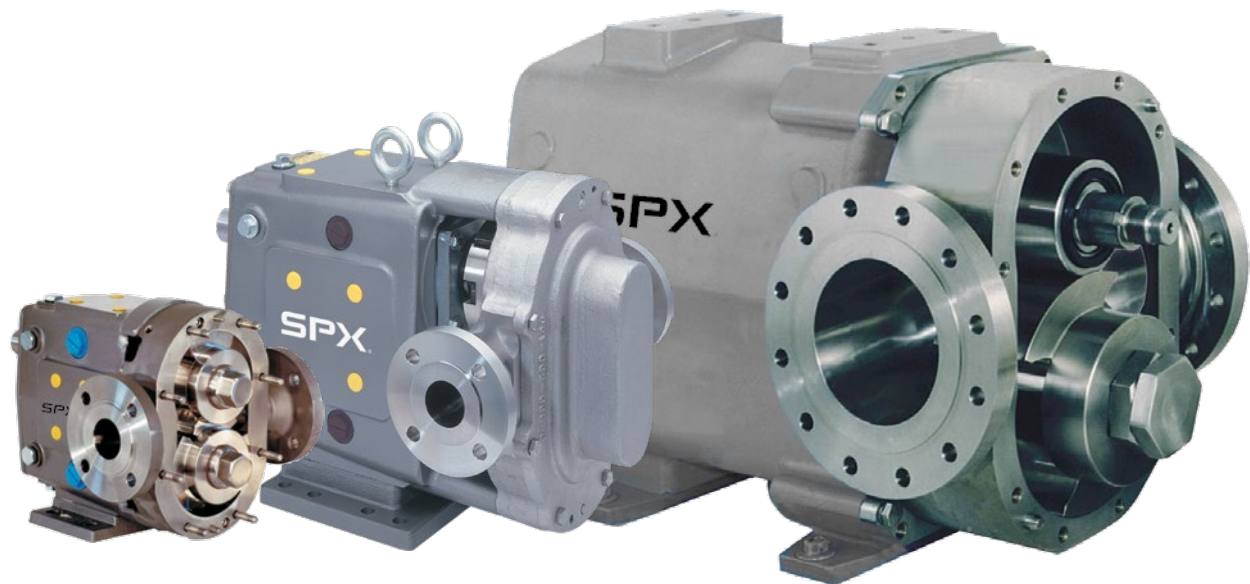


# SPXFLOW

## Universal SP (U2, 5000, 420/520) Series

EXTERNAL CIRCUMFERENTIAL PISTON PUMPS



**> Waukesha Cherry-Burrell®**

The Waukesha External Circumferential Piston (ECP) positive displacement pump offers a number of unique advantages. The pump will handle settled slurries that jam up lobe pumps or progressing cavity pumps with ease. The pump imparts very low shear forces to the pumped product, far lower shear than lobe pumps or progressive cavity pumps. The pump is designed for 300° F (149°C). If we flush the mechanical seal, the pump can run dry as there is no internal contact.

The Waukesha ECP positive displacement pump has features the paper industry has demanded for a long time.

SPX FLOW, Inc. (NYSE:FLOW) is a leading manufacturer of innovative flow technologies, many of which help define the industry standard in the market segments they serve. From its headquarters in Charlotte, North Carolina, it operates a sales and support network, centers of manufacturing excellence, and advanced engineering facilities, throughout the world. Its cutting-edge flow components and process equipment portfolio includes a wide range of pumps, valves, heat exchangers, mixers, homogenizers, separators, filters, UHT, and drying technology that meet many application needs. Its expert engineering capability also makes it a premium supplier of customized solutions and complete, turn-key packages to meet the most exacting of installation demands.

Incorporating many leading brands, SPX FLOW has a long history of serving the food and beverage, power and energy, and industrial market sectors. Its designs and engineered solutions help customers drive efficiency and productivity, increase quality and reliability, and meet the latest regulatory demands. In-depth understanding of applications and processes, state-of-the-art Innovation Centers, and advanced pilot/testing technology further assist in optimizing processes and reducing timescales to reliably meet production targets.

