

NOZZLES

40,000 PSI



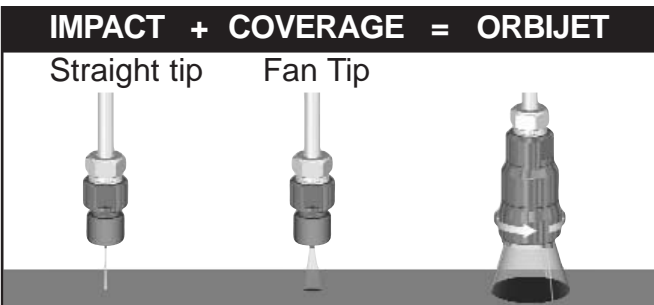
ORBI-JET SURFACE CLEANING NOZZLES

Product Description

The patented 40,000 psi Orbi-Jet surface cleaning nozzle is a self-powered rotating nozzle that uses three straight-pattern, replaceable sapphire nozzles (tips) to provide maximum coverage of concentrated jets for optimized productivity. For use with DuraSafe™ Hand Control Guns (Page B-10).

Features

- Magnetic braking system for controlled rotational speed to ensure minimal wear and maximum impact without streaking
- Water provides the rotational motion and creates the bearing on which the nozzle spins. No drive belts or ball bearings to replace!
- Designed to be completely rebuilt in the field in less than five minutes using a standard socket and Allen wrench
- Lightweight shroud to protect rotor from abrasion



Assembly Part Number	Diameter		Assembly Length		Speed Range RPM	Assembly Weight		Maximum Flow Rate		Inlet Connection Size & Type*	Maximum Operating Pressure	
	in	mm	in	mm		lbs	kg	gpm	lpm		psi	bar
53490	2.10	53.3	3.85	97.8	1000-3000	2.65	1.18	7	31	9/16" HP Female	40,000	2,758

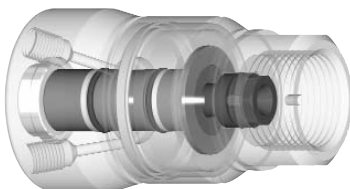
* See Page H-3 for connection specifications.

Related Accessories

REBUILD KIT

Includes all components necessary to completely rebuild the Orbi-Jet in less than five minutes using a standard socket and allen wrench.

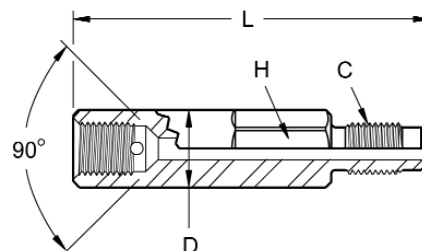
Part Number 53485



NOZZLE EXTENSION

Extensions are installed into the Orbi-Jet nozzle ports to provide a wider cleaning pattern while the additional length also serves as a flow straightener, resulting in more aggressive, less turbulent waterjets.

Part Number 53844 (Sold Individually)



Dimensions

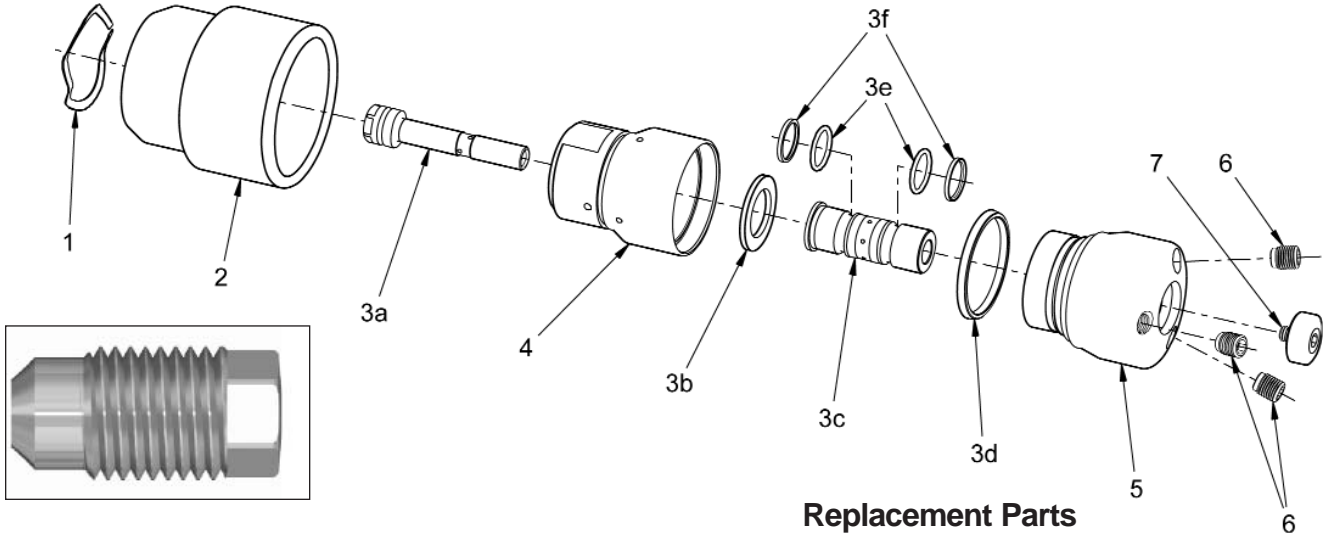
- Overall Length (L): 2.60 in
- Overall Diameter (D): .56 in
- Hex Size (H): .50 in
- Nozzle Thread (T): 3/8"-24UN

