



Alfa Laval Vortex Shear-Mixer Basic

Advanced Slurry Mixing Eductor

Introduction

Mixing of liquid and powder, or slurry mixing, is a necessary process for many applications. Effective slurry mixing significantly impacts operational safety, speed, and overall cost. However, the perceived simplicity of the process often leads to poor, unsafe slurry mixing practices and the use of outdated or improper equipment. Venturi eductors, or slurry eductors as they are commonly referred to, are relatively simple devices that are installed directly into motive liquid flow lines. They have been employed in numerous applications over the years as an extremely cost effective means of mixing slurries. They have no moving parts or motors, and passively convert motive flow pressure into vacuum, inducing powdered additives directly into the motive fluid. However, they are not free from issues such as plugging, sensitivity to recirculated solids, and inadequate powder dispersion which disqualifies them for use in applications where continuous powder flow, batch recirculation, and slurry homogeneity are critical. The Alfa Laval Vortex Shear-Mixer is an advanced style of venturi eductor that provides all of the functional simplicity of its predecessor, but overcomes multiple issues that inhibit the traditional venturi eductor.

Applications

The Alfa Laval Vortex Shear-Mixer is a high-performance venturi slurry eductor uniquely designed to operate in demanding slurry mixing jobs. Handling high flow rate requirements, high solids content, and difficult to mix additives are major criteria for meeting demanding slurry mixing conditions in applications such as oil and gas drilling fluid mixing, construction material production, chemical production, mining, liquid sugar mixing, brine mixing, cosmetics, paint pigment mixing, metal processing, and plastic production.

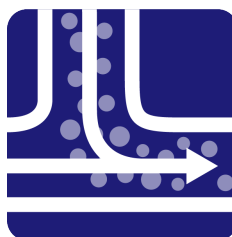
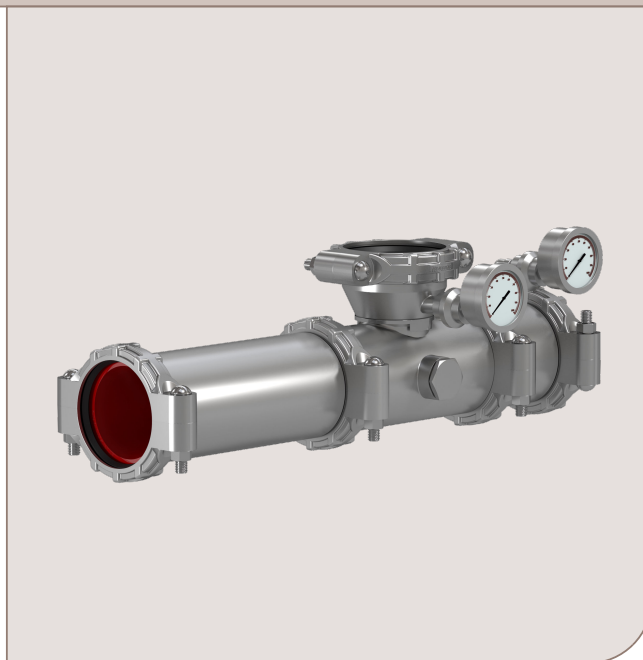
Benefits



Lobestar

Accelerated Mixing with dynamic shearing

Unique nozzle design creates high vacuum, dynamic shearing and reduces plugging



MaxiFlow

Maximized mixture and flow-through rates

Open mixing chamber significantly reduces clogging

- Robust design, no moving parts, easy to replace inserts
- Handles hard to mix additives such as clays or polymers
- Highly customizable to fit specific applications

Standard Design

Much like traditional slurry eductors, The Alfa Laval Vortex Shear-Mixer has no motorized or rotating components. It relies on low pressure vacuum and dynamic, hydraulic shear to easily mix additives into fluid. It outperforms traditional venturi eductors; providing higher additive loading rates and more complete additive mixing. However, unlike traditional venturi eductors, it is exceedingly resistant to plugging and downtime. The Alfa Laval Vortex Shear Mixer Basic is offered in four standard sizes: 2" (51mm,) 3" (76mm,) 4" (102mm,) and 6" (152mm.) The 4" and 6" Shear-Mixers are available in dual suction port options for added versatility and connection to secondary additive feed devices or accessories, such as bulk bag hoppers or bulk surge tanks. The Shear-Mixer

consists of a housing body with special Lobestar Mixing Nozzle® and venturi/diffuser tube inserts. 3", 4", and 6" models can be outfitted with the Radial Premixer "pre-wetting" and wash down accessory and all Shear-Mixers can be equipped with an optional hopper, V-Slide® bulk flow promoter, bulk bag station, or dustless surge tank accessory. The standard connection style for all basic 3", 4", and 6" Shear-Mixers is grooved end pipe couplings. Basic 2" Shear-Mixers have male pipe threaded connections. There are multiple basic Shear-Mixer models which can accommodate many different applications, but if a standard model does not suit the application, a custom engineered Shear-Mixer can be designed to meet specific application demands.

