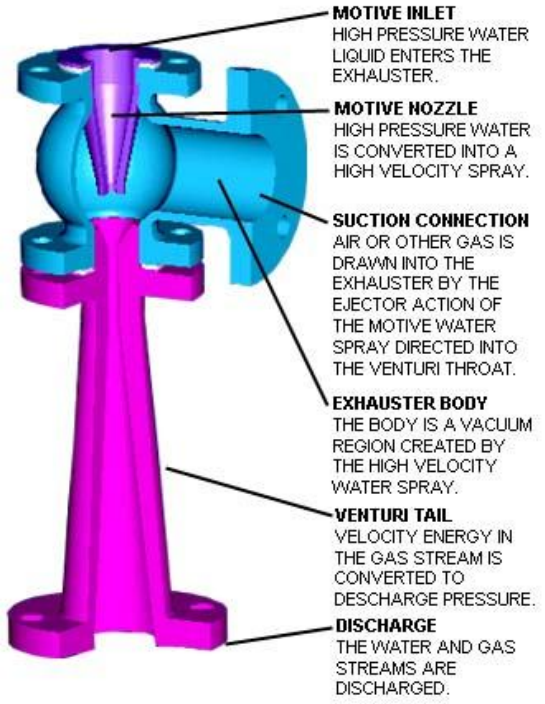
Liquid Jet Exhausters
E700 Series

PRIMETECH

The liquid jet exhauster is used to suck, entrain and pump out gases from its source point utilizing a high pressure motive liquid such as water or other liquid. Motive liquid is discharged at a high velocity through a specialized nozzle and sprayed through body and venturi throat & tail.

Specially designed nozzle creates a full cone spray. The liquid spray covers and seals the exhauster throat and fills the tail portion of the exhauster to create effective self priming action. The nozzle converts the pressure energy of the motive liquid into a high velocity spray. When the sucked gas is mixed with the high velocity motive liquid, momentum of the motive liquid is transferred to the suction gas. This transfer in momentum creates vacuum.

The liquid & gas stream enters the exhauster throat and passes through tail where the velocity energy is converted into an intermediate discharge pressure. Lower the temperature or lower the vapour pressure of motive liquid a higher vacuum level can be obtained.



MATERIAL OF CONSTRUCTION

Several metals & plastics can be employed for exhauster body & nozzle depending on service conditions, fluid and its properties. Typically exhausters can be supplied in cast-iron, carbon steel, stainless steel, titanium, Hastalloy, Monel metals. In plastics PVC, CPVC, Teflon and Polypropylene can be supplied.

END CONNECTIONS

Threaded or flanged to specific standards as per customer requirement.

ADVANTAGES

- Exhausters have no moving parts
- Very little routine maintenance
- Can be effectively utilized in many gas and air pumping applications.

SERVICE INDUSTRIES

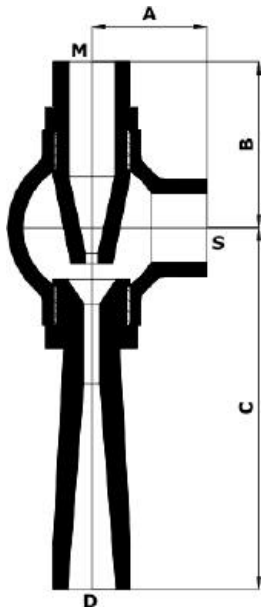
- Chemical
- Pharmaceutical
- Pulp & Paper
- Food
- Textile
- Marine
- Water & Waste water treatment.
- Power

