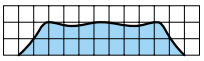
Standard Type
Full Cone Spray Nozzles

JJXP

[Spray Pattern]



[Spray Distribution]

[Features]
- Full cone spray pattern with a round impact area and uniform distribution.
- Spray capacity ranges from small to medium.
- X-shaped whirler provides large free passage diameter for minimal clogging.

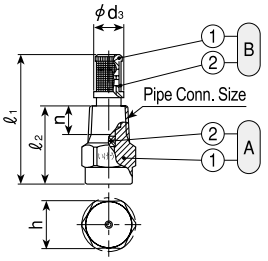
[Standard Pressure]
0.2MPa

[Applications]
Cleaning : Gases, incinerator fumes, machinery, eliminators, screen, tanks, gravel, stones, sand, etc.
Cooling : Gases, machineries, tanks, steels, etc.
Spraying : Waste water treatment, aeration, foam breaking, fire extinguishing, dust suppression, sea water desalination, etc.

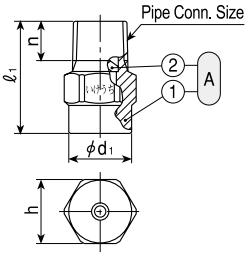
JJXP-series

	JJXP-series
Structure	• One-piece structure with press-fit X-shaped whirler.
Material	• Sizes ⅛M -⅜M(F) : S303 (stainless steel 303) • Sizes ½F - 1F : B (brass) or S303 • Sizes 1½F or larger : S316 (SCS14) • Optional material : S316L (SCS16), plastic, others [Note] Thread size of optional material may differ depending on materials.

⅛M(005)



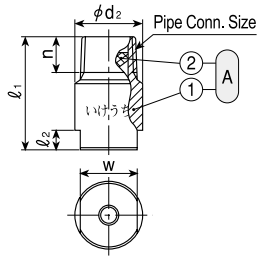
⅛M•¼M



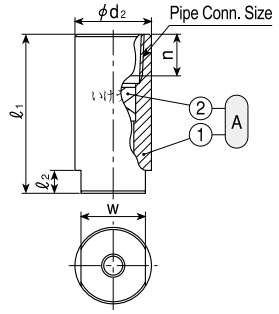
Series	Pipe Conn. Size *2	Dimensions(mm) ℓ1	ℓ2	h	W	φd1	φd2	φd3	n	Mass(g) B	S303 (S316)
JJXP	⅛M(005)	32.5	20	12	—	—	—	7.5	7	—	9.5 *1
	⅛M	20	—	12	—	11.5	—	—	7	—	11
	¼M	28	—	14	—	13.5	—	—	10.5	—	21
	⅜M	34	6	—	17	—	20	—	11	—	50
	⅜F	43	6	—	17	—	20	—	11	—	61
	½F	54	8	—	22	—	25	—	14	150	140
	¾F	69	10	—	27	—	32	—	15	290	270
	1F	89	14	—	34	—	40	—	17	550	515
	1½F	124	20	—	50	—	58	—	19	—	1520
	2F(250~350)	160	24	—	60	—	70	—	23	—	2600
	2F(400~500)	118.5	24	—	60	—	70	—	23	—	2050
	2½F	147.5	27	—	80	—	90	—	27	—	4360
	3F(920)	163.5	30	—	90	—	105	—	30	—	6700
	3F(1200)	170.5	30	—	90	—	105	—	30	—	6500

*1) For JJXP005 with strainer, add 2g to the above mass.
*2) Figures in ( ) after Pipe Conn. Size indicate the spray capacity codes.

⅜M



⅜F and over



ⒶNozzle (①Body ②Whirler)
ⒷStrainer (①Strainer holder ②Strainer screen)

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

Spray Capacity Code	Pipe Conn. Size						Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1/8M	1/4M	3/8M	3/8F	1/2M	1/2F	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
005	●	●					—	55°	65°	—	—	0.36	0.44	0.50	0.59	0.73	0.83	0.96	270	0.5
010	○	○					50°	55°	45°	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	1.93	290	0.8
015	○	○					60°	65°	55°	—	0.79	1.09	1.32	1.50	1.77	2.18	2.50	2.89	〃	0.8
020	○	○					60°	65°	55°	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34	3.86		1.4
030	○	○					65°	70°	60°	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00	5.79	410	1.4
040		○					60°	65°	55°	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67	7.72	380	1.7
050		○					65°	70°	60°	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34	9.64	〃	1.7
060		○					70°	75°	65°	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	11.6	520	1.7
070			○	○			60°	65°	60°	2.93	3.71	5.09	6.14	7.00	8.26	10.2	11.7	13.5	480	1.9
080			○	○			65°	70°	65°	3.35	4.24	5.82	7.01	8.00	9.44	11.6	13.3	15.4	〃	1.9
10			○	○			75°	80°	75°	4.19	5.29	7.28	8.77	10.0	11.8	14.5	16.7	19.3		2.6
12			○	○			80°	85°	80°	5.03	6.35	8.73	10.5	12.0	14.2	17.4	20.0	23.1	660	2.6
14					○	○	65°	70°	55°	5.86	7.41	10.2	12.3	14.0	16.5	20.3	23.3	27.0	590	3.5
16					○	○	70°	75°	60°	6.70	8.47	11.6	14.0	16.0	18.9	23.3	26.7	30.9	〃	3.5
18					○	○	75°	80°	65°	7.54	9.53	13.1	15.8	18.0	21.2	26.2	30.0	34.7		3.5
20					○	○	80°	85°	70°	8.38	10.6	14.6	17.5	20.0	23.6	29.1	33.4	38.6	740	3.5

