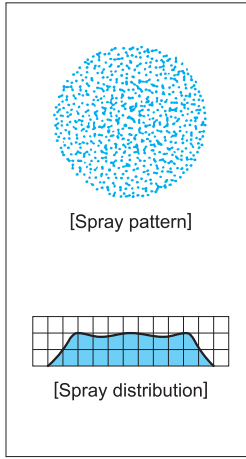


Standard Type Full Cone Spray Nozzles

JJXP

Full Cone



[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]

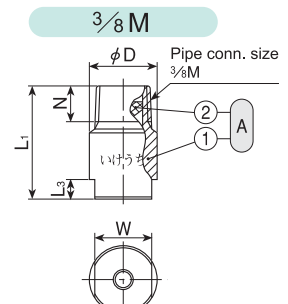
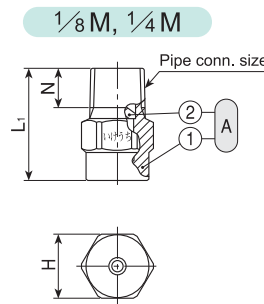
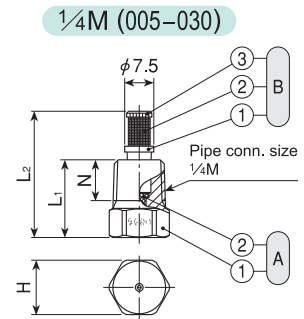
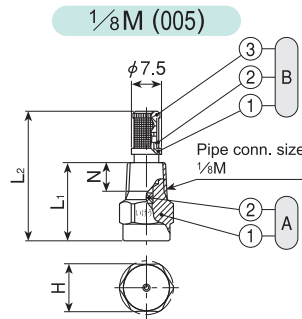
0.2 MPa

[Applications]

- Cleaning: Gas, incinerator fumes, machinery, eliminators, screen, tanks, parts, crushed stones, earth and sand
- Cooling: Gas, machineries, tanks, steels
- Spraying: Waste water treatment, aeration, foam breaking, fire extinguishing, dust suppression, sea water desalination

JJXP series

JJXP series	
Structure	● One-piece structure with press-fit X-shaped whirler.
Material	<ul style="list-style-type: none"> ● Sizes 1/8M–3/8M (3/8F): S303 ● Sizes 1/2F–1F: S303 or B (brass) ● Sizes 1 1/2F or larger: S316 ● Whirler material is mainly S316L equivalent, but depending on nozzle codes, S316 equivalent or SCS16 whirlers are used. ● Optional material: S316, S316L PP, PTFE (for 3/8F sizes and over) <p>[Note] Thread size of optional material may differ depending on materials.</p>



Pipe conn. size*1	Dimensions (mm)							Mass (g)	
	L ₁	L ₂	L ₃	H	W	φD	N	S303 S316	B
1/8M (005)	32.5	20	—	12	—	—	7	9.5*2	—
1/8M (010-030)	20	—	—	12	—	—	7	11	—
1/4M (005-030)	20	32.5	—	14	—	—	10.5	18	—
1/4M (040-060)	28	—	—	14	—	—	10.5	21	—
3/8M	34	—	6	—	17	20	11	50	—
3/8F	43	—	6	—	17	20	11	61	—
1/2F	54	—	8	—	22	25	14	140	150
3/4F	69	—	10	—	27	32	15	270	290
1F	89	—	14	—	34	40	17	515	550
1 1/2F	124	—	20	—	50	58	19	1,520	—
2F (250-350)	160	—	24	—	60	70	23	2,600	—
2F (400-500)	118.5	—	24	—	60	70	23	2,050	—
2 1/2F	147.5	—	27	—	80	90	27	4,360	—
3F (920)	163.5	—	30	—	90	105	30	6,700	—
3F (1200)	170.5	—	30	—	90	105	30	6,500	—

