


Hydraulic Spray Nozzles



“The Fog Engineers”
H. IKEUCHI & CO., LTD.

23H

Fog, Humanity and IKEUCHI



Fog, covering the earth, growing forests and moistening the air, has always been closely related to our lives.

Crops essential to our life grow by absorbing moisture from the air, as well as their roots. Fog plays a part in converting undergrowth and fallen leaves into organic fertilizer. Additionally, textile production's weaving techniques were developed in areas near rivers, because the river's fog produced the proper humidity needed.

We wanted to create this fog, which had played such an important role in our existence and had been key to the development of society. This desire was the origin for IKEUCHI's idea to "sell fog" as an industrial material. With nozzles as our instruments IKEUCHI, "The Fog Engineers", has utilized the research and development of new technologies to provide products capable of producing a wide range of droplet sizes that can accommodate all applications and a variety of liquids, in shapes that are easy to use.

The evolution of the industrial spray nozzle is our history. Based on our accumulated knowledge of advanced technology as fog engineers, we continually pursue new methods to generate and utilize fog. We strive to meet the evolving and advancing needs of our customers, and will continue to contribute to the development of the industrial world.



Table of Contents

■ This catalog offers IKEUCHI's hydraulic spray nozzles, which are divided into the following sections: flat spray nozzles, hollow cone and full cone spray nozzles, solid stream jet nozzles, and special spray nozzles.

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Product Lineup

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Flat Spray Nozzles	Standard Flat Spray	<ul style="list-style-type: none"> ● One-piece structure standard flat spray ● Three-piece structure standard flat spray ● Quick detach stainless steel nozzles ● Coin-shaped design ● Quick detach plastic nozzles <ul style="list-style-type: none"> ● Quick detach plug ● Quick detach nozzle connector 	VVP series p.10 VP series p.10 VVP (S316L-IN) series p.13 UVVP series p.14 VV series p.15 V series p.15 INVV-SS series p.18 INV series p.18 CVVP series p.20 INVV series p.21 IN PLUG series p.22 INCO series p.23
	Even Flat Spray	<ul style="list-style-type: none"> ● Even flat spray ● Quick detach stainless steel nozzles ● High pressure cleaning nozzles ● Descaling nozzles 	VEP series p.24 VE series p.24 INVE series p.27 VNP series p.29 DSP series p.31
	Wide-angle Flat Spray	<ul style="list-style-type: none"> ● Wide-angle flat spray ● Wide-angle flat spray for ultra-low pressure 	YYP series p.33 LYYP series p.35
	Off-center Even Flat Spray	<ul style="list-style-type: none"> ● Off-center even flat spray ● Quick detach plastic nozzles 	OVVEP series p.37 INOVE series p.39
	Special Nozzles	<ul style="list-style-type: none"> ● Foam nozzles ● Self-cleaning flat spray ● Air & steam spray ● Flat spray with ON/OFF control ● Universal-jointed flat spray ● Quick-installation nozzles <ul style="list-style-type: none"> ● QB series related products 	AWVV series p.40 MOMOJet series p.41 VZ series p.42 SO-V series p.44 SO-VV series p.44 UT + VP series p.47 QB series p.48 BAA+QB, QBP, IS PLUG p.50
Cone Spray Nozzles	Hollow Cone Spray	<ul style="list-style-type: none"> ● Extremely fine fog and ultra-low flow rate ● Semi-fine atomization and low flow rate ● Low flow rate ● Medium capacity ● Medium capacity / Alumina ceramic ● Flange connection, large capacity 	KB series p.52 KBN series p.54 K series p.55 KKBP series p.56 KD series p.57 AAP series p.58 AP-AL92 series p.59 TAA series p.60
	Full Cone Spray	<ul style="list-style-type: none"> ● Standard full cone spray 	JJXP series p.61 INJJX-SS series p.63 JJXP-PVDF series p.64 JJXP-HTPVC series p.65 JJXP-PVC p.65

Cone Spray Nozzles	Full Cone Spray	<ul style="list-style-type: none"> Quick detach plastic nozzles Ceramic orifice and whirler inserted nozzles Alumina ceramic nozzles Low flow rate Flange connection, large capacity Wide-angle full cone spray Narrow-angle full cone spray Clog-resistant vaneless nozzles Clog-resistant / Alumina ceramic 	INJXX series p.67 JUP series p.68 JUXP-AL92 series p.70 JJRP series p.71 J series p.72 TJXX series p.73 BBXP series p.75 BBXP-PVDF series p.75 BBXP-PVC p.75 NJJP series p.77 AJP series p.78 AJP-PPS series p.78 AJP-AL92 series p.80 SSXP series p.81 SSXP-HTPVC p.81 SPB series p.83 7KB series p.84 7JJXP series p.85 13JJXP series p.86 TSP series p.86
	Square Spray	<ul style="list-style-type: none"> Square spray nozzles 	
	Special Nozzles	<ul style="list-style-type: none"> SPILLBACK nozzles for gas cooling Seven-head type, extremely fine atomization Seven-head type 13-head type Multi-orifice semi-fine fog nozzles 	
Solid Stream Jet Nozzles	Solid Stream Spray	<ul style="list-style-type: none"> Standard solid stream Convex round inlet solid stream Paper trimming nozzle 	CCP series p.88 CP series p.88 CCRP series p.91 CRP series p.91 CM-FB series p.92 2CM-FB series p.92 CMP-T series p.94 CTM series p.94 CM series p.94 2CCP-7CCP series p.96 2CP-7CP series p.96 MOMOJet "C" series p.98 RSP series p.99 RSP-R p.101 SO-CC series p.102 SO-CM series p.102 UT + CP series p.104 p.105 EJX series p.106 SLNH-H series p.107 SLNHA-H series p.107
	Multi-orifice Solid Stream Spray	<ul style="list-style-type: none"> Multi-orifice solid stream 	
	Special Nozzles	<ul style="list-style-type: none"> Self-cleaning solid stream Pipe cleaning nozzles Solid stream with ON/OFF control Universal-jointed solid stream Surface washing nozzles Ejector nozzles Slit laminar nozzles 	
Accessories		<ul style="list-style-type: none"> Universal ball joints 	UT series p.108 WUT p.109

Technical Data for Nozzles

pp.110–

Technical references to help select spray nozzles and ensure their most effective use.

● Spray Performance to Consider	p.110
● Spray Nozzle Characteristics	p.115
● Conversion of Units	p.120
● How to Use the CAD Data Website	p.121

Specifications of the products and contents of this catalog are subject to change without prior notice for purpose of product improvement.

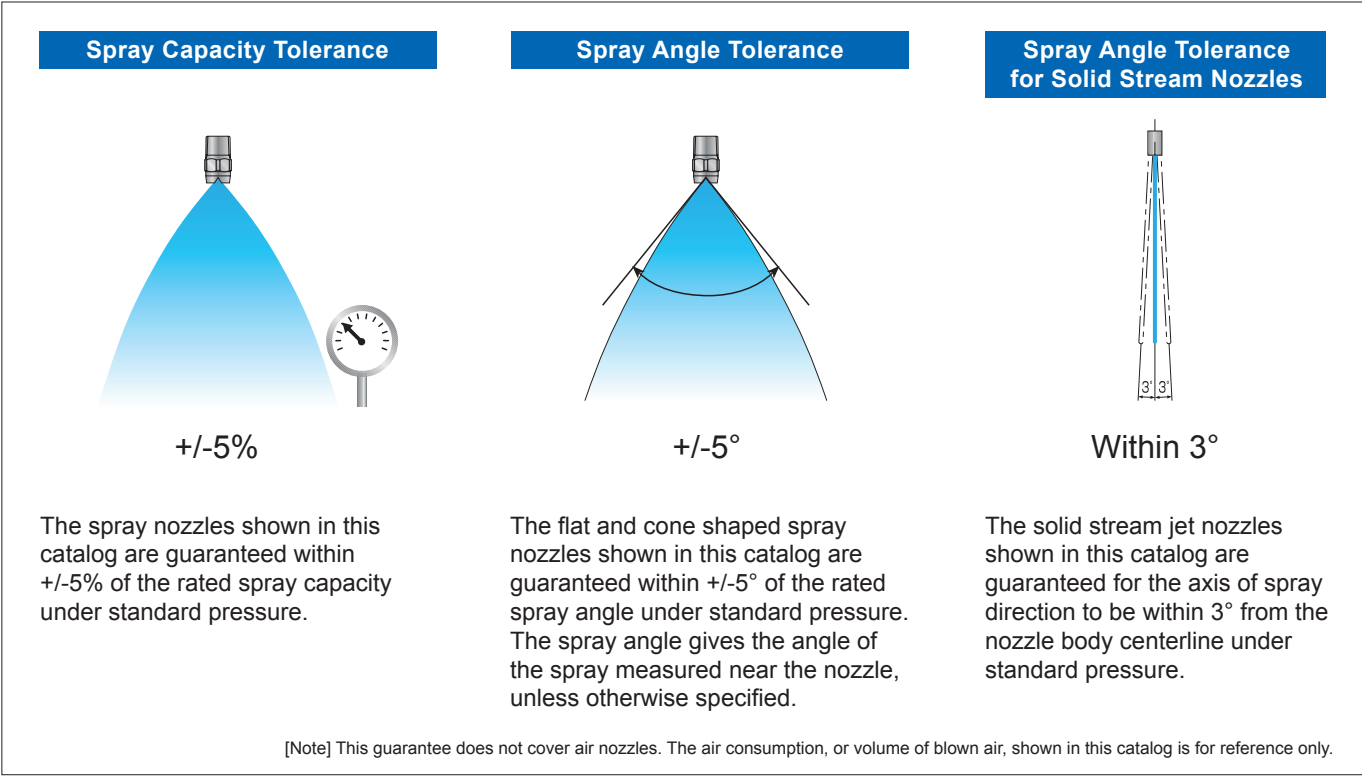
Spray Nozzle Basics

Spray Nozzle Precision Guarantee

All IKEUCHI's precision-made hydraulic spray nozzles are guaranteed for spray capacity and spray angle.

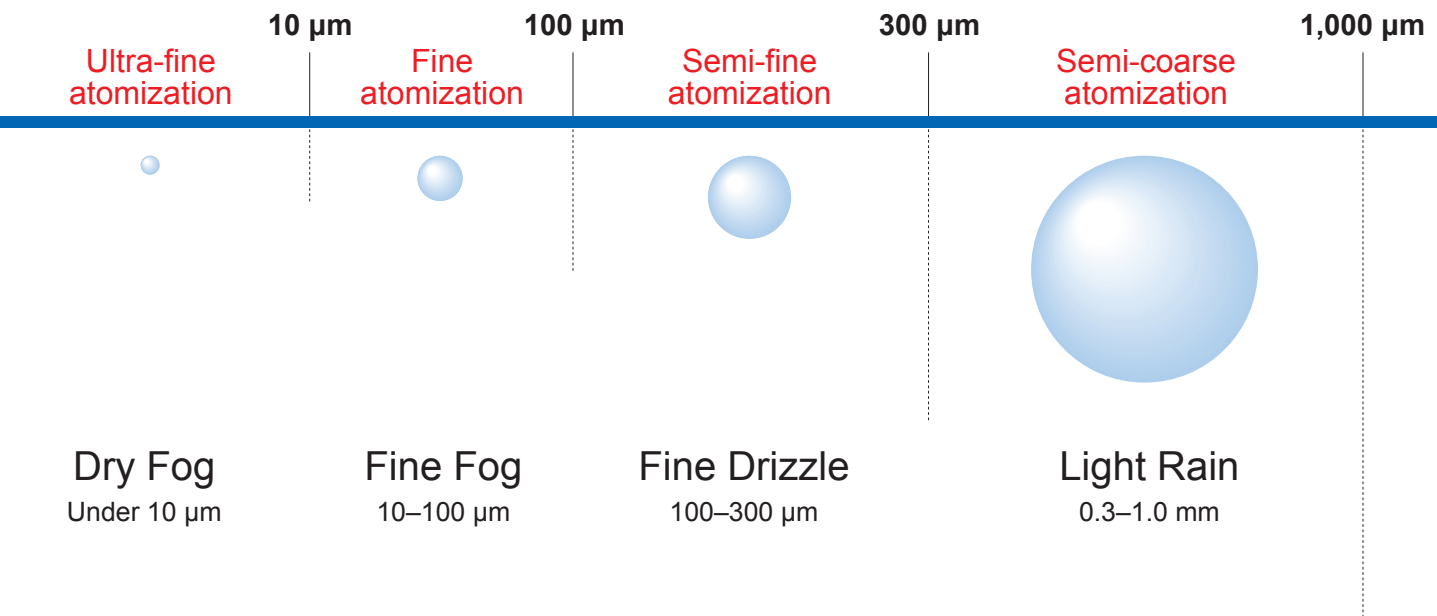
This guarantee covers metal, plastic, and ceramic nozzles.

We also set our own inspection standard for spray pattern and only the nozzles that pass the inspection will be shipped.



Fog Classification System

This classification is based on the spray droplet size, by measuring the spray droplet diameter with the immersion sampling method.

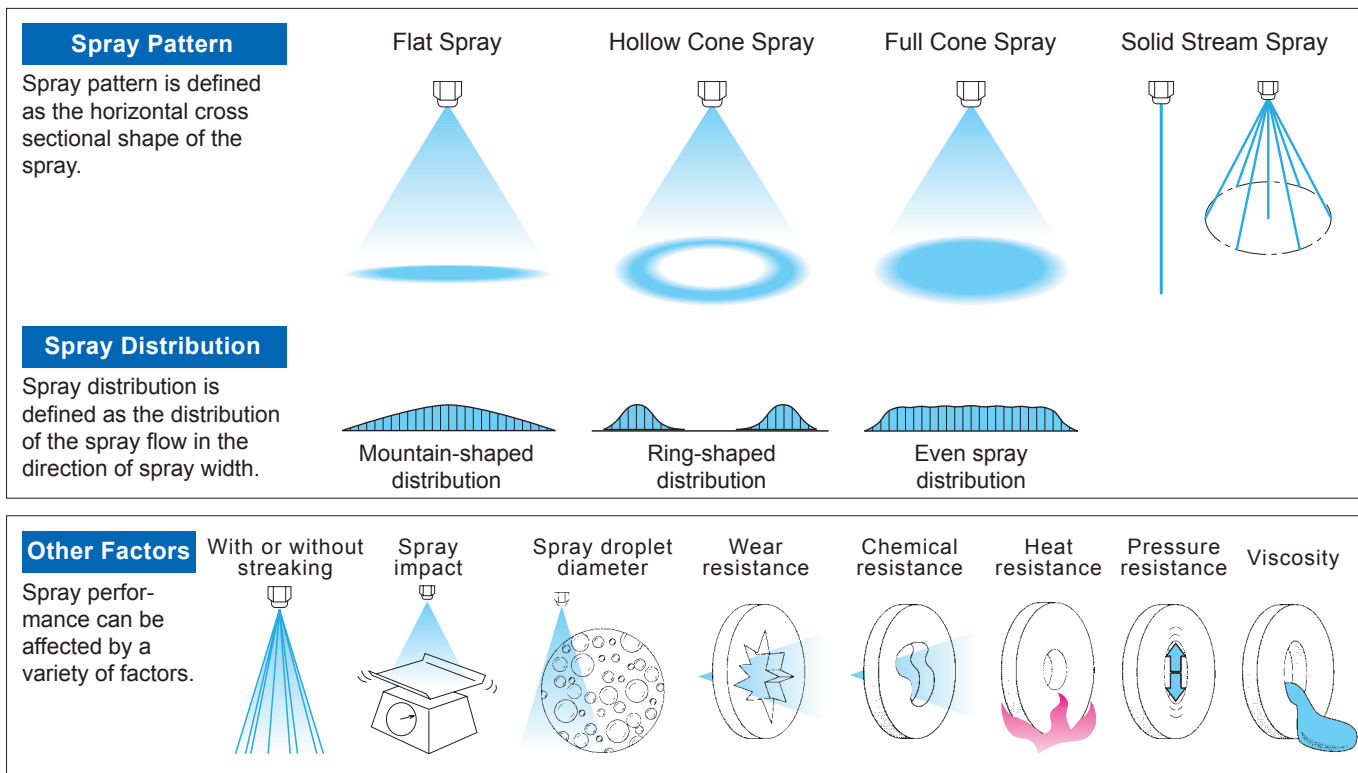


Spray Pattern and Distribution

Standard pressure, or design pressure, is defined as the most commonly used liquid pressure for each hydraulic spray nozzle series. Our nozzles are designed to provide the specified spray capacity, spray angle, optimal spray pattern, and spray distribution at each standard pressure.

The values in this catalog are based on tap water at room temperature and the liquid pressure is measured right at the nozzle.

For details please see the technical references at the end of this catalog.



Although there are many opinions on the classification of spray droplet sizes, IKEUCHI, "The Fog Engineers", classify them as shown below.

Coarse
atomization

Rain-Storms
Over 1.0 mm

Spray Nozzle Materials

Listed below are the materials of nozzles and parts, as well as resistance characteristics of each material against common chemicals. For more information on resistance characteristics, please see the technical references at the end of this catalog.

The standard and optional materials available for the nozzles are shown in the material table of each nozzle series page, using the material codes shown on this page.

If you need a specific nozzle material that is not mentioned in the material table, please contact us.