Spray Capacity Code	Pipe Conn. Size						Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	3/4F	1F	1 1/2F	2F	2 1/2F	3F	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
23	○						70°	75°	60°	9.63	12.2	16.7	20.2	23.0	27.1	33.4	38.4	44.4	630	4.7
26	○						75°	80°	65°	10.9	13.8	18.9	22.8	26.0	30.7	37.8	43.4	50.1		4.7
30	○						80°	85°	70°	12.6	15.9	21.8	26.3	30.0	35.4	43.6	50.0	57.9	〃	4.7
35	○						85°	90°	75°	14.7	18.5	25.5	30.7	35.0	41.3	50.9	58.4	67.5		4.7
40	○						90°	95°	80°	16.8	21.2	29.1	35.1	40.0	47.2	58.1	66.7	77.2		4.7
45	○						90°	95°	80°	18.8	23.8	32.7	39.5	45.0	53.1	65.4	75.0	86.8	950	4.7
50		○					70°	75°	60°	20.9	26.5	36.4	43.8	50.0	59.0	72.7	83.4	96.4	800	6.0
60		○					80°	85°	70°	25.1	31.8	43.7	52.6	60.0	70.8	87.2	100	115	〃	6.0
80		○					90°	95°	80°	33.5	42.4	58.2	70.1	80.0	94.4	115	135	155		6.0
90		○					90°	95°	80°	37.7	47.7	65.5	78.9	90.0	106	130	150	175	1150	6.6
100			○				80°	85°	70°	41.9	52.9	72.8	87.7	100	120	145	170	195	1000	8.4
150			○				85°	90°	75°	62.8	79.4	110	130	150	180	220	250	290	〃	8.4
200			○				90°	95°	80°	83.8	105	145	175	200	240	290	335	385	1350	10.3
250				○			85°	90°	75°	105	130	180	220	250	295	360	420	480	1200	12.7
300				○			90°	95°	80°	125	160	220	265	300	355	435	500	580		12.7
350				○			90°	95°	80°	150	185	255	310	350	415	510	585	675	〃	12.7
400				○			75°	80°	65°	170	210	290	350	400	470	580	670	770		13.4
500				○			95°	95°	80°	210	265	365	440	500	590	730	835	965	1500	13.4
600					○		75°	80°	65°	250	320	440	525	600	710	870	1000	1160	1500	17.0
700					○		85°	90°	75°	290	370	510	615	700	826	1020	1170	1359	1800	17.0
920						○	100°	100°	85°	385	490	670	810	920	1090	1340	1535	1780	1660	18.4
1200						○	105°	105°	90°	505	635	875	1050	1200	1420	1740	2000	2320	1950	22.0

●……With strainer (100 mesh only)　○……Without strainer

For spraying slurry, the nozzle material should be wear-resistant. For this purpose, the JUXP-AL92 nozzle with a cup-shaped ceramic orifice and ceramic whirler is available (see page 66).

How to order

Please inquire or order for a specific nozzle using this coding system.

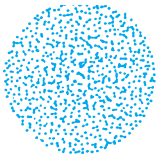
〈Example〉…1/8MJJXP005S303W

1/8M	JJXP	005	S303	W
Pipe Conn. Size (*1)		Spray Capacity Code	Material (*2)	Strainer
1/8M		005	B	W (with Strainer : 1/8MJJXP005 only)
〃		〃	S303	— (without Strainer)
3F		1200	S316	

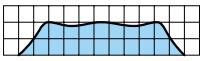
*1) Pipe connection size code for 1/4M is indicated as "1/4x1/8M" when spray capacity is 005-030.
*2) See "Material" information on page 57 for standard materials by each size.

Standard Type
Full Cone Spray Nozzles

JJXP-PP / JJXP-PVDF



[Spray Pattern]



[Spray Distribution]

[Features]
- Full cone spray pattern with a round impact area and uniform distribution.
- X-shaped whirler provides large free passage diameter for minimal clogging.

[Standard Pressure]
0.2MPa

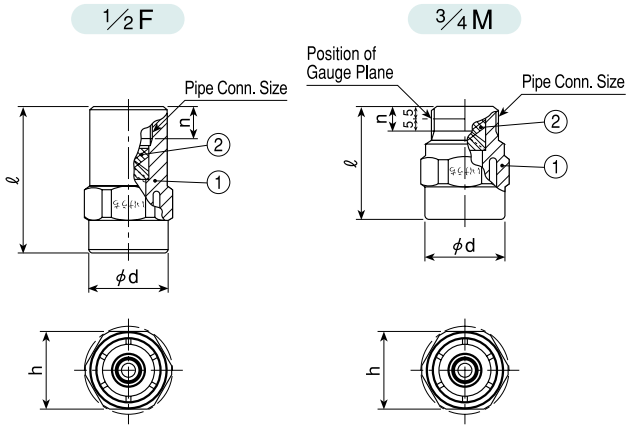
[Applications]
Cleaning : Machinery, screens, tanks, gravel, stones, sand, etc.

Cooling : Machinery, tanks, etc.

Spraying : Waste water treatment, aeration, foam breaking, dust suppression, etching, chemicals, etc.

JJXP-PP series

	JJXP-PP series
Structure	• One-piece structure with press-fit X-shaped whirler.
Material	• PP (polypropylene)



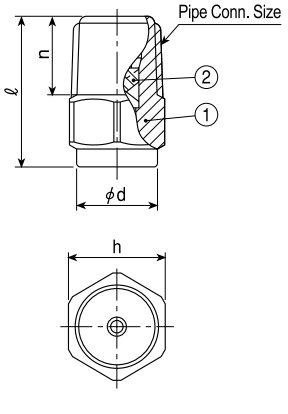
Series	Pipe Conn. Size	Dimensions(mm)				Mass(g)
		ℓ	h	n	ϕd	PP
JJXP-PP	1/2 F	56	32	13	31	25.3
	3/4 M	44	32	10	31	17.9

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

* Please note that the position of standard diameter for male thread type has been changed.

JJXP-PVDF series

	JJXP-PVDF series
Structure	• One-piece structure with press-fit X-shaped whirler.
Material	• PVDF (polyvinylidene fluoride)



Series	Pipe Conn. Size	Dimensions(mm)				Mass(g)
		ℓ	h	ϕd	n	PVDF
JJXP-PVDF	1/8 M	18	12	11.5	8	2.2
	1/4 M	22	14	11.5	11.5	4.1

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

JJXP-PP series

Spray Capacity Code	Pipe Conn. Size		Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	½F	¾M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
$2^{100}/_{12}$	○	●	96°	100°	92°	5.03	6.35	8.73	10.5	12.0	14.2	17.4	20.0	23.1	570	3.1
$2^{100}/_{13}$	○	○	96°	100°	92°	5.44	6.88	9.46	11.4	13.0	15.3	18.9	21.7	25.1		3.1
$2^{100}/_{14}$	●	●	96°	100°	92°	5.86	7.41	10.2	12.3	14.0	16.5	20.3	23.3	27.0		3.5
$2^{100}/_{15}$	●	●	96°	100°	92°	6.28	7.94	10.9	13.1	15.0	17.7	21.8	25.0	28.9	≀	3.5
$2^{100}/_{16}$	●	●	96°	100°	92°	6.70	8.47	11.6	14.0	16.0	18.9	23.3	26.7	30.9		3.5
$2^{100}/_{18}$	●	●	96°	100°	92°	7.54	9.53	13.1	15.8	18.0	21.2	26.2	30.0	34.7		3.5
$2^{100}/_{20}$	●	●	96°	100°	92°	8.38	10.6	14.6	17.5	20.0	23.6	29.1	33.4	38.6	740	3.5

* The nozzles with black dot "●" are available.