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

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

- A Nozzle** (1)Body (2)Whirler [S316L equivalent])
B Strainer (1)Strainer holder (2)Strainer screen [S316] (3)Strainer cap

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	1/2M	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	0.4
010	○	○			50	55	45	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	1.93	290	0.7
015	○	○			60	65	55	—	0.79	1.09	1.31	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	6.13	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	8.76	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

Spray Capacity Code	Pipe Conn. Size							Spray Angle (°)			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1/2F	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		
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
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	39.4	45.0	53.1	65.4	75.0	86.8	§	4.7
50			○					70	75	60	20.9	26.5	36.4	43.8	50.0	59.0	72.7	83.4	96.4	§	6.0
60			○					80	85	70	25.1	31.8	43.7	52.6	60.0	70.8	87.2	100	116	§	6.0
80			○					90	95	80	33.5	42.4	58.2	70.1	80.0	94.4	116	133	154	§	6.0
90			○					90	95	80	37.7	47.7	65.5	78.9	90.0	106	131	150	174	1,150	6.6
100				○				80	85	70	41.9	52.9	72.8	87.6	100	118	145	167	193	1,000	8.4
150				○				85	90	75	62.8	79.4	109	131	150	177	218	250	289	§	10.3
200				○				90	95	80	83.8	106	146	175	200	236	291	334	386	1,350	10.3
250					○			85	90	75	105	132	182	219	250	295	363	417	482	1,200	12.7
300					○			90	95	80	126	159	218	263	300	354	436	500	579	§	12.7
350					○			90	95	80	147	185	255	307	350	413	509	584	675	§	12.7
400					○			75	80	65	168	212	291	351	400	472	581	667	772	§	13.2
500					○			95	95	80	209	265	364	438	500	590	727	834	964	1,500	13.2
600						○		75	80	65	251	318	437	526	600	708	872	1,001	1,157	1,500	16.9
700						○		85	90	75	293	371	509	613	700	826	1,017	1,167	1,350	1,800	16.9
920							○	100	100	85	385	487	669	806	920	1,086	1,337	1,534	1,775	1,660	18.1
1200							○	105	105	90	503	635	873	1,052	1,200	1,416	1,744	2,001	2,315	1,950	20.0

●.....With strainer (#100 mesh only) ○.....Without strainer

For spraying slurry, the nozzle material should be wear-resistant. For this purpose, the [JUXP-AL92 series] nozzles made of 92% alumina are 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 (*3)	Spray Capacity Code	Material (*4)	Strainer	
1/8M	005	S303	W (with Strainer: JJXP005 only)	
§	§	B	— (without Strainer)	
3F	1200	S316		

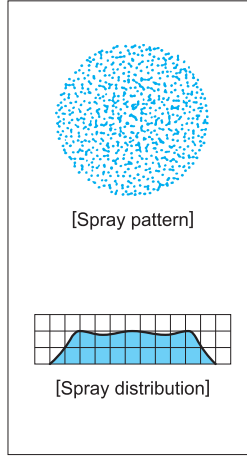
*3) When spray capacity code is 005–030, pipe connection size for 1/4M is indicated as "1/4x1/8M".

*4) See "Material" information on page 57 for standard materials by each size.

Standard Type Full Cone Spray Nozzles

JJXP-PP / JJXP-PVDF

Full Cone



[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]

0.2 MPa

[Applications]