Material List

Metals	[Material code Material]
	S303 Stainless steel 303
	S304 Stainless steel 304
	S316 Stainless steel 316
	S316L Stainless steel 316L
	SCS13 Die-cast stainless steel equiv. to S304
	SCS14 Die-cast stainless steel equiv. to S316
	SCS16 Die-cast stainless steel equiv. to S316L
	S420J2 Hardened stainless steel 420J2
	B Brass C3604

Rubbers	[Material code Material]
	NBR Nitrile rubber
	FKM Fluororubber
	FEPM Tetrafluoroethylene-propylene rubber
	EPDM Ethylene-propylene rubber

Ceramics	CERJET® Ceramics
	Alumina ceramics (Alumina 92%, etc.)
	[Material code Material]
	SiC Silicon nitride bonded silicon carbide
	SiSiC Sintered reaction-bonded silicon carbide

Plastics	[Material code Material]
	PP Polypropylene
	PPS Polyphenylene sulfide
	PVC Polyvinyl chloride
	HTPVC Heat-treated polyvinyl chloride
	PTFE Polytetrafluoroethylene
	PCTFE Polychlorotrifluoroethylene
	PVDF Polyvinylidene fluoride
	FRPP Glass-fiber reinforced polypropylene
	PA Polyamide
	PE Polyethylene
	Ultrahigh molecular weight polyethylene (UHMWPE)
	Polyester elastomer
	Araldite®*1 Epoxy resin (Adhesive)
	Araldite®H High-temperature epoxy resin (Adhesive)

*1) Araldite is the registered trademark of Huntsman Advanced Materials.

Oil-free options are available at additional cost.
Contact us for details.

Table of Chemical and Heat Resistance

Items		Chemical resistance												Heat resistance*2	
		Hydrochloric acid	Concentrated Hydrochloric acid	Sulfuric acid (35%)	Concentrated sulfuric acid	Nitric acid (35%)	Concentrated nitric acid	Acetic acid	Sodium hydroxide (caustic soda)	Aqueous ammonia	Acetone	Trichloroethylene	Ethyl alcohol	Suitable (°C)	Short-term use only (°C)
Metals	S303	×	×	×	×	○	△	△	○	○	○	○	○	400	800
	S304	×	×	×	×	○	○	○	○	○	○	○	○	400	800
	S316, S316L	×	×	×	○	○	△	○	○	○	○	○	○	400	800
	B	×	×	×	×	×	×	×	△	△	○	○	○	200	400
Plastics	PP	○	△	○	×	×	×	○	○	○	○	△	○	80	90
	PPS	○	○	○	△	△	×	○	○	○	○	○	○	170	180
	PVC	○	○	○	○	○	×	○	○	○	×	×	○	40	50
	HTPVC	○	○	○	○	○	×	○	○	○	×	×	○	50	70
	PTFE	○	○	○	○	○	○	○	○	○	○	○	○	100	150
	PVDF	○	○	○	○	○	○	○	△	○	×	○	○	80	120
	FRPP	○	△	○	×	×	×	○	△	○	○	△	○	90	100
	PA	×	×	×	×	△	△	△	○	○	○	○	△	130	230
	UHMWPE	○	○	○	×	△	×	○	○	○	△	△	○	80	100
	Polyester elastomer	×	×	×	×	×	×	○	△	×	△	△	○	100	120
	Araldite®	△	×	△	×	×	×	×	×	×	×	×	×	60	70
	Araldite®H	○	×	○	△	×	×	○	△	○	○	○	○	120	140
Rubbers	NBR	×	×	×	×	×	×	○	○	○	×	△	○	90	120
	FKM	○	○	○	○	○	○	○	△	×	×	○	○	150	200
	FEPM	○	○	○	○	○	○	○	○	×	×	○	○	150	200
	EPDM	○	△	○	△	×	×	○	○	○	○	×	○	90	120
Ceramics*3	CERJET® ceramics	○	○	○	○	○	○	○	×	○	○	○	○	700	800
	Alumina ceramics	○	○	○	○	○	○	○	△	○	○	○	○	1,000	1,200
	SiC	○	○	○	○	○	○	○	△	○	○	○	○	1,550	1,550
	SiSiC	○	○	○	○	○	○	○	△	○	○	○	○	1,350	1,350

*2) The heat resistance (operating temperature limit) of spray nozzles varies widely depending on the operating conditions, environment, liquid sprayed, etc.

*3) Ceramic should be used at temperatures under 100°C to avoid a crack caused by heat shock.

Note: As for the spray nozzles including adhesive, please also take into account the heat/chemical resistance of the adhesive.

○ ... Suitable
△ ... Possible for short term
× ... Unusable

How to Read the Tables

■ Spray nozzle specifications are shown in the respective tables.

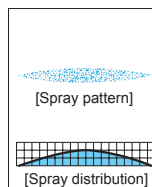
One-piece Structure Standard Flat Spray Nozzles

Some Models are Made-to-Order


VVP/VP



- The photo of spray at the standard pressure



[Spray pattern]



[Spray distribution]

- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Tapered edges overlap to provide uniform spray distribution in multi-nozzle arrangements.

[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]

Cleaning: Automotives, containers, films, felts, filters,

- Figures showing stylized/simplified spray pattern and distribution

Structure	<ul style="list-style-type: none"> One-piece structure, made of metal or plastic. Small spray capacity VVP nozzles made of metal come with or without a strainer.
Material	<ul style="list-style-type: none"> S303, PP, or PVDF <p>SPECIAL ORDER MATERIAL: S316, PVC, or others</p>

- Standard material

- Optional material only available on a made-to-order basis

- Spray angle code at standard pressure (115)

- Spray capacity code at standard pressure (03)

- Thread type* and size of spray nozzle:
R1/4: 1/4" male taper pipe thread
Rc1/4: 1/4" female taper pipe thread

- Series (VVP)

- Plastic nozzle molded around a ceramic orifice

- Spray angle at the specified pressure (124° at 0.7 MPa)

- Calculated spray capacity at the specified pressure (0.21 L/min at 0.15 MPa)

- Spray capacity at standard pressure (0.30 L/min at 0.3 MPa)

- Range of Sauter mean droplet diameter measured by immersion sampling method

Minimum passage
diameter
(approximate value)

[illegible]

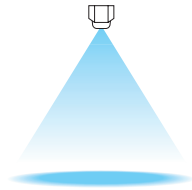
- shows availability of the item.
- : Available with or without strainer
- : Only available without strainer
- No mark: Not available

- At 0.05 MPa, defined spray pattern does not develop

Mesh size number of strainer

Threads noted in this catalog are tapered pipe threads unless otherwise specified. The connection thread size and type are described according to the ISO standard. When ordering our nozzles, please specify the thread size using our thread code as shown on the right. For mixed fractions, our thread size code inserts "" after the whole number, for example "1*1/4M" for "R1 1/4".

Thread type	ISO standard	British standard	Our thread code
Male tapered pipe threads	R1/4	1/4 BSPT male	1/4M
Female tapered pipe threads	Rc1/4	1/4 BSPT female	1/4F



Product Lineup

Flat Spray Nozzles

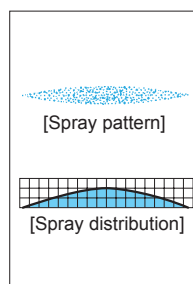
Standard Flat Spray Nozzles	pp.10–
	<ul style="list-style-type: none"> One-piece Structure: VVP / VP, UVVP Three-piece Structure: VV / V Quick-detach Metal Nozzles: INVV-SS / INV Coin-shaped Design: CVVP Quick-detach Plastic Nozzles: INVV
Accessories	<ul style="list-style-type: none"> Quick-detach Plug: IN PLUG Quick-detach Nozzle Connector: INCO
Even Flat Spray Nozzles	pp.24–
	<ul style="list-style-type: none"> Even Flat Spray Nozzles: VE / VEP Quick-detach Metal Nozzles: INVE High pressure Cleaning Nozzles: VNP Descaling Nozzles: DSP
Wide-angle Flat Spray Nozzles	pp.33–
	<ul style="list-style-type: none"> Wide-angle Flat Spray Nozzles YYP Wide-angle Flat Spray Nozzles for Ultra-low Pressure: LYYP
Off-center Even Flat Spray Nozzles	pp.37–
	<ul style="list-style-type: none"> Off-center Even Flat Spray Nozzles: OVVEP Quick-detach Plastic Nozzles: INOVVE
Special Flat Spray Nozzles	pp.40–
	<ul style="list-style-type: none"> Foam Nozzles: AWVV Self-cleaning Flat Spray Nozzles: MOMOJet® Air & Steam Spray Nozzles: VZ Flat Spray Nozzles with ON/OFF Control: SO-V / SO-VV Universal-jointed Flat Spray Nozzles: UT + VP Quick-installation Nozzles: QB

One-piece Structure Standard Flat Spray Nozzles

Some Models are Made-to-Order

VVP/VP

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Tapered edges overlap to provide uniform spray distribution in multi-nozzle arrangements.

[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]

Cleaning: Automotives, containers, films, felts, filters, screens, bottles, crushed stone, earth and sand, metal parts, machines, steel plates and pieces
Spraying: Etchants, oils, lubricants, liquids, solutions, insecticides, herbicides
Cooling: Gas, heat exchangers, tanks, steel, roofs
Water screen: Fire protection, heat protection, dust suppression, deodorization

VVP SERIES

Size R1/2 or larger: made-to-order

Structure	<ul style="list-style-type: none"> • One-piece structure, made of metal or plastic. • Small spray capacity VVP nozzles made of metal come with or without a strainer. 		
Material	<ul style="list-style-type: none"> • S303, PP, or PVDF <p>SPECIAL ORDER MATERIAL: S316, PVC, or others</p>		

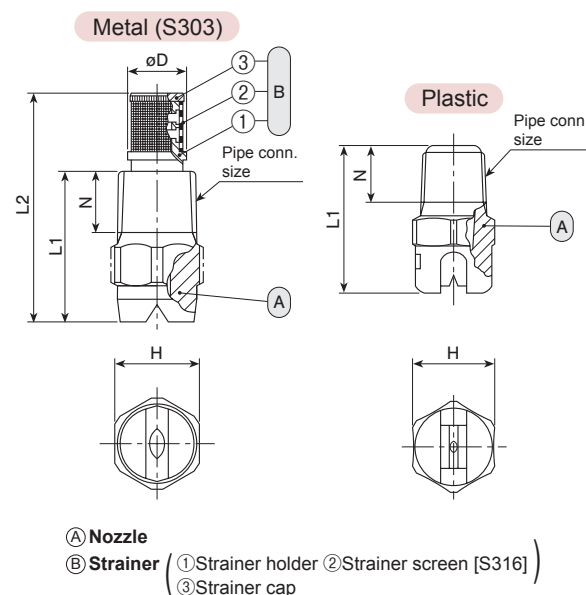
Material	Pipe conn. size	Dimensions (mm)					Weight (g)		
		L1	L2	H	øD	N	S303	PP	PVDF
Metal ^{1,2}	R1/8	18.5	31	12	7.5	6.5	10	—	—
	R1/4	25	40	14	10	10.5	21	—	—
	R3/8	30	—	19	—	10.5	37	—	—
	R1/2	38	—	23	—	14	65	—	—
	R3/4	45	—	29	—	15	110	—	—
Plastic	R1	55	—	35	—	18	170	—	—
	R1/8	22	—	12	—	8.5	—	1.1	2.1
	R1/4	27	—	14	—	11.5	—	2.2	4.3

*1) VVP nozzles with a spray capacity code of 20 or smaller differ in dimension (L1, L2) and shape. Contact us for details.

*2) With strainer, add 2 g for R1/8 and 5 g for R1/4 to the above weight.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



① Nozzle
② Strainer (① Strainer holder ② Strainer screen [S316] ③ Strainer cap)

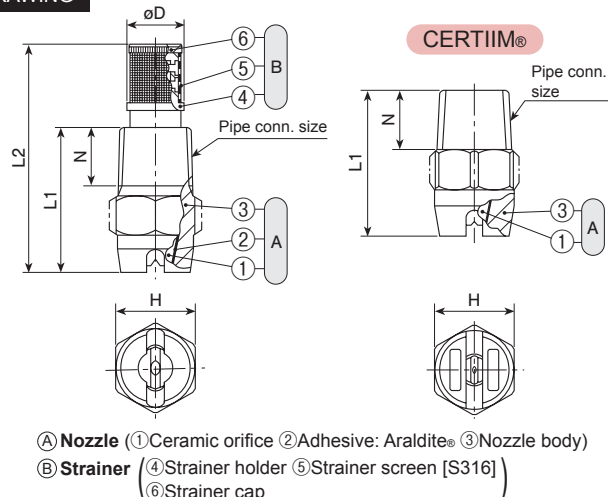
VP SERIES (with ceramic orifice)

Structure	<ul style="list-style-type: none"> • One-piece structure with a ceramic orifice insert. • Small spray capacity VP nozzles made of metal come with or without a strainer. • CERTIIM is a one-piece plastic nozzle molded around a ceramic orifice. 		
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303 or B (brass) • CERTIIM's plastic body: PVDF <p>SPECIAL ORDER MATERIAL: S316 or others</p>		

Body material	Pipe conn. size	Dimensions (mm)					Weight (g)		
		L1	L2	H	øD	N	S303	B	CERTIIM
Metal ²	R1/8	16.5	30	12	7.5	6.5	8	9	—
	R1/4	26	40	14	10	10.5	20	22	—
PVDF (CERTIIM)	R1/8	22	—	12	—	8.5	—	—	2.1
	R1/4	26	—	14	—	10.5	—	—	6

*2) With strainer, add 2 g for R1/8 and 5 g for R1/4 to the above weight.

DRAWING



① Nozzle (① Ceramic orifice ② Adhesive: Araldite® ③ Nozzle body)
② Strainer (④ Strainer holder ⑤ Strainer screen [S316] ⑥ Strainer cap)

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

One-piece Structure Standard Flat Spray Nozzles

VVP/VP SERIES

VVP Series, VP Series

Spray angle code	Spray capacity code	Pipe connection size												Spray angle (°)			Spray capacity (L/min)								Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size	
		VVP ³						VP																				
		All metal						All plastic		Metal		CER-TIIM		0.15 MPa	0.3 MPa	0.7 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 MPa
		R1/8	R1/4	R3/8	R1/2	R3/4	R1	R1/8	R1/4	R1/8	R1/4	R1/8	R1/4															
115	03							○	○	●	●	○	○												101	115	124	
	04							○	○	●	●	○	○	102	115	124	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	160	0.2	200
	05							○	○	●	●	○	○	102	115	124	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	160	0.3	150
	07							○	○	●	●	○	○	103	115	124	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	160	0.3	150
	10							○	○	●	●	○	○	103	115	124	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	0.4	150	
	15	●	●					○	○	●	●	○	○	104	115	123	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	0.5	100	
	20	●	●					○	○	●	●	○	○	104	115	123	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	270	0.6	100
	30	●	●					○	○	●	●	○	○	105	115	122	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	0.8	50	
	40	●	●					○	○	●	●	○	○	106	115	122	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	0.8	50	
	60	○	○											107	115	121	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	1.0	—	
	80	○	○											107	115	121	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	1.2	—	
	100	○	○											107	115	120	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	1.7	—	
	200		○											109	115	120	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	510	2.4	—
	230		○											109	115	119	9.39	13.3	16.3	18.8	23.0	29.7	35.1	42.0	59.4	2.7	—	
	260			○										109	115	119	10.6	15.0	18.4	21.2	26.0	33.6	39.7	47.5	67.1	2.8	—	
	300			○										109	115	119	12.2	17.3	21.2	24.5	30.0	38.7	45.8	54.8	77.5	3.0	—	
	400				○									110	115	118	16.3	23.1	28.3	32.7	40.0	51.6	61.1	73.0	103	580	3.5	—
	500				○	○								110	115	118	20.4	28.9	35.4	40.8	50.0	64.6	76.4	91.3	129	3.9	—	
600				○	○	○							111	115	118	24.5	34.6	42.4	49.0	60.0	77.5	91.7	110	155	610	4.3	—	
800					○	○							111	115	117	32.7	46.2	56.5	65.3	80.0	103	122	146	206	700	5.0	—	
1000					○	○							111	115	117	40.8	57.7	70.7	81.7	100	129	153	183	258	5.6	—		
1500						○							111	115	117	61.2	86.6	106	122	150	194	229	274	387	900	7.2	—	
90	02							○	○	●	●	○	○	76	90	100	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	145	0.2	200
	03							○	○	●	●	○	○	76	90	100	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	150	0.2	200
	04							○	○	●	●	○	○	77	90	100	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	170	0.3	150
	05							○	○	●	●	○	○	77	90	100	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	170	0.3	150
	07							○	○	●	●	○	○	78	90	100	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	160	0.4	150
	10							○	○	●	●	○	○	78	90	99	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	0.5	100	
	15	●	●					○	○	●	●	○	○	79	90	99	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	0.6	100	
	20	●	●					○	○	●	●	○	○	79	90	98	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	0.7	50	
	30	○	○					○	○	●	●	○	○	80	90	97	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	280	0.9	50
	40	○	○					○	○	●	●	○	○	81	90	97	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	1.1	—	
	50	○	○					○	○	●	●	○	○	81	90	97	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	1.2	—	
	60	○	○					○	○	●	●	○	○	82	90	96	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	1.3	—	
	80	○	○					○	○	●	●	○	○	82	90	96	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	1.5	—	
	100	○	○					○	○	●	●	○	○	82	90	96	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	1.7	—	
	120	○						○	○	●	●	○	○	83	90	95	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	2.0	—	
	140		○					○	○	●	●	○	○	83	90	95	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	2.2	—	
	170		○					○	○	●	●	○	○	83	90	95	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	2.4	—	
	200		○					○	○	●	●	○	○	84	90	95	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	540	2.6	—
	230		○					○	○	●	●	○	○	84	90	94	9.39	13.3	16.3	18.8	23.0	29.7	35.1	42.0	59.4	2.8	—	
	260		○					○	○	●	●	○	○	84	90	94	10.6	15.0	18.4	21.2	26.0	33.6	39.7	47.5	67.1	3.1	—	
	300			○				○	○	●	●	○	○	84	90	94	12.2	17.3	21.2	24.5	30.0	38.7	45.8	54.8	77.5	3.4	—	
	400				○			○	○	●	●	○	○	85	90	94	16.3	23.1	28.3	32.7	40.0	51.6	61.1	73.0	103	580	3.8	—
500				○	○		○	○	●	●	○	○	85	90	93	20.4	28.9	35.4	40.8	50.0	64.6	76.4	91.3	129	4.2	—		
600				○	○	○		○	○	●	●	○	○	86	90	93	24.5	34.6	42.4	49.0	60.0	77.5	91.7	110	155	4.7	—	
800				○	○	○	○	○	●	●	○	○	86	90	93	32.7	46.2	56.5	65.3	80.0	103	122	146	206	700	5.4	—	
900				○	○	○	○	○	●	●	○	○	86	90	92	36.7	52.0	63.6	73.5	90.0	116	137	164	232	750	5.7	—	
1000				○	○	○	○	○	●	●	○	○	86	90	92	40.8	57.7	70.7	81.7	100	129	153	183	258	6.0	—		
1200				○	○	○	○	○	●	●	○	○	86	90	92	49.0	69.3	84.9	98.0	120	155	183	219	310	6.6	—		
1500						○							86	90	92	61.2	86.6	106	122	150	194	229	274	387	950	7.2	—	
80	02							○	○	●	●	○	○	67	80	90	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	150	0.2	200
	03							○	○	●	●	○	○	67	80	90	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	170	0.3	150
	04							○	○	●	●	○	○	67	80	90	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	180	0.3	150
	05	●	●					○	○	●	●	○	○	67	80	90	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	180	0.3	150
	07																											