JJXP-PVDF series

Spray Capacity Code	Pipe Conn. Size		Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	⅛M	¼M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
010	○	○	60°	65°	55°	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	1.93	290	0.8
015	○	○	60°	65°	55°	—	0.79	1.09	1.32	1.50	1.77	2.18	2.50	2.89		1.0
020	○	○	60°	65°	55°	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34	3.86	≀	1.5
025	○	○	60°	65°	55°	—	1.32	1.82	2.20	2.50	2.95	3.62	4.17	4.82		1.5
030	○	○	60°	65°	55°	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00	5.79	410	1.5

How to order

Please inquire or order for a specific nozzle using this coding system.

① JJXP-PP

〈Example〉···¾MJJXP$2\frac{100}{16}$PP

¾M	JJXP	$2\frac{100}{16}$	PP
Pipe Conn. Size		Spray Capacity Code	
½F		$2\frac{100}{12}$	
¾M		≀	
		$2\frac{100}{20}$	

② JJXP-PVDF

〈Example〉···⅛MJJXP010PVDF

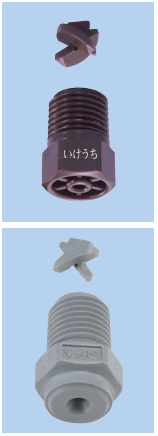
⅛M	JJXP	010	PVDF
Pipe Conn. Size		Spray Capacity Code	
⅛M		010	
¼M (*1)		≀	
		030	

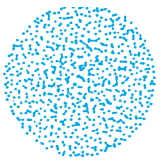
*1) Pipe connection size code is indicated as "¼x⅛M" for JJXP-PVDF with ¼M thread.

Standard Type
Full Cone Spray Nozzles

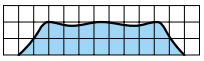
JJXP-HTPVC/JJXP-PVC

For spraying chemicals such as hydrochloric acid, heat-treated HTPVC injection-molded JJXP-HTPVC nozzles are available.





[Spray Pattern]



[Spray Distribution]

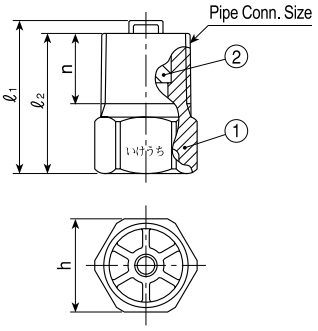
[Features]
- Full cone spray pattern with a round impact area and uniform distribution.
- X-shaped whirler provides large free passage diameter for minimal clogging.
- X-shaped whirler is removable for easy maintenance.

[Standard Pressure]
0.2MPa

[Applications]
Spraying : Etchants, chemicals, etc.
Cleaning : Printed circuit boards, etc.

JJXP-HTPVC series

	JJXP-HTPVC series
Structure	• One-piece structure with removable X-shaped whirler.
Material	• HTPVC (heat-treated polyvinyl chloride)



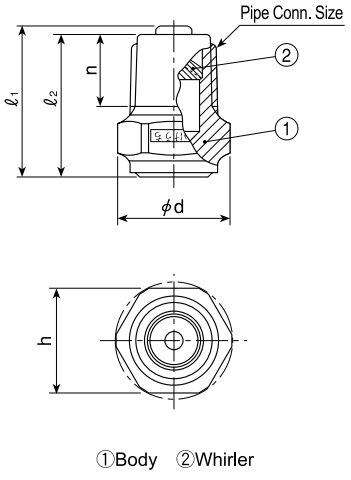
①Body ②Whirler

Series	Pipe Conn. Size	Dimensions(mm)				Mass(g)
		ℓ1	ℓ2	h	n	
JJXP-HTPVC	1/4 M	23	21	14	10.5	2.5

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

JJXP-PVC series

	JJXP-PVC series
Structure	• One-piece structure with removable X-shaped whirler.
Material	• PVC (polyvinyl chloride)



①Body ②Whirler

Series	Pipe Conn. Size	Dimensions(mm)					Mass(g)
		ℓ1	ℓ2	h	n	ϕd	
JJXP-PVC	1/8 M	16.9	16	12	8	10	1.4

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

■JJXP-HTPVC series

Spray Capacity Code	Pipe Conn. Size	Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
		0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
040	1/4M	60°	65°	55°	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67	7.72	380	2.2
050		65°	70°	60°	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34	9.64	〃	2.2
060		70°	75°	65°	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	11.6	520	2.2

■JJXP-PVC series

Spray Capacity Code	Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
2 75/2	70°	75°	66°	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34	3.86	350	1.5

How to order Please inquire or order for a specific nozzle using this coding system.

① JJXP-HTPVC

〈Example〉…1/4MJJXP040HTPVC

1/4M JJXP 040 HTPVC

Spray Capacity Code
- 040
- 050
- 060

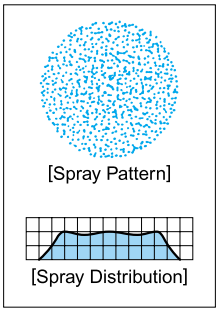
② JJXP-PVC

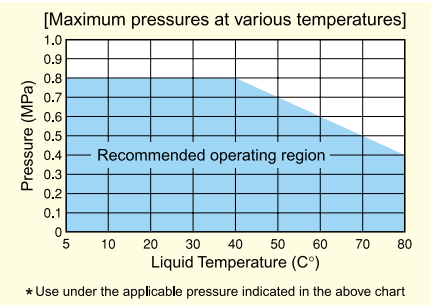
1/8M JJXP 2 75/2 PVC

Quick-Detachable
Standard Full Cone Spray Nozzles

Patented

INJJX





∗Use under the applicable pressure indicated in the above chart

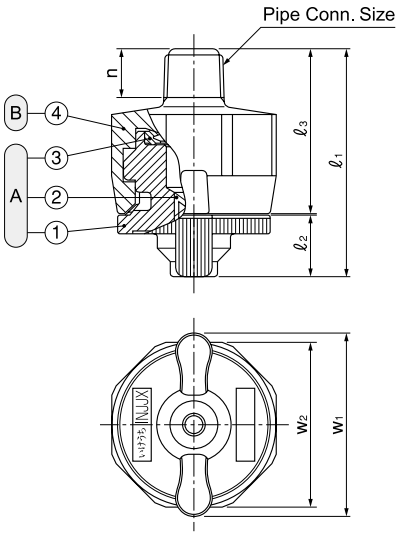
[Features]
- Full cone spray nozzle with a removable whirler.
- Quick installation and removal by just turning the nozzle 60° by hand.
- Easy maintenance with quick detachable nozzle.
- Nozzle bodies are color-coded by spray capacity for easy identification.