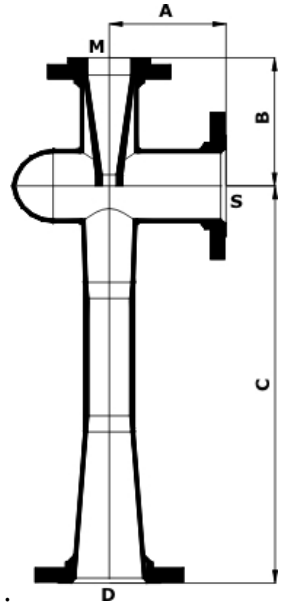
TYPICAL APPLICATIONS

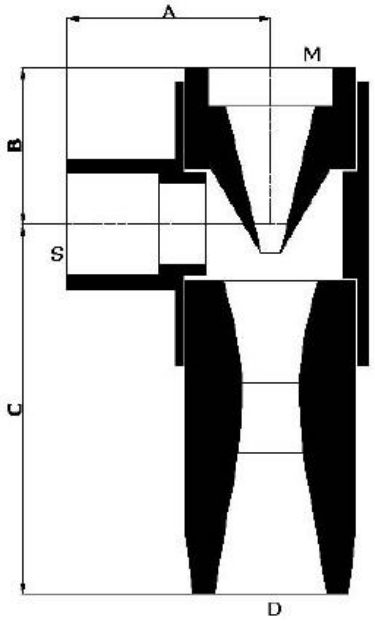
- Vacuum generation in chemical elaborations / Production plants.
- Evacuation of air and fumes from process vessels.
- Exhausting and absorbing soluble gases such as HCl, Cl_2, NH_3, SO_2, CO_2.
- Priming of pumps by creating vacuum and sucking water into pump casing.
- De-aeration of liquid and de-aeration gas chambers.
- Initiating siphon effect.
- Vacuum drying.
- Vacuum distillation.
- Desecration of condensers and pressure vessels.
- Evacuation of siphon line on acid plant.
- Evacuation of acid or solvent vapors.

EDUCTOR TYPES & DIMENSIONS

E701A-T/F	E701B-F	E702-T/F
MACHINED & CAST EDUCTOR	FABRICATED EDUCTOR	PLASTIC EDUCTOR







DIMENSIONS TABLE MODEL E701–T/F

MODEL	NOMINAL LINE SIZE	OVERALL DIMENSION MM			END CONNECTION NB		
		A	B	C	M	S	D
E701.75	20NB	50	50	120	20	20	20
E7011	25NB	50	60	160	25	25	25
E7011.5	40NB	60	70	240	40	40	40
T - Threaded Ends - Standard Pipe threads				F - Flanged Ends - ASNI B 16.5 150#			

FABRICATED EDUCTOR MODEL E701–F

MODEL	NOMINAL LINE SIZE	OVERALL DIMENSION MM			END CONNECTION NB		
		A	B	C	M	S	D
E7012	50NB	125	150	300	50	50	50
E7012.5	65NB	150	160	400	50	65	654
E7013	80NB	160	175	500	50	80	80
E7014	100NB	180	200	700	65	100	100
E7015	125NB	230	250	800	100	125	125
E7016	150NB	230	250	800	100	150	150
E7018	200NB	280	300	1350	150	200	200

PLASTIC EDUCTOR MODEL E702 - T/F

MODEL	NOMINAL LINE SIZE	OVERALL DIMENSION MM			END CONNECTION NB		
		A	B	C	M	S	D
E7021	25NB	50	60	160	20	25	25
E7022	50NB	70	80	325	40	50	50
E7022.5	65NB	85	95	300	50	65	65
E7023	80NB	95	105	475	50	80	80

PERFORMANCE DATA OF LIQUID JET VACUUM PUMP / EXHAUSTER - TYPE 'A'
FOR A STANDARD (25mm SIZE) EXHAUSTERS WITH MOTIVE WATER @ 27°C

Suction Pressure mm Hg vacuum	Discharge Pressure kg/cm²g	Air suction rate in m³/hr @ Motive pressure in Kg/cm²			
		3.0	4.5	6	7.5
600 mm	0	0.48	1.29	1.60	1.85
	0.25		0.97	1.38	1.68
	0.50			1.2	1.68
	1.0			0.8	1.60
	1.25				1.50
500 mm	0	1.0	2.19	2.86	3.20
	0.25		1.60	2.35	3.0
	0.50		1.20	2.19	3.0
	1.0			2.0	2.86
	1.25				2.69
375 mm	0	2.0	3.2	4.38	5.0
	0.25	1.2	2.5	4.0	4.7
	0.50		2.0	3.0	4.30
	1.0			2.8	4.0
	1.25				3.7
250 mm	0	2.86	4.5	6.4	7.0
	0.25	2.0	3.5	5.0	6.2
	0.50		2.8	4.2	5.8
	1.0			3.7	5.0
	1.25				4.8
125 mm	0	4.5	6.5	8.25	9.2
	0.25	2.8	4.7	6.5	8.0
	0.50		3.70	5.30	7.2
	1.0			4.70	6.4
	1.25				5.8
0 mm	0	7.2	9.7	10.60	11.40
	0.25	4.0	6.5	8.00	10.60
	0.50		4.8	6.90	8.90
	1.0			5.80	7.70
	1.25				6.90
MOTIVE FLOW m³/hr		2.7	3.2	3.7	4.0