Working Principle

Fluid is pumped at a high rate into the inlet of the Shear-Mixer where pressure builds behind the Lobestar Mixing Nozzle

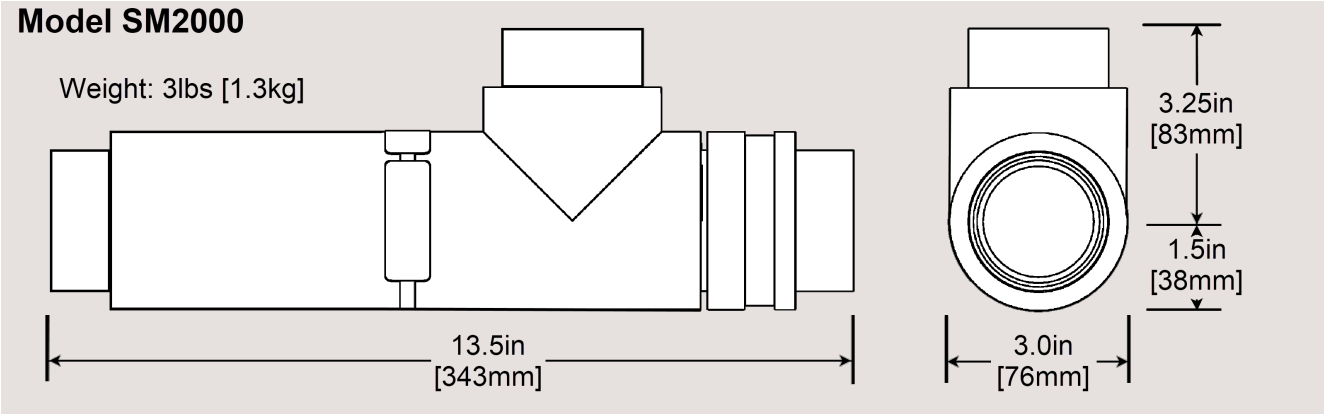
insert. The fluid’s velocity spikes as it passes through the nozzle, and the resulting pressure drop creates a near perfect vacuum for maximum additive loading. The Lobestar Mixing Nozzle produces a unique jet stream that has a dual impact. First, it dynamically shears fluid, rapidly hydrating and uniformly dispersing additives. Secondly, it promotes a highly-energized fluid boundary layer, which when combined with the effect of the Shear-Mixer's specialized venturi/diffuser tube, minimizes the impact of pressure loss in the downstream piping and increases the distance and elevation which the mixed slurry can be delivered through the discharge piping. Generally, the Shear-Mixer can be utilized in any application where the motive fluid can be handled by a centrifugal pump.

Technical Data

Physical Attributes					
Model	Inlet & Discharge Connections	Suction Connection	Body Material	Insert Material	Gaskets
SM2000	2" (51mm) MNPT	2" (51mm) MNPT	Molded Polyurethane	Molded Polyurethane	None
SM3100	3" (76mm) grooved pipe	3" (76mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna
SM4000					
SM4100	4" (102mm) grooved pipe	4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna
SM4200					
SM4203					
SM6000	6" (152mm) grooved pipe	6" (152mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna
SM6100					
SM6200	6" (152mm) grooved pipe	4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna

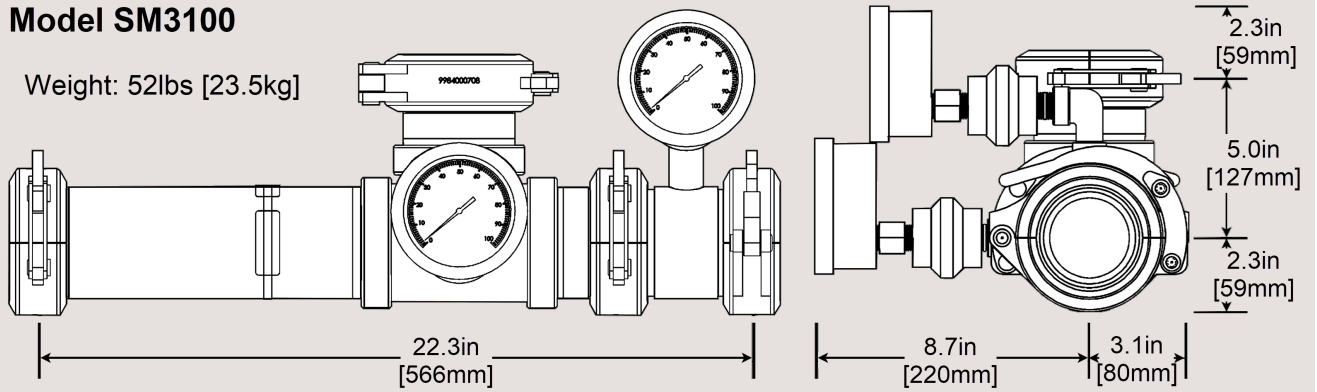
Performance Attributes			
Model	Optimum Motive Flow Range	Optimum Differential Head	Design Temp.
SM2000	65–85gpm (14.7–19.3m³/hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM3100	118–150gpm (28–38m³/hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4000			
SM4100	260–350gpm (59–79.5m³/hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4200			
SM4203			
SM6000			
SM6100	475–625gpm (108–142m³/hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM6200			

Dimensional Drawings



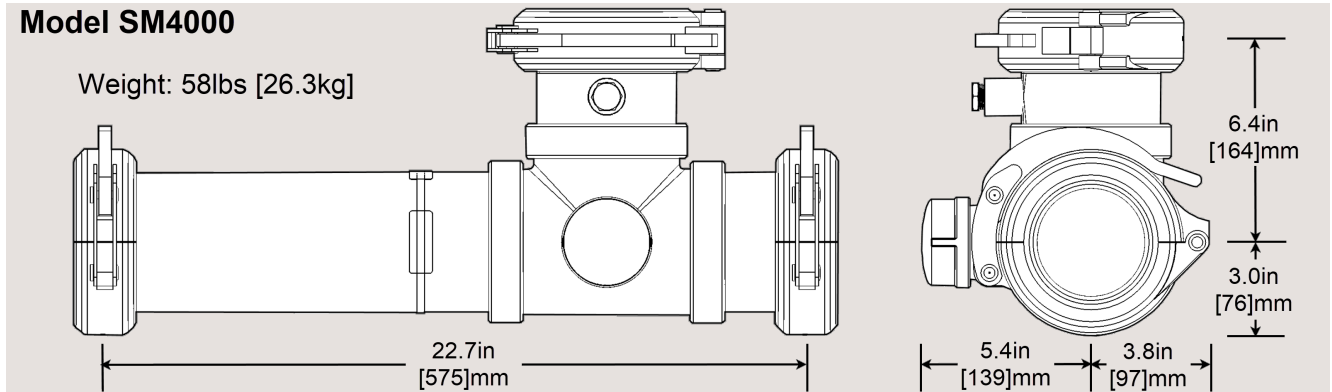
Model SM3100

Weight: 52lbs [23.5kg]



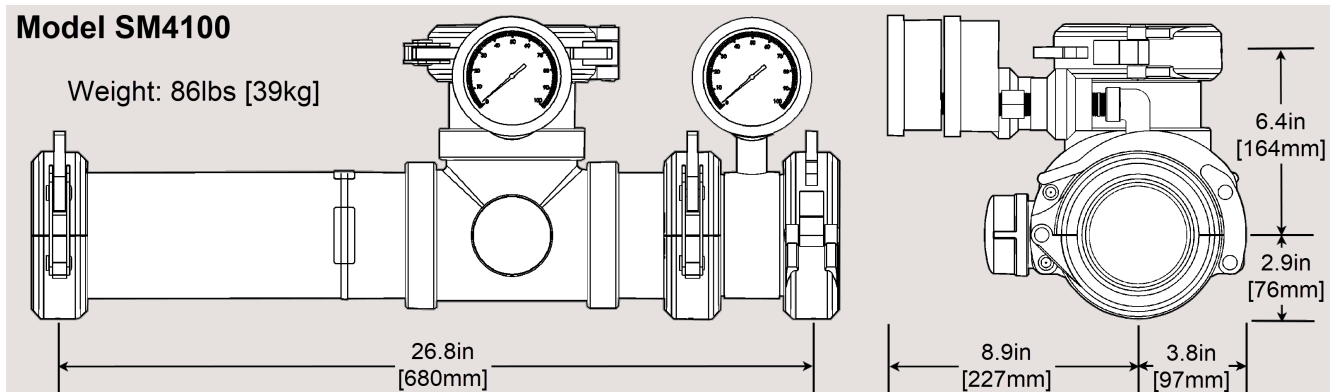
Model SM4000

Weight: 58lbs [26.3kg]