[Standard Pressure]
0.2MPa

[Applications]
Etching, stripping, chemical treatment
Cleaning

INJJX-series

	INJJX-series
Structure	• 2-piece structure comprised of nozzle and adaptor. • Easy installation and removal by just turning the nozzle 60°.
Material	• Nozzle : PP (polypropylene) • Adaptor : PPS (polyphenylene sulfide) • Packing : FEPM



Series	Pipe Conn. Size	Dimensions(mm)						Mass (g)
		ℓ1	ℓ2	ℓ3	n	w1	w2	
INJJX	1/8M	37	10	26.5	8	30	27	12
	1/4M	40	10	29.5	11.5	30	27	13
	3/8M	40	10	29.5	12	30	27	14

[Note] • Appearance and dimensions may differ slightly depending on materials and nozzle codes.

• INJJX series nozzles are not compatible with ISJJX series. (The INJJX series is the successor to the ISJJX series.)

Ⓐ Nozzle (①Body ②Whirler ③Packing-FEPM)
Ⓑ Adaptor

Spray Capacity Code	Pipe Conn. Size			Spray Angle			Spray Capacity (ℓ/min)								Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Color of nozzle body
	1/8M	1/4M	3/8M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa			
010	○	○	○	60°	65°	55°	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	290	0.8	
015	○	○	○	60°	65°	55°	—	0.79	1.09	1.32	1.50	1.77	2.18	2.50		1.0	
020	○	○	○	60°	65°	55°	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34		1.5	
025	○	○	○	60°	65°	55°	—	1.32	1.82	2.20	2.50	2.95	3.62	4.17		1.5	
030	○	○	○	60°	65°	55°	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00	⟆	1.5	
040	○	○	○	60°	65°	55°	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67		2.0	
050	○	○	○	65°	70°	60°	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34		2.0	
060	○	○	○	70°	75°	65°	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	520	2.0	

How to order

Please inquire or order for a specific nozzle using this coding system.

① Complete unit

〈Example〉 ···1/8M(PT)INJJX040PP(FEPM)+PPS

1/8M	(PT)	INJJX	040	PP	(FEPM)	+	PPS
Pipe Conn. Size	Thread type		Spray Capacity Code	Nozzle Material	Packing Material		Adaptor Material
1/8M	(PT)		05				
1/4M	(NPT)		⟆				
3/8M			50				

② Nozzle only

〈Example〉 ··· INJJX040PP(FEPM)

INJJX	040	PP	(FEPM)
	Spray Capacity Code	Nozzle Material	Packing Material
	05		
	⟆		
	50		

ALSO AVAILABLE!

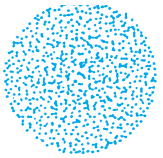
Quick-Detachable
Standard
Flat Spray Nozzles
INVV series

See p.21 of this catalog.

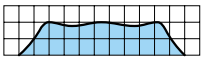
All Alumina Ceramic
Full Cone Spray Nozzles

JUXP-AL92

(JUXP-AL92 with S316 socket)



[Spray Pattern]



[Spray Distribution]

[Features]
- X-shaped whirler provides large free passage diameter for minimal clogging.
- Whirler and orifice are made of high-purity alumina and provide excellent wear-resistance.
- Spray capacity ranges from medium to large.

[Standard Pressure]
0.2MPa

[Applications]
- Absorption tower of flue gas desulfurization equipment.
- Spraying slurry, etc.

Full Cone

JUXP-AL92 series

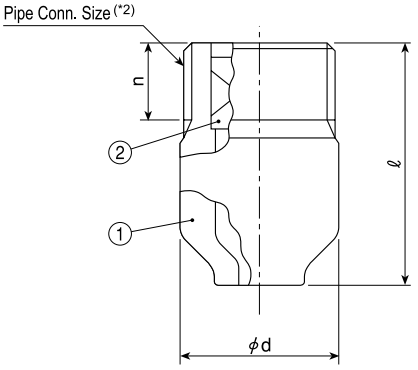
	JUXP-AL92 series (with ceramic orifice inserted)
Structure	• Whole nozzle fired as one piece.
Material	• 92% Alumina

* If installed into a metal header, this nozzle should be used with a socket made of S316, shown on page 85 (otherwise, the thread may be damaged). Please refer to page 85.

Series	Pipe Conn. Size*1,2	Dimensions(mm)			Mass(g)
		ϕd	ℓ	n	
JUXP	1M	35	53	18	110
	1½M	50	67	20	350
	2M	65	100	24	760
	2½M (250~350)	80	136	29	1520
	2½M (400~550)	80	94	29	1130
	3M	90	157	31	1690

*1) Figures in ( ) after Pipe Conn. Size indicate the spray capacity codes.

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



①Ceramic tip (Al_2O_3 92%)
②Ceramic whirler (Al_2O_3 92%)

*2) When used with our S316 socket, socket thread for pipe connection is female thread.
Drawing for nozzle with socket is available on request.
(The above drawing is nozzle only)