One-piece Structure Standard Flat Spray Nozzles
VVP/VP SERIES

Flat Spray

Spray angle code	Spray capacity code	Pipe connection size												Spray angle (°)			Spray capacity (L/min)								Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size	
		VVP ³						VP																				
		All metal						All plastic		Metal		CER-TiIM		0.15 MPa	0.3 MPa	0.7 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 MPa
		R1/8	R1/4	R3/8	R1/2	R3/4	R1	R1/8	R1/4	R1/8	R1/4	R1/8	R1/4															
65	02							○	○	●	●	○	○												52	65	75	
	03							○	○	●	●	○	○	52	65	75	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	160	0.3	150
	04							○	○	●	●	○	○	52	65	75	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	190	0.3	150
	05							○	○	●	●	○	○	52	65	74	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	190	0.4	150
	07							○	○	●	●	○	○	53	65	74	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	—	0.5	100
	10							○	○	●	●	○	○	54	65	73	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	—	0.6	100
	15	●	●					○	○	○	○	○	○	54	65	73	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	—	0.8	50
	20	○	○					○	○	○	○	○	○	55	65	72	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	310	0.9	50
	30	○	○					○	○	○	○	○	○	56	65	72	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	—	1.1	—
	40	○	○					○	○	○	○	○	○	56	65	71	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	1.3	—
	50	○	○					○	○	○	○	○	○	57	65	71	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	—	1.5	—
	60	○	○					○	○	○	○	○	○	57	65	71	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	—	1.6	—
	80	○	○					○	○	○	○	○	○	58	65	71	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	1.9	—
	100	○	○					○	○	○	○	○	○	58	65	70	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	—	2.1	—
	120	○	○					○	○	○	○	○	○	58	65	70	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	—	2.3	—
	140	○	○					○	○	○	○	○	○	59	65	69	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	—	2.5	—
	170	○	○					○	○	○	○	○	○	59	65	69	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	—	2.8	—
	200	○	○					○	○	○	○	○	○	59	65	69	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	580	3.0	—
	300	○	○					○	○	○	○	○	○	60	65	69	12.2	17.3	21.2	24.5	30.0	38.7	45.8	54.8	77.5	650	3.9	—
	400	○	○					○	○	○	○	○	○	60	65	68	16.3	23.1	28.3	32.7	40.0	51.6	61.1	73.0	103	—	4.7	—
500	○	○	○				○	○	○	○	○	○	61	65	67	20.4	28.9	35.4	40.8	50.0	64.6	76.4	91.3	129	—	5.3	—	
600	○	○	○	○			○	○	○	○	○	○	61	65	67	24.5	34.6	42.4	49.0	60.0	77.5	91.7	110	155	—	5.7	—	
800	○	○	○	○	○		○	○	○	○	○	○	62	65	67	32.7	46.2	56.5	65.3	80.0	103	122	146	206	—	6.5	—	
1000	○	○	○	○	○	○		○	○	○	○	○	62	65	66	40.8	57.7	70.7	81.7	100	129	153	183	258	—	7.3	—	
1500	○	○	○	○	○	○	○		○	○	○	○	62	65	66	61.2	86.6	106	122	150	194	229	274	387	1,000	9.0	—	
50	03									●	●	○	○	37	50	60	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	180	0.3	150
	04									●	●	○	○	37	50	60	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	—	0.4	150
	05	●	●							●	●	○	○	38	50	59	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	210	0.4	150
	07	●	●							●	●	○	○	38	50	58	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	—	0.5	100
	10	●	●							●	●	○	○	40	50	58	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	—	0.6	100
	15	○	○							○	○	○	○	40	50	57	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	—	0.8	50
	20	○	○							○	○	○	○	41	50	57	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	—	1.0	—
	30	○	○						○	○	○	○	○	42	50	56	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	340	1.2	—
	40	○	○						○	○	○	○	○	42	50	56	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	1.4	—
	50	○	○						○	○	○	○	○	43	50	55	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	—	1.6	—
	60	○	○						○	○	○	○	○	43	50	55	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	—	1.7	—
	80	○	○						○	○	○	○	○	43	50	55	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	2.0	—
	120	○	○						○	○	○	○	○	44	50	54	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	550	2.5	—
	200	○	○						○	○	○	○	○	45	50	53	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	640	3.3	—
	300	○	○						○	○	○	○	○	45	50	53	12.2	17.3	21.2	24.5	30.0	38.7	45.8	54.8	77.5	—	4.2	—
	400	○	○	○					○	○	○	○	○	46	50	52	16.3	23.1	28.3	32.7	40.0	51.6	61.1	73.0	103	—	4.9	—
500	○	○	○	○				○	○	○	○	○	46	50	52	20.4	28.9	35.4	40.8	50.0	64.6	76.4	91.3	129	—	5.6	—	
600	○	○	○	○	○			○	○	○	○	○	47	50	52	24.5	34.6	42.4	49.0	60.0	77.5	91.7	110	155	750	6.1	—	
800	○	○	○	○	○	○		○	○	○	○	○	47	50	51	32.7	46.2	56.5	65.3	80.0	103	122	146	206	—	7.1	—	
1000	○	○	○	○	○	○	○		○	○	○	○	47	50	51	40.8	57.7	70.7	81.7	100	129	153	183	258	1,000	7.9	—	
1500	○	○	○	○	○	○	○	○		○	○	○	48	50	51	61.2	86.6	106	122	150	194	229	274	387	1,100	9.7	—	
40	05	●	●											30	40	48	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	230	0.4	150
	07	●	●											30	40	48	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	—	0.5	100
	10	●	●											31	40	47	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	—	0.7	50
	20	○	○											32	40	46	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	380	1.0	—
	30	○	○											33	40	46	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	—	1.3	—
	40	○	○											33	40	45	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	1.5	—
	80	○	○											34	40	44	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	2.1	—
	120	○	○											35	40	44	4.90											

One-piece Structure Standard Flat Spray Nozzles

VVP/VP SERIES

Flat Spray

VVP (S316L-IN) SERIES

Precision-manufactured stainless steel VVP nozzle with low flow rate.

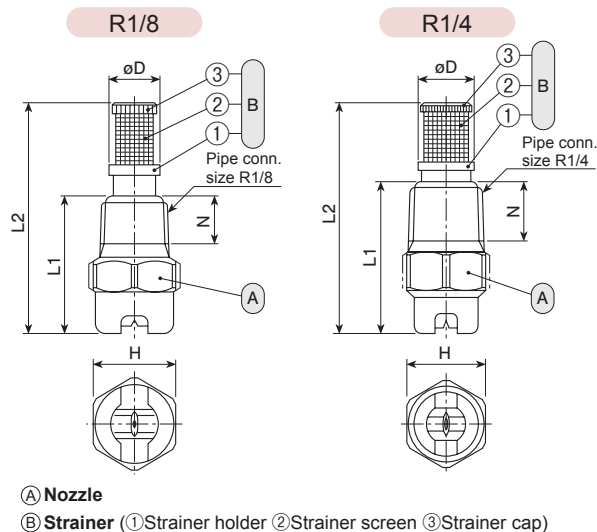
Structure	<ul style="list-style-type: none"> Made of metal. Available with or without a strainer.
Material	<ul style="list-style-type: none"> S316L equivalent Strainer: S303 or S316

Pipe conn. size	Dimensions (mm)					Weight ² (g)
	L1	L2	H	øD	N	
R1/8	20	33.5	12	7.5	7	9.6
R1/4	27	41	14	10	10.5	16

*2) With strainer, add 2g for R1/8 and 5g for R1/4 to the above weight.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



VVP (S316L-IN) Series, precision stainless steel nozzle with low flow rate

Spray angle code	Spray capacity code	Pipe connection size		Spray angle (°)			Spray capacity (L/min)										Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size
		R1/8	R1/4	0.15 MPa	0.3 MPa	0.7 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 MPa				
115	03	●	●	101	115	124	—	—	0.21	0.24	0.30	0.39	0.46	0.55	0.77	140	0.2	200	
	04	●	●	102	115	124	—	—	0.28	0.33	0.40	0.52	0.61	0.73	1.03				
	05	●	●	102	115	124	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	}	0.3	150	
	07	●	●	103	115	124	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81				
	10	●	●	103	115	124	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	270	0.4	150	
90	03	●	●	76	90	100	—	—	0.21	0.24	0.30	0.39	0.46	0.55	0.77	150	0.2	200	
	04	●	●	77	90	100	—	—	0.28	0.33	0.40	0.52	0.61	0.73	1.03				
	05	●	●	77	90	100	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	}	0.3	150	
	07	●	●	78	90	100	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81				
	10	●	●	78	90	99	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	280	0.5	100	
80	07		●	68	80	89	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	180 290	0.4	150	
	10			68	80	89	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58				0.5
65	03	●	●	52	65	75	—	—	0.21	0.24	0.30	0.39	0.46	0.55	0.77	160	0.3	150	
	04	●	●	52	65	75	—	—	0.28	0.33	0.40	0.52	0.61	0.73	1.03				
	05	●	●	52	65	74	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	}	0.4	150	
	07	●	●	53	65	74	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81				
	10	●	●	54	65	73	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	310	0.6	100	
50	03	●	●	37	50	63	—	—	0.21	0.24	0.30	0.39	0.46	0.55	0.77	180	0.3	150	

●: Available with or without strainer

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

VVP

VP

Example: 1/4M VVP 11515 S303W

1/4M	VVP	115	15	S303	W
Pipe conn. size ⁴	Series	Spray angle code	Spray capacity code	Material ⁵	Strainer
1/8M 1M	VVP VP	115 15	02 1500	S303 B TPVDF PVDF PP-IN	W (with strainer) (Blank indicates "without strainer")

The VVP series with thread size R1/2 and larger are made-to-order.

VVP (S316L-IN)

Example: 1/4M VVP 6507 S316L-IN + WS303

1/4M	VVP	65	07	S316L-IN +	W	S303
Pipe conn. size ⁴	Series	Spray angle code	Spray capacity code	Nozzle material	Strainer	Strainer material
1/8M 1/4M	VVP VP	115 15 50	03 04 05 07 10	S316L-IN	W (with strainer) (Blank indicates "without strainer")	S303 S316

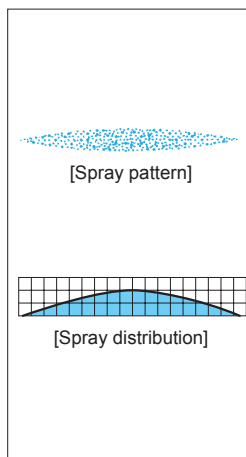
*4) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

*5) TPVDF and B are only for the VP series. PVDF and PP-IN are only for the VVP series.

One-piece Structure Standard Flat Spray Nozzles

UVVP

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Made of ultra-high-molecular-weight polyethylene, the UVVP series features high wear resistance and maintains stable performance as polishing nozzles over prolonged use.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

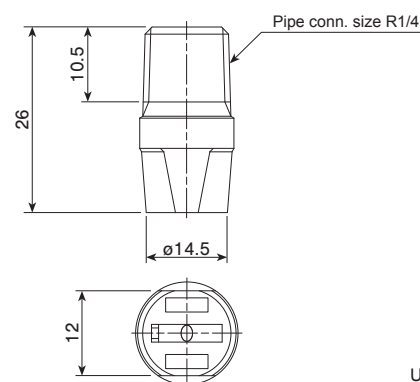
Polishing: Liquid honing, through-hole
Others: Cleaning, spraying, cooling

Structure	• Simple one-piece structure.
Material	• Ultra-high-molecular-weight polyethylene (UPE)
Weight	• 2.5g

[Note]

- Appearance and dimensions may differ slightly depending on material and nozzle code.
- The flat spray spread direction is parallel to the surface milling.

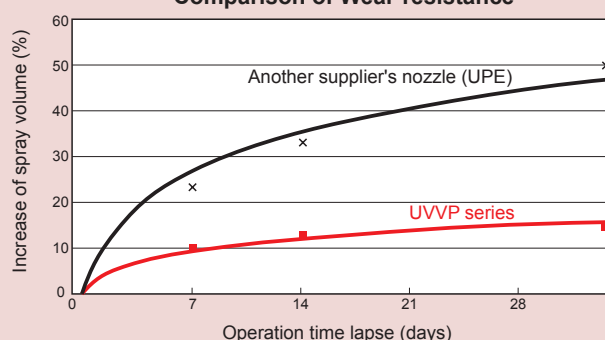
DRAWING



Unit: mm

Spray capacity code	Spray angle (°)			Spray capacity (L/min)						Mean droplet diameter (μm)	Free passage diameter (mm)
	0.15 MPa	0.3 MPa	0.5 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa		
40	50	65	70	1.63	2.31	2.83	3.27	4.00	5.16	300	1.3
50	51	65	70	2.04	2.89	3.54	4.08	5.00	6.46	360	1.5

Comparison of Wear-resistance



Shown on the right is the comparison of test results between the UVVP series flat spray nozzle and a UPE nozzle made by another manufacturer.

Test conditions

Spray pressure: 0.2 MPa
Test liquid: Al₂O₃ (#200) in water
Percentage of Al₂O₃: 20wt%

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M UVVP 6540 UPE

1/4M	UVVP	65	40	UPE
Pipe conn. size*		Spray angle code	Spray capacity code	Material
			40	
			50	

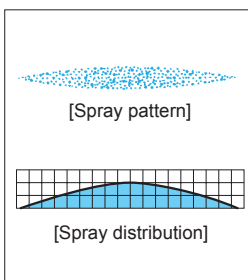
*"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Three-piece Structure Standard Flat Spray Nozzles

VV: Made-to-Order

VV / V

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Tapered edges overlap to provide uniform spray distribution in multi-nozzle arrangements.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Cleaning: Automotives, containers, films, felts, filters, screens, bottles, crushed stone, earth and sand, metal parts, machines, steel plates and pieces
 Spraying: Etchants, oils, lubricants, glues, solutions, insecticides, herbicides
 Cooling: Gas, heat exchangers, tanks, steel, roofs
 Water screen: Fire protection, heat protection, dust suppression, deodorization

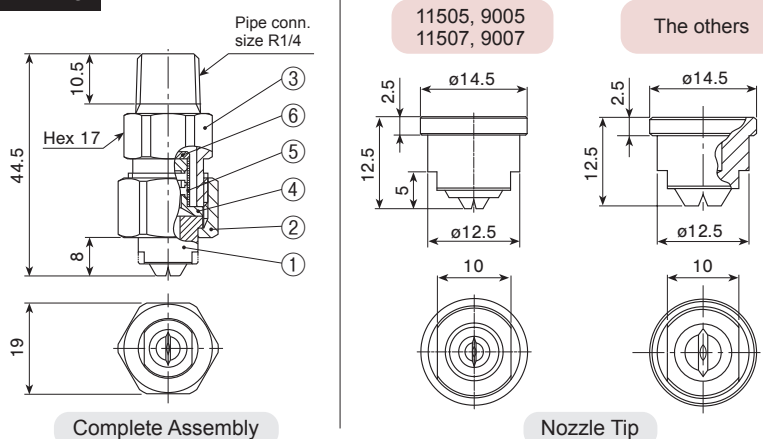
VV SERIES (all metal)

Made-to-Order

Structure	<ul style="list-style-type: none"> • Three-piece structure, made of metal. • Includes three parts: Nozzle tips, cap, and adaptor. Worn-out nozzle tips can be replaced separately. • Small spray capacity models come with or without a strainer.
Material	<ul style="list-style-type: none"> • S303 <p>SPECIAL ORDER MATERIAL: S316 or others</p>
Weight	<ul style="list-style-type: none"> • Complete assembly^{*1}: 47 g • Nozzle tip: 11 g

^{*1}) With strainer, add 5 g to the above weight and 2 mm to the total length.

DRAWING



Nozzle (①Nozzle tip ②Cap ③Adaptor)

Strainer (④Strainer holder ⑤Strainer screen [S316] ⑥Strainer cap)

Unit: mm

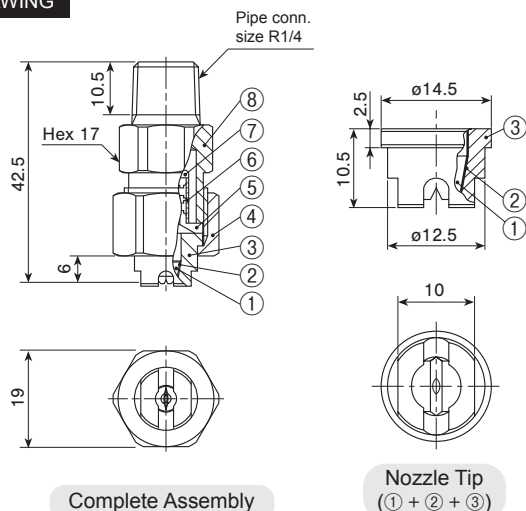
[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

V SERIES (with ceramic orifice)

Structure	<ul style="list-style-type: none"> • Three-piece structure with a ceramic orifice insert. • Includes three parts: Nozzle tips, cap, and adaptor. Worn-out nozzle tips can be replaced separately. • Small spray capacity models come with or without a strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Tip retainer: S303 • Cap, Adaptor, and Strainer: S303 <p>SPECIAL ORDER MATERIAL: S316 or others</p>
Weight	<ul style="list-style-type: none"> • Complete assembly^{*1}: 43 g • Nozzle tip: 6.6 g

^{*1}) With strainer, add 5 g to the above weight and 2 mm to the total length.