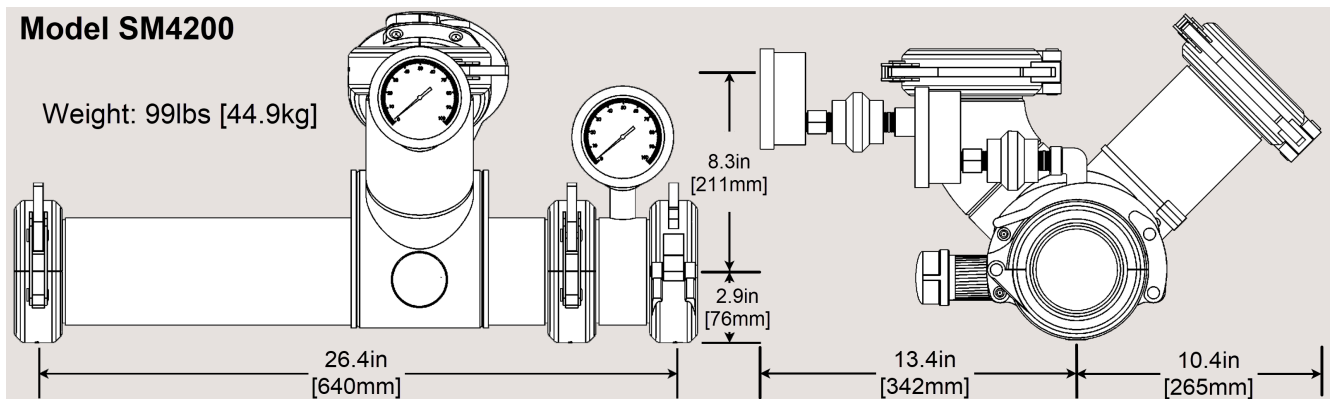
Model SM4100

Weight: 86lbs [39kg]



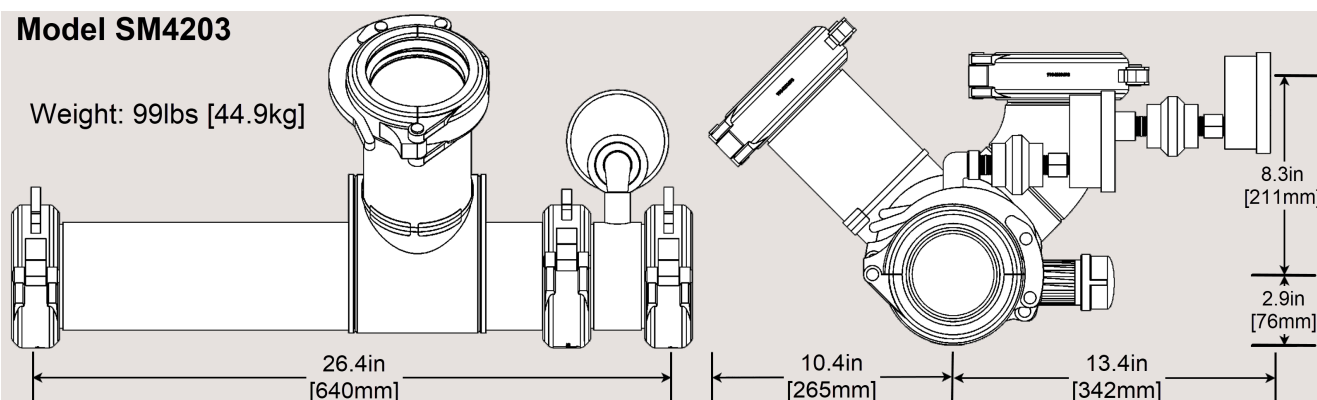
Model SM4200

Weight: 99lbs [44.9kg]



