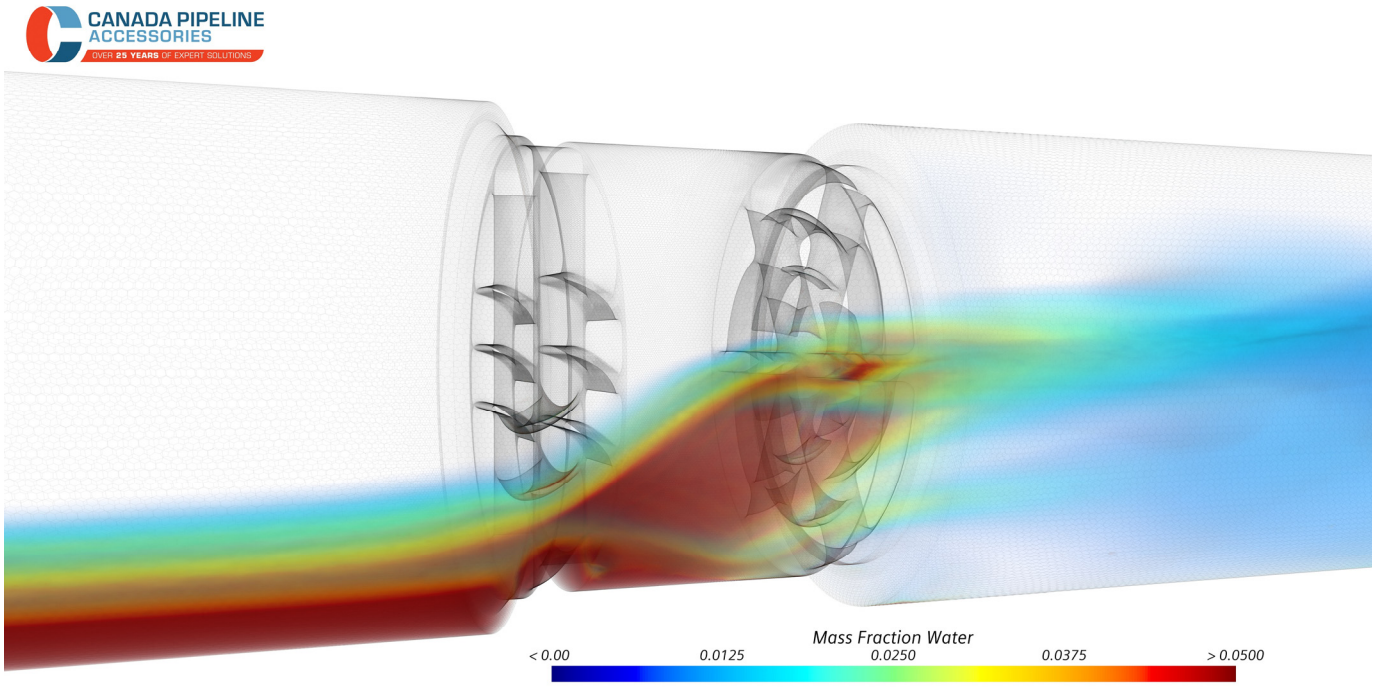
CPA Multiphase Flow Conditioners & Static Mixers

When taking measurements or samples of any fluid that contains multiple components, it is very important for the fluid to be properly mixed. Proper and complete mixing means that the fluid has consistent properties that are representative of the whole/average. The degree of mixing is even more important when taking finite samples since sample probes only extract a limited amount of fluid. This small amount of fluid is taken to represent the whole, and can go on to affect many things such as payments, operations planning, environmental compliance and future maintenance.