EJECTOR CAPACITY RATIOS (CR)

Ejector Size mm	15	20	25	40	50	65	80	100	125	150	200
CR	0.25	0.56	1	2.25	4	6.25	9	16	25	36	64

Note:
Above table refers to motive water @ Temp 27ºC vacuum depends on motive water temperature. For any variation in water temp, suction pressure is to be corrected. Contact us.

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Liquid jet Exhauster – Selection procedure

Typical sizing sample -1.
Type-A: Suitable for higher vacuum range.

A vacuum pump has to handle continuously 65m3/hr of air at 250mmHg vacuum against '0' back pressure. Size the exhauster and motive flow required to be estimated for water temperature of 27ºC temp. Motive head available is 5kg/cm^2

Refer table: At 250mmHg vacuum @ 4.5kg/cm^2 pressure motive head @ 0kg/cm^2 back pressure

Air suction rate is	4.5m^3 /hr
Required air rate	65m^3 /hr
Capacity ratio	65/4.5 = 14.44
Refer capacity ratio table for nearest higher CR	16
Select Liquid jet exhauster for CR =16	100mmNB
Motive flow from table	3.2m^3 /hr
Motive flow required = 3.2m^3 /hr (std) X 16 (CR)	51.2m^3 /hr @ 4.5kg/cm^2

Typical sizing Sample -2.
Type-B: Suitable for near atmosphere vacuum.

A Vessel of volume 10m^3 is to be evacuated to 0mmHg vacuum in 15min. Size & select the exhauster for the available motive water pressure of 8kg/cm^2.

A standard 1" exhauster @ 7.5 kg/cm^2 motive water head	14.6m^3 /hr @0mmHg and 0 back pressures evacuates
Required evacuation rate	10m^3/(15 min/60)=40m^3 /hr
Capacity Ratio	40/14.6 = 2.73
Refer CR Table (Nearest higher CR=4 for 50NB size exhauster)	50NB Size.
Standard motive Flow from table	4.0m^3 /hr
Required motive flow	4x4=16 m^3 /hr
Select 2" size exhauster	