To learn more about SPX FLOW capabilities, its latest technology innovations and complete service offerings, please visit [www.spxflow.com](http://www.spxflow.com).

## Uniquely designed and engineered specifically for the pulp and paper industry.

### FEATURES AND BENEFITS

For more than half a century, Waukesha Cherry-Burrell has been a leader in the design, manufacture and application of external circumferential, piston ECP style, rotary positive displacement pumps. Waukesha Cherry-Burrell PD pumps are in thousands of challenging chemical and industrial applications.

- 316 stainless steel pump body and cover.
- Pumps with water flush seals will run dry indefinitely with water.
- Up to 500 psi (34.5 bar) pressure capability.
- No bearing in product zone.
- Larger diameter 17-4 PH shafts in seal area for greater strength and stiffness. Helps eliminate vibration; extends seal life on SP-U2 and SP-420/520.
- Heavy duty bearing frame.
- Double tapered roller bearings on all models. Contribute further to precise rotor position and longer seal life.
- Grease lubed bearings for positive lubrication to all bearings over entire speed, temperature and pressure range.
- Operates up to 300°F (149°C) capacity upon application.
- NPT or ANSI flange configuration available.

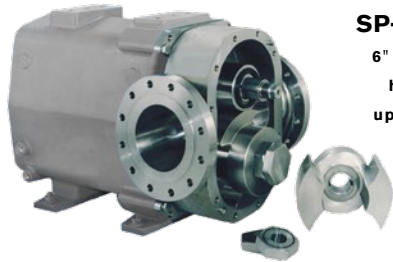
### Installation Features

- Bidirectional flow. Rotors rotate securely in either direction, locked with Belleville washers and torqued nuts.
- Versatile 3-Way mounting of gear case, including vertical alignment of ports on SP-U2 and SP-5000.
- Upper or lower drive shaft position.

### Universal SP Series Features

- Pumps with water flushed seals can run dry indefinitely
- Pumps filled with settled slurries will start without damaging pump or seals
- Minimize damage to shear sensitive products
- Smooth pulsation free flow
- No internal rotor contact
- Requires less horsepower than Progressing Cavity Pumps
- Shaft timing is not critical like on lobe pump designs
- No cross contamination of oil into product zone due to unique gear case design

