Alfa Laval Vortex Snub Radial Eductor®

Advanced tank mixing eductor for fluid shearing

Introduction

In tank mixing and shearing of fluids is a necessary process in many industry applications that is often achieved via mechanical paddle agitators or a network of in tank piping with nozzles and recirculating pumps. Although these agitation methods are widely accepted, they are not always the best option. Mechanical agitators are often large, expensive and require the construction of additional support structure. Their moving parts must receive regular maintenance, and agitators often don't provide the level of fluid shearing required for full reactivity. Recirculation of tank fluid through piping with simple nozzles is a method of fluid agitation, but it leaves much to be desired in terms of overall turbulence generation and fluid mixing. A great alternative to these methods are tank mxing eductors. These are small, simple devices that can be used to achieve highly effective fluid mixing and agitation. They use pressurized fluid energy to entrain, mix, and pump fluid in tanks, and they possess a number of benefits over the more traditional approaches. The Alfa Laval Vortex Snub Radial Eductor is a unique style of tank mixing eductor that employs a proprietary nozzle design to dynamically shear fluid and achieve up to 2.5 times the total in tank fluid movement that can be had by simple nozzles. It can be used as the primary means of pit agitation, or as a complement to existing mechanical agitators for eliminating dead zones in corners of rectangular tanks.

Applications

The Alfa Laval Vortex Snub Radial Eductor is a high performance tank mixing eductor that is optimized to operate in demanding tank mixing jobs with irregular shaped tanks, fluid shearing requirements, and corrosive liquids. Applications that are ideal for Vortex Snub Radial Eductors include blending, reactor tanks, and chemical mixing. Industrial applications where Snub Radial Eductors are commonly used include vegetable oil, biodiesel, and chemical production.

Benefits

- Simple, robust design, no moving parts
- No maintenance
- Low cost alternative to mechanical paddle agitators
- Compact design
- Dynamically shears fluid. Enhances reactions
- Fully homogeneous tank fluid mix

Standard Design

The Alfa Laval Vortex Snub Radial Eductor consists of a uniquely designed, 304 stainless steel body with proprietary Lobestar Mixing Nozzle® insert and female NPT connection. It is offered in 38 mm (1.5 in,) 51 mm (2 in,) and 76 mm (3 in) connection sizes. Typically, one or more are mounted on a manifold inside of a tank, and the number and size of eductors required is dependent on the vessel size and the necessary agitation or turnover rate (TOR.)

Working Principle

Fluid is pumped into the Snub Radial Eductor inlet where pressure builds at its nozzle. The fluid velocity increases at the nozzle, resulting in a pressure drop and strong vacuum that pulls surrounding fluid into the eductor body through its four peripheral suction ports. The converging fluid streams are dynamically sheared by the nozzle and discharged into the tank as a high-energy plume. The Snub Radial Eductor can be utilized in any application where the motive fluid can be handled by a centrifugal pump.

