flow of condensation to be handled, measured between the high and low water lines in the receiver. For direct acting steam-driven pumps the receiver capacity may be less than for electrically-driven pumps.

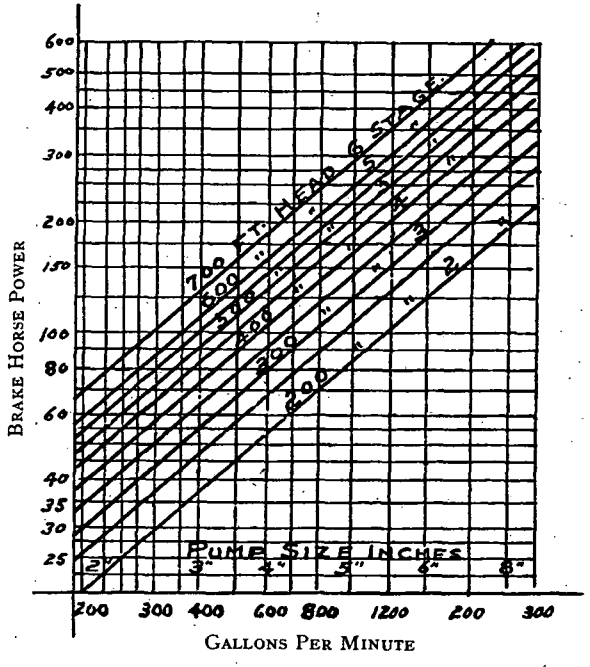


FIG. 1. FOR SELECTION OF SIZE AND STAGE OF CENTRIFUGAL BOILER FEED PUMPS

The piston speed in feet per minute should not be more than 10 times the square root of the number of inches in the length of stroke.

The volumetric displacement rate of water pistons should not be less than three times the maximum volumetric rate of the flow of condensate to be handled.

The normal capacity of centrifugal pumps should not be less than twice the maximum rate of flow of the condensate to be handled.