DRAWING



Nozzle (①Ceramic orifice ②Adhesive: Araldite® ③Tip retainer)
 (④Cap ⑧Adaptor)

Strainer (⑤Strainer holder ⑥Strainer screen [S316] ⑦Strainer cap)

Unit: mm

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Three-piece Structure Standard Flat Spray Nozzles

VV/V SERIES

Flat Spray

Spray angle code	Spray capacity code	VV ²	V	Spray angle (°)			Spray capacity (L/min)										Mean drop. dia. (μm)	Free pass. dia. (mm)	Strainer mesh size
				0.15 MPa	0.3 MPa	0.7 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 MPa				
115	03		●	101	115	124	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	140	0.2	200	
	04		●	102	115	124	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	160	0.2	200	
	05	●	●	102	115	124	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	160	0.3	150	
	07	●	●	103	115	124	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	160	0.3	150	
	10	●	●	103	115	124	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	160	0.4	150	
	15	●	●	104	115	123	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	160	0.5	100	
	20	●	●	104	115	123	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	270	0.6	100	
	30	●	●	105	115	122	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	270	0.8	50	
	40	●	●	106	115	122	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	270	0.8	50	
	60	○	○	107	115	121	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	340	1.0	—	
	80	○	○	107	115	121	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	340	1.2	—	
	100	○	○	107	115	120	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	340	1.7	—	
200	○	○	109	115	120	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	510	2.4	—		
90	02		●	76	90	100	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	145	0.2	200	
	03		●	76	90	100	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	150	0.2	200	
	04		●	77	90	100	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	170	0.3	150	
	05	●	●	77	90	100	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	170	0.3	150	
	07	●	●	78	90	100	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	170	0.4	150	
	10	●	●	78	90	99	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	170	0.5	100	
	15	●	●	79	90	99	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	170	0.6	100	
	20	●	●	79	90	98	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	280	0.7	50	
	30	●	●	80	90	97	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	280	0.9	50	
	40	○	○	81	90	97	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	340	1.1	—	
	50	○	○	81	90	97	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	340	1.2	—	
	60	○	○	82	90	96	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	340	1.3	—	
80	○	○	82	90	96	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	340	1.5	—		
100	○	○	82	90	96	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	340	1.7	—		
120	○	○	83	90	95	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	340	2.0	—		
140	○	○	83	90	95	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	340	2.2	—		
170	○	○	83	90	95	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	340	2.4	—		
200	○	○	84	90	95	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	540	2.6	—		
80	02		●	67	80	90	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	150	0.2	200	
	03		●	67	80	90	—	0.17	0.21	0.24	0.30	0.39	0.46	0.56	0.77	160	0.3	150	
	04		●	67	80	90	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	180	0.3	150	
	05	●	●	67	80	90	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	180	0.3	150	
	07	●	●	68	80	89	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	180	0.4	150	
	10	●	●	68	80	89	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	180	0.5	100	
	15	●	●	69	80	88	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	180	0.7	50	
	20	●	●	69	80	88	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	290	0.8	50	
	30	○	○	70	80	87	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	290	1.0	—	
	40	○	○	71	80	87	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	340	1.2	—	
	50	○	○	71	80	86	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	340	1.4	—	
	60	○	○	72	80	86	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	340	1.5	—	
80	○	○	72	80	86	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	340	1.7	—		
100	○	○	72	80	85	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	340	1.7	—		
120	○	○	73	80	85	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	340	2.1	—		
200	○	○	74	80	85	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	550	2.9	—		
65	02		●	52	65	75	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	155	0.2	200	
	03		●	52	65	75	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	160	0.3	150	
	04		●	52	65	75	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	190	0.3	150	
	05	●	●	52	65	74	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	190	0.4	150	
	07	●	●	53	65	74	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	190	0.5	100	
	10	●	●	54	65	73	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	210	0.6	100	
	15	●	●	54	65	73	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	210	0.8	50	
	20	●	●	55	65	72	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	310	0.9	50	
	30	○	○	56	65	72	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	310	1.1	—	
	40	○	○	56	65	71	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	340	1.3	—	
	50	○	○	57	65	71	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	340	1.5	—	
	60	○	○	57	65	71	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	340	1.6	—	
80	○	○	58	65	71	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	340	1.9	—		
100	○	○	58	65	70	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	340	2.1	—		
120	○	○	58	65	70	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	340	2.3	—		
140	○	○	59	65	69	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	340	2.5	—		
170	○	○	59	65	69	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	340	2.8	—		
200	○	○	59	65	69	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	580	3.0	—		
50	03		●	37	50	60	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	180	0.3	150	
	04		●	37	50	60	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	210	0.4	150	
	05	●	●	38	50	59	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	210	0.4	150	
	07	●	●	38	50	58	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	210	0.5	100	
	10	●	●	40	50	58	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	210	0.6	100	
	15	●	●	40	50	57	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	210	0.8	50	
	20	○	○	41	50	57	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	340	1.0	—	
	30	○	○	42	50	56	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	340	1.2	—	
	40	○	○	42	50	56	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	340	1.4	—	
	50	○	○	43	50	55	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	340	1.6	—	
	60	○	○	43	50	55	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	340	1.7	—	
	80	○	○	43	50	55	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	340	2.0	—	
120	○	○	44	50	54	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	340	2.5	—		
200	○	○	45	50	53	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	640	3.3	—		

●: Available with or without strainer ○: Only available without strainer

*2) The VV series is made-to-order.

Three-piece Structure Standard Flat Spray Nozzles

VV/V SERIES

Flat Spray

Spray angle code	Spray capacity code	VV ²	V	Spray angle (°)			Spray capacity (L/min)									Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size
				0.15 MPa	0.3 MPa	0.7 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 MPa			
40	05	●		30	40	48	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	230	0.4	150
	07	●		30	40	48	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81		}	0.5
	10	●		31	40	47	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	380		0.7
	20	○		32	40	46	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16		}	1.0
	30	○		33	40	46	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}		1.3
	40	○		33	40	45	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3		}	1.5
	80	○		34	40	44	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}		2.1
	120	○		35	40	44	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0		}	2.8
200	○		35	40	43	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	710	3.5		—
25	05	●		18	25	32	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	270	0.5	100
	07	●		18	25	32	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81		}	0.6
	10	●		18	25	32	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	}		0.8
	15	○		19	25	31	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87		440	1.0
	30	○		19	25	30	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}		1.4
	40	○		19	25	30	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3		}	1.7
	80	○		20	25	29	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}		2.3
	200	○		21	25	27	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6		850	4.0
15	05	●		9	15	22	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	310	0.5	100
	07	●		9	15	21	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81		}	0.7
	10	●		9	15	21	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	}		0.8
	15	○		10	15	20	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87		}	1.0
	30	○		10	15	19	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}		1.5
	40	○		10	15	19	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3		}	1.7
	80	○		11	15	18	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}		2.4
	200	○		11	15	17	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6		1,000	4.0

●: Available with or without strainer ○: Only available without strainer

*2) The VV series is made-to-order.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M V 11505 S303W

Pipe conn. size ^{*3}	Series	Spray angle code	Spray capacity code	Material	Strainer
1/4M	V	115	05	S303	W
■ VV	■ 115	■ 02	■ W (with strainer)		
■ V	■ ∩	■ ∩	■ (Blank indicates "without strainer")		
	■ 15	■ 200			

② Nozzle Tip Only

Example: 1/4 V 11505 S303

Series	Spray angle code	Spray capacity code	Material
1/4	V	115	05
■ VV	■ 115	■ 02	
■ V	■ ∩	■ ∩	
	■ 15	■ 200	

*3) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

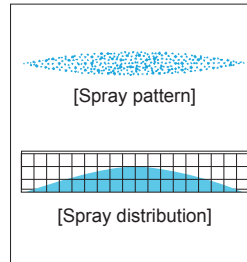
The VV series is made-to-order.

Quick-detachable Standard Flat Spray Nozzles

Stainless Steel

INVV-SS
INV

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- The unique design accommodates easy installation and removal.
- Quick-detachable design helps to significantly reduce maintenance time.

[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]

Cleaning: Automotives, containers, films, felts, filters, screens, bottles, crushed stone, earth and sand, metal parts, machines, steel plates and pieces

Spraying: Oils, lubricants, glues, insecticides, herbicides

Cooling: Tanks, roofs

Water screen: Dust suppression, deodorization

INVV-SS SERIES

Structure	<ul style="list-style-type: none"> • Includes a nozzle section (nozzle tip + cap + packing) and an adaptor. • Worn-out nozzle tips and other parts are available separately for replacement. • Easy installation and removal of the nozzle section with a twist of about 90°. • Tip or packing will not fall out when the nozzle section is removed.
Material	<ul style="list-style-type: none"> • Nozzle tip: S303 • Cap and Adaptor: S316L equivalent • Packing: FEPM
Weight	<ul style="list-style-type: none"> • Complete assembly: 57 g • Nozzle tip: 11 g

Max. temperature: 150°C

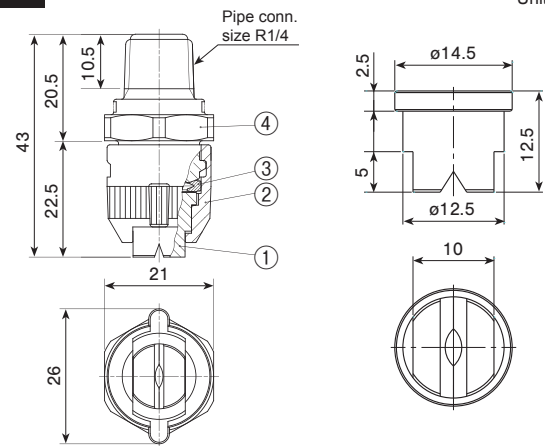
Max. operating pressure: 2.0 MPa

The flat spray spread direction is parallel to the surface milling.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Complete Assembly

Nozzle Tip

① Nozzle tip ② Cap ③ Packing (FEPM) ④ Adaptor

INV SERIES (with ceramic orifice)

Structure	<ul style="list-style-type: none"> • Has a ceramic orifice in the nozzle tip. • Includes a nozzle section (nozzle tip + cap + packing) and an adaptor. • Worn-out nozzle tips and other parts are available separately for replacement. • Easy installation and removal of the nozzle section with a twist of about 90°. • Tip or packing will not fall out when the nozzle section is removed.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Tip retainer: S303 • Cap and Adaptor: S316L equivalent • Packing: FEPM
Weight	<ul style="list-style-type: none"> • Complete assembly: 51 g • Nozzle tip: 6.5 g

Max. temperature: 60°C

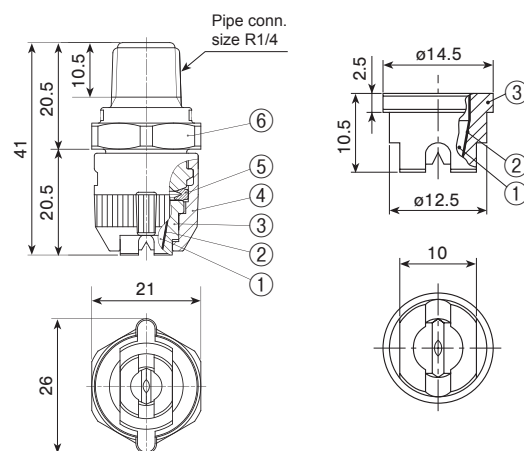
Max. operating pressure: 2.0 MPa

The flat spray spread direction is parallel to the surface milling.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Complete Assembly

Nozzle Tip
(① + ② + ③)

① Ceramic orifice ② Adhesive: Araldite® ③ Tip retainer
④ Cap ⑤ Packing (FEPM) ⑥ Adaptor

Quick-detachable Standard Flat Spray Nozzles

INVV-SS/INV SERIES Stainless Steel

Flat Spray

Spray angle code	Spray capacity code	INVV-SS	INV	Spray angle (°)			Spray capacity (L/min)										Mean droplet diameter (μm)	Free passage diameter (mm)
				0.15 MPa	0.3 MPa	0.7 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 MPa			
115	60	○		107	115	121	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	340	1.0	
	80	○		107	115	121	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	1.2	
	100	○		107	115	120	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	}	1.4	
	200	○		109	115	120	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	510	2.4	
90	40	○	○	81	90	97	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	300	1.1	
	50	○	○	81	90	97	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	}	1.2	
	60	○		82	90	96	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	}	1.3	
	80	○		82	90	96	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	1.5	
	100	○		82	90	96	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	}	1.8	
	120	○		83	90	95	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	}	1.9	
	140	○		83	90	95	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	}	2.1	
	170	○		83	90	95	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	}	2.3	
200	○		84	90	95	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	540	2.4		
80	30	○	○	70	80	87	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	290	1.0	
	40	○	○	71	80	87	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	}	1.2	
	80	○	○	72	80	86	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	1.7	
	100	○		72	80	85	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	}	2.0	
	120	○		73	80	85	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	}	2.3	
	200	○		74	80	85	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	550	2.8	
65	30	○	○	56	65	72	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	310	1.1	
	40	○	○	56	65	71	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	}	1.3	
	50	○	○	57	65	71	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	}	1.5	
	60	○	○	57	65	71	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	}	1.6	
	80	○	○	58	65	71	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	1.9	
	100	○		58	65	70	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	}	2.1	
	120	○		58	65	70	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	}	2.3	
	140	○		59	65	69	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	}	2.5	
170	○		59	65	69	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	}	2.8		
200	○		59	65	69	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	580	3.0		
50	20	○	○	41	50	57	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	320	1.0	
	30	○	○	42	50	56	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}	1.2	
	40	○	○	42	50	56	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	}	1.4	
	80	○	○	43	50	55	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	2.0	
	120	○		44	50	54	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	}	2.4	
	200	○		45	50	53	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	640	3.3	
40	20	○		32	40	46	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	380	1.0	
	30	○		33	40	46	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}	1.3	
	40	○		33	40	45	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	}	1.5	
	80	○		34	40	44	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	2.1	
	120	○		35	40	44	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	}	2.8	
	200	○		35	40	43	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	710	3.5	
25	15	○		19	25	31	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	440	1.0	
	30	○		19	25	30	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}	1.4	
	40	○		19	25	30	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	}	1.7	
	80	○		20	25	29	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	2.3	
	200	○		21	25	27	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	850	3.9	
15	15	○		10	15	20	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	500	1.0	
	30	○		10	15	19	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	}	1.5	
	40	○		10	15	19	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	}	1.7	
	80	○		11	15	18	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	}	2.4	
	200	○		11	15	17	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	1,000	4.0	

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M INV V 11560 S303 (FEPM) + S316L-IN

1/4M	INV V	115	60	S303 (FEPM) + S316L-IN
Pipe conn. size ¹⁾	Series	Spray angle code	Spray capacity code	Nozzle tip material Packing material Material of cap & adaptor
	INV V	115	15	
	INV	15	200	

② Nozzle Tip Only²⁾

Example: 1/4 V V 11560 S303

1/4	V V	115	60	S303
	Series	Spray angle code	Spray capacity code	Material
	V V	115	15	
	V	15	200	

③ Adaptor (R1/4), cap, and packing are available separately for purchase.

*1) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

*2) Nozzle tips for the INV V-SS series are the same as those used for the V V series.
Nozzle tips for the INV series are the same as those used for the V series.

ALSO AVAILABLE!

Quick-detachable **Even Flat** Spray Nozzles

Stainless Steel

INVE SERIES

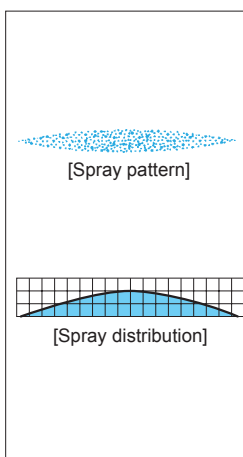
See page 27 of this catalog.

Coin-shaped Standard Flat Spray Nozzles

Made-to-Order

CVVP

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Shaped like a thin coin, this nozzle mounts flush with the pipe surface, making it ideal for applications where nozzle projection needs to be minimal, such as tight spaces.

[STANDARD PRESSURE]

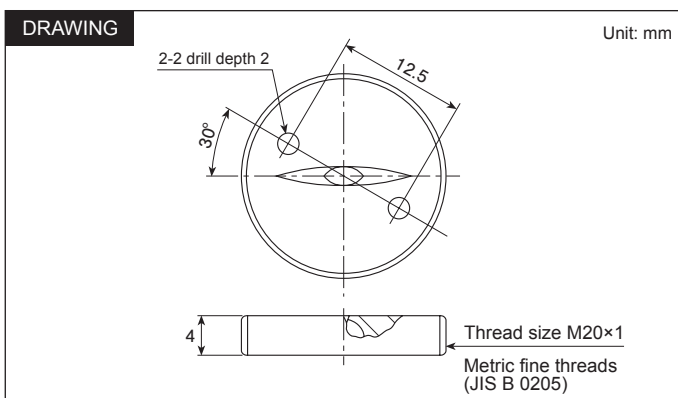
0.3 MPa

[APPLICATIONS]

Cleaning: Felts, rolls, screens, filters, wires
Spraying: Lubricants, chemicals
Cooling: Steel plates and coils

Structure	• One-piece structure with threaded outside edge.
Material	• S303
Weight	• 8.5 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.



