

“BROWN” EJECTOR FOR STEAM OR AIR

OPERATION

- Bronze and Brass Construction
- No Moving Parts
- Available in Stainless Steel
- Replacement Jets Available
- Solid Construction
- Simple to Operate



STEAM OPERATED – PUMPING LIQUID

A powerful steam operated jet pump for operating pressures from 25 to 150 pounds/sq in. For liquid transfer, agitating, mixing, heating and circulating liquids, priming pumps.

STEAM OR AIR OPERATED – PUMPING GASES

For evacuation of vessels, evacuation and moving of air and certain suitable gases, aerating, priming pumps, producing vacuum.

Approximate Dimensions								
Model Number	Overall Length		Pipe Sizes					
			Steam Supply		Suction		Discharge	
	Inches	mm	BSP	mm	BSP	mm	BSP	mm
1	4 5/8	117	3/8"	10	1/2"	15	1/2"	15
2	5 1/2	140	1/2"	15	3/4"	20	3/4"	20
3	6 3/8	162	3/4"	20	1"	25	1"	25
4	7 5/16	185	1"	25	1 1/4"	32	1 1/4"	32
5	8 9/16	218	1"	25	1 1/2"	40	1 1/2"	40
6	10 1/8	257	1 1/4"	32	2"	50	2"	50
7	11 3/16	284	1 1/2"	40	2 1/2"	65	2 1/2"	65
8	13 7/8	352	2"	50	3"	80	3"	80

Capacity of Brown Ejector – Steam Operated – Pumping Water

The capacities given in the table below are for 1 1/2" size No. 5 ejector pumping water under various conditions of operating steam pressure, suction lift, suction water temperature and discharge head. Capacities for other sizes of ejectors can be determined by multiplying the values in the Table by the performance factors given in Table 5.

It will be noted from the table that a reduced steam pressure will often result in an increase in capacity. By throttling the steam supply to the ejector to the most efficient operating pressure, maximum economy of operation can be obtained. Viscous suction fluids or suction fluids with a specific gravity or specific heat value differing to a great extent from that of water will effect the capacity of ejector.

Capacity in Gallons per Hour of Size 5A (1 1/2") Series 1A Ejector

Suction Lift in Feet	Discharge Head in Feet	Suction Water Temp. 70° F Operating Steam Pressure					Suction Water Temp. 100° F Operating Steam Pressure					Suction Water Temp. 130° F Operating Steam Pressure				
		30	60	90	120	150	30	60	90	120	150	30	60	90	120	150
2	0	2700	2760	2580	2280	2040	2580	2520	2280	2060	1830	2160	1950	1740	1620	1500
	10	1500	2760	2580	2280	2040	2100	2520	2280	2060	1830	2040	1950	1740	1620	1500
	20	-	2760	2580	2280	2040	-	2520	2280	2060	1830	-	1950	1740	1620	1500
	30	-	2580	2580	2280	2040	-	2520	2280	2060	1830	-	1950	1740	1620	1500
	40	-	1920	2580	2280	2040	-	1920	2280	2060	1830	-	1950	1740	1620	1500
	60	-	-	2500	2280	2040	-	-	2280	2060	1830	-	-	1740	1620	1500
	80	-	-	-	2280	2040	-	-	-	2060	1830	-	-	-	1620	1500
	100	-	-	-	-	2040	-	-	-	-	1830	-	-	-	-	1500
10	0	2520	2240	1950	1740	1500	2160	1950	1700	1500	1350	1700	1580	1380	1200	-
	10	1080	2240	1950	1740	1500	1100	1950	1700	1500	1350	1100	1580	1380	1200	-
	20	-	2240	1950	1740	1500	-	1950	1700	1500	1350	-	1580	1380	1200	-
	30	-	2240	1950	1740	1500	-	1950	1700	1500	1350	-	1580	1380	1200	-

	40	-	19 80	19 50	17 40	15 00	-	18 00	17 00	15 00	13 50	-	-	13 80	12 00	-
	60	-	-	19 50	17 40	15 00	-	-	17 00	15 00	13 50	-	-	13 80	12 00	-
	80	-	-	-	17 40	15 00	-	-	-	15 00	13 50	-	-	-	12 00	-
	100	-	-	-	-	15 00	-	-	-	-	-	-	-	-	-	-
20	0	16 00	12 60	10 00	80 0	72 0	12 90	10 50	84 0	-	-	84 0	-	-	-	-
	10	30 0	12 60	10 00	80 0	72 0	60 0	10 50	84 0	-	-	60 0	-	-	-	-
	20	-	12 60	10 00	80 0	72 0	-	10 50	84 0	-	-	-	-	-	-	-
	30	-	12 60	10 00	80 0	72 0	-	10 50	84 0	-	-	-	-	-	-	-
	40	-	-	10 00	80 0	72 0	-	-	84 0	-	-	-	-	-	-	-
	60	-	-	-	80 0	72 0	-	-	-	-	-	-	-	-	-	-
	80	-	-	-	-	72 0	-	-	-	-	-	-	-	-	-	-

Performance Factors for Other Ejector Sizes

Ejector Size No	1.	2.	3.	4.	5.	6.	7.	8.
Performance Factor	.13	.25	.40	.70	1.0	1.7	2.8	4.5

Air Handling Capacity in Cubic Feet per Minute of Standard Air for No. 5 (1 1/2") Ejector at Various Steam Pressures and Vacuums

Operating Steam or Air Pressure	Atmospheric Suction		Vacuum at Suction in Inches of Mercury at Atmospheric Discharge			
	With Discharge Head Up To	Capacity	5	10	15	20
20	2 #/ Sq. in.	37	26	17	10	-
40	7 #/ Sq. in.	34	23.5	16	9.5	4.00
60	12 #/ Sq. in.	29.5	22	16	9.5	5.50
80	18 #/ Sq. in.	25	19	13	9.0	5.00

Values given in the table below are based in the 'Evacuation of Air' or non-condensable gases from closed systems and give the size of system in cubic feet which can be evacuated to a given vacuum in one minute

Capacities for priming centrifugal pumps or syphons are approximately 40% of the values given in the table.