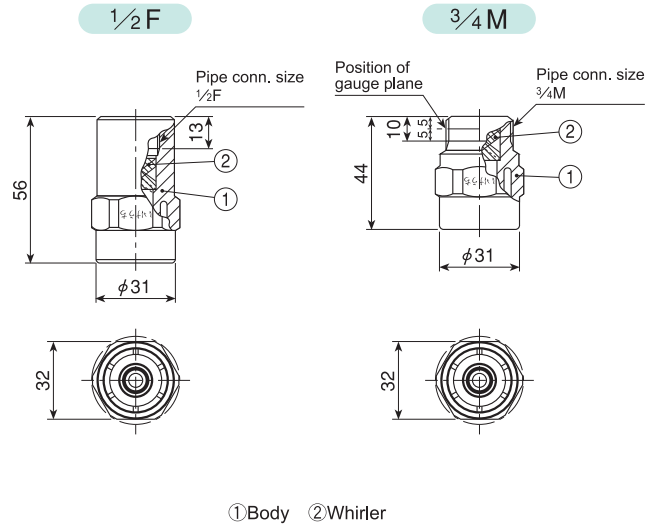
- Cleaning: Machinery, screens, tanks, crushed stones, earth and sand
- Cooling: Machinery, tanks
- Spraying: Waste water treatment, aeration, foam breaking, dust suppression, etching, chemicals

JJXP-PP series

JJXP-PP series	
Structure	• One-piece structure with press-fit X-shaped whirler.
Material	• PP (polypropylene)
Mass	• Size 1/2F: 25.3 g • 3/4M: 17.9 g

[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.

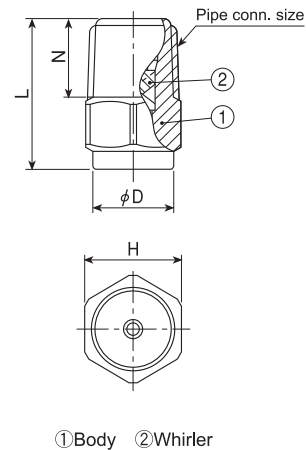


JJXP-PVDF series

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

Pipe conn. size	Dimensions (mm)				Mass (g)
	L	H	φD	N	
1/8 M	18	12	11	8	2.2
1/4 M	22	14	12	11.5	4.1

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



Standard Type Full Cone Spray Nozzles JJXP-PP / JJXP-PVDF series

Full Cone

JJXP-PP series

Spray Capacity Code	Pipe Conn. Size		Spray Angle (°)			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1/2F	3/4M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
2 ¹⁰⁰ / ₂		○	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 / ₃		○	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 / ₄	○	○	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 / ₅	○	○	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 / ₆	○	○	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 / ₈	○	○	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

JJXP-PVDF 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	0.3 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 series

〈Example〉...1/2FJJXP 2¹⁰⁰/₁₄ PP

1/2F	JJXP	2 ¹⁰⁰ / ₁₄	PP
Pipe Conn. Size		Spray Capacity Code	
1/2 F		2 ¹⁰⁰ / ₁₂	
3/4 M		∩	
		2 ¹⁰⁰ / ₂₀	

② JJXP-PVDF series

〈Example〉...1/8MJJXP010PVDF

1/8M	JJXP	010	PVDF
Pipe Conn. Size		Spray Capacity Code	
1/8 M		010	
1/4 x 1/8 M(*1)		∩	
		030	

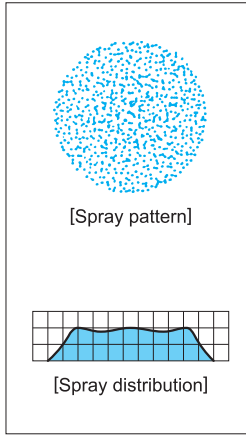
*1) Pipe Connection Size code for 1/4M is "1/4x1/8M" in JJXP-PVDF series.