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ORBI-JET SURFACE CLEANING NOZZLES



UHPX NOZZLES are the premier high productivity sapphire nozzle and are used in a variety of 40,000 psi applications. Tapered orifice retainer reduces turbulence and provides a cohesive, aggressive waterjet.

Nozzle Selection

Select Nozzles from the chart below by finding the desired flow in the column under the desired operating pressure. Read across to find the nozzle Part Number in the chart's left hand column. (Part numbers referenced are for individual UHPX nozzles.)

Replacement Parts

Item	Part Number	Description
1	27523	Retaining Ring
2	53548	Shroud
3	53485	Rebuild Kit (Includes Items 3a to 3f)
4	53544	Body
5	53541	Rotor
6	53502	UHP Nozzle Retainer
7	53543	Retaining Screw

UHPX Nozzle Part Number	Orifice Size		Nozzle Flow, Three UHPX Nozzles in Orbi-Jet @ Selected Working Pressures									
			20,000 psi (1,379 bar)		25,000 psi (1,724 bar)		30,000 psi (2,069 bar)		35,000 psi (2,414 bar)		40,000 psi (2,758 bar)	
	in	mm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm
53638	.010	0.25	1.7	6.6	2.0	7.8	2.3	8.9	2.4	9.2	2.5	9.5
53875	.011	0.28	1.9	7.3	2.2	8.5	2.6	9.7	2.7	10.1	2.8	10.4
53639	.012	0.30	2.1	8.0	2.5	9.3	2.8	10.6	2.9	11.0	3.0	11.5
53876	.013	0.33	2.3	8.8	2.7	10.2	3.1	11.6	3.2	12.1	3.3	12.6
53641	.014	0.36	2.6	9.7	3.0	11.2	3.3	12.6	3.5	13.2	3.7	13.8
53902	.015	0.38	2.8	10.6	3.2	12.2	3.6	13.8	3.8	14.5	4.0	15.1
53642	.016	0.41	3.1	11.6	3.5	13.4	4.0	15.0	4.2	15.8	4.4	16.5
53903	.017	0.43	3.4	12.7	3.8	14.5	4.3	16.3	4.5	17.2	4.8	18.0
53643	.018	0.46	3.6	13.8	4.2	15.8	4.7	17.7	4.9	18.7	5.2	19.6
53877	.019	0.48	4.0	15.0	4.5	17.1	5.1	19.1	5.4	20.3	5.6	21.3
53644	.020	0.51	4.3	16.3	4.9	18.5	5.5	20.7	5.8	21.9	6.1	23.1
54017	.021	0.53	4.6	17.6	5.3	20.0	5.9	22.3	6.3	23.7	6.6	25.0
54018	.022	0.56	5.0	19.0	5.7	21.5	6.3	24.0	6.7	25.5	7.1	26.9
53646	.023	0.58	5.4	20.4	6.1	23.2	6.8	25.7	**	**	**	**
54019	.024	0.61	5.8	21.9	6.6	24.8	**	**	**	**	**	**
53647	.025	0.64	6.2	23.5	7.0	26.6	**	**	**	**	**	**
54021	.027	0.69	7.1	26.8	**	**	**	**	**	**	**	**

