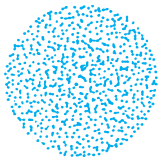
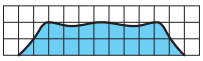
Small Capacity
Full Cone Spray Nozzles

JJRP



[Spray pattern]



[Spray distribution]

[Features]
- Small capacity full cone spray nozzles made of excellent wear-resistant PTFE (polytetrafluoroethylene) and injection molded PVDF (polyvinylidene fluoride).
- Disc whirler is designed to provide uniform spray distribution at small spray capacity.

[Standard Pressure]
0.2 MPa

[Applications]
Spraying: Etchants, acid liquids
Cleaning: When spraying pure water

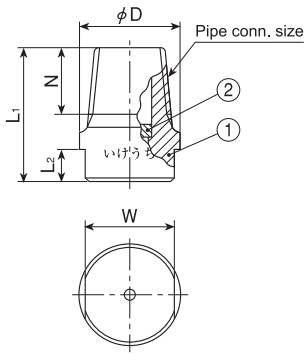
JJRP series

	JJRP series
Structure	● One-piece structure with press-fit disc whirler. ● JJRP-PVDF nozzle body is injection molded.
Material	● PTFE (polytetrafluoroethylene), PVDF (polyvinylidene fluoride)

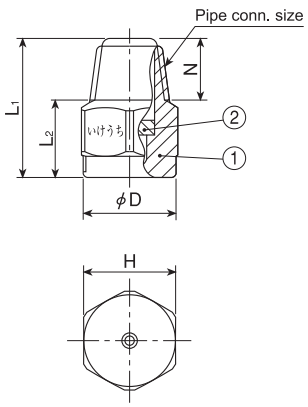
Series	Pipe conn. size	Dimensions (mm)						Mass (g)
		L_1	L_2	H	W	ϕD	N	
JJRP-PTFE	1/8M	16	4	—	10	12	7	2
	1/4M	21	5	—	14	16	10.5	5
JJRP-PVDF	1/8M	18	10	12	—	11	8	2
	1/4M	22	10.5	14	—	12	11.5	4.1

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

JJRP-PTFE



JJRP-PVDF



①Body ②Whirler

Spray Capacity Code	Pipe Connection Size				Spray Angle (°)			Spray Capacity (ℓ/min)								Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	JJRP-PTFE		JJRP-PVDF														
	1/8M	1/4M	1/8M	1/4M	0.15 MPa	0.2 MPa	0.5 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	○	○	○	○	56	60	60	—	0.36	0.44	0.50	0.59	0.74	0.85	0.99	260	0.4
007	○	○	○	○	60	65	62	—	0.51	0.61	0.70	0.83	1.03	1.19	1.39		0.6
010	○	○			63	65	62	—	0.73	0.88	1.00	1.19	1.48	1.70	1.98	≀	0.8
015	○	○			64	70	72	0.79	1.09	1.31	1.50	1.78	2.22	2.56	2.98		1.0
020	○	○			64	70	72	1.06	1.45	1.75	2.00	2.38	2.95	3.41	3.97		1.2
030	○	○			75	80	78	1.58	2.18	2.63	3.00	3.56	4.43	5.11	5.95	410	1.3
040		○			67	70	65	2.11	2.91	3.50	4.00	4.75	5.91	6.82	7.93	380	1.4
050		○			76	80	70	2.64	3.63	4.38	5.00	5.94	7.38	8.52	9.92	≀	1.6
060		○			88	90	80	3.17	4.36	5.26	6.00	7.13	8.86	10.2	11.9	520	1.6

*Only the nozzles with white circle "○" in the above table are available.

How to order

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

① JJRP-PTFE series

〈Example〉···1/8MJJRP005PTFE

1/8M (Pipe Conn. Size) JJRP 005 (Spray Capacity Code) PTFE

Pipe Conn. Size
- 1/8M
- 1/4M(*1)

Spray Capacity Code
- 005
- ≀
- 060

② JJRP-PVDF series

〈Example〉···1/8MJJRP007PVDF

1/8M (Pipe Conn. Size) JJRP 007 (Spray Capacity Code) PVDF

Pipe Conn. Size
- 1/8M
- 1/4M(*1)

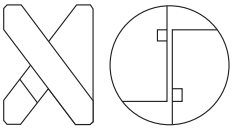
Spray Capacity Code
- 005
- 007

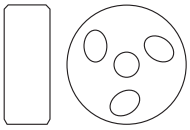
*1) When Spray Capacity Code is 005–030, Pipe Connection Size for 1/4M is indicated as "1/4x1/8M".

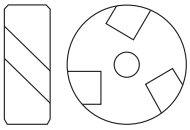
Effective Use of Full Cone Spray Nozzles

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.

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

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

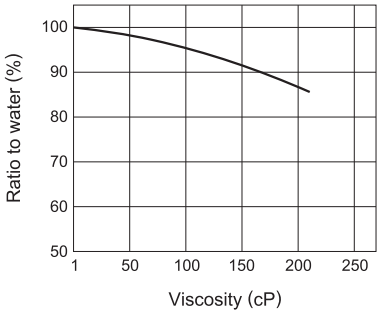
[Example]

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

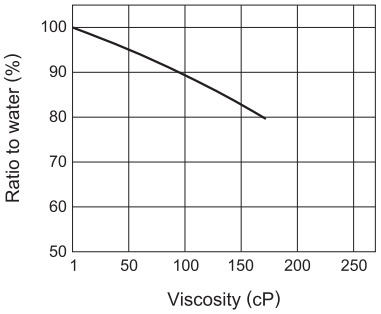
Viscosity

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