

**PUMPING - INJECTING - EVACUATING - CONDENSING - LIFTING - BLENDING - MIXING - AGITATING - DILUTING - DEWATERING - DRAINING**

ELMRIDGE 'TLL Series' Liqui-Jet Eductors use water or other liquids as the motive fluid, and operate on the Venturi principle to pump other liquids or slurries. Liquid is pumped through the Eductor nozzle, emerging at a relatively high velocity, creating a zone of lower pressure contained within the Suction Chamber of the Eductor. The secondary or Suction fluid (liquid, gas, or vapor), is drawn to this lower pressure zone, where the momentum of the motive liquid is transferred to the Suction fluid, causing the Suction fluid to be pumped. While the 'TLL Series' design is optimized for use with liquids, the fact that these eductors will pump gases and vapors dictates that they are also self-priming. Operating characteristics (Water Motive / Water Suction), for standard models are shown below, and special units are also available to meet your specifications. Standard materials of construction are PVC, CPVC, Polypropylene, PVDF, Bronze/Brass, Cast Iron/Steel, 316L Stainless Steel, Alloy 20, and Hastelloy C®. Other materials are available upon request. Threaded, flanged, sanitary, buttweld, or socket weld connections (except Cast Iron).

**Table 1** Suction Capacity (usgpm water) for a TLL5 Liqui-Jet Eductor using 70 deg. F Water

Suction Lift (feet water)	Discharge Head (feet water)	Operating Water Pressure (psig)								
		10	20	30	40	50	60	80	100	
0	0	12.0	20.1	26.4	34.1	34.1	34.1	34.1	34.1	
	10	-	9.2	16.6	24.2	30.4	34.1	34.1	34.1	
	20	-	-	6.2	14.3	22.1	30.4	34.1	34.1	
	30	-	-	-	4.2	11.8	22.0	33.5	34.1	
	40	-	-	-	-	-	10.0	26.2	33.7	
	50	-	-	-	-	-	-	14.4	30.6	
5	0	6.1	15.3	23.2	29.6	32.7	32.7	32.7	32.7	
	10	-	3.6	11.9	19.9	27.4	32.7	32.7	32.7	
	20	-	-	-	9.5	17.5	27.6	32.7	32.7	
	30	-	-	-	-	6.7	16.7	30.6	32.7	
	40	-	-	-	-	-	4.1	21.2	32.0	
	50	-	-	-	-	-	-	8.2	26.5	
10	0	-	9.7	17.6	25.6	28.3	28.3	28.3	28.3	
	10	-	-	6.5	15.1	23.4	28.3	28.3	28.3	
	20	-	-	-	4.4	12.5	23.1	28.3	28.3	
	30	-	-	-	-	-	10.6	27.2	28.3	
	40	-	-	-	-	-	-	15.4	28.3	
	50	-	-	-	-	-	-	-	21.4	
15	0	-	3.9	12.5	20.2	24.6	24.6	24.6	24.6	
	10	-	-	-	10.0	18.4	23.8	24.6	24.6	
	20	-	-	-	-	6.9	17.6	23.5	24.6	
	30	-	-	-	-	-	4.3	21.5	24.0	
	40	-	-	-	-	-	-	8.7	23.1	
	50	-	-	-	-	-	-	-	16.3	
20	0	-	-	6.7	15.7	20.4	20.4	20.4	20.4	
	10	-	-	-	4.5	13.4	20.4	20.4	20.4	
	20	-	-	-	-	-	11.2	20.4	20.4	
	30	-	-	-	-	-	-	16.1	20.4	
	40	-	-	-	-	-	-	-	19.5	
	50	-	-	-	-	-	-	-	-	
25	0	-	-	-	10.3	15.0	15.1	15.1	15.1	
	10	-	-	-	-	13.8	15.1	15.1	15.1	
	20	-	-	-	-	-	4.6	15.1	15.1	
	30	-	-	-	-	-	-	9.2	14.8	
	40	-	-	-	-	-	-	-	13.2	
	50	-	-	-	-	-	-	-	-	
<b>Power Water Consumption (USGPM)</b>		8.9	13.0	16.0	18.5	20.1	22.8	26.2	29.2	