** Indicates unsafe flows which are not recommended for use in a hand held control gun due to excessive thrust.

NOZZLES

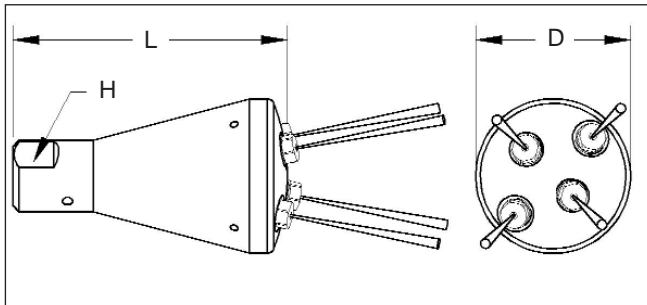
40,000 PSI



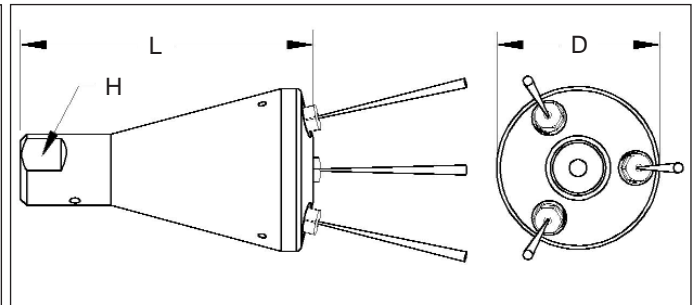
TORNADO SURFACE CLEANING NOZZLES

Product Description

- Designed for use with the Jetstream Tornado Gun and other air-powered rotary control guns
- Button seal connection prevents wear and leakage of the nozzle
- Manufactured from heat-treated stainless steel.
- Utilize Jetstream UHPX or UHP replaceable nozzle tips
- Maximum Operating Pressure:** 40,000 psi (2,758 bar)



Part Number 53971: staggered 4-jewel pattern



Part Number 53970: 3-jewel pattern

Assembly Part Number	Diameter (D)		Assembly Length (L)		Flats (H)		Weight		Inlet Connection*	Maximum Operating Pressure	
	in	mm	in	mm	in	mm	lbs	kg		psi	bar
53970	1.99	50.5	3.60	91.4	0.75	19.0	1.29	0.59	9/16" Button Seal	40,000	2,758
53971	1.90	48.3	3.37	85.6	0.75	19.0	1.16	0.53	9/16" Button Seal	40,000	2,758

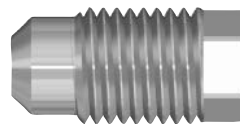
* See Page H-4 for connection specifications.

REPLACEMENT SEAL

Part Number 54059



UHPX Nozzles



UHPX Nozzles are the premier high productivity sapphire nozzle and are used in a variety of 40,000 psi applications. Tapered orifice retainer reduces turbulence and provides a cohesive, aggressive waterjet. See UHPX Nozzles on page D-5 for details.

Related Items

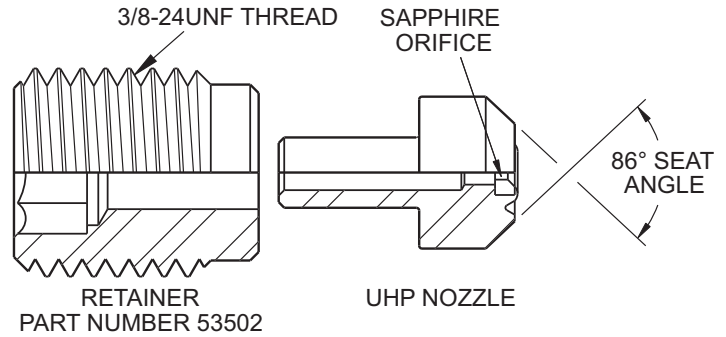
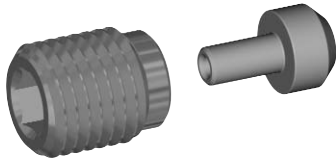
TORNADO SPINNER GUN — See Control Guns & Valves, Pages B-1 & 2

TUMBLE BOXES — See Control Guns & Valves, Pages B-3 to 9

NOZZLES

40,000 PSI

UHP NOZZLES



Product Description

- Economically designed replaceable sapphire nozzle
- Used in a variety of 40,000 psi products
- Installed using a special retainer (see Related Items)