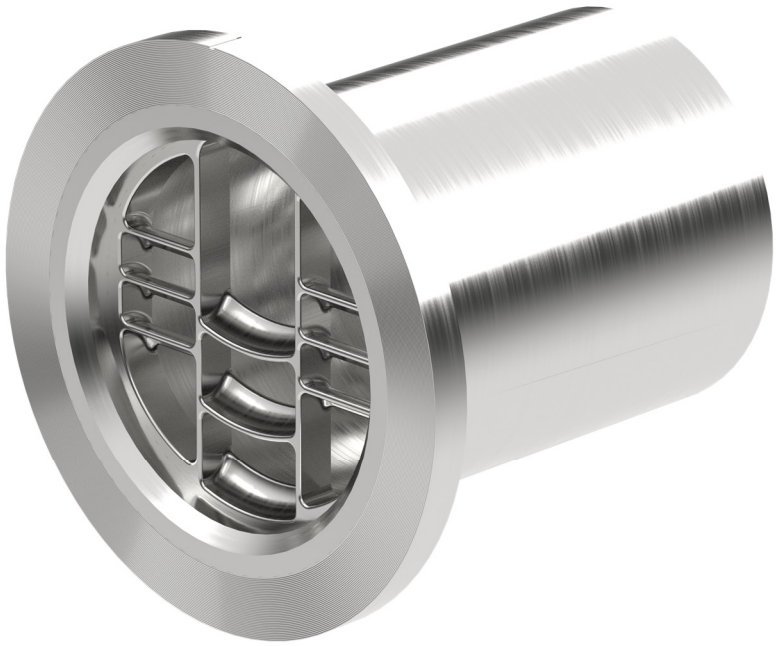
One of the biggest challenges in mixing applications occurs when the fluid components normally cannot be dissolved into each other. In these cases, the mixture will naturally tend to separate and stratify. Even when the fluid is agitated, the components will resist mixing together. A common example of this situation is water and oil.

The CPA Flo2Gether line of multiphase flow conditioners + static mixers are cutting edge products offered by Canada Pipeline Accessories. They are designed and engineered completely in-house by CPA's engineering team and leverage our extensive experience and knowledge of fluid dynamics. Our patented design is specifically optimized for mixing and dispersing immiscible fluids; fluid mixtures that strongly stratify and do not easily mix together, such as water and oil.



CPA 750M FMSMA, Multi Stage Mixer Assembly

- Dual plate construction designed to achieve full mixing within 5D of mixer outlet.
- Optimized for horizontal mixing applications when a vertical mixing loop is not being utilized.
- Specifically designed for use with fluids that do not readily mix together, IE, oil in water.
- First pre-mixer plate creates large scale fluid movement to disrupt stratified flows.
- Second main-mixer plate creates multiple small scale fluid movements to disperse and mix fluids.
- Simple and compact construction requires very little space for installation.
- Can be installed in any available piping spool using ANSI RF flanges, other flange styles available on request.
- Scalable construction for all pipe sizes including custom schedules and wall thicknesses.
- Multiple mixers can be installed in-line for even more aggressive flow mixing.
- Lower pressure drop than many multi-element mixers, K factor = 5-6.
- Designed to create mixed flow according to ISO 3171.
- Designed and validated using advanced CFD software, field tested with customer participation.