Standard Type Full Cone Spray Nozzles

JJXP-HTPVC/JJXP-PVC

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

Full Cone



[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]

0.2 MPa

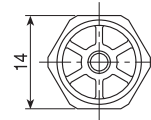
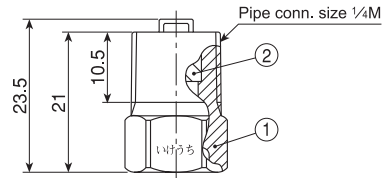
[Applications]

Spraying: Etchants, chemicals
Cleaning: Printed circuit boards

JJXP-HTPVC series

JJXP-HTPVC series	
Structure	● One-piece structure with removable X-shaped whirler.
Material	● HTPVC (heat-treated polyvinyl chloride)
Mass	● 2.5 g

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

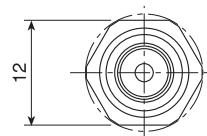
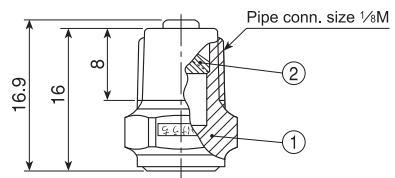


①Body ②Whirler

JJXP-PVC series

JJXP-PVC series	
Structure	● One-piece structure with removable X-shaped whirler.
Material	● PVC (polyvinyl chloride)
Mass	● 1.4 g

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



①Body ②Whirler

Standard Type Full Cone Spray Nozzles JJXP-HTPVC / JJXP-PVC series

Full Cone

■ JJXP-HTPVC 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		
040	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	5	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 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		
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 series

〈Example〉... 1/4MJJXP040HTPVC

1/4M JJXP **040** HTPVC

Spray Capacity Code
040
050
060

② JJXP-PVC series

1/8M JJXP 2-75/2 PVC

Effective Use of Full Cone Spray Nozzles

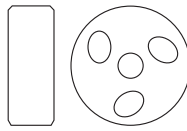
Clogging and Free Passage Diameter

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.

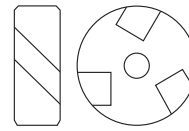
As compared with other whirlers, the **X-shaped whirler** has a larger free passage diameter, which minimizes clogging. Some full cone nozzles without whirlers have been developed to eliminate clogging problems, such as the **AJP series** nozzle which features minimal clogging.



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** nozzle is ideal, as the orifice and whirler are made of ceramics. **JUXP, AJP-AL92 and TJJX-SiC series** nozzles 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.

Mass Savings

For arrangements of many large size nozzles, mass savings of the nozzles affects the total production cost for the systems. The **TJJX series** nozzle with a newly developed X-shaped whirler has a 20% shorter overall length and 20% less mass than conventional nozzles. In addition, the mass of TJJX-SiC series nozzle (made of silicon nitride bonded silicon carbide) 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.

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

[Example]

Nozzle No.	Torque at pressure of 0.2 MPa
¾FJJXP23	0.025 N-m
6TJJX4000	3,000 N-m

T: Torque (N-m)

C: Constant

Q: Spray capacity (ℓ/min)

D: External dimension of whirler (mm)

P: Spray pressure (MPa)

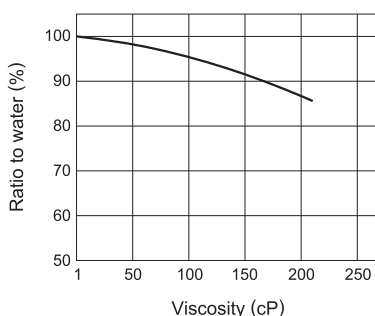
Viscosity

As the viscosity of the liquid increases, generally spray capacity and angle decreases, spray distribution deteriorates and spray droplet size becomes larger.

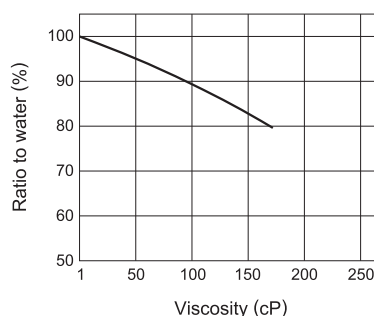
(Spray capacity of hollow cone spray nozzles increases as the viscosity of liquid increases.

See page 55 for details.)

[Relation between viscosity and spray capacity]



[Relation between viscosity and spray angle]



Nozzle tested: JJXP90
Pressure: 0.02–0.03 MPa