Related Items

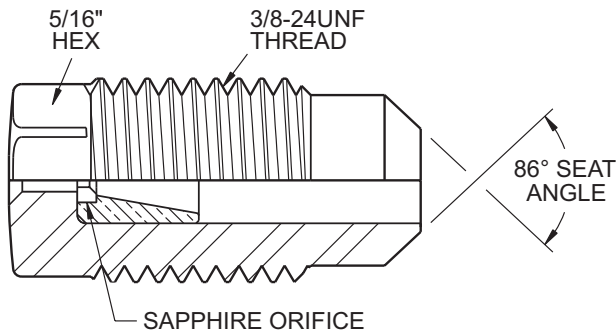
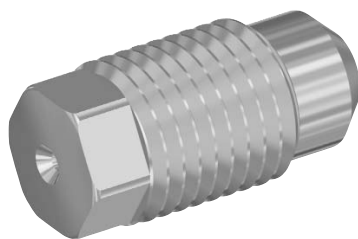
- 53502 UHP NOZZLE RETAINER
- 53503 UHP PLUG

Part Number	Orifice Size		Nozzle Flow, UHP Nozzle @ Selected Working Pressures									
			20,000 psi (1,379 bar)		25,000 psi (1,724 bar)		30,000 psi (2,069 bar)		35,000 psi (2,414 bar)		40,000 psi (2,758 bar)	
	in	mm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm
53504	0.006	0.15	0.10	0.37	0.11	0.41	0.12	0.45	0.13	0.48	0.14	0.52
54436	0.007	0.18	0.13	0.50	0.15	0.56	0.16	0.61	0.17	0.66	0.19	0.70
53506	0.008	0.20	0.17	0.65	0.19	0.73	0.21	0.80	0.23	0.86	0.24	0.92
54437	0.009	0.23	0.22	0.82	0.24	0.92	0.27	1.0	0.29	1.1	0.31	1.2
53507	0.010	0.25	0.27	1.0	0.30	1.1	0.33	1.2	0.36	1.3	0.38	1.4
54438	0.011	0.28	0.33	1.2	0.36	1.4	0.40	1.5	0.43	1.6	0.46	1.7
53508	0.012	0.30	0.39	1.5	0.43	1.6	0.47	1.8	0.51	1.9	0.55	2.1
53917	0.013	0.33	0.45	1.7	0.51	1.9	0.56	2.1	0.60	2.3	0.64	2.4
53509	0.014	0.36	0.53	2.0	0.59	2.2	0.65	2.4	0.70	2.6	0.74	2.8
54439	0.015	0.38	0.60	2.3	0.68	2.6	0.74	2.8	0.80	3.0	0.86	3.2
53511	0.016	0.41	0.69	2.6	0.77	2.9	0.84	3.2	0.91	3.4	0.97	3.7
53964	0.017	0.43	0.78	2.9	0.87	3.3	0.95	3.6	1.0	3.9	1.1	4.2
53512	0.018	0.46	0.87	3.3	0.97	3.7	1.1	4.0	1.2	4.4	1.2	4.7
53951	0.019	0.48	0.97	3.7	1.1	4.1	1.2	4.5	1.3	4.9	1.4	5.2
53513	0.020	0.51	1.1	4.1	1.2	4.5	1.3	5.0	1.4	5.4	1.5	5.8
54007	0.021	0.53	1.2	4.5	1.3	5.0	1.5	5.5	1.6	5.9	1.7	6.3
54008	0.022	0.56	1.3	4.9	1.5	5.5	1.6	6.0	1.7	6.5	1.8	7.0
53514	0.023	0.58	1.4	5.4	1.6	6.0	1.7	6.6	1.9	7.1	2.0	7.6
54009	0.024	0.61	1.5	5.9	1.7	6.5	1.9	7.2	2.0	7.7	2.2	8.3
53516	0.025	0.64	1.7	6.4	1.9	7.1	2.1	7.8	2.2	8.4	2.4	9.0
53918	0.027	0.69	2.0	7.4	2.2	8.3	2.4	9.1	2.6	9.8	2.8	10.5
53952	0.028	0.71	2.1	8.0	2.4	8.9	2.6	9.8	2.8	10.5	3.0	11.3
53517	0.029	0.74	2.3	8.6	2.5	9.6	2.8	10.5	3.0	11.3	3.2	12.1
53953	0.030	0.76	2.4	9.2	2.7	10.2	3.0	11.2	3.2	12.1	3.4	12.9
54011	0.031	0.79	2.6	9.8	2.9	10.9	3.2	12.0	3.4	12.9	3.7	13.8
53518	0.033	0.84	2.9	11.1	3.3	12.4	3.6	13.6	3.9	14.7	4.1	15.7
54012	0.034	0.86	3.1	11.8	3.5	13.1	3.8	14.4	4.1	15.6	4.4	16.6
54013	0.037	0.94	3.7	13.9	4.1	15.6	4.5	17.1	4.9	18.4	5.2	19.7
53519	0.038	0.97	3.9	14.7	4.3	16.4	4.8	18.0	5.1	19.4	5.5	20.8
53521	0.042	1.07	4.7	17.9	5.3	20.1	5.8	22.0	6.3	23.7	6.7	25.4
53522	0.046	1.17	5.7	21.5	6.4	24.1	7.0	26.4	7.5	28.5	8.0	30.4
53523	0.052	1.32	7.3	27.5	8.1	30.7	8.9	33.7	9.6	36.4	10.3	38.9