Spray angle code	Spray capacity code	Spray angle (°)			Spray capacity (L/min)											Mean droplet dia. (μm)	Free passage dia. (mm)
		0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.07 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa		
90	10	78	90	99	0.41	0.48	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.24	2.58	210	0.5
	15	79	90	98	0.61	0.72	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.36	3.87		0.6
	20	80	90	97	0.82	0.97	1.15	1.41	1.63	2.00	2.58	3.06	3.65	4.47	5.16		0.7
	30	82	90	96	1.23	1.45	1.73	2.12	2.45	3.00	3.88	4.58	5.48	6.71	7.75		0.9
	40	83	90	97	1.63	1.93	2.31	2.83	3.27	4.00	5.16	6.11	7.30	8.94	10.3		1.1
	50	83	90	97	2.04	2.42	2.89	3.54	4.08	5.00	6.46	7.64	9.13	11.2	12.9		1.2
	60	83	90	97	2.45	2.90	3.46	4.24	4.90	6.00	7.75	9.17	11.0	13.4	15.5		1.3
	80	84	90	97	3.27	3.86	4.62	5.66	6.53	8.00	10.3	12.2	14.6	17.9	20.6	420	1.5
80	10	69	80	87	0.41	0.48	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.24	2.58	210	0.5
	15	70	80	86	0.61	0.72	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.36	3.87		0.7
	20	71	80	86	0.82	0.97	1.15	1.41	1.63	2.00	2.58	3.06	3.65	4.47	5.16		0.8
	30	72	80	84	1.23	1.45	1.73	2.12	2.45	3.00	3.88	4.58	5.48	6.71	7.75		1.0
	40	74	80	83	1.63	1.93	2.31	2.83	3.27	4.00	5.16	6.11	7.30	8.94	10.3		1.2
	50	74	80	83	2.04	2.42	2.89	3.54	4.08	5.00	6.46	7.64	9.13	11.2	12.9		1.4
	60	74	80	83	2.45	2.90	3.46	4.24	4.90	6.00	7.75	9.17	11.0	13.4	15.5		1.5
	80	74	80	83	3.27	3.86	4.62	5.66	6.53	8.00	10.3	12.2	14.6	17.9	20.6	430	1.7
65	10	53	65	72	0.41	0.48	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.24	2.58	230	0.6
	15	53	65	72	0.61	0.72	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.36	3.87		0.8
	20	54	65	72	0.82	0.97	1.15	1.41	1.63	2.00	2.58	3.06	3.65	4.47	5.16		0.9
	30	55	65	72	1.23	1.45	1.73	2.12	2.45	3.00	3.88	4.58	5.48	6.71	7.75		1.1
	40	57	65	72	1.63	1.93	2.31	2.83	3.27	4.00	5.16	6.11	7.30	8.94	10.3		1.3
	50	58	65	72	2.04	2.42	2.89	3.54	4.08	5.00	6.46	7.64	9.13	11.2	12.9		1.5
	60	59	65	72	2.45	2.90	3.46	4.24	4.90	6.00	7.75	9.17	11.0	13.4	15.5		1.6
	80	62	65	72	3.27	3.86	4.62	5.66	6.53	8.00	10.3	12.2	14.6	17.9	20.6	450	1.9

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: M20×1 CVVP 9010 S303

M20×1	CVVP	90	10	S303
Pipe conn. size		Spray angle code	Spray capacity code	Material
		90	10	
		80		
		65	80	

This nozzle series is made-to-order.

Quick-detachable Standard Flat Spray Nozzles

Plastic

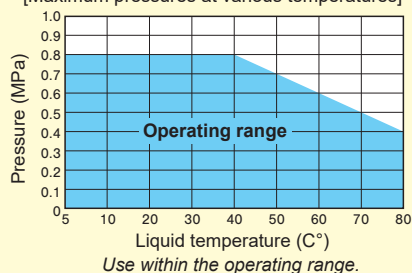
INVV

Flat Spray

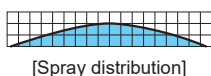


- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Made of highly chemical and heat resistant plastic.
- Quick-detachable design helps to significantly reduce maintenance time.
- Nozzle tips are color-coded by spray capacity for easy identification.
- Adaptors are color-coded by material: gray for PP and black for PPS. (PVDF adaptor is only available on a made-to-order basis.)

[Maximum pressures at various temperatures]



[Spray pattern]



[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

- Cleaning
- Etching
- Stripping
- Chemical treatment
- For periodic maintenance or for applications where precise spray alignment is required

Structure	<ul style="list-style-type: none"> • Two-piece structure including a nozzle tip with packing and an adaptor. • Easy installation and removal of the nozzle tip with a twist of about 60°.
Material	<ul style="list-style-type: none"> • Nozzle tip: PP • Adaptor: PP or PPS [SPECIAL ORDER MATERIAL: PVDF] • Packing: FEPM

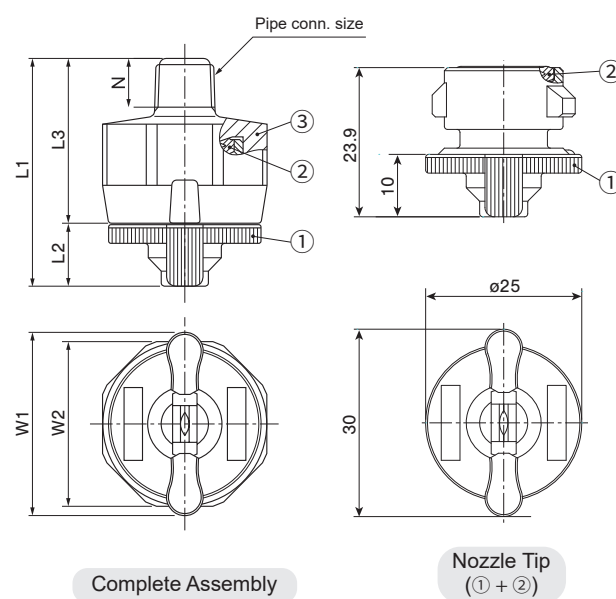
Pipe conn. size	Dimensions (mm)						Weight (g)	
	L1	L2	L3	W1	W2	N	PP	PPS
R1/8	37	10	27	30	27	8	9.0	12
R1/4	40	10	30	30	27	11.5	9.4	12
R3/8	40	10	30	30	27	12	10.3	14

[Note]

- **INVV series nozzles are not compatible with the discontinued ISVV series.**
- Appearance and dimensions may differ slightly depending on material and nozzle code.
- The tabs (wings) are in line with the flat spray spread direction.

DRAWING

Unit: mm



① Nozzle tip ② Packing (FEPM) ③ Adaptor

Spray angle code	Spray capacity code	Pipe connection size			Spray angle (°)			Spray capacity (L/min)							Mean drop. dia. (µm)	Free pass. dia. (mm)	Nozzle tip color
		R1/8	R1/4	R3/8	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa			
115	05	○	○	○	102	115	124	—	0.29	0.35	0.41	0.50	0.65	0.76	160	0.3	Green
	07	○	○	○	103	115	124	—	0.40	0.49	0.57	0.70	0.90	1.07		0.3	Brown
	10	○	○	○	103	115	124	0.41	0.58	0.71	0.82	1.00	1.29	1.53		0.4	Red
	15	○	○	○	104	115	123	0.61	0.87	1.06	1.23	1.50	1.94	2.29		0.5	Grey
	20	○	○	○	104	115	123	0.82	1.15	1.41	1.63	2.00	2.58	3.06	300	0.6	Black
	30	○	○	○	105	115	122	1.23	1.73	2.12	2.45	3.00	3.88	4.58		0.8	Blue
	40	○	○	○	106	115	122	1.63	2.31	2.83	3.27	4.00	5.16	6.11		0.8	Orange
	50	○	○	○	106	115	122	2.04	2.89	3.54	4.08	5.00	6.46	7.64		0.9	Pink
90	05	○	○	○	77	90	100	—	0.29	0.35	0.41	0.50	0.65	0.76	170	0.3	Green
	07	○	○	○	78	90	100	—	0.40	0.49	0.57	0.70	0.90	1.07		0.4	Brown
	10	○	○	○	78	90	99	0.41	0.58	0.71	0.82	1.00	1.29	1.53		0.5	Red
	15	○	○	○	79	90	99	0.61	0.87	1.06	1.23	1.50	1.94	2.29		0.6	Grey
	20	○	○	○	79	90	98	0.82	1.15	1.41	1.63	2.00	2.58	3.06	300	0.7	Black
	30	○	○	○	80	90	97	1.23	1.73	2.12	2.45	3.00	3.88	4.58		0.9	Blue
	40	○	○	○	81	90	97	1.63	2.31	2.83	3.27	4.00	5.16	6.11		1.1	Orange
	50	○	○	○	81	90	97	2.04	2.89	3.54	4.08	5.00	6.46	7.64		1.2	Pink
65	05	○	○	○	52	65	74	—	0.29	0.35	0.41	0.50	0.65	0.76	190	0.4	Green
	07	○	○	○	53	65	74	—	0.40	0.49	0.57	0.70	0.90	1.07		0.5	Brown
	10	○	○	○	54	65	73	0.41	0.58	0.71	0.82	1.00	1.29	1.53		0.6	Red
	15	○	○	○	54	65	73	0.61	0.87	1.06	1.23	1.50	1.94	2.29		0.8	Grey
	20	○	○	○	55	65	72	0.82	1.15	1.41	1.63	2.00	2.58	3.06	350	0.9	Black
	30	○	○	○	56	65	72	1.23	1.73	2.12	2.45	3.00	3.88	4.58		1.1	Blue
	40	○	○	○	56	65	71	1.63	2.31	2.83	3.27	4.00	5.16	6.11		1.3	Orange
	50	○	○	○	57	65	71	2.04	2.89	3.54	4.08	5.00	6.46	7.64		1.5	Pink
50	05	○	○	○	38	50	59	—	0.29	0.35	0.41	0.50	0.65	0.76	210	0.4	Green
	07	○	○	○	38	50	58	—	0.40	0.49	0.57	0.70	0.90	1.07		0.5	Brown
	10	○	○	○	40	50	58	0.41	0.58	0.71	0.82	1.00	1.29	1.53		0.6	Red
	15	○	○	○	40	50	57	0.61	0.87	1.06	1.23	1.50	1.94	2.29		0.8	Grey
	20	○	○	○	41	50	57	0.82	1.15	1.41	1.63	2.00	2.58	3.06	400	1.0	Black
	30	○	○	○	42	50	56	1.23	1.73	2.12	2.45	3.00	3.88	4.58		1.2	Blue
	40	○	○	○	42	50	56	1.63	2.31	2.83	3.27	4.00	5.16	6.11		1.4	Orange
	50	○	○	○	43	50	55	2.04	2.89	3.54	4.08	5.00	6.46	7.64		1.6	Pink

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/8M INVV 9030 PP (FEPM) + PP

1/8M	INVV	90	30	PP (FEPM) +	PP
Pipe conn. size*		Spray angle code	Spray capacity code	Nozzle tip material (packing: FEPM)	Adaptor material
1/8M		115	05		PP
1/4M		50	50		PPS
3/8M					

③ Adaptor is available for purchase separately.

**M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

② Nozzle Tip Only (with packing)

Example: INVV 9030 PP (FEPM)

INVV	90	30	PP (FEPM)
	Spray angle code	Spray capacity code	Nozzle tip material (packing: FEPM)
	115	05	
	50	50	

ALSO AVAILABLE!

Quick-detachable
Off-center Even Flat
Spray Nozzles

INOVE SERIES


See page 39 for more details.

Quick-detachable
Full Cone
Spray Nozzles

INJXX SERIES

See page 67 for more details.

Quick-detachable IN PLUG SERIES

Picture	Features																					
 IN Plug tip	<ul style="list-style-type: none">• Two-piece structure includes a plug tip with packing and an adaptor.• You can change an IN-series nozzle tip to this plug tip, or replace a complete IN nozzle assembly with an IN plug assembly. <p>IN plug tips are compatible with INVV, INOVVE, and INJJX series adaptors. When ordering use the item names shown in the table below.</p>																					
	<table><tr><th>Pipe conn. size</th><th>Adaptor material</th><th>Order item name</th></tr><tr><td rowspan="2">R1/8</td><td>PPS</td><td>1/8M INPLUG PP(FEPM)+PPS</td></tr><tr><td>PP</td><td>1/8M INPLUG PP(FEPM)+PP</td></tr><tr><td rowspan="2">R1/4</td><td>PPS</td><td>1/4M INPLUG PP(FEPM)+PPS</td></tr><tr><td>PP</td><td>1/4M INPLUG PP(FEPM)+PP</td></tr><tr><td rowspan="2">R3/8</td><td>PPS</td><td>3/8M INPLUG PP(FEPM)+PPS</td></tr><tr><td>PP</td><td>3/8M INPLUG PP(FEPM)+PP</td></tr><tr><td colspan="2">Plug tip only, without adaptor</td><td>INPLUG PP(FEPM)</td></tr></table>	Pipe conn. size	Adaptor material	Order item name	R1/8	PPS	1/8M INPLUG PP(FEPM)+PPS	PP	1/8M INPLUG PP(FEPM)+PP	R1/4	PPS	1/4M INPLUG PP(FEPM)+PPS	PP	1/4M INPLUG PP(FEPM)+PP	R3/8	PPS	3/8M INPLUG PP(FEPM)+PPS	PP	3/8M INPLUG PP(FEPM)+PP	Plug tip only, without adaptor		INPLUG PP(FEPM)
	Pipe conn. size	Adaptor material	Order item name																			
	R1/8	PPS	1/8M INPLUG PP(FEPM)+PPS																			
		PP	1/8M INPLUG PP(FEPM)+PP																			
	R1/4	PPS	1/4M INPLUG PP(FEPM)+PPS																			
		PP	1/4M INPLUG PP(FEPM)+PP																			
R3/8	PPS	3/8M INPLUG PP(FEPM)+PPS																				
	PP	3/8M INPLUG PP(FEPM)+PP																				
Plug tip only, without adaptor		INPLUG PP(FEPM)																				

Quick-detachable Nozzle Connector

INCO

Flat Spray



Photo is INCO with a wide-angle flat spray nozzle YYP series.

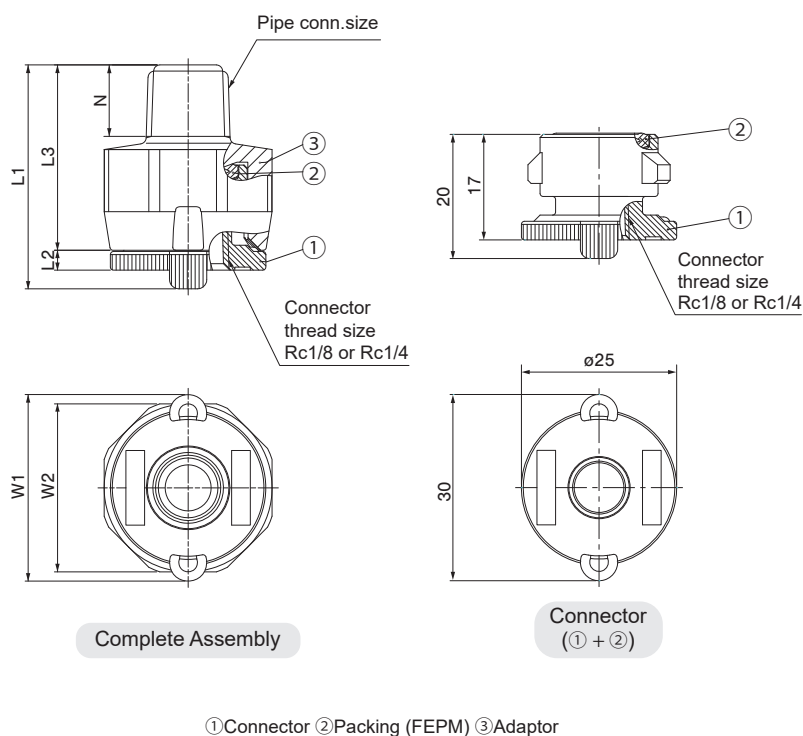
- Easy installation and removal by attaching a nozzle to this connector.
- Made of highly chemical and heat resistant plastic.
- Quick-detachable design helps to significantly reduce maintenance time.
- R1/4 or R1/8 threaded nozzle is attachable.
- Adaptors are color-coded by material: gray for PP and black for PPS. (PVDF adaptor is only available on a made-to-order basis.)

Structure	<ul style="list-style-type: none"> • Two-piece structure including a connector with packing and an adaptor. • Easy installation and removal of the connector with a twist of about 60°.
Material	<ul style="list-style-type: none"> • Connector: PP • Adaptor: PP or PPS [SPECIAL ORDER MATERIAL: PVDF] • Packing: FEPM

Pipe conn. size	Dimensions (mm)							Weight (g)	
	L1	L2	L3	W1	W2	N	PP	PPS	
R1/8	33	3	27	30	27	8	9	12	
R1/4	36	3	30	30	27	11.5	10	13	
R3/8	36	3	30	30	27	12	11	14	

DRAWING

Unit: mm



[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

HOW TO ORDER

To inquire about or order a specific connector please refer to this coding system.

① Complete Assembly

Example: INCO 1/4M×1/8F PP (FEPM) + PP

INCO	1/4M	×	1/8F	PP (FEPM) +	PP
	Pipe conn. size*		Connector thread size*	Connector material (packing: FEPM)	Adaptor material
	1/8M		1/8F		PP
	1/4M		1/4F		PPS
	3/8M				

② Connector Only (with packing)

Example: INCO 1/8F PP (FEPM)

INCO	1/8F	PP (FEPM)
	Connector thread size*	Connector material (packing: FEPM)
	1/8F	
	1/4F	

③ Adaptor is available for purchase separately.

**M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard).

ALSO AVAILABLE!

Quick-detachable
Off-center Even Flat
Spray Nozzles

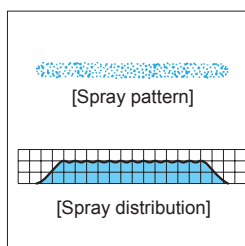
INOVE
SERIES

See page 39 for
more details.

Even Flat Spray Nozzles

VEP/VE

Flat Spray



- Flat spray pattern with uniform distribution across the pattern area.
- Even spray impact across the entire spray area.