## Typical product applications



**SP-420/520 UHC pumps**  
6" to 8" (152 to 203mm) for  
high-volume capacities  
up to 830 GPM (187 m<sup>3</sup>/hr)

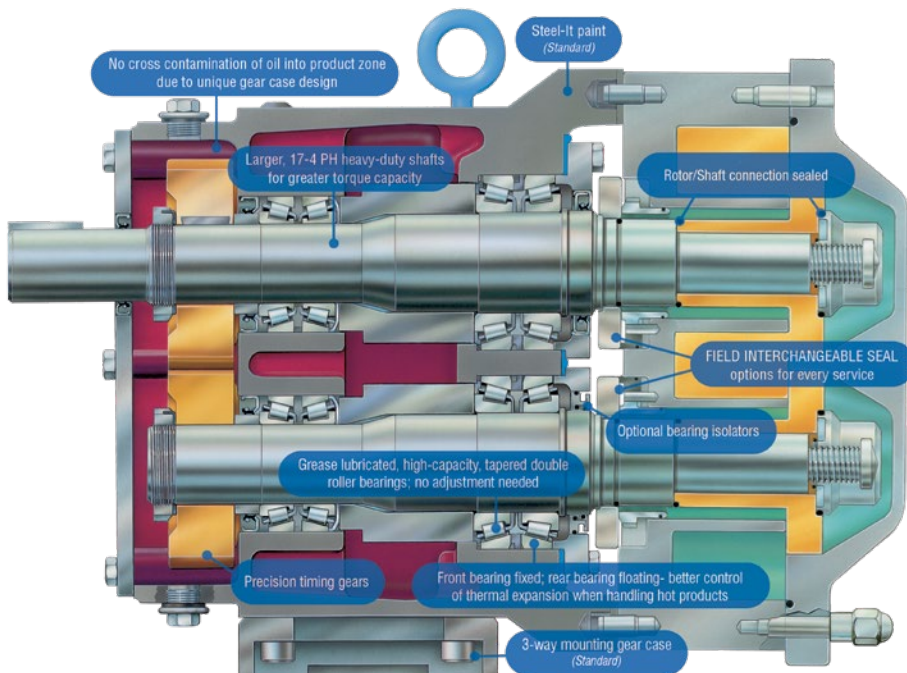


**SP-5000 Pumps**  
1.5" to 6" (38 to 152 mm) for  
pressures up to 200 psi (13.8 bar)



**SP-U2 Pumps**  
1" to 6" (25 to 152mm) for  
pressures up to 500 psi (34.4 bar)

### PERFORMANCE AND LONG LIFE THROUGH ENGINEERING.



Coating Pigments

Polymers

Starch Slurry

GCC Fillers

PCC Fillers

TiO<sub>2</sub> Fillers

Kaolin

Cooked Starch

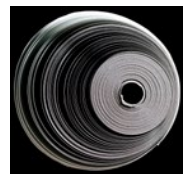
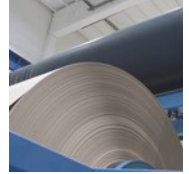
Emulsions

Resins

Retention Aids

TiO<sub>2</sub> Slurry

Specialty Chemicals



### High pressure capability:

**SP-U2** - Up to 500 psi (34.4 bar)\*, for more demanding jobs.

\*For higher pressures, consult the factory.

**SP-420/520 UHC** - 6" - 8" (152 - 203 mm) for high volume capacity up to 830 GPM (187 m<sup>3</sup>/hr) Pressure capacity 200 psi (13.8 bar)

**The right seal** material for every application, plus interchangeability when needed.

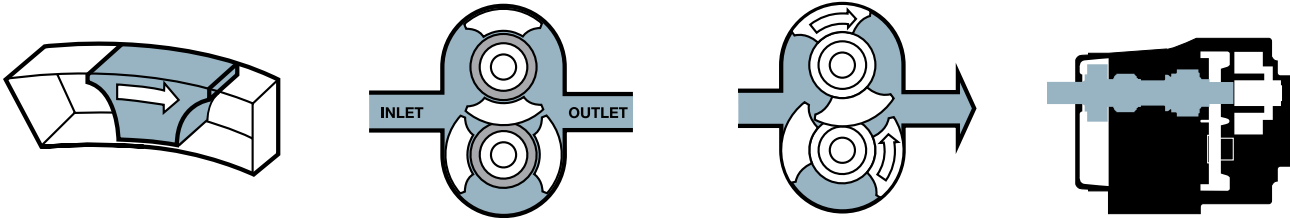
**Metal rotor** - Waukesha "88" non-galling alloy, for close running clearance.

**SP-5000** - Commercial Mechanical Seals or packing available.

## THEORY OF OPERATION

# Time-tested Waukesha Cherry-Burrell rotary pump; external circumferential piston ECP operating principle

In the WCB design, arc-shaped “pistons” rotor wings travel in annular-shaped cylinders machined in the pump body; the resulting long sealing path reduces slippage and produces a smooth flow of product without destructive pulses or pressure peaks and without valves or complex parts.



### Exclusive Waukesha Cherry-Burrell design features

**For Low Viscosity Fluids,** rotors, made of exclusive Waukesha “88” alloy, can be run with close clearance to the 316 stainless steel fluid head, without galling or seizing should inadvertent pressure surges cause contact. The close clearances combined with the rotor geometry, which gives a long sealing path between the pump inlet and outlet, means low slip operation. As a result, you achieve: high volumetric efficiency and good flow control.