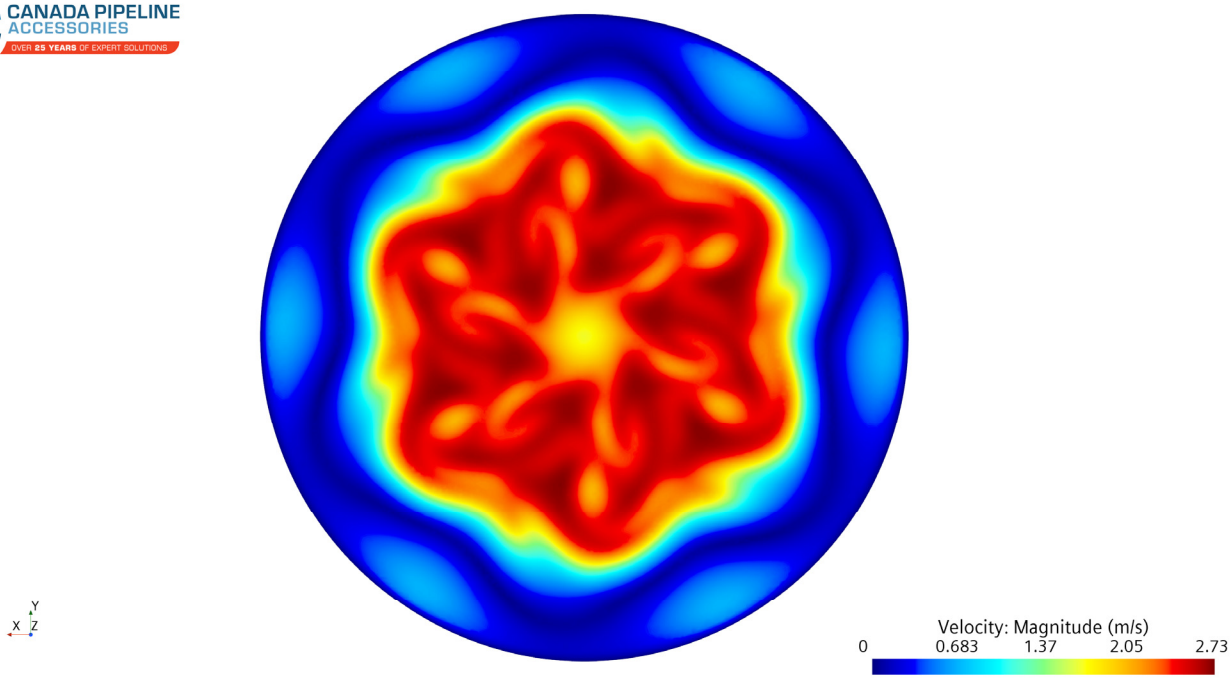
CPA 850M SSRVM, Single Stage Mixing Plate

- Simple, machined single plate construction.
- Optimized for vertical mixing applications.
- Specifically designed for fluids with less stratification and gas mixing applications.
- Recommended for any hydrogen blending applications.
- Single mixer plate creates multiple small scale fluid movements to disperse and mix fluids.
- Even more compact construction requires even less space for installation.
- Can be installed in any available piping spool using ANSI RF flanges, other flange styles available on request.
- Scalable construction for all pipe sizes including custom schedules and wall thicknesses.
- Multiple mixers can be installed in-line for even more aggressive flow mixing.
- Lower pressure drop than many other mixers, K factor = 2-3.
- Designed to create mixed flow according to ISO 3171.
- Designed and validated using advanced CFD software, field tested with customer participation.

Materials and Installation

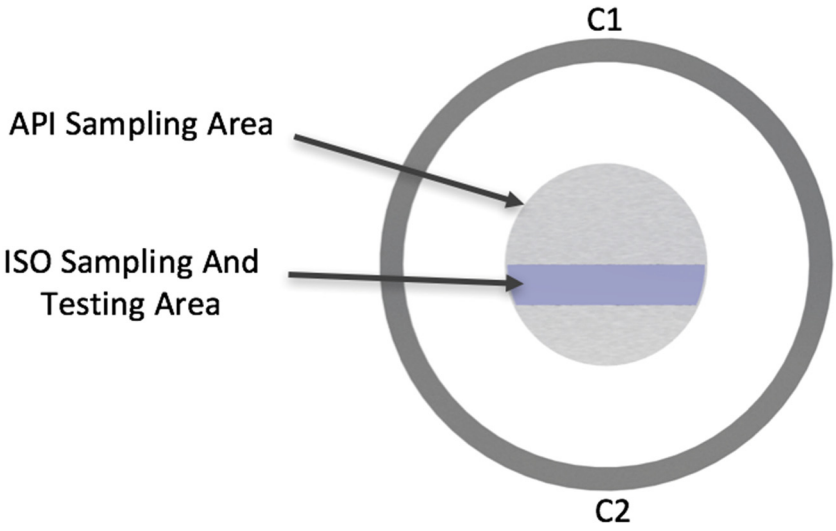
In its standard configuration, the CPA Flo2Gether multiphase flow conditioners are installed between two standard ANSI raised face flanges. CPA stocks the devices in a 316SS & carbon steel for the CPA 750M FMSMA style and 316SS for the CPA 850M SSRVM.