Ejector Size No.	Operating Steam or Air Pressure	Final Vacuum in inches of Mercury or approximate left in feet of Water			
		5	10	15	20
1.	40	29	9	4	2
2.	40	50	17	7	4
3.	40	125	34	17	8
4.	40	190	60	25	11
5.	40	250	89	42	21
6.	40	450	160	75	38
7.	40	720	240	135	64
8.	40	1000	380	200	100

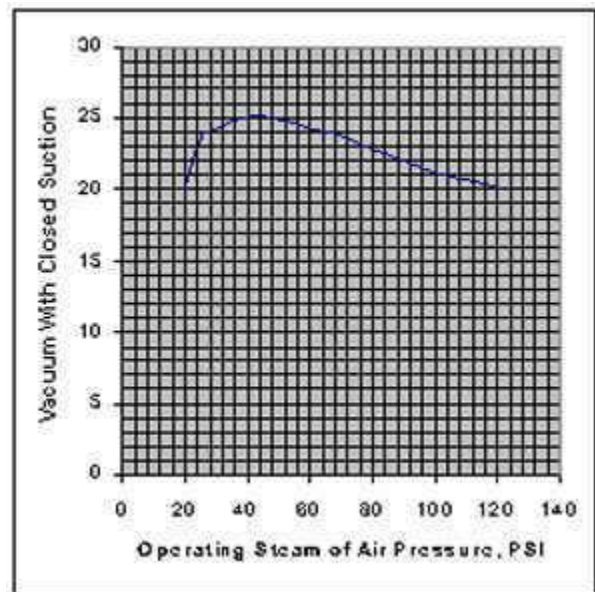
The table below indicates the steam consumption. To obtain the approximate air consumption in cubic feet per minute multiply by 20.

Operating Steam Gauge Pressure	Ejector Size No.							
	1.	2.	3.	4.	5.	6.	7.	8.
30	0.6	1.1	1.8	3.2	4.5	7.6	12.4	21.5
60	1.0	1.9	3.1	5.4	7.6	12.8	21.1	36.6
90	1.4	2.6	4.2	7.4	10.5	17.6	29.0	50.0
120	1.8	3.3	5.5	9.5	13.5	22.6	37.2	64.6
150	2.2	4.1	6.7	11.6	16.5	27.7	45.5	78.9

Lifts 22 to 25 Feet A Forcing ejector of sufficient power to elevate 1 foot per each 1 1/4 to 1 3/4 lb. of steam. This model in a range of eight sizes is of all bronze construction, has no moving parts and its likelihood of getting out of order in remote. In operation it is almost noiseless. Replacement parts may be purchased separately; see the illustration.

When supplying ejectors neither the strainer nor socket is included – they must be purchased separately.

For sizes, capacities and steam consumption, refer to the chart.



INSTALLATION, OPERATION AND MAINTENANCE OF BROWN EJECTORS

Installation

Brown Ejectors will operate in any position but should be installed with minimum length of piping and as few elbows, valves and restrictions as possible.

When the application requires that fluids be lifted by suction, the ejector should be located as close to the liquid level as practical with the balance of elevation being on the discharge side.

Pressure supply piping should be adequate to supply the quantity of operating medium to the ejector nozzle without causing a drop in the pressure sufficient to impair the operating efficiency of the ejector.

Suction piping must be tight to insure maximum capacity and highest possible vacuums. When lifting liquids the suction piping should be sized so that the velocity does not exceed 4 feet per second. Suction strainers or foot valves, if used, should be of a size and design to prevent resistance to fluid flow.

Discharge piping should be the full size of the ejector discharge connection and, if the line is long, it should be increased in size so as to keep the discharge head to a minimum.

On water operated units required to produce a vacuum at suction, it is necessary to install a check valve in the discharge line, change the direction of the piping, or terminate discharge line below water level so that a seal can be effected when starting.

Operation

When starting steam jet pumps that are required to lift and elevate liquids by suction, steam operating valve should be opened slowly so that the unit will prime quickly. At this time, valve should be opened to a point that will provide the most efficient operating pressure for the conditions of operation. Discharge line should be open when starting so that the flow of steam will not be affected by excessive back pressure. After ejector is primed, it will operate against discharge heads as indicated in capacity tables. Condensate should be eliminated from steam lines before operating ejectors.

On application requiring the priming of centrifugal pumps, open the ejector suction valve and then open the ejector supply valve. When the pump casing has been evacuated, start pump, then close suction valve after which ejector supply valve may be shut off.

Maintenance and Service Parts

If properly selected to suit conditions, ejectors will operate over long periods of time without the necessity for renewal of parts. Faulty operation, particularly on the small units, may be due to obstruction in jets due to pipe scale or foreign matter. Installation of suitable strainers in the supply and suction lines will eliminate further trouble.