NOZZLES

40,000 PSI

UHPX NOZZLES



Product Description

- Premier high productivity sapphire nozzle
- Used in a variety of 40,000 psi applications
- Tapered orifice retainer reduces turbulence and provides a cohesive, aggressive waterjet

Part Number	Orifice Size		Nozzle Flow, UHPX Nozzle @ Selected Working Pressures									
			20,000 psi (1,379 bar)		25,000 psi (1,724 bar)		30,000 psi (2,069 bar)		35,000 psi (2414 bar)		40,000 psi (2,758 bar)	
	in	mm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm
54016	0.006	0.15	0.10	0.39	0.11	0.43	0.12	0.47	0.13	0.51	0.14	0.55
53873	0.007	0.18	0.14	0.52	0.15	0.59	0.17	0.64	0.18	0.69	0.20	0.74
53637	0.008	0.20	0.18	0.69	0.20	0.77	0.22	0.84	0.24	0.91	0.26	1.0
53874	0.009	0.23	0.23	0.87	0.26	1.0	0.28	1.1	0.30	1.1	0.32	1.2
53638	0.010	0.25	0.28	1.1	0.32	1.2	0.35	1.3	0.37	1.4	0.40	1.5
53875	0.011	0.28	0.34	1.3	0.38	1.4	0.42	1.6	0.45	1.7	0.48	1.8
53639	0.012	0.30	0.41	1.5	0.46	1.7	0.50	1.9	0.54	2.0	0.58	2.2
53876	0.013	0.33	0.48	1.8	0.53	2.0	0.59	2.2	0.63	2.4	0.68	2.6
53641	0.014	0.36	0.55	2.1	0.62	2.3	0.68	2.6	0.73	2.8	0.78	3.0
53902	0.015	0.38	0.64	2.4	0.71	2.7	0.78	3.0	0.8	3.2	0.90	3.4
53642	0.016	0.41	0.72	2.7	0.81	3.1	0.89	3.4	1.0	3.6	1.0	3.9
53903	0.017	0.43	0.82	3.1	0.91	3.5	1.0	3.8	1.1	4.1	1.2	4.4
53643	0.018	0.46	0.92	3.5	1.0	3.9	1.1	4.2	1.2	4.6	1.3	4.9
53877	0.019	0.48	1.0	3.9	1.1	4.3	1.3	4.7	1.4	5.1	1.4	5.5
53644	0.020	0.51	1.1	4.3	1.3	4.8	1.4	5.2	1.5	5.7	1.6	6.1
54017	0.021	0.53	1.2	4.7	1.4	5.3	1.5	5.8	1.7	6.2	1.8	6.7
54018	0.022	0.56	1.4	5.2	1.5	5.8	1.7	6.3	1.8	6.9	1.9	7.3
53646	0.023	0.58	1.5	5.7	1.7	6.3	1.8	6.9	2.0	7.5	2.1	8.0
54019	0.024	0.61	1.6	6.2	1.8	6.9	2.0	7.6	2.2	8.2	2.3	8.7
53647	0.025	0.64	1.8	6.7	2.0	7.5	2.2	8.2	2.3	8.9	2.5	9.5
54021	0.027	0.69	2.1	7.8	2.3	8.7	2.5	9.6	2.7	10.3	2.9	11.0
54297	0.028	0.71	2.2	8.4	2.5	9.4	2.7	10.3	2.9	11.1	3.1	11.9
53648	0.029	0.74	2.4	9.0	2.7	10.1	2.9	11.0	3.1	11.9	3.4	12.7
54441	0.030	0.76	2.5	9.6	2.8	10.8	3.1	11.8	3.4	12.7	3.6	13.6
54022	0.031	0.79	2.7	10.3	3.0	11.5	3.3	12.6	3.6	13.6	3.8	14.5
53649	0.033	0.84	3.1	11.7	3.4	13.0	3.8	14.3	4.1	15.4	4.4	16.5
54442	0.034	0.86	3.3	12.4	3.7	13.8	4.0	15.2	4.3	16.4	4.6	17.5
54443	0.037	0.94	3.9	14.7	4.3	16.4	4.7	17.9	5.1	19.4	5.5	20.7
54282	0.038	0.97	4.1	15.5	4.6	17.3	5.0	18.9	5.4	20.5	5.8	21.9
54283	0.042	1.07	5.0	18.9	5.6	21.1	6.1	23.1	6.6	25.0	7.1	26.7
54284	0.046	1.17	6.0	22.7	6.7	25.3	7.3	27.7	7.9	30.0	8.5	32.0