Spray Capacity Code	Pipe Conn. Size						Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1M	1½M	2M	2½M (250~350)	2½M (400~550)	3M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
23	○						70°	75°	60°	9.63	12.2	16.7	20.2	23.0	27.1	33.4	38.4	44.4	630	4.7
26	○						75°	80°	65°	10.9	13.8	18.9	22.8	26.0	30.7	37.8	43.4	50.1		4.7
30	○						80°	85°	70°	12.6	15.9	21.8	26.3	30.0	35.4	43.6	50.0	57.9	〃	4.7
35	○						85°	90°	75°	14.7	18.5	25.5	30.7	35.0	41.3	50.9	58.4	67.5		4.7
40	○						90°	95°	80°	16.8	21.2	29.1	35.1	40.0	47.2	58.1	66.7	77.2		4.7
45	○						90°	95°	80°	18.8	23.8	32.7	39.5	45.0	53.1	65.4	75.0	86.8	950	4.7
50		○					70°	75°	60°	20.9	26.5	36.4	43.8	50.0	59.0	72.7	83.4	96.4	800	6.0
55		○					75°	80°	65°	23.0	29.1	40.0	48.2	55.0	64.9	79.9	91.7	105		6.0
60		○					80°	85°	70°	25.1	31.8	43.7	52.6	60.0	70.8	87.2	100	115	〃	6.0
70		○					85°	90°	75°	29.3	37.1	50.9	61.4	70.0	82.6	100	120	135		6.0
80		○					90°	95°	80°	33.5	42.4	58.2	70.1	80.0	94.4	115	135	155		6.6
90		○					90°	95°	80°	37.7	47.7	65.5	78.9	90.0	106	130	150	175	1150	6.6
100			○				80°	85°	70°	41.9	52.9	72.8	87.7	100	120	145	170	195	1000	8.7
120			○				80°	85°	70°	50.3	63.5	82.3	105	120	140	175	200	230		8.7
150			○				85°	90°	75°	62.8	79.4	110	130	150	180	220	250	290	〃	8.7
180			○				90°	95°	80°	75.4	95.3	130	160	180	210	260	300	350		10.3
200			○				90°	95°	80°	83.8	105	145	175	200	240	290	335	385	1350	10.7
250				○			85°	90°	75°	105	130	180	220	250	295	360	420	480	1200	12.7
300				○			90°	95°	80°	125	160	220	265	300	355	435	500	580	〃	12.7
350				○			90°	95°	80°	150	185	255	310	350	415	510	585	675	1450	12.7

Spray Capacity Code	Pipe Conn. Size						Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1M	1½M	2M	2½M (250~350)	2½M (400~550)	3M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
400					○		75°	80°	65°	170	210	290	350	400	470	580	670	770	1300	13.4
450					○		90°	90°	75°	190	240	330	395	450	530	655	750	870	≀	13.4
500					○		95°	95°	80°	210	265	365	440	500	590	730	835	965		13.4
550					○		100°	100°	85°	230	290	400	480	550	650	800	920	1060	1550	13.4
600						○	75°	80°	65°	250	320	440	525	600	710	870	1000	1160	1500	17.0
700						○	85°	90°	75°	290	370	510	615	700	826	1020	1170	1359	1800	17.0

How to order

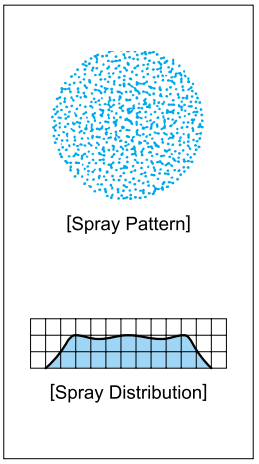
Please inquire or order for a specific nozzle using this coding system.

〈Example〉…1½MJUXP90AL92

1½M	JUXP	90	AL92
Pipe Conn. Size		Spray Capacity Code	
1M		23	
≀		≀	
3M		700	

Flange-type, Large Capacity
Full Cone Spray Nozzles

TJJX



[Features]
- Full cone spray pattern with a round impact area and uniform distribution.
- Flanged connection.
- X-shaped whirler provides large free passage diameter for minimal clogging.
- Adopting newly developed X-shaped whirler has shortened total length by 20% compared to conventional nozzles.

[Standard Pressure]
0.2MPa

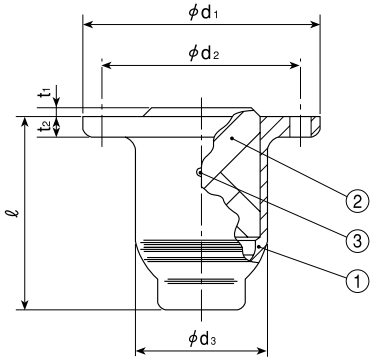
[Applications]
Cooling : Gases, liquids, etc.
Reacting : Chemical plants, etc.
Spraying : Aeration, sea water desalination, etc.

TJJX-series

	TJJX-series
Structure	• One-piece structure with removable X-shaped whirler fixed to nozzle body by lock bolt. • Flanged connection.
Material	• S304 (stainless steel 304) (SCS13) or S316 (stainless steel 316) (SCS14) • Optional material : S316L (SCS16)

Series	Flange size	Dimensions(mm)						Flange (JIS 10K)		Mass (kg)
		ℓ	φd1	φd2 PCD	φd3	t1	t2	Qty. of bolt holes	φ(mm)	
TJJX	4T	171	210	175	117	8	18	8	19	9.3
	5T	211	250	210	143	9	20	8	23	11.4
	6T	253	280	240	169	10	22	8	23	22.7

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



①Body ②Whirler ③Lock bolt

Spray Capacity Code	Flange size			Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	4T	5T	6T	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa		
1500	○			90°	90°	75°	630	795	1090	1315	1500	1770	2180	1850	29
2000	○			100°	100°	85°	840	1060	1460	1755	2000	2360	2910		29
2500		○		90°	90°	75°	1050	1325	1820	2190	2500	2950	3630	≀	36
3000		○		100°	100°	85°	1260	1590	2180	2630	3000	3540	4360	2500	36
3500			○	90°	90°	75°	1470	1850	2550	3070	3500	4130	5090	≀	44
4000			○	95°	95°	80°	1680	2120	2910	3510	4000	4720	5810	2650	44

[Note]
TJJX with larger spray flow / larger flange is available upon request.

How to order

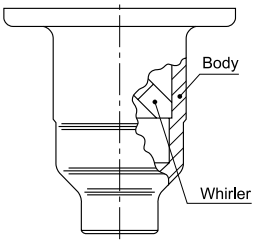
Please inquire or order for a specific nozzle using this coding system.

〈Example〉···4TJJX1500S304

4	TJJX	1500	S304
Pipe Conn. Size		Spray Capacity Code	Material
4		1500	S304
≀		≀	S316
6		4000	

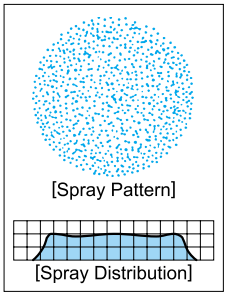
Related Products

For spraying slurry, TJJX nozzles made of highly wear-resistant SiC (silicon carbide) are available.

Series	Appearance	Structure	Features	Applications
TJJX-SiC			● Full cone spray pattern with a round impact area and uniform distribution. ● X-shaped whirler provides large free passage diameter for minimal clogging. ● Whole nozzle fired as one piece. ● Highly wear-resistant and lightweight structure made of SiC.	● Spraying recirculated water for water granulation, etc. ● Other applications for spraying slurry, etc.