[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]

Cleaning: Automotives, containers, films, felts, filters, screens, bottles, crushed stone, earth and sand, metal parts, machines, steel plates, steel pieces, wires

Spraying: Etchants, oils, lubricants, liquids, solutions, insecticides, herbicides

Cooling: Gas, heat exchangers, tanks, steel, roofs

Water screen: Fire protection, heat protection, dust suppression, deodorization

VEP SERIES (one-piece structure)

Structure	<ul style="list-style-type: none"> • One-piece structure with a ceramic orifice insert. • Small spray capacity VEP nozzles made of metal come with or without a strainer. • CERTIIM is a one-piece plastic nozzle molded around a ceramic orifice.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303 or B (brass) • CERTIIM's plastic body: PVDF <p>SPECIAL ORDER MATERIAL: S316 or others</p>

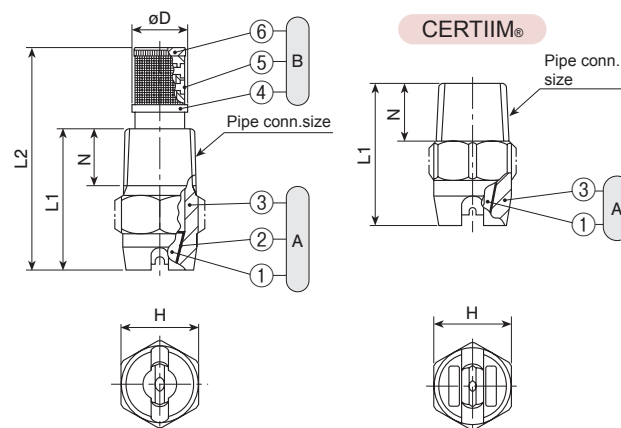
Pipe conn. size	Dimensions (mm)					Weight (g)		
	L1	L2	H	øD	N	S303 ^{*1}	B ^{*1}	CERTIIM
R1/8	16.5	30	12	7.5	6.5	8	9	—
R1/4	26	40	14	10	10.5	20	22	—
R3/8	30	—	19	—	11	33	—	—
R1/2	38	—	23	—	14	57	—	—
CERTIIM R1/8	22	—	12	—	8.5	—	—	2.1
CERTIIM R1/4	26	—	14	—	10.5	—	—	6

*1) With strainer, add 2 g for R1/8 and 5 g for R1/4 to the above weight.
No strainers for CERTIIM (VEP-TPVDF).

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



A) Nozzle (①Ceramic orifice ②Adhesive: Araldite® ③Nozzle body)
B) Strainer (④Strainer holder ⑤Strainer screen [S316] ⑥Strainer cap)

VE SERIES (three-piece structure)

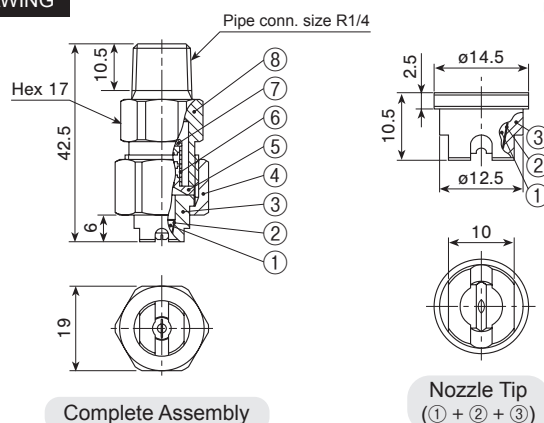
Structure	<ul style="list-style-type: none"> • Three-piece structure with a ceramic orifice insert. • Includes three parts: Nozzle tip, cap, and adaptor. • Worn-out nozzle tips can be replaced separately. • Small spray capacity models come with or without a strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Tip retainer: S303 • Cap, Adaptor, and Strainer: S303 <p>SPECIAL ORDER MATERIAL: S316 or others</p>
Weight	<ul style="list-style-type: none"> • Complete assembly^{*2}: 43 g • Nozzle tip: 6.5 g

*2) With strainer, add 5 g to the above weight and 2 mm to the total length.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Nozzle (①Ceramic orifice ②Adhesive: Araldite® ③Tip retainer)
Strainer (⑤Strainer holder ⑥Strainer screen [S316] ⑦Strainer cap)

Even Flat Spray Nozzles

VEP/VE SERIES

Flat Spray

Spray angle code	Spray capacity code	Pipe connection size								Spray angle (°)			Spray capacity (L/min)										Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size			
		VEP							VE																			
		Metal				CER-TIIM		0.15 MPa		0.3 MPa	0.7 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 MPa	3 MPa³	5 MPa³						
		R1/8	R1/4	R3/8	R1/2	R1/8	R1/4																			R1/4		
115	19		●					○	●	104	115	122	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	240	0.5	100		
	23		●					○	●	105	115	122	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39		0.6	100		
	31		●					○	●	105	115	122	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7		0.6	100		
	36		●						○	●	105	115	122	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	0.7	50		
	39		●						○	●	105	115	122	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	}	0.7	50	
	59		●						○	●	105	115	122	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1		0.9	50	
	78		○						○	○	106	115	121	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	1.0	—		
	117		○						○	○	106	115	120	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	1.2	—		
	157		○							○	○	106	115	120	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	1.4	—	
	196				○						108	115	120	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	450	1.6	—	
	235				○						108	115	118	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3	95.9	}	1.7	—	
	274				○						108	115	118	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112		1.9	—	
	314						○				108	115	118	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	510	2.0	—	
392						○				108	115	118	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	}	2.2	—		
469						○				108	115	118	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192		640	2.4	—	
90	03	●	●					○	○	●	78	90	101	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	0.95	1.22	140	0.2	200	
	04	●	●					○	○	●	79	90	101	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	1.26	1.63		0.2	200	
	05	●	●					○	○	●	79	90	101	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	1.58	2.04		0.3	150	
	07	●	●					○	○	○	80	90	101	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	2.21	2.86	}	0.3	150	
	10	●	●					○	○	○	80	90	100	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	3.16	4.08		0.4	150	
	15	●	●					○	○	○	82	90	100	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	4.74	6.12		0.4	150	
	19	●	●						○	○	○	82	90	98	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	250	0.7	50
	23	●	●						○	○	○	82	90	98	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39		0.7	50
	31	●	●						○	○	○	83	90	97	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7		0.9	50
	36	○	○						○	○	○	83	90	97	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	1.0	—	
	39	○	○						○	○	○	83	90	97	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	1.0	—	
	59	○	○						○	○	○	83	90	97	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	}	1.2	—
	78	○	○						○	○	○	84	90	97	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8		1.4	—
	117	○	○						○	○	○	84	90	96	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	1.7	—	
	157	○	○						○	○	○	84	90	96	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	2.0	—	
	196				○						84	90	96	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	480	2.2	—	
	235				○						85	90	95	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3	95.9	2.4	—		
	274				○						85	90	95	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112	}	2.6	—	
314						○				85	90	94	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	540		2.8	—	
392						○				85	90	94	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	}	3.1	—		
469						○				85	90	94	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192		680	3.4	—	
80	19		●					○	●	72	80	84	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	260	0.7	50		
	23		●					○	●	72	80	84	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39		0.8	50		
	31		●					○	●	72	80	84	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7		0.9	50		
	36		○						○	○	72	80	84	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	1.0	—		
	39		○						○	○	73	80	84	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	}	1.0	—	
	59		○						○	○	74	80	84	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1		1.3	—	
	78		○						○	○	74	80	84	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8		1.6	—	
	117		○						○	○	75	80	84	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	1.9	—		
	157		○						○	○	76	80	84	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	2.4	—		
	196				○						76	80	83	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	490	2.6	—	
	235				○						76	80	83	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3	95.9	3.1	—		
	274				○						76	80	83	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112	}	3.3	—	
	314						○				76	80	83	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128		560	3.3	—
392						○				76	80	83	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	}	3.7	—		
469						○				76	80	83	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192		700	4.3	—	
65	03	●	●					○	○	●	54	65	76	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	0.95	1.22	150	0.3	150	
	04	●	●					○	○	●	54	65	76	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	1.26	1.63		0.3	150	
	05	●	●					○	○	●	54	65	75	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	1.58	2.04		0.4	150	
	07	●	●					○	○	○	55	65	75	—	0.40	0.49	0.57	0.70	0.90	1.0								

●: Available with or without strainer ○: Only available without strainer

Spray angle code	Spray capacity code	Pipe connection size							Spray angle (°)			Spray capacity (L/min)										Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size			
		VEP						VE																			
		Metal				CER-TIIM																					
		R1/8	R1/4	R3/8	R1/2	R1/8	R1/4		R1/4	0.15 MPa	0.3 MPa	0.7 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 MPa				3 MPa ³	5 MPa ³	
50	19	●					○	●	43	50	56	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	300	0.9	50		
	31	○					○	○	43	50	55	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7		1.2	—		
	39	○					○	○	43	50	55	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9		1.4	—		
	59	○					○	○	43	50	55	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	}	1.5	—		
	78	○					○	○	43	50	55	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8		2.0	—		
	117	○					○	○	43	50	54	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8		2.4	—		
	157	○					○	○	43	50	54	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	570	2.9	—		
	196	○		○			○	○	43	50	53	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0		3.3	—		
	235	○		○	○			○	○	43	50	53	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3		95.9	3.7	—	
	274	○		○	○			○	○	43	50	53	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112	}	4.0	—	
	314	○			○			○	○	44	50	52	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128		650	4.4	—
	392	○			○	○		○	○	44	50	52	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160		}	4.7	—
469	○			○	○		○	○	44	50	52	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	850	5.0	—		
40	23	○					○	○	31	40	46	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39	350	1.1	—		
	36	○					○	○	32	40	45	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6		1.4	—		
	59	○					○	○	32	40	45	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1		1.8	—		
	78	○					○	○	33	40	45	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	}	2.1	—		
	117	○					○	○	33	40	44	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8		2.6	—		
	157	○					○	○	33	40	44	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1		3.0	—		
	196	○		○			○	○	33	40	43	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	630	3.6	—		
	235	○		○	○			○	○	33	40	43	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3		95.9	3.7	—	
	274	○		○	○			○	○	33	40	43	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6		112	4.1	—	
	314	○			○			○	○	33	40	43	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	720	4.3	—	
	392	○			○	○		○	○	33	40	43	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	}	4.8	—	
	469	○			○	○		○	○	34	40	43	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	900	5.5	—	
25	19	○					○	○	18	25	32	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	390	1.1	—		
	31	○					○	○	19	25	32	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7		1.4	—		
	39	○					○	○	20	25	32	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9		1.5	—		
	59	○					○	○	21	25	32	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	}	1.9	—		
	78	○					○	○	21	25	32	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8		2.3	—		
	117	○					○	○	21	25	32	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8		2.7	—		
	157	○					○	○	21	25	32	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	3.4	—			
	196	○		○			○	○	21	25	32	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	730	3.7	—		
	235	○		○	○			○	○	21	25	31	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3		95.9	4.0	—	
	274	○		○	○			○	○	21	25	31	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6		112	4.5	—	
	314	○			○			○	○	21	25	31	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	800	4.8	—	
	392	○			○	○		○	○	21	25	31	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	}	5.1	—	
469	○			○	○		○	○	21	25	31	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	1,050	5.5	—		
15	23	○					○	○	10	15	19	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39	500	1.3	—		
	36	○					○	○	10	15	19	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6		1.6	—		
	59	○					○	○	10	15	19	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1		2.0	—		
	78	○					○	○	10	15	19	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	}	2.4	—		
	117	○					○	○	10	15	19	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8		3.0	—		
	157	○					○	○	12	15	19	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1		3.5	—		
	196	○		○			○	○	13	15	19	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	850	3.8	—		
	235	○		○	○			○	○	13	15	19	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3		95.9	4.3	—	
	274	○		○	○			○	○	13	15	19	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6		112	4.7	—	
	314	○			○			○	○	13	15	19	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	950	5.2	—	
	392	○			○	○		○	○	13	15	19	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	}	5.4	—	
	469	○			○	○		○	○	13	15	18	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	1,250	5.8	—	

●: Available with or without strainer ○: Only available without strainer

*3) Use CERTIIM (VEP-TPVDF) only at pressures below 2.0 MPa.

HOW TO ORDER VEP SERIES

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M VEP 11519 S303W

Pipe conn. size ⁷	Spray angle code	Spray capacity code ⁴	Material ⁵	Strainer ⁶
1/8M	115	03	S303	W (with strainer)
1/4M	5	5	B	(Blank indicates "without strainer")
3/8M	15	469	TPVDF	
1/2M				

*4) When spray capacity code is 03, 04, or 05, "AL99-" is indicated before the material code.

Example: 1/4M VEP 9003 AL99-S303W

*5) Brass body is available only in sizes R1/8 and R1/4.

*6) No strainers for VEP-TPVDF.

HOW TO ORDER VE SERIES

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M VE 11519 S303W

Pipe conn. size ⁷	Spray angle code	Spray capacity code ⁴	Material	Strainer
1/4M	115	03	S303	W (with strainer)
	5	5		(Blank indicates "without strainer")
	15	157		

② Nozzle Tip Only

Example: 1/4 VE 11519 S303

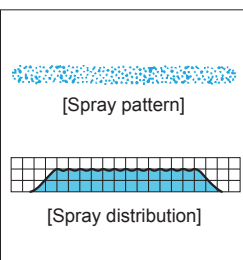
Pipe conn. size

Quick-detachable Even Flat Spray Nozzles

Stainless Steel

INVE

Flat Spray



- Flat spray pattern with uniform distribution across the pattern area.
- The unique design accommodates easy installation and removal.
- Quick-detachable design helps to significantly reduce maintenance time.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Cleaning: Automotives, containers, films, felts, filters, screens, bottles, crushed stone, earth and sand, metal parts, machines, steel plates and pieces, wires

Spraying: Oils, lubricants, glues, insecticides, herbicides

Cooling: Tanks, roofs

Water screen: Dust suppression, deodorization

Structure	<ul style="list-style-type: none"> • Has a ceramic orifice in the nozzle tip. • Includes a nozzle section (nozzle tip + cap + packing) and an adaptor. • Worn-out nozzle tips and other parts are available separately for replacement. • Easy installation and removal of the nozzle section with a twist of about 90°. • Tip or packing will not fall out when the nozzle section is removed.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Tip retainer: S303 • Cap and Adaptor: S316L equivalent • Packing: FEPM
Weight	<ul style="list-style-type: none"> • Complete assembly: 51 g • Nozzle tip: 6.5 g

Max. temperature: 60°C

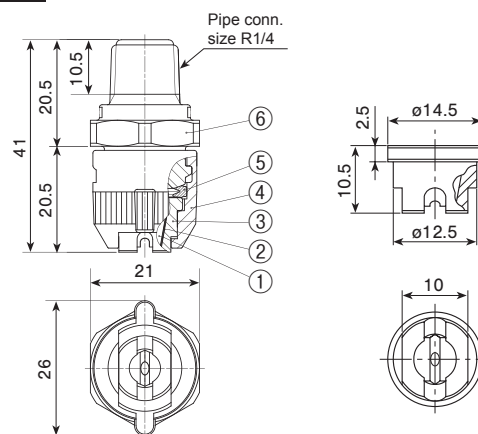
Max. operating pressure: 2.0 MPa

The flat spray spread direction is parallel to the surface milling.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Complete Assembly

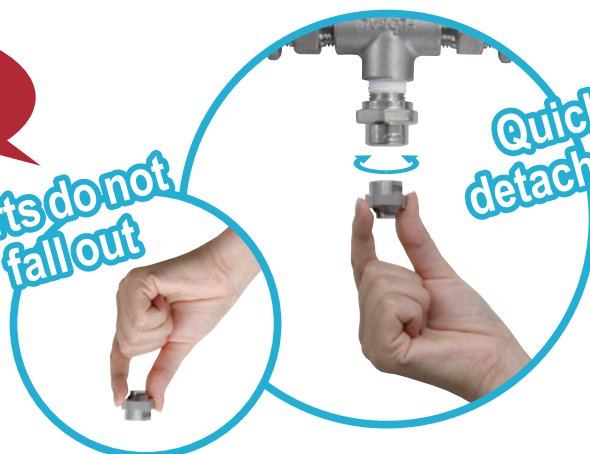
Nozzle Tip
(① + ② + ③)

- ①Ceramic orifice ②Adhesive: Araldite® ③Tip retainer
④Cap ⑤Packing (FEPM) ⑥Adaptor

Safe design
prevents parts
from falling out

Parts do not
fall out

Quick-
detachable



Common Features of INVV-SS, INV, INVE,
and INJJX-SS Series

Easy to install and remove
by hand

For more details see page 18 for the INVV-SS and INV series flat spray nozzles and page 63 for the INJJX-SS series full cone spray nozzles.