NOZZLES

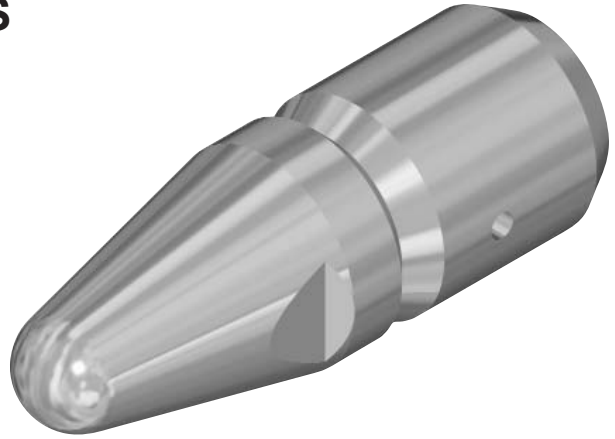
40,000 PSI



UHPE TUBE CLEANING NOZZLES

Product Description

- Designed for use with Flex or Rigid Lances
- High pressure male left-hand or right-hand threads
- Hardened stainless steel
- Available in 3 sizes, 14 jet patterns, and 9 flow ratings
- Custom drilled patterns available upon request
- Maximum Operating Pressure:** 40,000 psi (2,578 bar)



UHPER-ABBCC

Nozzle Type

40,000 psi rated Jetstream "Ultra-High Pressure Evaporator"

Threads

L = Left Hand Threads

R = Right Hand Threads

Nozzle Size (A)

1 = 1/4" threaded nozzle body

2 = 3/8" threaded nozzle body

3 = 9/16" threaded nozzle body

See Nozzle Sizes chart (next page) for each nozzle specifications.

Example: **3** designates a nozzle that is 2.13" long by .75" diameter with a 9/16" HP connection.

Pattern (BB)

Select the two digit number corresponding to the desired pattern. See Patterns chart on the next page.

When sizing a nozzle, it is important to note that each pattern has a corresponding minimum flow rating determined by the number of orifices in the pattern.

Example: **06** denotes a nozzle with 1 jet front, 3 jets drilled at the forward location, and 6 jets drilled at the back location. This particular pattern is available only for nozzles with a flow rating number of 4 or greater.

Flow Rating Number (CC)

To select the correct flow number:

- 1) Determine the desired nozzle tip pressure.
- 2) Consult available flow charts for hoses, flexible lances, and rigid lances which will be used for the tube cleaning operation to determine the amount of flow through all components which will result in the desired tip pressure. For pressure drop through Jetstream rigid lances, see page C-7. For Jetstream hoses and flexible lances, consult pressure drop charts on page C-5.
- 3) Find the column in the flow rating chart (next page) which corresponds to the desired tip pressure, and select the flow number corresponding to the row containing the desired flow rate within that column.

NOTE: Do not insert spaces between segments of the part number.