Wide-angle
Full Cone Spray Nozzles

BBXP/BBXP-PVDF/BBXP-PVC



[Features]
- Wide-angle full cone spray pattern with a round impact area and uniform distribution.
- Spray angle of 120° provides larger spray coverage than other nozzles.
- Spray capacity ranges from small to medium.
- X-shaped whirler provides large free passage diameter for minimal clogging.

[Standard Pressure]
0.2MPa for spray capacity codes of 015-060.
0.35MPa for spray capacity codes of 10 and over.

[Applications]
Cleaning : Gases, incinerator fumes, machinery, eliminators, screen, tanks, gravel, stones, sand, etc.
Cooling : Gases, machineries, tanks, steels, etc.
Spraying : Water treatment, aeration, foam breaking, fire extinguishing, dust suppression, sea water desalination, etc.

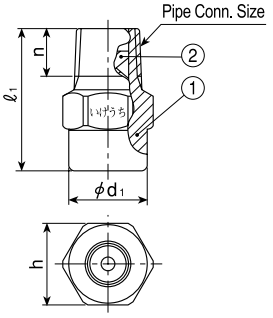
BBXP-series

	BBXP-series
Structure	• One-piece structure with press-fit X-shaped whirler.
Material	• Sizes 1/8M - 3/8F : S303 (stainless steel 303) • Sizes 1/2F - 1F : B (brass) or S303 • Sizes 1 1/2F or larger : S316 (SCS14) • Optional material : S316L (SCS16) or others

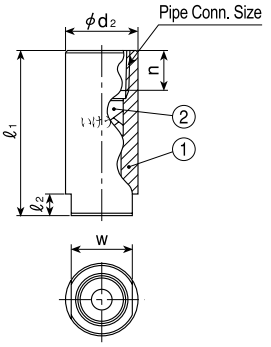
Series	Pipe Conn. Size	Dimensions(mm)							Mass(g)	
		ℓ_1	ℓ_2	h	w	ϕd_1	ϕd_2	n	B	S303 (S316)
BBXP	1/8M	21	—	12	—	11.5	—	7	—	11
	1/4M	29	—	14	—	13.5	—	10.5	—	19.5
	3/8F	45.5	6	—	17	—	20	11	—	75
	1/2F	56	8	—	22	—	25	14	150	140
	3/4F	73	10	—	27	—	32	15	320	300
	1F	94	14	—	34	—	40	17	625	585
	1 1/2F	131	20	—	50	—	58	19	—	1760
	2F	168	24	—	60	—	70	23	—	2980
	2 1/2F	199	27	—	80	—	90	27	—	5890
	3F	220	30	—	90	—	105	30	—	9400
	4F	278	40	—	115	—	130	36	—	16100

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

1/8M•1/4M



3/8F and over



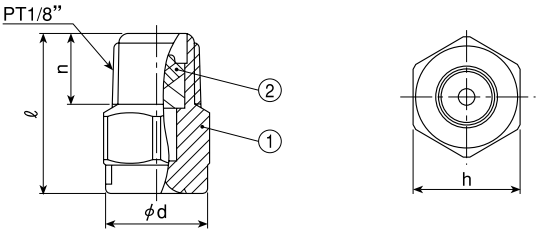
①Body ②Whirler

BBXP-PVDF series

	BBXP-PVDF series
Structure	• One-piece structure with press-fit X-shaped whirler.
Material	• PVDF (polyvinylidene fluoride)

Series	Pipe Conn. Size	Dimensions(mm)				Mass(g)
		ℓ	h	n	ϕd	PVDF
BBXP-PVDF	1/8M	18	12	8	11.5	2
	1/4M	22	14	11.5	11.5	4.1

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



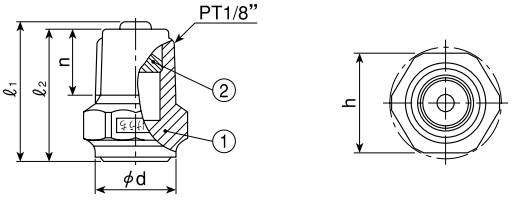
①Body ②Whirler

BBXP-PVC series

	BBXP-PVC series
Structure	• One-piece structure with removable X-shaped whirler.
Material	• PVC (polyvinyl chloride)

Series	Pipe Conn. Size	Dimensions(mm)					Mass(g)
		ℓ_1	ℓ_2	h	n	ϕd	PVC
BBXP-PVC	1/8M	16.9	16	12	8	10	1.4

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



①Body ②Whirler

Wide-angle Full Cone Spray Nozzles

BBXP/BBXP-PVDF/BBXP-PVC series

BBXP-series

Spray Capacity Code	Pipe Conn. Size		Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1/8M	1/4M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.35 MPa	0.5 MPa	0.7 MPa	1 MPa		
015	○	○	—	120°	112°	—	—	1.09	1.32	1.50	1.88	2.18	2.50	2.89	300	0.8
020	○	○	110°	120°	112°	—	1.06	1.46	1.75	2.00	2.51	2.91	3.34	3.86	≀	1.2
030	○	○	112°	120°	113°	—	1.59	2.18	2.63	3.00	3.77	4.36	5.00	5.79	340	1.3
040		○	110°	120°	112°	—	2.12	2.91	3.51	4.00	5.03	5.81	6.67	7.72	350	1.3
050		○	112°	120°	113°	—	2.65	3.64	4.38	5.00	6.28	7.27	8.34	9.64	≀	1.5
060		○	114°	120°	114°	2.51	3.18	4.37	5.26	6.00	7.54	8.72	10.0	11.6	430	1.8