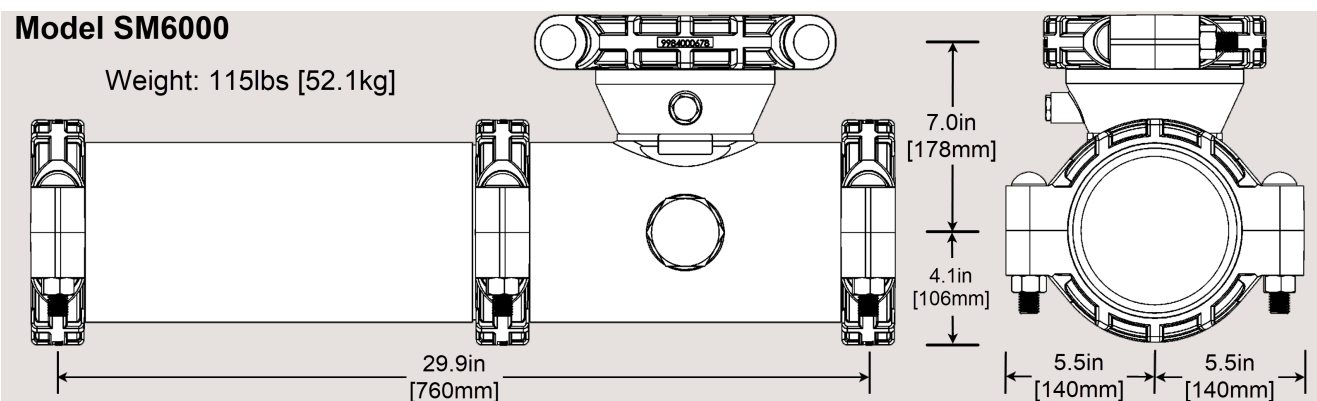
Model SM4203

Weight: 99lbs [44.9kg]



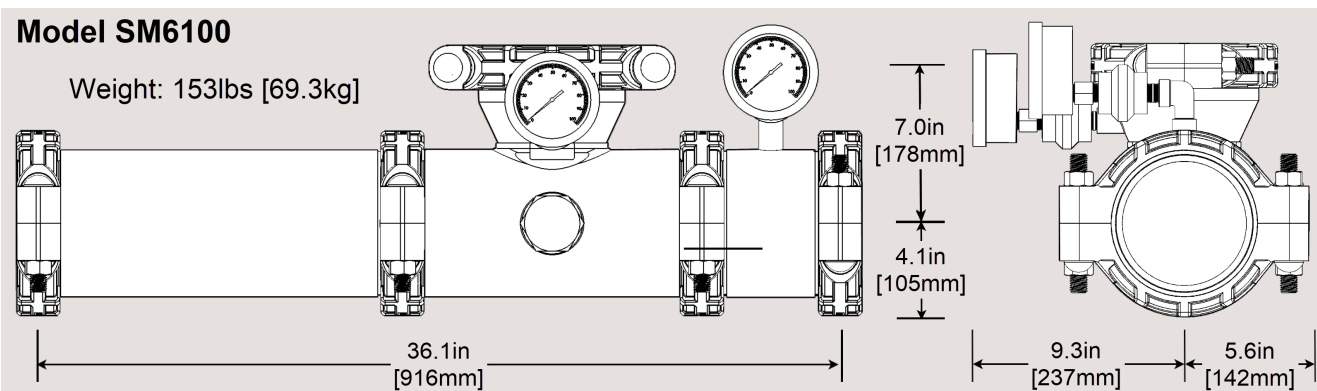
Model SM6000

Weight: 115lbs [52.1kg]



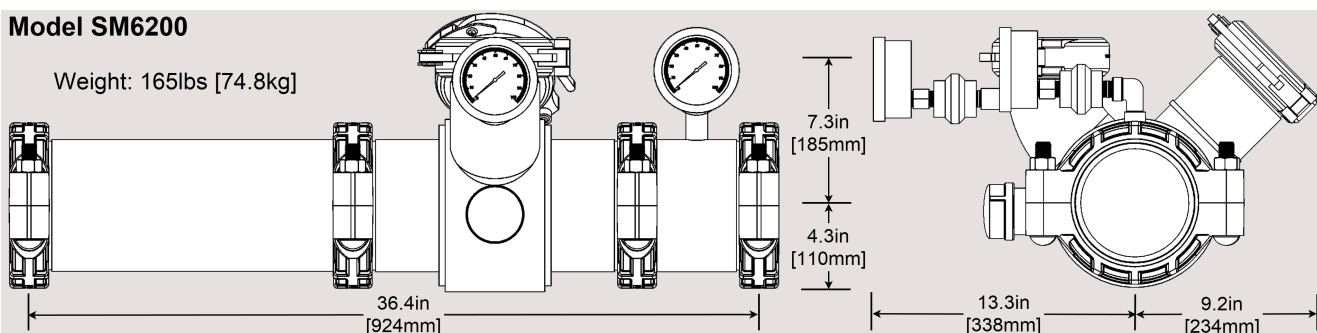
Model SM6100

Weight: 153lbs [69.3kg]



Model SM6200

Weight: 165lbs [74.8kg]



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