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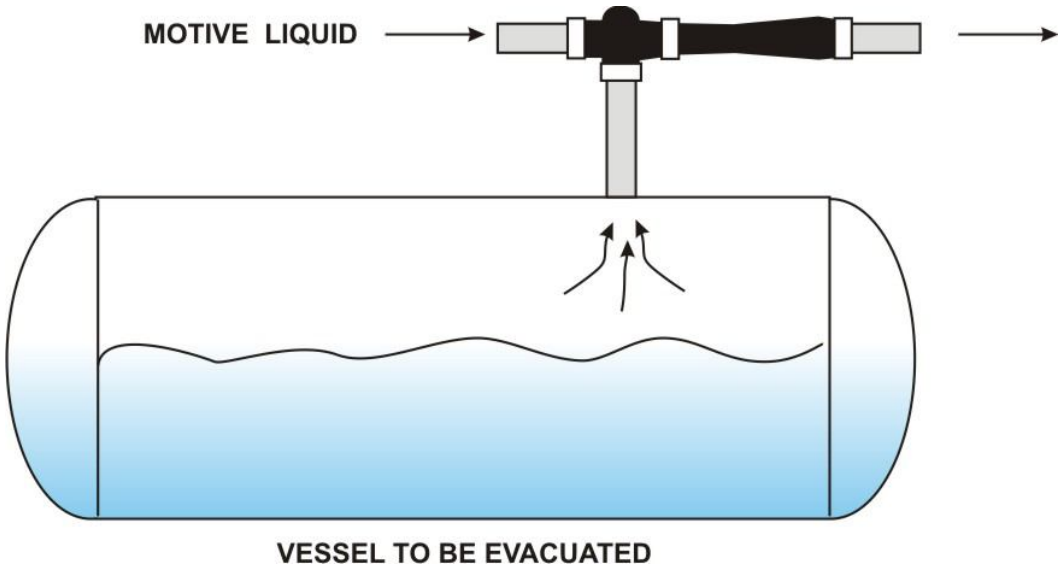
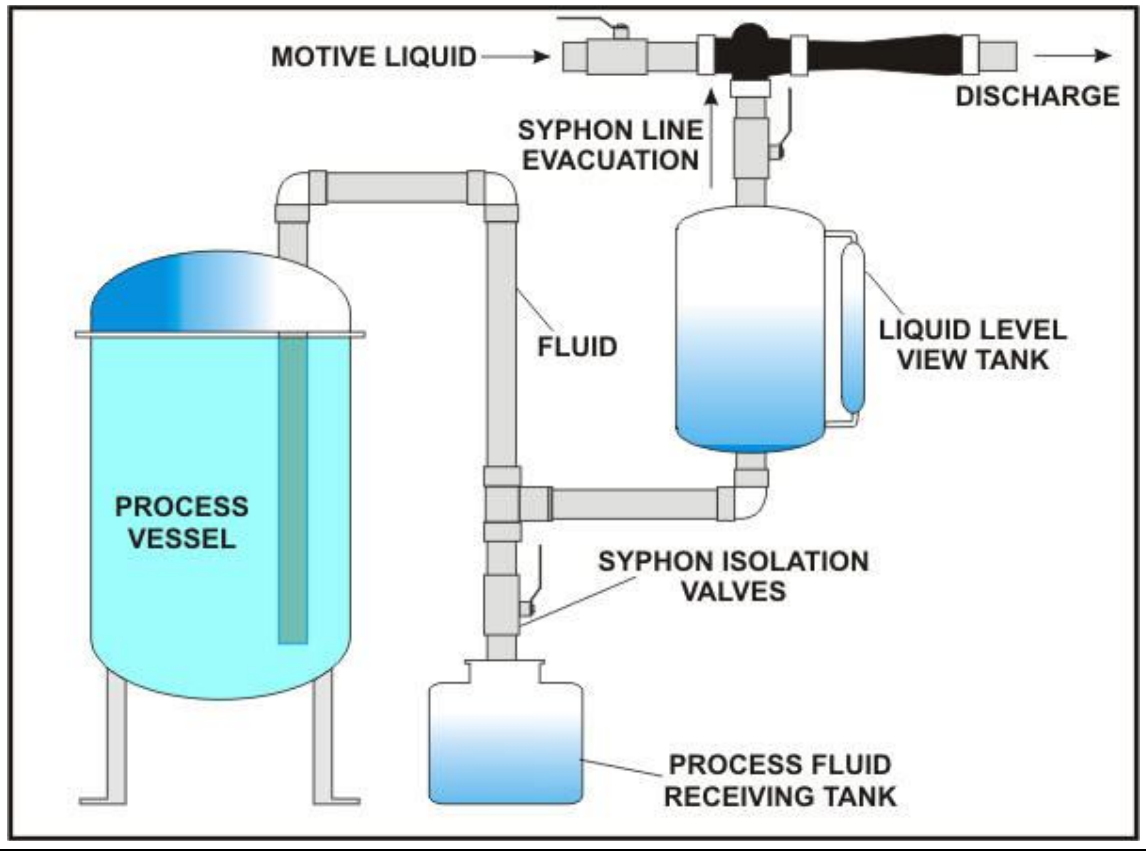
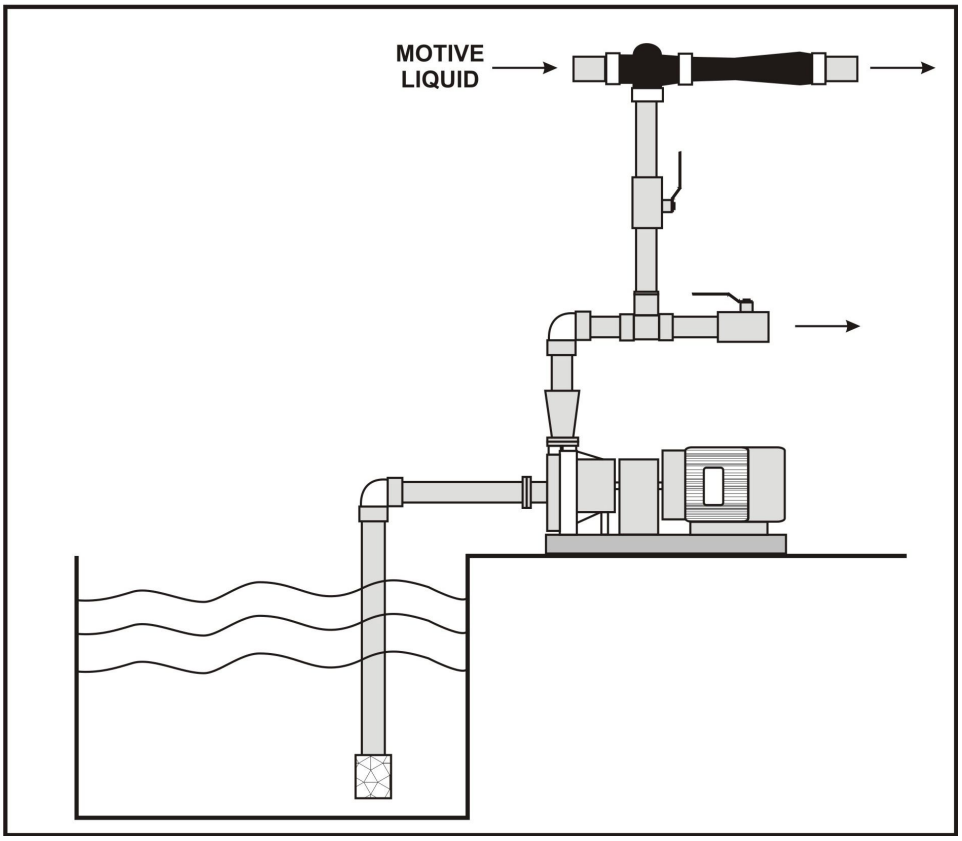
EVACUATION OF VESSEL (OR) EXHAUSTING FUMES FROM PROCESS VESSELS, DEAERATING THE LIQUID