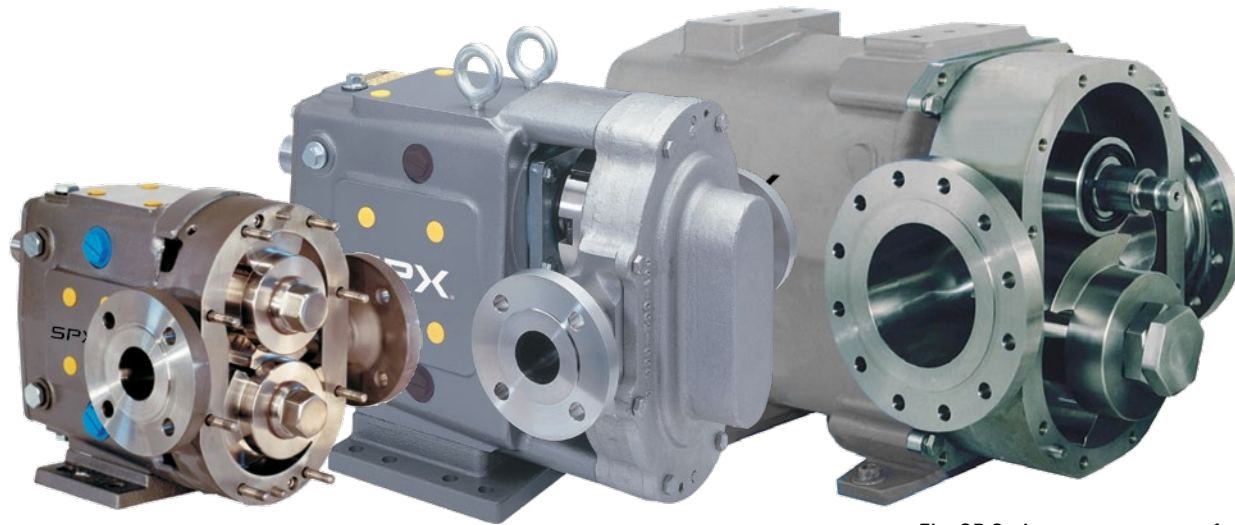
**For High Viscosity Fluids,** the large fluid cavities of the rotors ... plus the large, easy entry anti-cavitation ports, allow efficient pumping of high viscosity fluids, slurries or even liquids with large chunks or particles.

**For Non-Lubricating and Abrasive Fluids,** the unique WCB design has no bearings in the fluid being pumped, no sliding or rolling contact and no rotor-to-rotor contact. This produces MAXIMUM SERVICE LIFE even under severe operating conditions.

**Resuspending solids/slurries.** When slurries settle to the bottom of lobe or progressing cavity pumps, many will jam the pump when you attempt to restart it. The unique shape of the Waukesha rotor will resuspend the slurry and with hardly a pulse. Ask for our demonstration USB (USB-1701, Benefiting the Pulp and Paper Industry) which demonstrates the difference.

## PRODUCT DIMENSIONS

New levels of performance



The SP Series covers a range of nominal flow rates from 7 to 830 GPM (1.5 to 189 m<sup>3</sup>/hr) and at 100 CC per minute the SP series pump can be used as a metering pump.