Spray angle code	Spray capacity code	Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (μm)	Free passage diameter (mm)
		0.15 MPa	0.3 MPa	0.7 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 MPa		
115	78	106	115	121	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	350	1.0
	117	106	115	120	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	450	1.2
	157	106	115	120	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	450	1.4
90	36	83	90	97	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	300	1.0
	39	83	90	97	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	300	1.0
	59	83	90	97	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	300	1.2
	78	84	90	97	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	300	1.4
	117	84	90	96	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	300	1.7
	157	84	90	96	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	480	2.0
80	36	72	80	84	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	310	1.0
	39	73	80	84	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	310	1.0
	59	74	80	84	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	310	1.3
	78	74	80	84	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	310	1.6
	117	75	80	84	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	310	1.9
	157	76	80	84	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	490	2.4
65	31	57	65	73	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	310	1.1
	36	57	65	73	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	310	1.2
	39	57	65	73	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	310	1.3
	59	58	65	72	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	310	1.4
	78	58	65	72	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	310	1.8
	117	58	65	69	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	310	2.3
50	157	58	65	69	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	520	2.7
	31	43	50	55	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	350	1.2
	39	43	50	55	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	350	1.4
	59	43	50	55	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	350	1.5
	78	43	50	55	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	350	2.0
	117	43	50	54	4.76	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	350	2.4
40	157	43	50	54	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	570	2.9
	23	31	40	46	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	350	1.1
	36	32	40	45	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	350	1.4
	59	32	40	45	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	350	1.8
	78	33	40	45	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	350	2.1
	117	33	40	44	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	350	2.6
25	157	33	40	44	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	630	3.0
	19	18	25	32	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	390	1.1
	31	19	25	32	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	390	1.4
	39	20	25	32	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	390	1.5
	59	21	25	32	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	390	1.9
	78	21	25	32	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	390	2.3
15	117	21	25	32	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	390	2.7
	157	21	25	32	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	730	3.4
	23	10	15	19	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	500	1.3
	36	10	15	19	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	500	1.6
	59	10	15	19	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	500	2.0
	78	10	15	19	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	500	2.4
15	117	10	15	19	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	500	3.0
	157	12	15	19	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	850	3.5

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M INVE 11578 S303 (FEPM) + S316L-IN

1/4M INVE **115** **78** S303 (FEPM) + S316L-IN

Pipe conn. size ^{*1}	Spray angle code	Spray capacity code	Nozzle tip material	Packing material	Material of cap & adaptor
15	115	19			
	15	157			

② Nozzle Tip Only^{*2}

Example: 1/4 VE 11578 S303

1/4 VE **115** **78** S303

Spray angle code	Spray capacity code	Material
115	19	
15	157	

③ Adaptor (R1/4), cap, and packing are available separately for purchase.^{*1} "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.^{*2} Nozzle tips for the INVE series are the same as those used for the VE series.

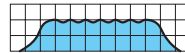
High Pressure Cleaning Even Flat Spray Nozzles

VNP

Flat Spray



[Spray pattern]



[Spray distribution]

- Flat spray pattern with uniform distribution across the pattern area.
- Small R1/4 and R1/8 pipe connection sizes for high pressure cleaning.

[STANDARD PRESSURE]

3.0 MPa

[APPLICATIONS]

High pressure cleaning:

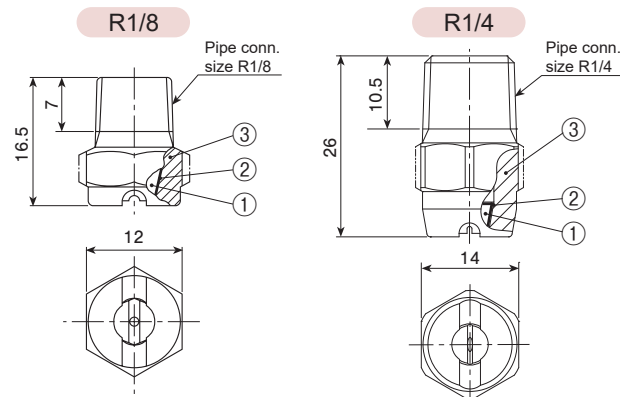
Automotives, containers, tanks, wire and felt parts of paper making machines, wire cylinders, filter presses, other industrial cleaning and degreasing

Structure	• One-piece structure with a ceramic orifice insert.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303 or B (brass) <p>SPECIAL ORDER MATERIAL: S316</p>
Weight	<ul style="list-style-type: none"> • R1/8... S303: 7 g, B (brass): 7.4 g • R1/4... S303: 20 g, B (brass): 22 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



① Ceramic orifice ② Adhesive: Araldite® ③ Nozzle body

Spray angle code	Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)													Free pass. dia. (mm)
		R1/8	R1/4	1 MPa	3 MPa	5 MPa	1 MPa	2 MPa	2.5 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa		
65	43	○	○	60	65	65	2.50	3.54	3.96	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	0.7	
	49	○	○	60	65	65	2.86	4.04	4.52	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	0.8	
	56	○	○	60	65	65	3.22	4.54	5.08	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	0.9	
	62	○	○	60	65	65	3.57	5.05	5.65	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	0.9	
	68	○	○	60	65	65	3.93	5.55	6.21	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	1.0	
	74	○	○	60	65	65	4.29	6.06	6.78	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	1.0	
	80	○	○	60	65	65	4.65	6.56	7.35	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	1.0	
	87	○	○	60	65	65	5.00	7.07	7.91	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	1.1	
	99	○	○	60	65	65	5.72	8.08	9.04	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	1.1	
	124	○	○	60	65	65	7.15	10.1	11.3	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	1.3	
40	25	○	○	35	40	40	1.43	2.02	2.25	2.47	2.67	2.85	3.03	3.19	3.64	4.03	4.51	5.52	0.6	
	31	○	○	35	40	40	1.78	2.52	2.82	3.09	3.34	3.57	3.78	3.99	4.55	5.05	5.64	6.91	0.7	
	37	○	○	35	40	40	2.14	3.03	3.39	3.71	4.01	4.28	4.54	4.79	5.46	6.06	6.77	8.30	0.7	
	43	○	○	35	40	40	2.50	3.54	3.96	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	0.8	
	49	○	○	35	40	40	2.86	4.04	4.52	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	1.0	
	56	○	○	35	40	40	3.22	4.54	5.08	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	1.0	
	62	○	○	35	40	40	3.57	5.05	5.65	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	1.1	
	68	○	○	35	40	40	3.93	5.55	6.21	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	1.1	
	74	○	○	35	40	40	4.29	6.06	6.78	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	1.1	
	80	○	○	35	40	40	4.65	6.56	7.35	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	1.2	
	87	○	○	35	40	40	5.00	7.07	7.91	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	1.2	
	99	○	○	35	40	40	5.72	8.08	9.04	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	1.4	
124	○	○	35	40	40	7.15	10.1	11.3	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	1.5		
30	25	○	○	26	30	30	1.43	2.02	2.25	2.47	2.67	2.85	3.03	3.19	3.64	4.03	4.51	5.52	0.6	
	31	○	○	26	30	30	1.78	2.52	2.82	3.09	3.34	3.57	3.78	3.99	4.55	5.05	5.64	6.91	0.7	
	37	○	○	26	30	30	2.14	3.03	3.39	3.71	4.01	4.28	4.54	4.79	5.46	6.06	6.77	8.30	0.8	
	43	○	○	26	30	30	2.50	3.54	3.96	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	0.9	
	49	○	○	26	30	30	2.86	4.04	4.52	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	1.0	
	56	○	○	26	30	30	3.22	4.54	5.08	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	1.1	
	62	○	○	26	30	30	3.57	5.05	5.65	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	1.1	
	68	○	○	26	30	30	3.93	5.55	6.21	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	1.1	
	74	○	○	26	30	30	4.29	6.06	6.78	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	1.2	
	80	○	○	26	30	30	4.65	6.56	7.35	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	1.3	
	87	○	○	26	30	30	5.00	7.07	7.91	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	1.3	
	99	○	○	26	30	30	5.72	8.08	9.04	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	1.5	
124	○	○	26	30	30	7.15	10.1	11.3	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	1.7		

Spray angle code	Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)												Free pass. dia. (mm)
		R1/8	R1/4	1 MPa	3 MPa	5 MPa	1 MPa	2 MPa	2.5 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa	
25	25	○	○	22	25	25	1.43	2.02	2.25	2.47	2.67	2.85	3.03	3.19	3.64	4.03	4.51	5.52	0.7
	31	○	○	22	25	25	1.78	2.52	2.82	3.09	3.34	3.57	3.78	3.99	4.55	5.05	5.64	6.91	0.7
	37	○	○	22	25	25	2.14	3.03	3.39	3.71	4.01	4.28	4.54	4.79	5.46	6.06	6.77	8.30	0.8
	43	○	○	22	25	25	2.50	3.54	3.96	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	0.9
	49	○	○	22	25	25	2.86	4.04	4.52	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	1.0
	56	○	○	22	25	25	3.22	4.54	5.08	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	1.1
	62	○	○	22	25	25	3.57	5.05	5.65	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	1.1
	68	○	○	22	25	25	3.93	5.55	6.21	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	1.2
	74	○	○	22	25	25	4.29	6.06	6.78	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	1.3
	80	○	○	22	25	25	4.65	6.56	7.35	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	1.3
	87	○	○	22	25	25	5.00	7.07	7.91	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	1.4
	99	○	○	22	25	25	5.72	8.08	9.04	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	1.5
	124	○	○	22	25	25	7.15	10.1	11.3	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	1.7
15	25	○	○	12	15	15	1.43	2.02	2.25	2.47	2.67	2.85	3.03	3.19	3.64	4.03	4.51	5.52	0.7
	31	○	○	12	15	15	1.78	2.52	2.82	3.09	3.34	3.57	3.78	3.99	4.55	5.05	5.64	6.91	0.8
	37	○	○	12	15	15	2.14	3.03	3.39	3.71	4.01	4.28	4.54	4.79	5.46	6.06	6.77	8.30	0.9
	43	○	○	12	15	15	2.50	3.54	3.96	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	1.0
	49	○	○	12	15	15	2.86	4.04	4.52	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	1.1
	56	○	○	12	15	15	3.22	4.54	5.08	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	1.1
	62	○	○	12	15	15	3.57	5.05	5.65	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	1.2
	68	○	○	12	15	15	3.93	5.55	6.21	6.80	7.35	7.85	8.33	8.79	10.1	11.1	12.4	15.2	1.3
	74	○	○	12	15	15	4.29	6.06	6.78	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	1.3
	80	○	○	12	15	15	4.65	6.56	7.35	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	1.4
	87	○	○	12	15	15	5.00	7.07	7.91	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	1.5
	93	○	○	12	15	15	5.36	7.58	8.48	9.28	10.0	10.7	11.4	12.0	13.7	15.2	17.0	20.8	1.5
	99	○	○	12	15	15	5.72	8.08	9.04	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	1.6
	111	○	○	12	15	15	6.43	9.09	10.2	11.1	12.0	12.9	13.6	14.4	16.4	18.2	20.3	24.9	1.6
	124	○	○	12	15	15	7.15	10.1	11.3	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	1.7

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8M VNP 6543 S303

1/8M	VNP	65	43	S303
Pipe conn. size ¹		Spray angle code ²	Spray capacity code	Material
1/8M		65	25	S303
1/4M		15	124	B

*1) "M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

*2) Color of ceramic orifice differs depending on the nozzle code.

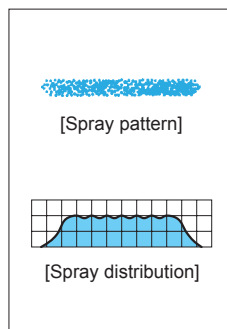
When the spray angle code is 25 or 15 and the spray capacity code is between 43–124, it is marked by "BR-" before the material code.
Example: 1/8M VNP 2543 BR-S303

Descaling Nozzles

Some Models are Made-to-Order

DSP

Flat Spray



[STANDARD PRESSURE]

5.0 MPa

[APPLICATIONS]

High pressure cleaning, descaling, rust-removal, degreasing

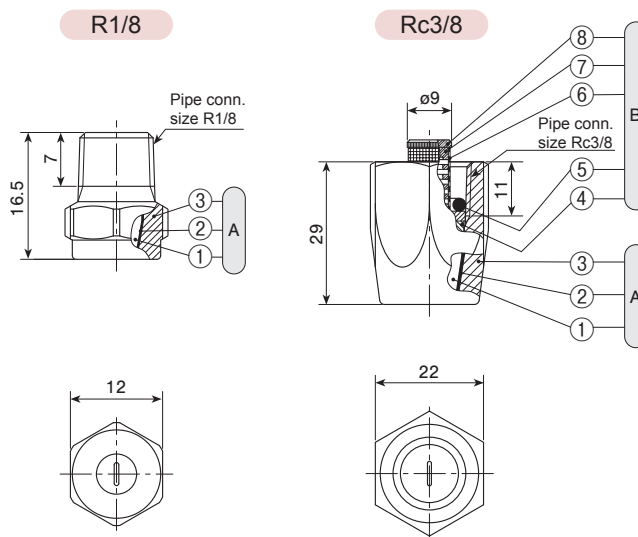
- This incredibly unique flat spray nozzle is engineered especially for powerful cleaning and descaling. With its thin, razor sharp flat spray pattern, the DSP series nozzles have a high spray impact and yield more powerful cleaning performance than any other flat spray nozzle, given the same spray pressure and capacity.

Structure	<ul style="list-style-type: none"> • One-piece structure with a ceramic orifice insert. • From the inlet to the throat the ceramic orifice is round and then draws together into a rectangular slit towards the outlet.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303
Weight ^{*1}	<ul style="list-style-type: none"> • R1/8: 7 g • Rc3/8: 52 g

*1) With strainer, add 5g to the above weight.

DRAWING

Unit: mm



- A) Nozzle** (①Ceramic orifice ②Adhesive: Araldite® ③Nozzle body)
B) Strainer (④Packing [PTFE] ⑤O-ring* [NBR] ⑥Strainer screen [S316] ⑦Strainer holder ⑧Strainer cap)

*2) This O-ring is to prevent the Packing ④ and Strainer ⑥ ⑦ ⑧ from falling out, but is not a seal between nozzle and pipe.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray angle code	Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)										Free pass. dia. (mm)
		R1/8	Rc3/8	3 MPa	5 MPa	10 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa	20 MPa	
15	56	○		14	15	15	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	11.2	0.4
	64	○		14	15	15	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	12.8	0.4
	72	○		14	15	15	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	14.4	0.4
	80	○		14	15	15	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	16.0	0.4
	88	○		14	15	15	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	17.6	0.4
	96	○		14	15	15	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	19.1	0.5
	104	○		14	15	15	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	20.8	0.5
	112	○		14	15	15	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	22.4	0.5
	120	○		14	15	15	9.26	10.0	10.7	11.4	12.0	13.7	15.2	17.0	20.8	24.0	0.6
	128	○		14	15	15	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	25.6	0.6
	144	○		14	15	15	11.1	12.0	12.9	13.6	14.4	16.4	18.2	20.3	24.9	28.8	0.7
	160	○		14	15	15	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	32.0	0.8

Spray angle code	Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)										Free pass. dia. (mm)
		R1/8	Rc3/8	3 MPa	5 MPa	10 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa	20 MPa	
12	83		● ^{*3}	11	12	12	6.43	6.94	7.42	7.87	8.30	9.46	10.5	11.7	14.4	16.6	0.4
	103		● ^{*3}	11	12	12	7.98	8.62	9.21	9.77	10.3	11.7	13.0	14.6	17.8	20.6	0.4
	148		○	11	12	12	11.5	12.4	13.2	14.0	14.8	16.9	18.7	20.9	25.6	29.6	0.5
	166		○	11	12	12	12.9	13.9	14.8	15.7	16.6	18.9	21.0	23.5	28.8	33.2	0.5
	189		○	11	12	12	14.6	15.8	16.9	17.9	18.9	21.5	23.9	26.7	32.7	37.8	0.6
	224		○	11	12	12	17.4	18.7	20.0	21.3	22.4	25.5	28.2	31.6	38.8	44.7	0.7
	250		○	11	12	12	19.4	20.9	22.4	23.7	25.0	28.5	31.6	35.4	43.3	50.0	0.7
	300		○	11	12	12	23.2	25.1	26.8	28.5	30.0	34.2	37.9	42.4	52.0	60.0	0.9
	332		○	11	12	12	25.7	27.8	29.7	31.5	33.2	37.9	42.0	46.9	57.5	66.4	1.0
	478		○	11	12	12	37.0	40.1	42.8	45.3	47.8	54.5	60.5	67.7	82.8	95.7	1.5
	865		○	11	12	12	67.0	72.5	77.4	82.1	86.5	98.6	110	123	150	173	2.6

●: Available with or without strainer (strainer mesh size #150) ○: Only available without strainer

*3) Made-to-order model

Attention:

Please make sure to only use clean water to prevent the nozzles from clogging.

Cleaning Power

The factors that determine the cleaning power of a nozzle are complex. To evaluate the effectiveness, we use the spray impact and the amount of erosion. In general, with an equal liquid pressure, spray capacity and distance, the solid stream jet nozzle has the strongest cleaning power, followed by the flat spray nozzle and the cone spray nozzle. Below is a comparison between our VNP and DSP flat spray nozzles.

[Spray Impact]

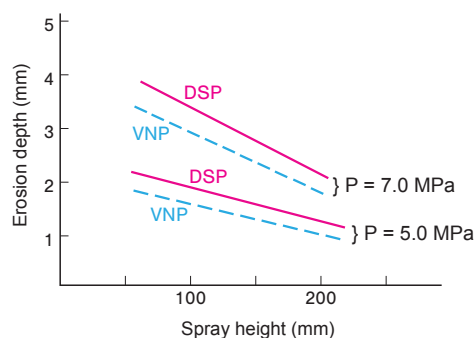
	Spray impact ($\times \frac{1}{100}$ N/cm)	
	Max.	Average
1/8M DSP 15104	560	503
1/8M VNP 1580	460	390



[Amount of Erosion]

The amount of erosion is the depth of the depression on a sample piece dug out by the flat spray nozzle.

Specifications	1/8M DSP 15104		1/8M VNP 1580	
Pressure (MPa)	5.0	7.0	5.0	7.0
Spray angle (°)	16.0	16.0	16.5	17.0
Spray capacity (L/min)	9.9	11.7	10.1	12.0



HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8M DSP 1556 BR-S303

1/8M	DSP	15	56	BR-S303	
Pipe conn. size ^{*4}		Spray angle code	Spray capacity code	Material	Strainer
■ 1/8M		■ 15	■ 56		■ W (with strainer)
■ 3/8F		■ 12	■ 5		■ (Blank indicates "without strainer")
			■ 865		

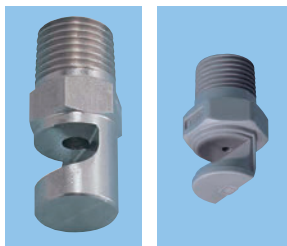
*4) "M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/8M = R1/8, 3/8F = Rc3/8.

Rc3/8 DSP with strainer is made-to-order.