Like all CPA products, the CPA Flo2Gether multiphase flow conditioners can also be customized to accommodate your exact installation requirements including RTJ, Norsok, weld in or any other installation styles. Available custom materials include carbon steel, stainless steel, aluminum, or other specialty materials.

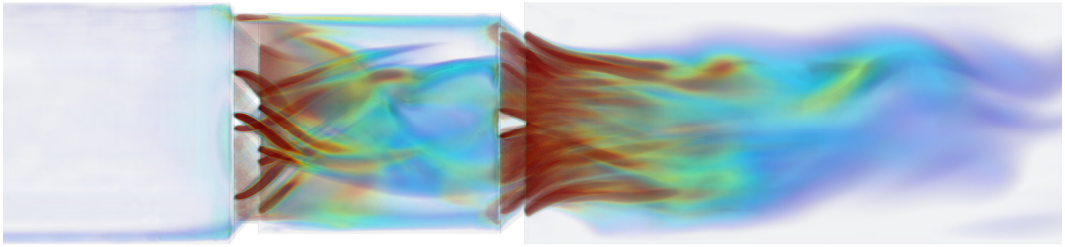


ISO 3171

The CPA Flo2Gether multiphase flow conditioners are designed around the ISO 3173 specification, which is more stringent than the API 8.2 C1/C2 ratio requirements. The C1/C2 ratio compares mixture concentration at the top and the bottom of the pipe, this is not typically where a sample probe is installed. This also assumes that if the mixture concentration is the same at the top and bottom of the pipe, then it is the same across the entire pipe. ISO 3171 specifically aims to minimize mixing error at the center of the pipe, where the sampler is located in order to maximize sampling performance.



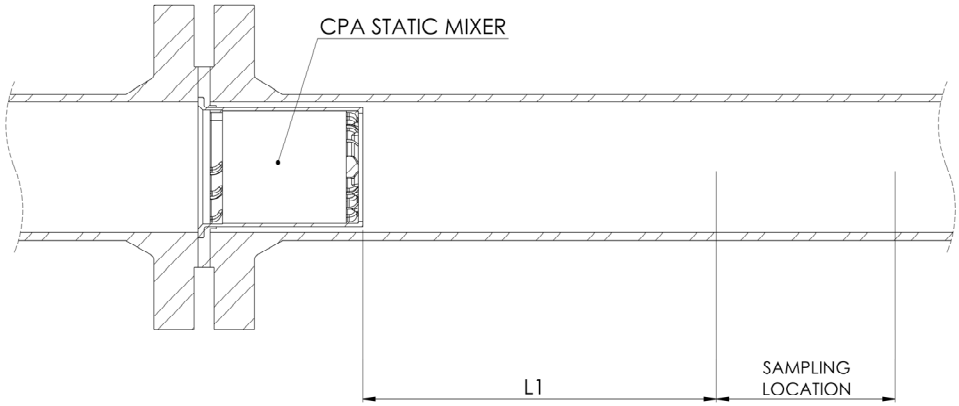
The ISO 3171 specification is much more precise in comparison. In the ISO specification, the center of the pipe must have a composition that is within 5% of the average for the whole fluid. The ISO standard is specifically designed around minimizing the mixing error at the centre of the pipe for maximum sampler performance.