MODEL	DISPLACEMENT PER REVOLUTION		NORMAL CAPACITY TO:		INLET/OUTLET		PRESSURE RANGE**		MAXIMUM RPM***	APPLICABLE WEIGHTS	
	GAL.	LITER	GPM	M <sup>3</sup> /HR	IN	MM	PSI	BAR		LBS	KGS
SP-U2-006	.0082	.031	8	1.8	1"	25	300	20.7	1000	55	25
SP-U2-015	.014	.054	11	2.5	1.5"	38	250	17.2	800	60	27
SP-U2-018	.029	.110	20	4.5	1.5"	38mm	200	13.8	700	60	27
SP-U2-030	.060	.227	36	8.2	1.5"	38	250	17.2	600	120	54
SP-U2-040	.076	.228	46	10.4	2"	51	150	10.50	600	120	54
SP-U2-045	.098	.371	58	13.2	2"	51	450	31.0	600	120	54
SP-U2-060	.153	.579	90	20.4	2.5"	64	300	20.7	600	270	122
SP-U2-130	.253	.958	150	34.1	3"	76	200	13.8	600	300	136
SP-U2-180	.380	1.438	230	52.2	3"	76	450	31.0	600	505	229
SP-U2-210	.502	1.900	300	68.1	4"	102	500	34.5	600	505	229
SP-U2-220	.521	1.972	310	70.4	4"	102	300	20.7	600	505	229
SP-U2-320	.752	2.847	450	102	6"	152	300	20.7	600	850	386
SP-U2-370	1.099	4.160	660	150	6"	152	200	13.8	600	1000	454
SP-420 UHC	1.619	6.13	648	147	6"	152	200	13.8	400	2595	1177
SP-520 UHC	2.375	8.99	830	187	8"	203	150	10.3	350	2905	1317
SP-5040	0.060	0.227	36	8.2	1.5"	38	200	13.8	600	135	61
SP-5050	0.153	0.579	90	20.4	2"	51	200	13.8	600	275	125
SP-5060	0.254	0.961	150	34.1	2.5"	64	200	13.8	600	285	129
SP-5070	0.440	1.666	260	59.1	4"	102	200	13.8	600	575	261
SP-5080	0.754	2.854	450	102	6"	152	200	13.8	600	940	426

Temperature Range for all models ranges from -40°F/C to 300°F (149°C)

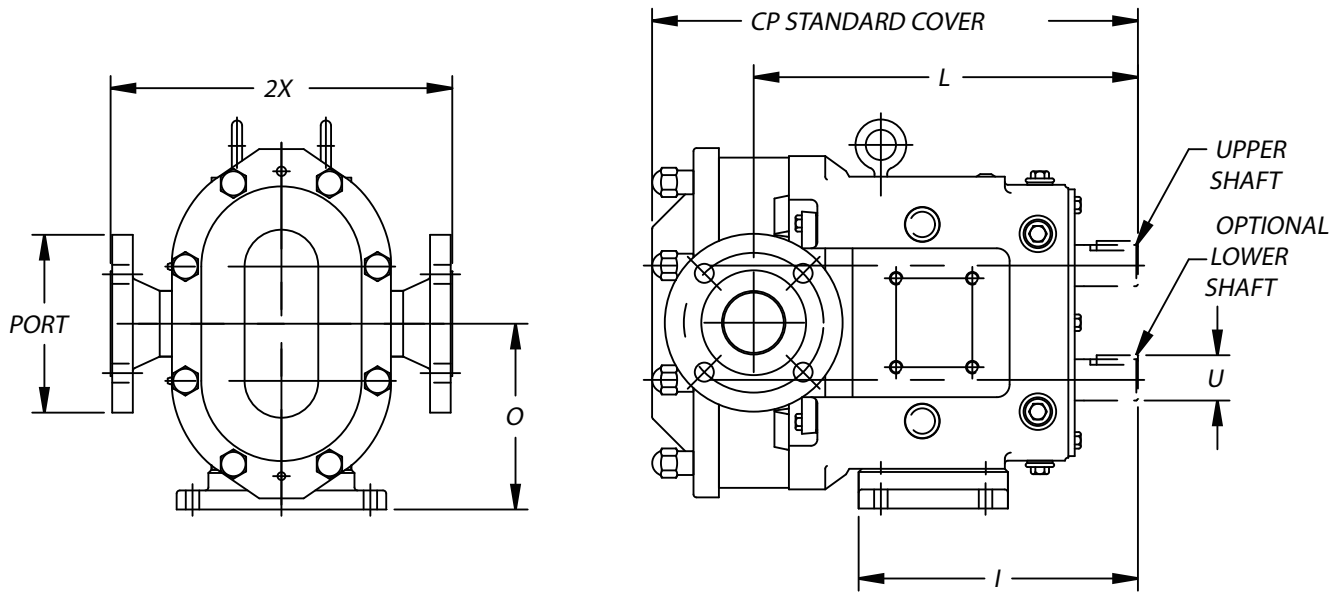
\* Optional Inlet and Outlet available for SP-5040 2", SP-5050 2.5", and SP-5060 3"