NOZZLES

40,000 PSI



UHPE EVAPORATOR TUBE CLEANING NOZZLES

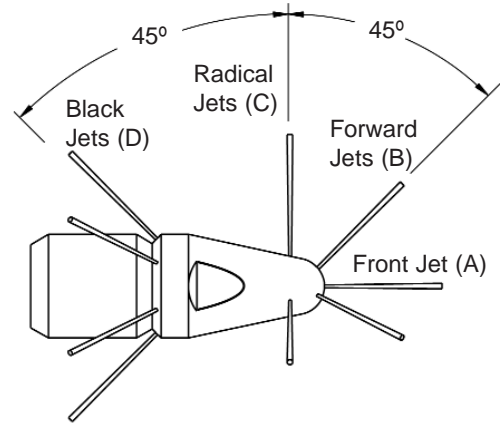
Nozzle Sizes (Nozzles Shown to Actual Size)

1		2		3	
Connection Type*	1/4" HP Lance	Connection Type*	3/8" HP Lance	Connection Type*	9/16" HP Lance
Outside Diameter	.375	Outside Diameter	.50	Outside Diameter	.75
Overall Length	1.25	Overall Length	1.59	Overall Length	2.13

* Left hand or right hand threads must be specified when ordering. See page G-4 for connection specifications.

Nozzle Patterns

Jet Locator	Use With	Flexible or Rigid Lance								Rigid Lance Only					
	Pattern Number	01	02	03	04	05	06	07	08	09	10	11	12	13	14
		Number of Jets at Each Location													
Front Jets (A)		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Forward Jets (B)						2	3				4				
Radial Jets (C)								2	4	3	4	3	4	8	4
Back Jets (D)		3	4	6	8	4	6	4	4	6					
Total Jets		4	5	7	9	7	10	7	9	10	9	4	5	9	4
Minimum Flow Rating		0	1	2	3	2	4	2	3	4	3	0	1	3	0



Nozzle Flow Rating

Flow Rating Number	Equivalent Orifice Size (in)	Flow (gpm) @ Specified Pressures (psi)											
		20,000 psi	22,000 psi	24,000 psi	26,000 psi	28,000 psi	30,000 psi	32,000 psi	34,000 psi	36,000 psi	38,000 psi	40,000 psi	
0	0.029	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.1	3.2	
1	0.033	2.9	3.1	3.2	3.3	3.4	3.6	3.7	3.8	3.9	4.0	4.1	
2	0.038	3.9	4.1	4.2	4.4	4.6	4.7	4.9	5.0	5.2	5.3	5.5	
3	0.042	4.7	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.3	6.5	6.7	
4	0.047	5.8	6.1	6.3	6.6	6.8	7.1	7.3	7.5	7.8	8.0	8.2	
5	0.055	8.1	8.5	8.9	9.2	9.6	9.9	10.2	10.6	10.9	11.2	11.5	
6	0.063	10.5	11.0	11.5	11.9	12.4	12.8	13.2	13.6	14.0	**	**	
7	0.067	12.0	12.6	13.2	13.7	14.2	14.7	15.2	**	**	**	**	
8	0.070	13.1	13.8	14.4	15.0	15.5	16.1	**	**	**	**	**	

Flow Rating Number	Equivalent Orifice Size (mm)	Flow (lpm) @ Specified Pressures (bar)									
		1,400 bar	1,550 bar	1,700 bar	1,850 bar	2,000 bar	2,150 bar	2,300 bar	2,450 bar	2,600 bar	2,758 bar
0	0.74	8.7	9.2	9.6	10.0	10.4	10.8	11.2	11.5	11.9	12.2
1	0.84	11.1	11.7	12.3	12.8	13.3	13.8	14.2	14.7	15.2	15.6
2	0.97	14.7	15.5	16.2	16.9	17.6	18.3	18.9	19.5	20.1	20.7
3	1.07	18.0	18.9	19.8	20.7	21.5	22.3	23.1	23.8	24.5	25.3
4	1.18	22.1	23.2	24.3	25.4	26.4	27.4	28.3	29.2	30.1	31.0
5	1.4	30.9	32.5	34.0	35.5	36.9	38.3	39.6	40.9	42.1	43.3
6	1.59	39.9	42.0	43.9	45.8	47.7	49.4	51.1	52.8	**	**
7	1.7	45.8	48.2	50.5	52.7	54.8	56.8	**	**	**	**
8	1.78	50.0	52.6	55.1	57.5	59.8	**	**	**	**	**

Example: Nozzles having a Flow Rating of 4 will produce 36,000 psi (2,450 bar) @ 7.8 gpm (29.2 lpm).