CPA Flo2Gether Installation Recommendations

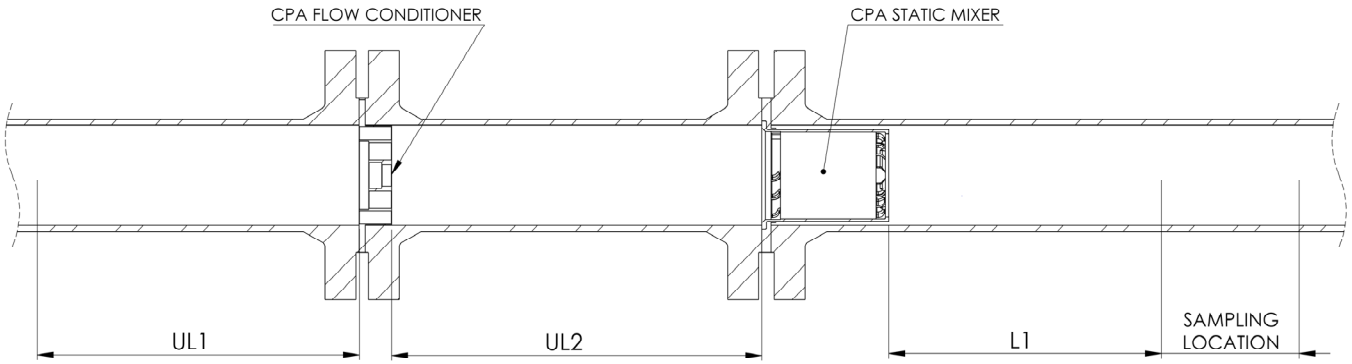
CPA 750M FMSMA, Full Multi Stage Mixer Assembly

When using the CPA 750M FMSMA, Full Multi Stage Mixer Assembly, Canada Pipeline Accessories recommends 3 – 5 internal pipe diameters downstream (L1) of the mixer for optimal sampler placement.



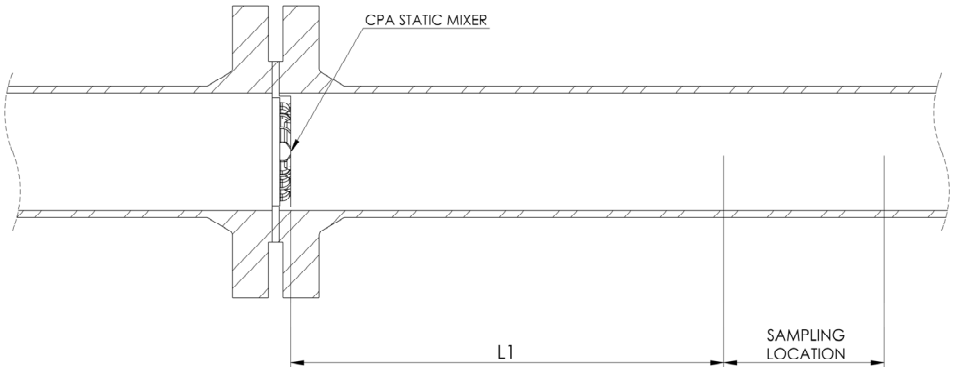
CPA 50E/55E/65E + CPA 750M

When using a CPA 750M FMSMA with a CPA Flow Conditioner (CPA 50E/55E/65E) a minimum of 3-5 internal pipe diameters is recommended between (UL2) the flow conditioner and static mixer, with 3-5 internal pipe diameters downstream (L1) of the mixer for optimal sampler placement.