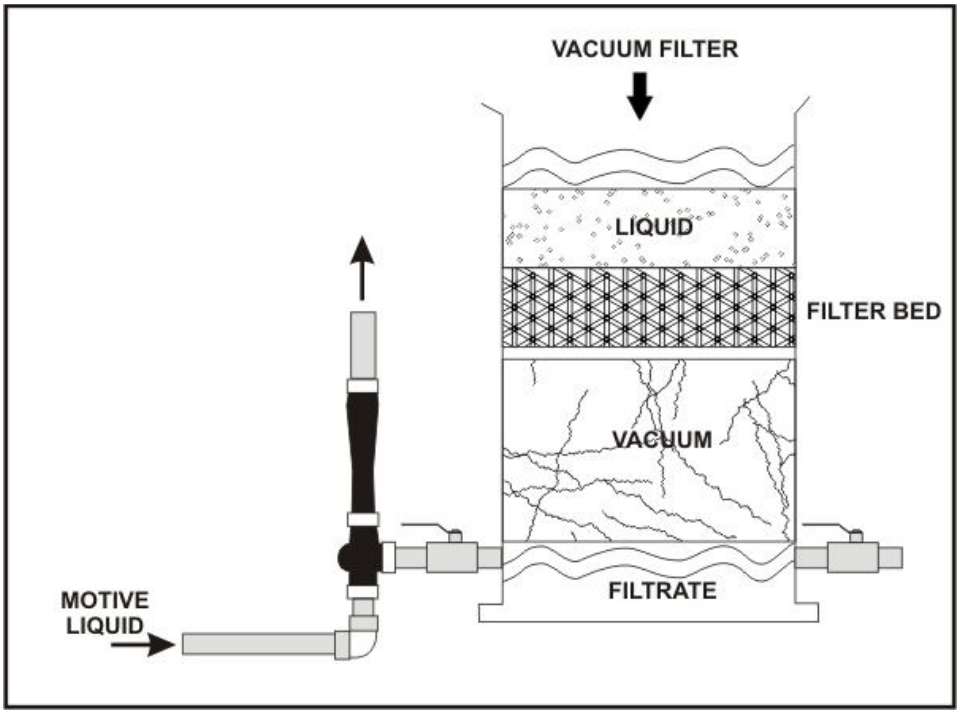
EVACUATION OF SYPHON LINES



EVACUATION OF SUCTION LINE OF CENTRIFUGAL PUMP FOR PRIMING



OPERATION OF VACCUM FILTERS



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