Technical Data

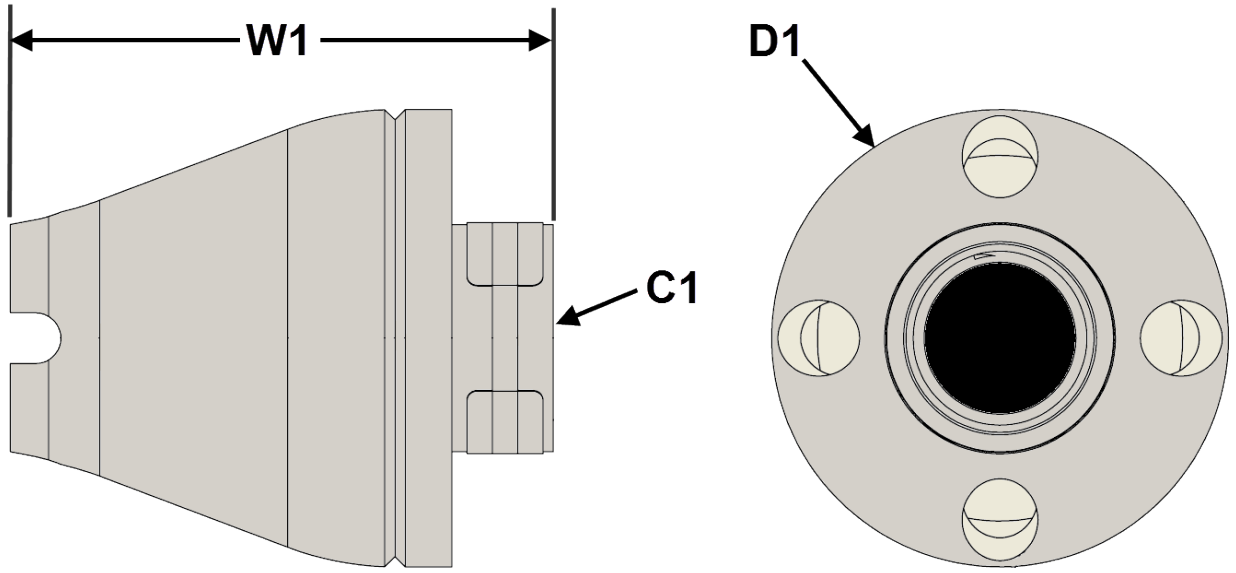
Model Number	SB1500	SB2000	SB3000
Connections	38 mm (1.5 in) FNPT	51 mm (2 in) FNPT	76 mm (3 in) FNPT
Body Material	304 stainless steel	304 stainless steel	304 stainless steel
Weight	2.72 kg (6 lbs)	6.35 kg (14 lbs)	7.3 kg (16 lbs)
Design Temperature	-40 to 82 C (-40 to 180 F)	-40 to 82 C (-40 to 180 F)	-40 to 82 C (-40 to 180 F)
Differential Head Requirement (with water)	70-185 ft head (30-80 PSI)	70-185 ft head (30-80 PSI)	70-185 ft head (30-80 PSI)

Performance Data

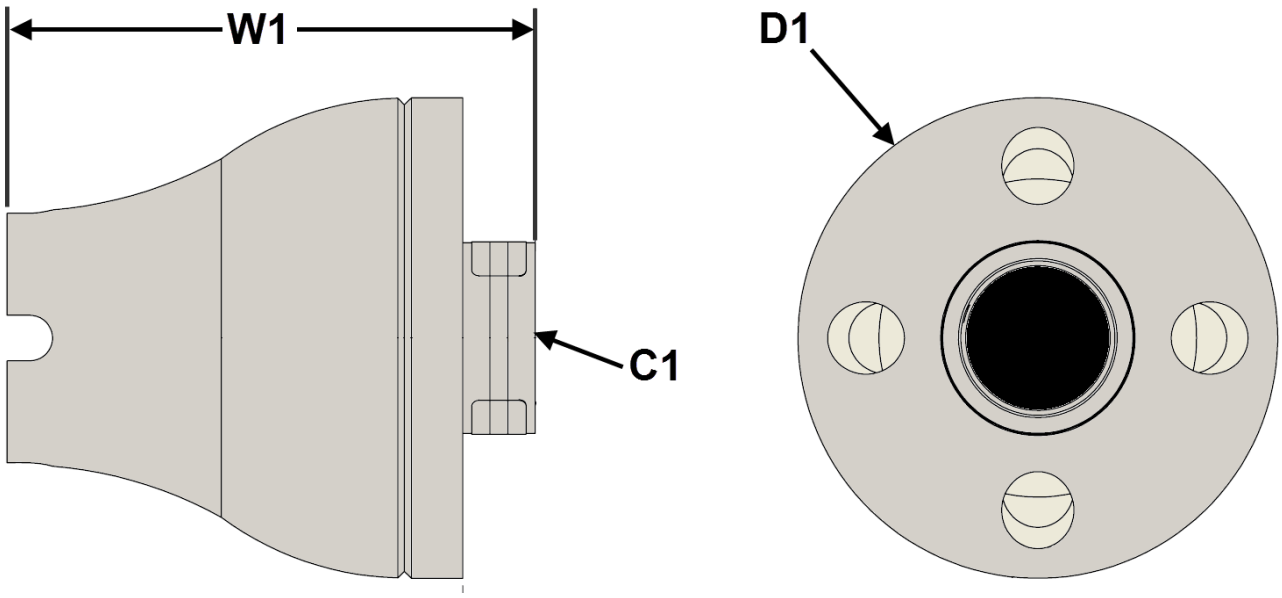
Model	Flow Type	Pressure Differential — PSI					
		30	40	50	60	70	80
SB1500	Inlet	37 (140)	43 (163)	48 (182)	53 (201)	57 (216)	61 (231)
	Outlet	93 (352)	108 (409)	120 (454)	133 (503)	143 (541)	153 (579)
SB2000	Inlet	73 (276)	84 (318)	94 (356)	103 (390)	111 (420)	119 (450)
	Outlet	183 (693)	210 (795)	235 (890)	258 (977)	278 (1052)	298 (1128)
SB3000	Inlet	95 (360)	110 (416)	123 (466)	135 (511)	145 (549)	155 (587)
	Outlet	238 (901)	275 (1041)	308 (1166)	338 (1279)	363 (1374)	388 (1469)

