SPXFLOW

The APV Cavitator

APV®

Based in Charlotte, North Carolina, SPX FLOW Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader with over $5 billion in annual revenue, operations in more than 35 countries and over 15,000 employees. The company's highly-specialized, engineered products and technologies are concentrated in Flow Technology and energy infrastructure. Many of SPX FLOW's innovative solutions are playing a role in helping to meet rising global demand for electricity and processed foods and beverages, particularly in emerging markets. The company's products include food processing systems for the food and beverage industry, power transformers for utility companies, and cooling systems for power plants. For more information, please visit www.spxflow.com.

Mixing and dispersing have never been more challenging. Margins are being squeezed, safety is paramount and consumer demands for new products make formulation changes a regular occurrence. The ability to improve process efficiencies, enhance product quality and to heat liquids efficiently and without scale build-up is a must.

To meet these challenges head on, you need a partner with a deep understanding of process engineering and a broad portfolio of equipment. Look to SPX FLOW and its industry leading brands to provide extensive technical support, equipment versatility and mixing and processing expertise. Explore the diverse solutions that SPX FLOW has to offer. You're sure to find answers that will improve plant performance, increase profitability and enhance the value of your brand.

The Innovative APV Cavitator

STANDARD DESIGN

- 4 models / rotor sizes: 8", 12", 14" and 16" (200, 305, 355 , 406 mm)
- Close-coupled design
- All parts in contact with the products are made of stainless steel AISI 316L / DIN 1.4404
- Rotor with 4, 3 or 2 rows of holes
- Housing for 2 radial clearances
- Sanitary 3A design for CIP cleaning
- Single or double mechanical shaft seal. (Same as the APV W+ pump seals)
- Seal material in SiC / Carbon or SiC / SiC
- Elastomer material in EPDM or FPM (FKM, Fluoroelastomer), FDA quality
- Motor is totally enclosed in IEC or NEMA norm
- Adjustable stainless steel legs or brackets for skid mounting
- Stainless steel motor shroud (European version only)
- Inlet / outlet fittings in accordance with required standards: ISO, DIN, etc.
- Capacity: Flow rate up to 20.000 l/h (5,283 gph). Based on application.

PRODUCT BENEFITS AND FEATURES

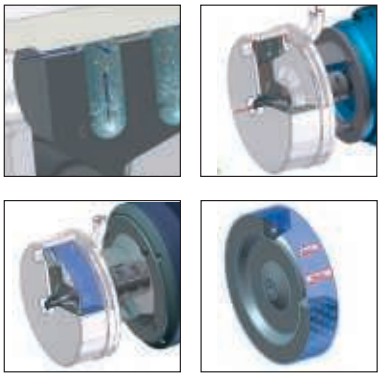
This advanced technology can be used for a multitude of sanitary applications ranging from scale free heating to microscopic mixing.

- Scale-free thermal processing of heat-sensitive and high fouling products
- Improved yield with less off-spec product
- Expanded capacity for existing processes, by increasing runtimes before fouling or by reducing mixing time
- Improved quality for heat-sensitive products damaged by conventional heat exchangers
- Easy retrofitting for existing operations
- Improved process efficiencies compared to conventional technologies (savings in time, operating costs, …)
- Enhanced product quality, yield, and/or raw material savings compared to conventional, less-effective mixing devices
- Elimination or reduction of process downtime from maintenance requirements
- Smaller footprint than traditional technology
- Efficient liquid heating without performance loss over time due to fouling
- Produces homogeneous gel, gum or polymer hydration at the proper viscosity without "fish eyes" or other unhydrated powder
- Makes high quality emulsions at the desired particle size

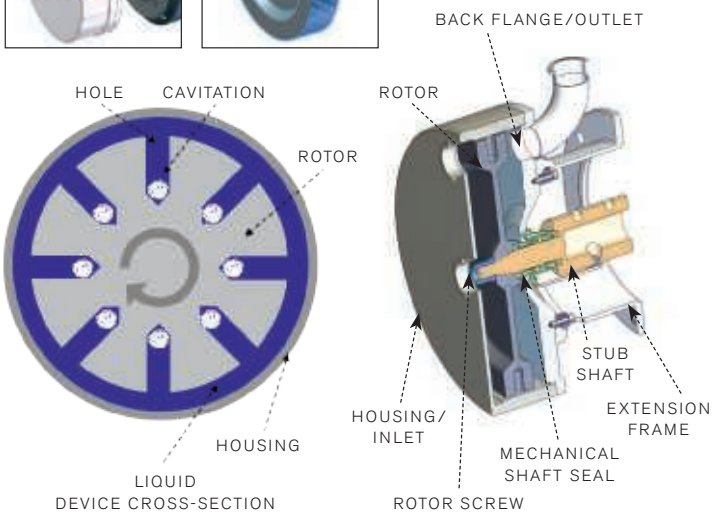
THEORY OF OPERATION

The heart of the technology is a specialized rotor with holes. The spinning action generates hydrodynamic cavitation within the holes away from the metal surfaces. The sites for cavitation are controlled, therefore there is no