Spray Capacity Code	Pipe Conn. Size										Spray Angle			Spray Capacity (ℓ/min)										Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	3/8M	3/8F	1/2F	3/4F	1F	1½F	2F	2½F	3F	4F	0.15 MPa	0.35 MPa	0.7 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.35 MPa	0.5 MPa	0.7 MPa	1 MPa		
10	○	○									123°	120°	111°	3.34	4.21	5.79	6.98	7.96	10.0	11.6	13.3	15.3	340	1.9
12	○	○									124°	120°	112°	4.00	5.06	6.95	8.37	9.55	12.0	13.9	15.9	18.4		2.3
14	○	○									124°	120°	112°	4.67	5.90	8.10	9.77	11.1	14.0	16.2	18.6	21.5	≀	2.6
16	○	○									125°	120°	113°	5.33	6.74	9.25	11.2	12.7	16.0	18.5	21.2	24.6		2.6
18			○								123°	120°	111°	6.00	7.58	10.4	12.6	14.3	18.0	20.8	23.9	27.6	420	2.9
20			○								123°	120°	111°	6.67	8.43	11.6	14.0	15.9	20.0	23.1	26.5	30.7	≀	2.9
23			○								124°	120°	112°	7.67	9.69	13.3	16.0	18.3	23.0	26.6	30.5	35.3		2.9
26			○								124°	120°	112°	8.67	11.0	15.1	18.1	20.7	26.0	30.1	34.5	39.9	480	3.5
30				○							123°	120°	111°	10.0	12.6	17.4	20.9	23.9	30.0	34.7	39.8	46.0	≀	3.8
40				○							124°	120°	112°	13.3	16.9	23.2	27.9	31.8	40.0	46.3	53.1	61.4		4.1
50				○							125°	120°	113°	16.7	21.0	29.0	34.9	39.8	50.0	57.8	66.3	76.7	580	4.7
60					○						124°	120°	112°	20.0	25.3	34.7	41.9	47.7	60.0	69.4	79.6	92.1	≀	5.3
80					○						125°	120°	113°	26.7	33.7	46.3	55.8	63.7	80.0	92.5	106	123	630	5.7
100						○					123°	120°	111°	33.3	42.1	57.9	69.8	79.6	100	115	135	155		6.2
150						○					124°	120°	112°	50.0	63.2	86.9	105	120	150	175	200	230	≀	7.5
200							○				124°	120°	112°	66.7	84.3	115	140	160	200	230	265	310	710	9.0
300							○				125°	120°	113°	100	125	175	210	240	300	350	400	460	900	11.5
400								○			124°	120°	112°	135	170	235	280	320	400	465	530	615	≀	13.4
500								○			125°	120°	113°	170	210	290	350	400	500	580	665	770	1000	18.4
600									○		124°	120°	112°	200	255	350	420	480	600	695	795	920	≀	16.0
700									○		125°	120°	113°	235	295	405	490	550	700	810	930	1070	1100	17.2
900										○	124°	120°	112°	300	380	520	630	720	900	1041	1195	1380	≀	19.3
1200										○	125°	120°	113°	400	505	695	840	955	1200	1390	1590	1840	1200	22.4

BBXP-PVDF series

Spray Capacity Code	Pipe Conn. Size		Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Nozzle Color
	1/8M	1/4M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.35 MPa	0.5 MPa	0.7 MPa	1 MPa			
008	○		—	120°	112°	—	—	0.58	0.70	0.80	1.00	1.16	1.33	1.54	280	0.5	
015	○	○	—	120°	112°	—	—	1.09	1.32	1.50	1.88	2.18	2.50	2.89	≀	0.8	
020	○		110°	120°	113°	—	1.06	1.46	1.75	2.00	2.51	2.91	3.34	3.86	340	1.2	

*Nozzle colors differ depending on Spray Capacity Codes; BBXP008 and BBXP020 are black, BBXP015 is gray.

BBXP-PVC series

Spray Capacity Code	Pipe Conn. Size	Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
		0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
030	1/8M	115°	120°	110°	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00	5.79	350	1.5

How to order

Please inquire or order for a specific nozzle using this coding system.

① BBXP

〈Example〉…1/8MBBXP015B

1/8M BBXP 015 S303

- Pipe Conn. Size(*1): 1/8M, ≀, 4F
- Spray Capacity Code: 015, ≀, 1200
- Material(*2): B, S303, S316

② BBXP-PVDF

〈Example〉…1/8MBBXP020PVDF

1/8M BBXP 020 PVDF (BLA)

- Pipe Conn. Size: 1/8M, 1/4M
- Spray Capacity Code: 008, 015, 020
- Nozzle Color: BLA (BBXP008, 020), GRA (BBXP015)

③ BBXP-PVC

〈Example〉…1/8MBBXP030PVC-IN

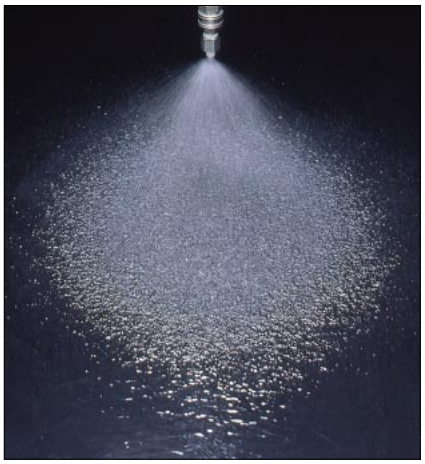
1/8MBBXP030PVC-IN

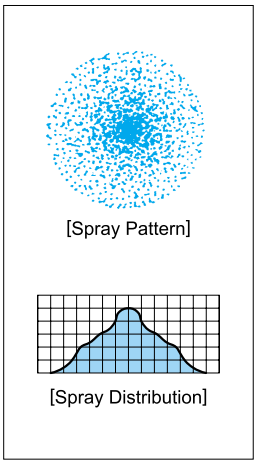
*1) Pipe connection size code for 1/4M is indicated as "1/4 x 1/8M" when spray capacity is 015-030.

*2) See "Material" information on page 72 for standard materials by each size.

Quick-Detachable High-efficiency Etching Nozzles

SNAPJet





[Features]

- Mountain-shaped distribution and high spray impact achieve high-precision etching.
- Uniform etching effect in any production lines because the distortion of spray distribution is minimized even if spray pressure is modulated.
- Quick-detachable design makes periodic maintenance easy.
  Whirler inside the nozzles is also removable.
- Also available in titanium for high-temperature and high-pressure condition.