**PUMPING LIQUIDS**



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**Table 2** Capacity Factors

Model	TLL00	TLL0	TLL1	TLL2	TLL3	TLL4	TLL5	TLL6	TLL7	TLL8	TLL9	TLL10	TLL11	TLL12	TLL13	TLL14	TLL15	TLL16
Capacity Factor	0.027	0.050	0.091	0.165	0.30	0.55	1.00	1.80	3.24	4.30	5.71	7.57	10.1	13.3	17.7	23.5	31.2	41.4

## APPLICATION EXAMPLES

### EXAMPLE 1:

It is required that water be removed from a sump at the rate of 14 usgpm. The maximum suction lift is 5 feet and the maximum discharge head is 20 feet. Water is available at 60 psig for operating the eductor.

- From Table TLL-1, the TLL5 eductor has a suction capacity of 27.6 usgpm under the conditions given.
- The required Capacity Factor is:

$$14.0 / 27.6 = 0.507$$

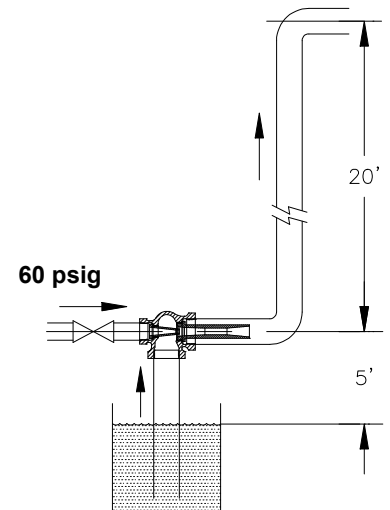
- From the Capacity Factor Table TLL-2, the Capacity Factor of the TLL4 Eductor is 0.55, ie. the suction capacity of the TLL4 at the given operating conditions is:

$$0.55 \times 27.6 = 15.2 \text{ usgpm}$$

The capacity can be reduced, if necessary, by throttling the power water supply.

- Power Water Consumption of the TLL4 at 60 psig is:

$$22.8 \times 0.55 = 12.5 \text{ USGPM}$$



### EXAMPLE 2:

It is required that a brine solution (S.G. = 1.11), be pumped from a tank in a specific ratio to the power water (1:2.2 [Vol.] brine to water). Total mixture flowrate required is 35 usgpm. The maximum suction lift is 4.5 feet and the maximum discharge head is 29 feet. Water is available at 80 psig for operating the eductor.

- The actual suction lift corrected for the Specific Gravity of the brine solution is:

$$4.5 \times 1.11 = 5.0 \text{ feet of water}$$

- The actual discharge head corrected for the Specific Gravity of the water/brine discharge mixture is:

$$29 \times \frac{(1 \times 1.11) + (2.2 \times 1)}{(1 + 2.2)} = 30 \text{ feet of water}$$

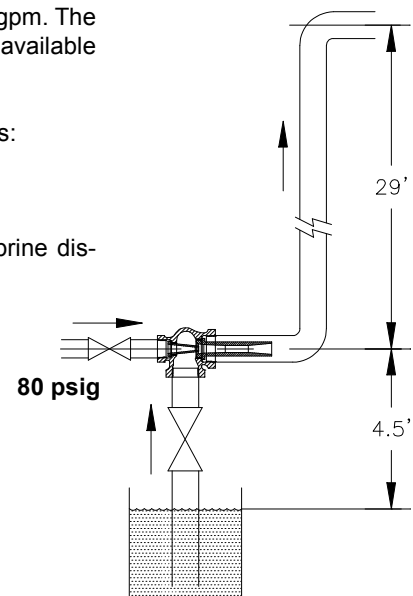
- The brine flowrate (Suction Flow) required is:

$$35 / (1 + 2.2) = 10.9 \text{ usgpm}$$

- Power Water flowrate is therefore:

$$35 - 10.9 = 24.1 \text{ usgpm}$$

- From Table TLL-1, the TLL5 eductor has a Power Water flowrate of 26.2 USGPM and a suction capacity of 30.6 USGPM under these conditions. Power Water inlet and Suction inlet can both be throttled to meet the necessary flow requirements.



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