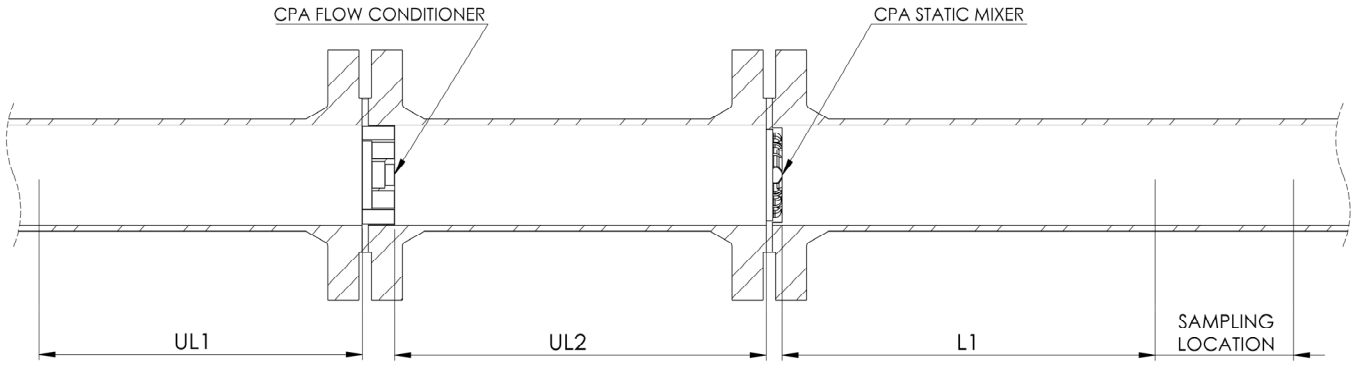
CPA 850M SSRVM, Single Stage Mixing Plate

When using the CPA 850M SSRVM, Single Stage Mixing Plate, Canada Pipeline Accessories recommends 3 – 5 internal pipe diameters downstream (L1) of the mixer for optimal sampler placement.



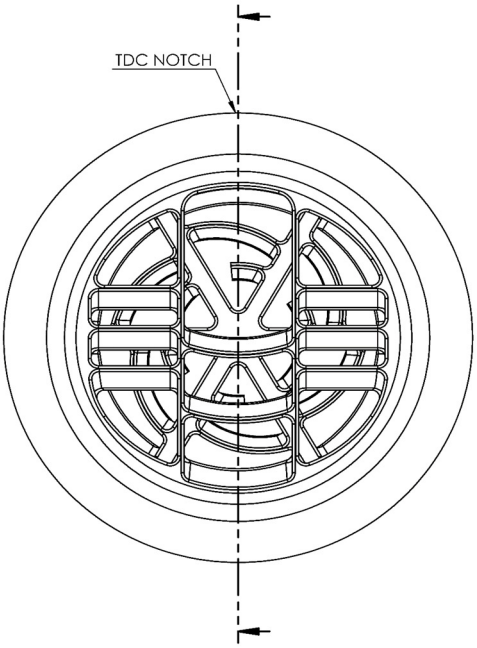
CPA 50E/55E/65E + CPA 850M SSRVM

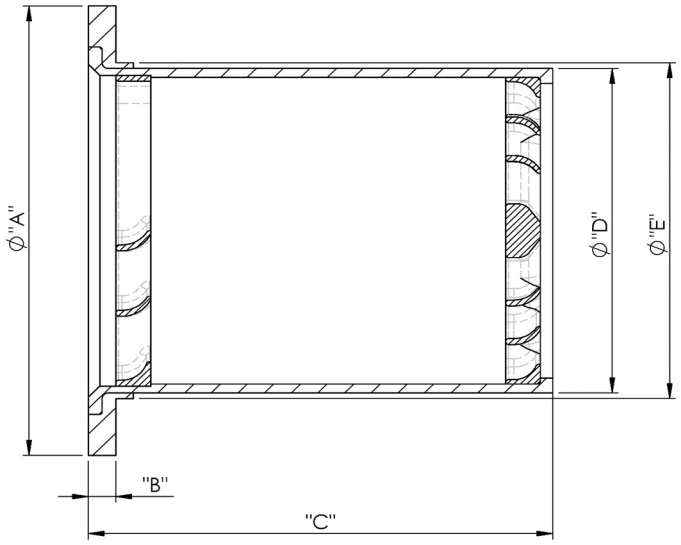
When using a CPA Flo2Gether Single Stage Mixing Plate with a CPA Flow Conditioner (CPA 50E/55E/65E) a minimum of 3-5 internal pipe diameters is recommended between (UL2) the flow conditioner and static mixer, with 3-5 internal pipe diameters downstream (L1) of the mixer for optimal sampler placement.