Flowrates are with water and are shown in gallons per minute and liters per minute in parentheses

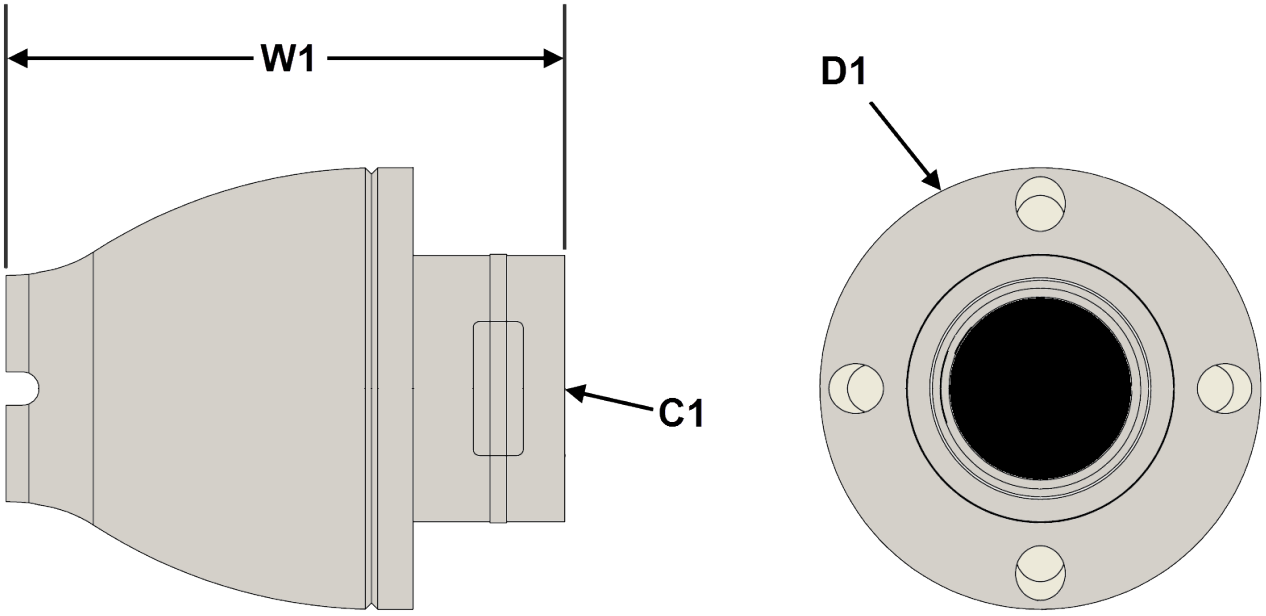
Dimensional Drawings



Model SB1500	
W1	136 mm (5.4 in)
C1	38 mm (1.5 in) female pipe threads
D1	115 mm (4.5 in) diameter



Model SB2000	
W1	185 mm (7.3 in)
C1	51 mm (2 in) female pipe threads
D1	168 mm (6.6 in) diameter



Model SB3000	
W1	213 mm (8.4 in)
C1	76 mm (3 in) female pipe threads
D1	168 mm (6.6 in) diameter

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com