[Standard Pressure]

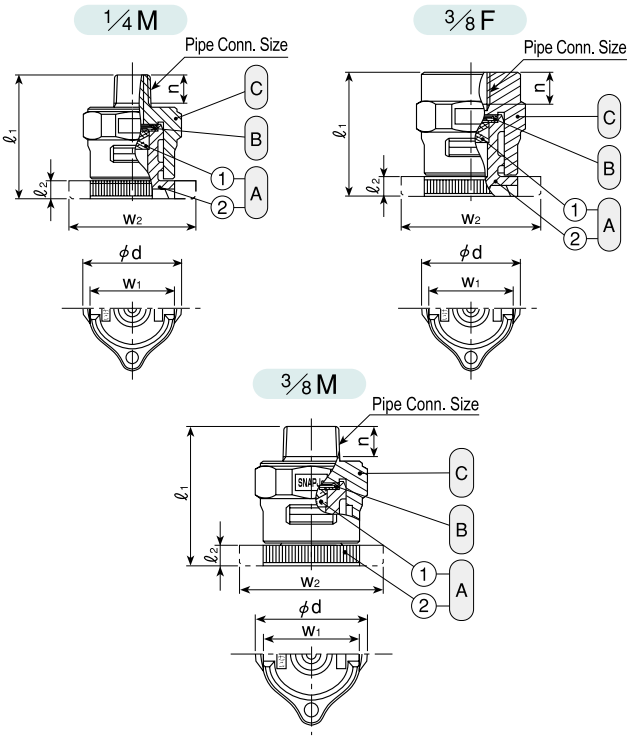
0.2MPa

[Applications]

Shadow mask etching, lead frame etching
High-precision etching for PCB and TAB, etc.

SNAPJet-series

	SNAPJet-series
Structure	• 2-piece structure comprised of adaptor and nozzle with whirler. Nozzle is removable only by turning 90°.
Material	• Nozzle body, adaptor and whirler : PPS(polyphenylene sulfide) • Packing : EPDM • Optional material : Nozzle body made of TN (titanium)



Series	Pipe Conn. Size	Dimensions(mm) ℓ1	ℓ2	ϕd	W1	W2	n	Mass (g)
SNAPJet	¼ M	44	6.5	35	30	45	10	30
	⅜ F	44	6.5	35	30	45	11	40
	⅜ M	44	6.5	35	30	45	10	35

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

Ⓐ Nozzle (①Whirler ②Body) Ⓑ Packing-EPDM Ⓒ Adaptor-PPS

Spray Capacity Code	Pipe Conn. Size (Adaptor) ¼M	⅜F	Spray Angle 0.05 MPa	0.2 MPa	0.5 MPa	Spray Capacity (ℓ/min) 0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
040	○	○	54°	65°	64°	2.10	2.90	3.50	4.00	4.79	6.01	6.98	380	1.6
050	○	○	54°	65°	64°	2.62	3.62	4.37	5.00	5.99	7.51	8.73	≀	2.0
060	○	○	59°	70°	69°	3.15	4.35	5.25	6.00	7.18	9.02	10.5		2.4
070	○	○	64°	75°	74°	3.67	5.07	6.12	7.00	8.38	10.5	12.2	520	2.4

How to order

Please inquire or order for a specific nozzle using this coding system.

① Complete unit

〈Example〉···¼MSNAPJJX040PPS+PPS

¼M (Pipe Conn. Size: ¼M, ⅜F, ⅜M) SNAPJJX 040 (Spray Capacity Code: 040 ≀ 070) PPS+PPS

② Nozzle only

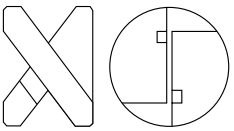
〈Example〉···SNAPJJX040PPS

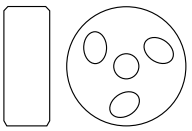
SNAPJJX 040 (Spray Capacity Code: 040 ≀ 070) PPS

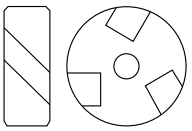
For Effective Use of Full Cone Spray Nozzles

Clogging & Free Passage Diameter

In order to form uniform distribution, full cone spray nozzles are usually fitted with whirlers and this part is the bottleneck of the liquid passage, where clogging problems often occur. Whirlers have several shapes such as X-shaped, disc-shaped and spiral-shaped ones, and the diameter of a sphere that can pass through the whirler is defined as free passage diameter.
As compared with other whirlers, the **X-shaped whirler** has a larger free passage diameter, which minimizes clogging. Some full cone nozzles without whirlers have been developed to eliminate clogging problems, such as the **AJP-series** which features minimal clogging.


X-shaped whirler


Disc whirler


Spiral-shaped whirler

Wear and Corrosion Resistance

If the liquid contains slurry, the inside of the nozzle exposed to the flow of liquid at high speed will wear out relatively quickly. For these applications, the **JUP-series** is ideal, as the orifice and whirler are made of ceramics. **JUXP, AJP-AL92 and TJJX-SiC series** are more effective as all parts are made of ceramics. For corrosive applications, nozzles made of special materials such as plastics and titanium alloy are available.

Weight Savings

For arrangements of many large size nozzles, weight savings of the nozzles affects the total production cost for the systems. The **TJJX-series** with a newly developed X-shaped whirler has a 20% shorter overall length and 20% less weight than conventional nozzles. In addition, the weight of TJJX-SiC is less than half of metal nozzles.

Rotation Reaction Force

In full cone spray nozzles with whirlers, rotation torque is generated as a reaction force by the vortex current produced by the whirler, which is determined by the following equation.

$$T \fallingdotseq C \cdot Q \cdot D \cdot \sqrt{P}$$

T : Torque (N-cm)
C : Constant
Q : Spray capacity (ℓ/min)
D : External dimension of whirler (mm)
P : Spray pressure (MPa)

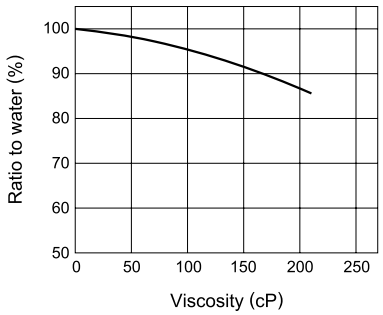
[Example]

Nozzle No.	Torque at pressure of 0.2MPa
¾FJJXP23	2.5N-cm
8TJJX8000	8,000N-cm

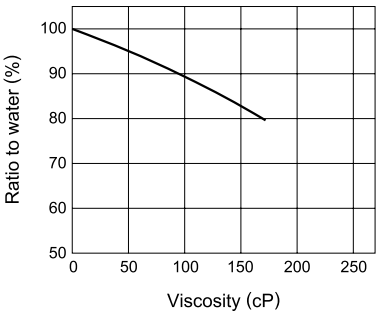
Viscosity

As the viscosity of the liquid increases, generally spray capacity and angle decreases, spray distribution deteriorates and spray droplet size becomes larger.
(Spray capacity of hollow cone spray nozzles increases as the viscosity of liquid increases. See p.55 for details.)

[Relation between viscosity and spray capacity]



[Relation between viscosity and spray angle]



Nozzle tested : JJXP90
Pressure : 0.02-0.03MPa