\*\* Contact Application Engineering for higher pressure or higher temperature applications.

\*\*\* Actual Max RPM is fluid dependant based on testing at SPX FLOW, Testing Lab

## PRODUCT DIMENSIONS

### SP-U2



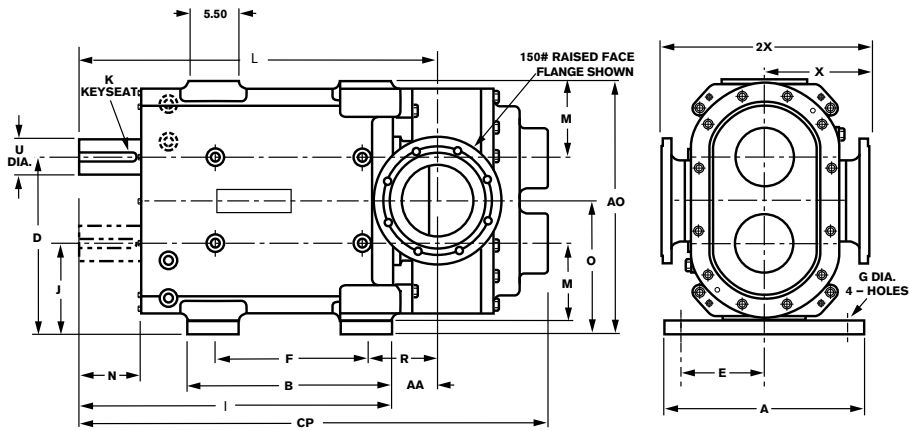
MODEL		CP	I	L	O	PORT SIZE	U +.000 -.001	2X	CP4
006-U2	IN	11.71	7.66	9.61	4.21	1"	.875	6.97	14.92
	mm	297	194	244	107	--	22.23	177	379
015-U2	IN	11.71	7.66	9.61	4.21	1-1/2"	.875	6.97	14.92
	mm	297	194	244	107	--	22.23	177	379
018-U2	IN	12.37	7.66	10.48	4.21	1-1/2"	.875	6.97	15.58
	mm	314	194	266	107	--	22.23	177	396
030-U2	IN	14.49	8.83	11.61	5.21	1-1/2"	1.250	8.50	17.58
	mm	368	224	295	132	--	31.75	216	447
040-U2	IN	14.87	8.83	11.77	5.21	2"	1.25	8.62	14.87
	mm	378	224	305	132	-----	31.75	219	378
045-U2	IN	18.59	10.99	14.86	7.31	2"	1.625	10.75	22.28
	mm	472	279	377	186	--	41.28	273	566
060-U2	IN	19.14	10.99	15.14	7.31	2-1/2"	1.625	10.75	22.83
	mm	486	279	385	186	--	41.28	273	580
130-U2	IN	20.15	10.99	15.77	7.312	3"	1.625	10.75	23.84
	mm	512	279	401	186	--	41.28	276	606
180-U2	IN	23.26	14.80	18.25	9.38	3"	2.000	13.06	28.51
	mm	591	376	464	238	--	50.80	332	724
210-U2	IN	27.08	17.80	21.24	10.38	4"	2.375	14.73	27.08
	mm	688	452	539	264	-----	60.45	374	688
220-U2	IN	24.00	14.80	18.49	9.38	4"	2.000	13.25	29.25
	mm	610	376	470	238	--	50.80	337	743
320-U2	IN	27.66	17.80	21.63	10.38	6 150# FLG	2.375	16.00	27.66
	mm	703	452	549	264	--	60.45	406	703
370-U2	IN	29.16	17.80	22.32	10.38	6 150# FLG	2.38	17.00	29.16
	mm	741	452	567	264	---	60.5	432	741

\* Listed capacity and maximum rpm for intermittent duty only.