Dimensional Information

CPA 750M FMSMA, Full Multi Stage Mixer Assembly

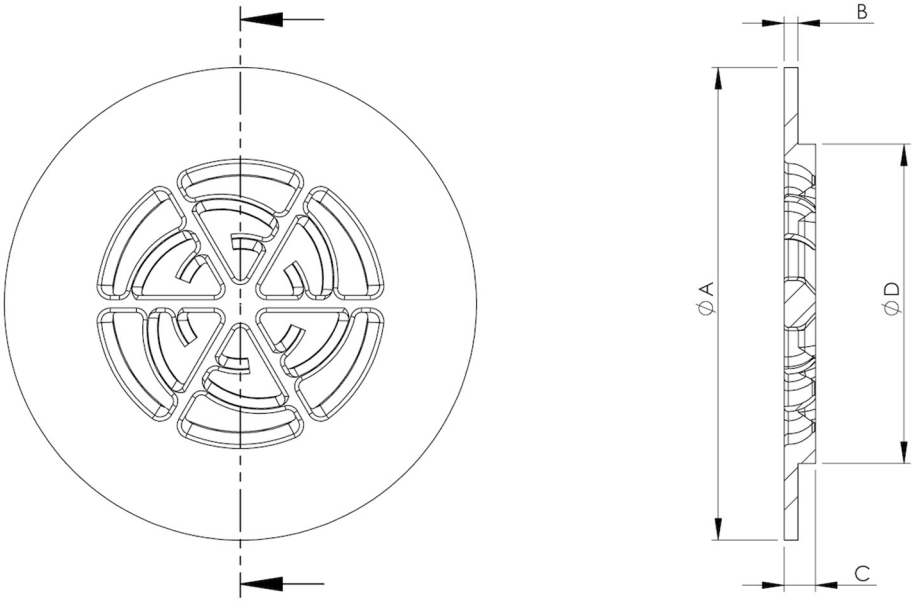




CPA 750M FMSMA, Full Multi Stage Mixer Assembly						
NPS	**Flange Outside Diameter (A)**	**Raised Face Thickness (B)**	**Overall Length (C)**	**Sleeve Diameter (D)**	**Shoulder Diameter (E)**	**Weight (Approx. lbs)**
2	3.620	0.250	2.632	1.845	1.909	0.83
3	5.000	0.375	3.955	2.774	2.870	2.43
4	6.190	0.375	5.111	3.670	3.796	4.33
6	8.500	0.500	7.650	5.540	5.731	12.31
8	10.620	0.750	10.212	7.332	7.585	27.68
10	12.750	0.750	12.631	9.207	9.524	48.02
12	15.000	0.750	14.867	10.939	11.316	76.11
16	18.500	1.000	18.757	13.760	14.234	150.60

All dimensions are in inches. Custom sizes are available, please contact CPA for more information!

CPA 850M SSRVM, Single Stage Mixing Plate



CPA 850M SSRVM, Single Stage Mixing Plate					
NPS	**Flange Outside Diameter (A)**	**Raised Face Thickness (B)**	**Overall Length (C)**	**Insertion Diameter (D)**	**Weight (Approx. lbs)**
2	3.620	0.125	0.475	1.909	0.35
3	5.000	0.250	0.600	2.870	1.20
4	6.190	0.250	0.600	3.796	1.87
6	8.500	0.250	0.618	5.731	3.76
8	10.620	0.375	0.818	7.585	8.23
10	12.750	0.375	1.028	9.524	13.10
12	15.000	0.375	1.221	11.316	19.96
16	18.500	0.500	1.536	14.234	39.15

All dimensions are in inches. Custom sizes are available, please contact CPA for more information!