damage to the metal from cavitation shockwaves. As a liquid passes through the APV Cavitator, it is subjected to controlled cavitation. Microscopic cavitation bubbles are produced, and as they collapse, shockwaves are given off into the liquid which can emulsify and prevent scaling. During heating, temperature is created uniformly throughout the entire liquid without any heat transfer surfaces. There are no hot or cold spots.

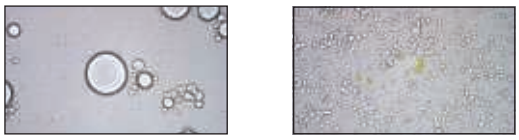


- The cavitation shock-waves generate high shear
- The internal liquid friction generates heating
- Increased number of holes result in increased cavitation efficiency



PARTICLE SIZE REDUCTION

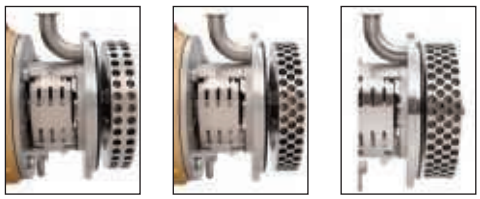
This is an example of particle size reduction in a recombined milk sample exposed to controlled cavitation compared to a reference sample.



BEFORE AFTER

ROTOR OPTIONS

The Cavitator can be supplied with multiple rotor cavity configurations of 2, 3, or 4 rows of holes in line. The desired level of dispersion and specificity of the application will determine which option provides the optimal result.



Typical product applications

The APV Cavitator is used for scale-free heating and microscopic mixing & dispersion. A very wide range of application and opportunities exist in the Dairy, Food & Beverage and Personal Care Industries Including:

Scale-Free Heating/ Pasteurization or heat sensitive products like egg products and high protein dairy products /ingredients and puddings.

Mixing, Dispersion & Homogenization for enhanced process efficiency and quality of a wide range of products

Emulsification for mayonnaise, dressing, sauces, recombined milk and dairy products as well as meat emulsions (pet food, etc.)

Hydration for dairy, food, and ingredient powders to enhance efficiency and speed of hydration

Aeration for viscous gums and liquids with small or large volumes of gas

OPTIONAL SKIDDED SYSTEMS

The APV Cavitator can be delivered as a skidded system equipped with:

- Frequency inverter for speed control
- Manual back pressure valve
- Monitoring Equipment (Cavitator inlet and outlet
  - PT100 transmitters, display on control unit
  - Manometers
- Flow meter (magnetic or propeller type)
- Gas nozzle to inject gas into the product
- Optional feed pump
  - centrifugal or positive displacement
- Sample valves at Cavitator inlet and outlet
- Skids can be rented for customer trials from the SPX FLOW Innovation Center. The Innovation Center can also carry out product trials.

IEC

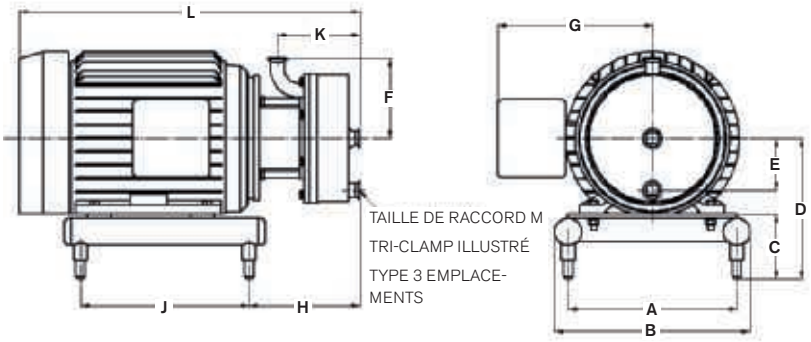
MODELS/ ROTOR SIZES	8"/ 200	12"/ 305	14"/ 355	16"/ 406
B	168	200	194	206
D1	16	38	38	51
D2	16	51*	51*	51
D3	16	38	38	51
E	98	141	166	185
F	123	194	224	251