Consult Waukesha Cherry-Burrell technical services for recommendations on your pumping requirements.

## PRODUCT DIMENSIONS

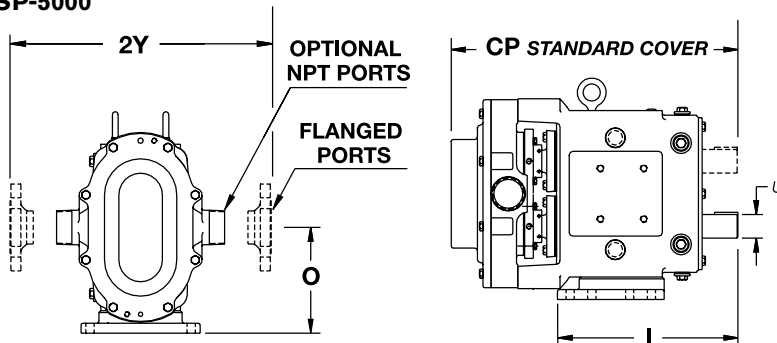
### SP-420/520 UHC



MODEL		A	AA	AO	B	CP	D	E	F	G	I
420-UHC	IN	21.00	5.60	27.25	22.00	49.60	18.75	9.00	16.50	1.06	33.60
	mm	533	142	692	559	1260	476	229	419	27	853
520-UHC	IN	21.00	5.95	27.25	22.00	51.47	18.75	9.00	16.50	1.06	33.60
	mm	533	151	692	559	1307	476	229	419	27	853

MODEL		J	K	L	M	N	O	R	U	X	2X	FLANGE SIZE
420-UHC	IN	9.75	1.00	39.19	8.50	6.04	14.25	8.35	3.875	11.25	22.50	ANSI 6"
	mm	248	25	995	216	153	362	212	98	286	572	152
520-UHC	IN	9.75	1.00	39.55	8.50	6.04	14.25	8.70	3.875	11.25	22.50	ANSI 8"
	mm	248	25	1005	216	153	362	221	98	286	572	203

### SP-5000



MODEL		CP	I	O	PORT SIZE	U +.000 -.001	2Y	WEIGHT	
								LBS	KG
5040	IN	16.52	8.83	5.21	1-1/2" - 150# Flange	1.250	11.91	100	45
	mm	419	224	132	--	31.75	303		
5050	IN	19.83	12.49	7.31	2" - 150# Flange	1.625	13.25	240	109
	mm	504	317	186	--	41.28	337		
5060	IN	20.78	12.49	7.31	2-1/2" - 150# Flange	1.625	13.50	245	111
	mm	528	317	186	--	41.28	343		
5070	IN	26.31	15.29	9.38	4" - 150# Flange	2.000	14.75	475	215
	mm	668	388	238	--	50.80	375		
5080	IN	30.17	17.80	10.38	6" - 150# Flange	2.375	16.00	810	367
	mm	766	452	264	--	60.33	406		

# Universal SP Series (U2, 5000, 420/520)

**EXTERNAL  
CIRCUMFERENTIAL  
PISTON PUMPS**

# SPXFLOW

Based in Charlotte, North Carolina, SPX FLOW, Inc. (NYSE: FLOW) is a multi-industry manufacturing leader. For more information, please visit [www.spxflow.com](http://www.spxflow.com)

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SPX FLOW, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation.

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ISSUED 03/2019 FH-1738

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