	IEC MOTOR SIZE (KW)	5,5-7,5	11-18,5	22	30-37	45-75
SIZE		132	160	180	200	225
12" 14" 16"	A		235	235	235	
8" 12" 14" 16"	AA	224	282	282	282	282
ALL	X		46	46	46	179
ALL	H	193	255	277	372	405
ALL	HA		305	305	305	305
ALL	K	482	588	688	848	921
ALL	L		318	362	463	286
ALL	M	360	450	480	580	700
ALL	P		254	279	318	356
ALL	PA		222	222	222	

ADJUSTABLE FEET (ONLY FOR 12", 14" AND 16")
*ADD ON A REDUCTION FITTING FROM Ø 51 TO Ø 38

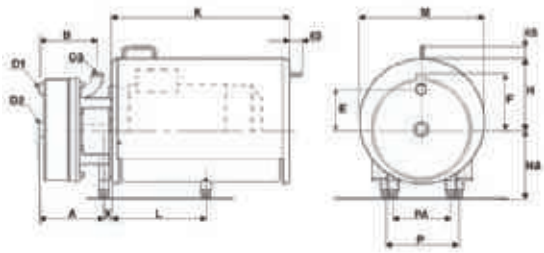
NEMA

SIZES (MM/IN.) AND MODEL NUMBER	8" #215TC	12" #284TSC	12" #326TSC	14" #326TSC	14" #365TSC	16" #326TSC	16" #365TSC	16" #405TSC
A	215.9 (3.26")	457.2 (18.00")	457.2 (18.00")	457.2 (18.00")	533.4 (21.00")	257.2 (18.00")	533.4 (21.00")	533.4 (21.00")
B	254 (10.00")	530.4 (20.88")	530.4 (20.88")	530.4 (20.88")	606.5 (23.88")	530.4 (20.88")	606.5 (23.88")	606.5 (23.88")
C	82.9 (3.26")	177.8 (7.00")	177.8 (7.00")	177.8 (7.00")	177.8 (7.00")	177.8 (7.00")	177.8 (7.00")	177.8 (7.00")
D	216.3 (8.51")	355.6 (14.00")	381 (15.00")	381 (15.00")	406.4 (16.00")	381 (15.00")	406.4 (16.00")	431.8 (17.00")
E	98.1 (3.86")	141.1 (5.56")	141.1 (5.56")	166.1 (6.54")	166.1 (6.54")	185.3 (7.29")	185.2 (7.29")	185.2 (7.29")
F	136.1 (5.36")	217.4 (8.56")	217.4 (8.56")	247.4 (9.74")	247.4 (9.74")	290.8 (11.45")	290.8 (11.45")	290.8 (11.45")
G	204.5 (8.05")	323.9 (12.75")	358.8 (15.19")	385.8 (15.19")	459.2 (18.08")	385.8 (15.19")	459.2 (18.08")	490.5 (19.31")
H	227.8 (8.97")	269.4 (10.61")	307.5 (12.11")	312.4 (12.30")	341.1 (13.43")	312.4 (12.30")	341.1 (13.43")	385.3 (15.17")
J	352.6 (13.88")	457.2 (18.00")	457.2 (18.00")	457.2 (18.00")	457.2 (18.00")	457.2 (18.00")	457.2 (18.00")	457.2 (18.00")
K	181.1 (7.13")	224.3 (8.83")	224.3 (8.83")	217.6 (8.57")	217.7 (8.57")	246.2 (9.69")	246.2 (9.69")	246.2 (9.69")
L	711 (27.99")	876.2 (34.50")	917.9 (36.14")	922.8 (36.33")	917.2 (36.11")	922.8 (36.33")	917.2 (36.11")	1082.3 (42.61")
M	19.5 (.75")	38.1 (1.50")	38.1 (1.50")	38.1 (1.50")	38.1 (1.50")	50.8 (2.00")	50.8 (2.00")	50.8 (2.00")

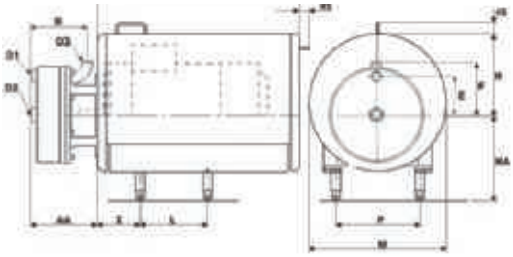


TAILLE DE RACCORD M
TRI-CLAMP ILLUSTRÉ
TYPE 3 EMPLACE-MENTS

MOTOR 160-200



MOTOR 225



NOTE: THE CONNECTIONS ARE NOT SHOWN AND ALL PORTS WILL BE THE SAME SIZE AS D1

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