Wide-angle Flat Spray Nozzles

YYP

Flat Spray



- Wide-angle flat spray nozzle to use at low pressure.
- Compared to other flat spray nozzles with the same spray flow rate, the free passage diameter is large and clogging is less likely to occur.
- Compared to other flat spray nozzles, the atomization, spray pattern and distribution are rough, and the spray impact is low.

[STANDARD PRESSURE]

0.15 MPa

[APPLICATIONS]

Cleaning: Conveyor belts, film, eliminator plates, plate glass, planks

Foam breaking: Waste water treatment, paper making

Cooling: Conveyor belts, roofs, tanks

Water screen: Fire protection, heat protection, deodorization

Others: Applications which require wide angle flat spray at low pressures

Structure	<ul style="list-style-type: none"> • One-piece structure, made of metal or plastic. • Small spray capacity models come with or without a strainer. (No strainers for YYP-PVC.)
Material	<ul style="list-style-type: none"> • S303 or PVC <p>SPECIAL ORDER MATERIAL: S316 or others</p>

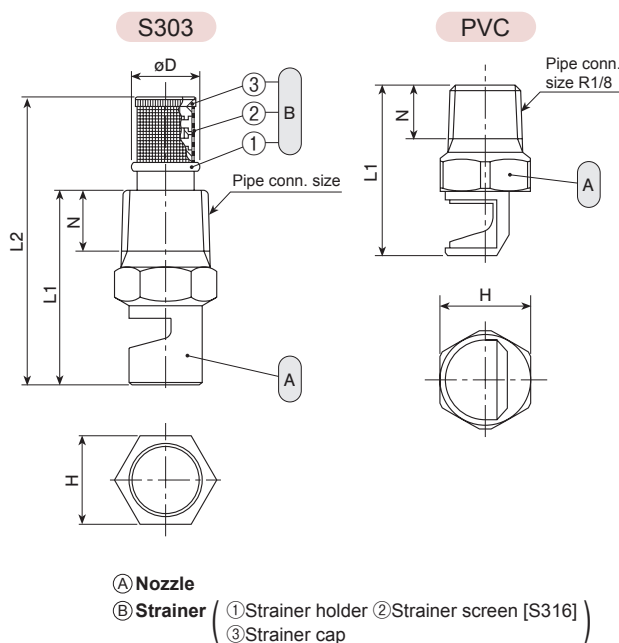
Material	Pipe conn. size ^{*1}	Dimensions (mm)						Weight (g)	
		L1	L2	H	øD	N	S303 ^{*2}	PVC	
Metal (S303)	R1/8 (03-13)	23	35.5	10	7.5	7	7.5	—	
	R1/8 (16-60)	25	—	10	—	7	9.3	—	
	R1/4	34	—	14	—	10.5	28	—	
	R3/8	44	—	19	—	11	65	—	
	R1/2	50	—	22	—	14	105	—	
	R3/4 (620)	55	—	27	—	15	175	—	
	R3/4 (1000)	65	—	36	—	15	345	—	
PVC	R1	75	—	41	—	18	510	—	
	R1/8 (03-13)	21.5	—	12	—	7	—	1.8	
	R1/8 (16-30)	22.5	—	12	—	7	—	1.8	

*1) Figures in () after the pipe connection sizes indicate the spray capacity codes.

*2) With strainer, add 2 g to the above weight.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

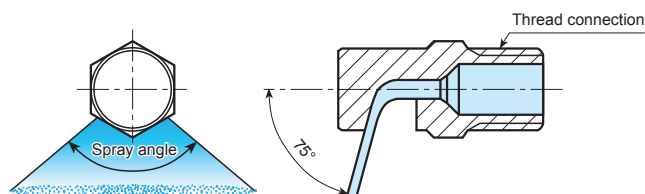
DRAWING



Spray Angle and Elevation Angle

Wide-angle flat spray nozzles spray at an angle of 75° to the axis of the nozzle.

For installation, the elevation (inclination) angle of 75° should be taken into consideration.



■ YYP Series (metal)

Spray capacity code	Pipe connection size						Spray angle (°)			Spray capacity (L/min)					Mean droplet dia. (μm)	Free passage dia. (mm)	Strainer mesh size
	R1/8	R1/4	R3/8	R1/2	R3/4	R1	0.05 MPa	0.15 MPa	0.2 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa			
03	●						—	100	107	—	—	0.25	0.30	0.35	190	0.6	100
04	●						—	120	126	—	—	0.33	0.40	0.46		0.6	50
05	●						—	130	136	—	—	0.41	0.50	0.58	∧	0.7	50
07	○						—	130	136	—	—	0.57	0.70	0.81		0.9	—
10	○						103	130	135	—	0.58	0.82	1.00	1.15		1.1	—
13	○						108	130	135	—	0.75	1.06	1.30	1.50		1.2	—
16	○						110	130	134	—	0.92	1.31	1.60	1.85	280	1.4	—
20	○						116	135	139	0.89	1.15	1.63	2.00	2.31		1.5	—
25	○						117	135	139	1.12	1.44	2.04	2.50	2.89		1.7	—
30	○						118	135	139	1.34	1.73	2.45	3.00	3.46	∧	1.9	—
40	○						119	135	139	1.79	2.31	3.27	4.00	4.62		2.2	—
50	○						120	135	138	2.24	2.89	4.08	5.00	5.77		2.4	—
60	○						121	135	138	2.68	3.46	4.90	6.00	6.93	470	2.6	—
70		○					125	140	144	3.13	4.04	5.72	7.00	8.08	480	2.9	—
100		○					128	140	143	4.47	5.77	8.16	10.0	11.5	∧	3.4	—
140		○					130	140	143	6.26	8.08	11.4	14.0	16.2	610	4.1	—
180			○				131	140	142	8.05	10.4	14.7	18.0	20.8	∧	4.8	—
230			○				133	140	142	10.3	13.3	18.8	23.0	26.6	650	5.2	—
320				○			134	140	142	14.3	18.5	26.1	32.0	37.0	∧	6.3	—
450				○			135	140	142	20.1	26.0	36.7	45.0	52.0	850	7.4	—
620					○		135	140	142	27.7	35.8	50.6	62.0	71.6	∧	8.8	—
1000					○		135	140	141	44.7	57.7	81.6	100	115	1,150	11.5	—
1500						○	136	140	140	67.1	86.6	122	150	173	1,100	14.0	—
2500						○	136	140	140	112	155	204	250	289	1,550	18.4	—

●: Available with or without strainer ○: Only available without strainer

■ YYP-PVC Series

Spray capacity code	Spray angle (°)			Spray capacity (L/min)					Mean droplet diameter (μm)	Free passage diameter (mm)
	0.05 MPa	0.15 MPa	0.2 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa		
03	—	115	122	—	—	0.25	0.30	0.35	190	0.6
04	—	120	126	—	—	0.33	0.40	0.46		0.6
05	—	130	136	—	—	0.41	0.50	0.58		0.7
07	—	130	136	—	—	0.57	0.70	0.81	∧	0.9
10	103	130	135	—	0.58	0.82	1.00	1.15		1.0
13	108	130	135	—	0.75	1.06	1.30	1.50		1.2
16	110	130	134	—	0.92	1.31	1.60	1.85	280	1.3
20	116	135	139	0.89	1.15	1.63	2.00	2.31		1.5
25	117	135	139	1.12	1.44	2.04	2.50	2.89	∧	1.6
30	118	135	139	1.34	1.73	2.45	3.00	3.46	380	1.8

[Note] No strainers for YYP-PVC.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8M YYP 03 S303W

1/8M

Pipe conn. size³⁾

1/8M

∧

1M

YYP

03

Spray capacity code

03

∧

2500

S303

Material

S303

PVC (Injection molded)

W

Strainer

W (with strainer)

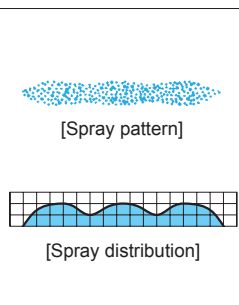
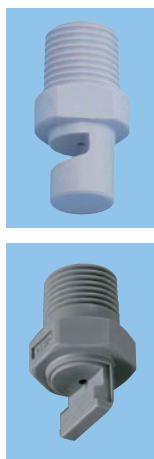
(Blank indicates "without strainer")

*3) "M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

Wide-angle Flat Spray Nozzles for Ultra-low Pressure Spraying

LYYP

Flat Spray



- Wide-angle flat spray nozzle that can maintain a fan-shaped spray pattern at ultra-low pressure, even as low as 0.015 MPa.
- The low spray impact and volume, create a bubble-free spray surface.
- Compared to other flat spray nozzles with the same spray flow rate, the free passage diameter is large and clogging is less likely to occur.
- Oil-free product.

[STANDARD PRESSURE]
0.015 MPa

[APPLICATIONS]

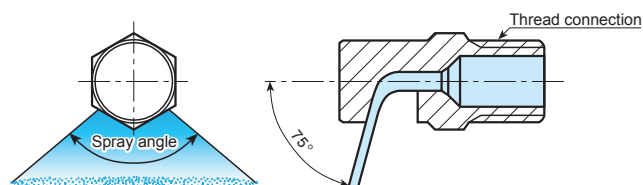
Spraying developing solution in semi-conductor manufacturing processes, ultra-low volume spray for pharmaceutical manufacturing processes, chemical spraying to surface treated steel plates

Structure	• One-piece structure made of plastic.
Material	• PVC SPECIAL ORDER MATERIAL: S316 or PCTFE
Weight	• 1.5 g (Injection-molded LYYP weigh 1.4 g)

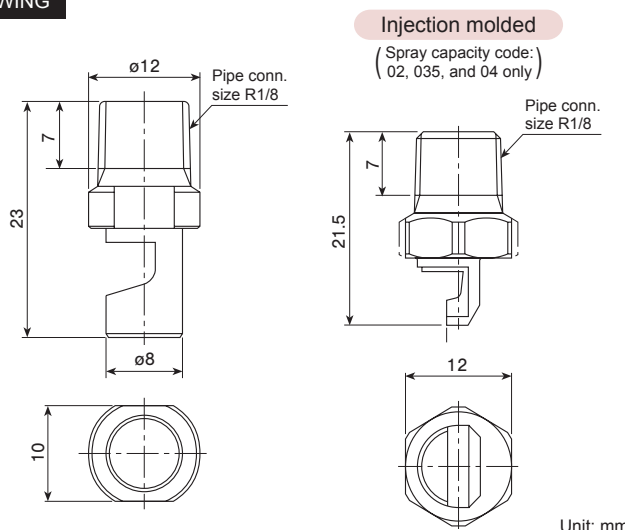
Spray Angle and Elevation Angle

Wide-angle flat spray nozzles spray at an angle of 75° to the axis of the nozzle.

For installation, the elevation (inclination) angle of 75° should be taken into consideration.



DRAWING



[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray capacity code	LYYP	LYYP (Injection molded)	Spray angle (°)			Spray capacity (L/min)							Mean droplet diameter (μm)	Free passage diameter (mm)
			0.01 MPa	0.015 MPa	0.02 MPa	0.008 MPa	0.01 MPa	0.012 MPa	0.015 MPa	0.02 MPa	0.03 MPa	0.04 MPa		
02			—	70	77	—	—	0.18	0.20	0.23	0.28	0.33	850	0.9
025	○		67	80	87	—	0.20	0.22	0.25	0.29	0.35	0.41		1.0
03	○		77	90	97	0.22	0.24	0.27	0.30	0.35	0.42	0.49		1.0
035		○	87	100	107	0.26	0.29	0.31	0.35	0.40	0.49	0.57		1.1
04		○	88	100	108	0.29	0.33	0.36	0.40	0.46	0.57	0.65	}	1.3
05	○		97	110	117	0.37	0.41	0.45	0.50	0.58	0.71	0.82		1.3
06	○		107	120	127	0.44	0.49	0.54	0.60	0.69	0.85	0.98		1.4
07	○		107	120	127	0.51	0.57	0.63	0.70	0.81	0.99	1.14		1.6
08	○		108	120	128	0.58	0.65	0.72	0.80	0.92	1.13	1.31		1.7
10	○		108	120	128	0.73	0.82	0.89	1.00	1.15	1.41	1.63	1,350	1.9

[Note] The LYYP series nozzles are guaranteed for a spray angle within -5° to +10° of the rated angle and for a spray capacity within +/-10% of the rated capacity under standard pressure.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

LYYP

Example: 1/8M LYYP 025 PVC

Pipe conn. size ¹	LYYP	Spray capacity code	Material
1/8M		025	PVC
		025	
		035	
		10	

LYYP (injection molded)

Example: 1/8M LYYP 02 PVC-IN

Pipe conn. size ¹	LYYP	Spray capacity code	Material
1/8M		02	PVC-IN
		02	
		035 ²	
		04	

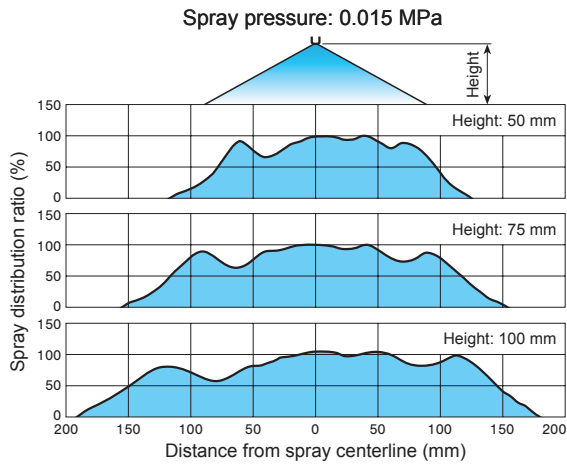
*1) "M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

*2) With a spray capacity code of 035, the nozzle description is 1/8M LYYP 035 PVC (injection-molded).

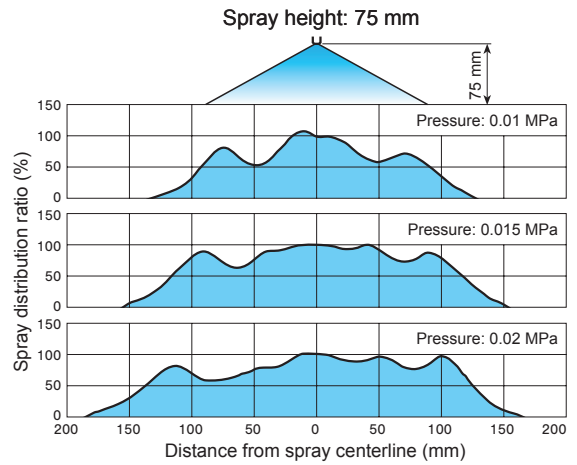
Spray Distribution of LYYP Series Wide-angle Flat Spray Ultra-low Pressure Nozzles

The variation in spray distribution is minimal despite changes in the spray height and spray pressure.

■ Nozzle: 1/8MLYYP07PVC



Relation between spray height and spray distribution



Relation between spray pressure and spray distribution

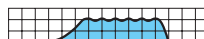
Off-center Even Flat Spray Nozzles

OVVEP

Flat Spray



[Spray pattern]



[Spray distribution]

- Off-center flat spray pattern with uniform distribution across the pattern area.
- In a multi-nozzle arrangement the diagonal spray of the OVVEP series prevents accumulation of spray fluid.
- No need to install the nozzles at an angle, as the angle is already built into the nozzle design.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Cooling: Steel plates, steel pieces

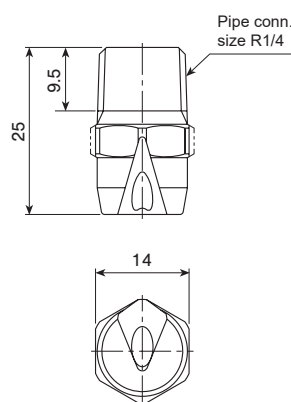
Spraying: Etchants, oils, lubricants, glues, acids, insecticides, herbicides

Cleaning: Steel plates, steel pieces, filters, felts, screens

Structure	• One-piece structure, made of metal.
Material	• S303 SPECIAL ORDER MATERIAL: S316 or others
Weight	• 17 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Unit: mm

Spray angle code	Spray capacity code	Spray angle (°)			Spray capacity (L/min)											Mean droplet dia. (μm)	Free passage dia. (mm)
		0.05 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.07 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa		
60	200	56	60	62	8.2	9.7	11.5	14.1	16.3	20.0	25.8	30.6	36.5	44.7	51.6	540	3.1
	250	57	60	61	10.2	12.1	14.4	17.7	20.4	25.0	32.3	38.2	45.6	55.9	64.5	~	3.3
	300	57	60	61	12.2	14.5	17.3	21.2	24.5	30.0	38.7	45.8	54.8	67.1	77.5	670	3.3
45	200	41	45	48	8.2	9.7	11.5	14.1	16.3	20.0	25.8	30.6	36.5	44.7	51.6	600	3.2
	250	42	45	47	10.2	12.1	14.4	17.7	20.4	25.0	32.3	38.2	45.6	55.9	64.5	~	3.6
	300	42	45	47	12.2	14.5	17.3	21.2	24.5	30.0	38.7	45.8	54.8	67.1	77.5	750	4.0

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M OVVEP 60200 S303

1/4M OVVEP 60 200 S303

Pipe conn. size*

Spray angle code

Spray capacity code

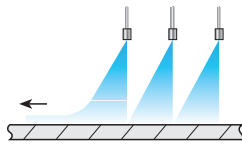
Material

60
45

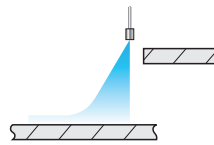
200
250
300

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

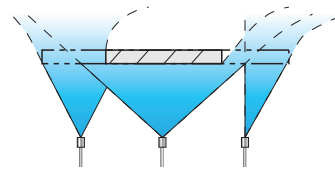
How to Use Off-center Even Flat Spray Nozzles



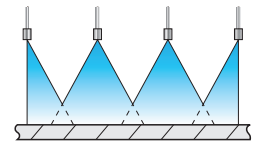
● Spray in one direction



● Spray in limited space



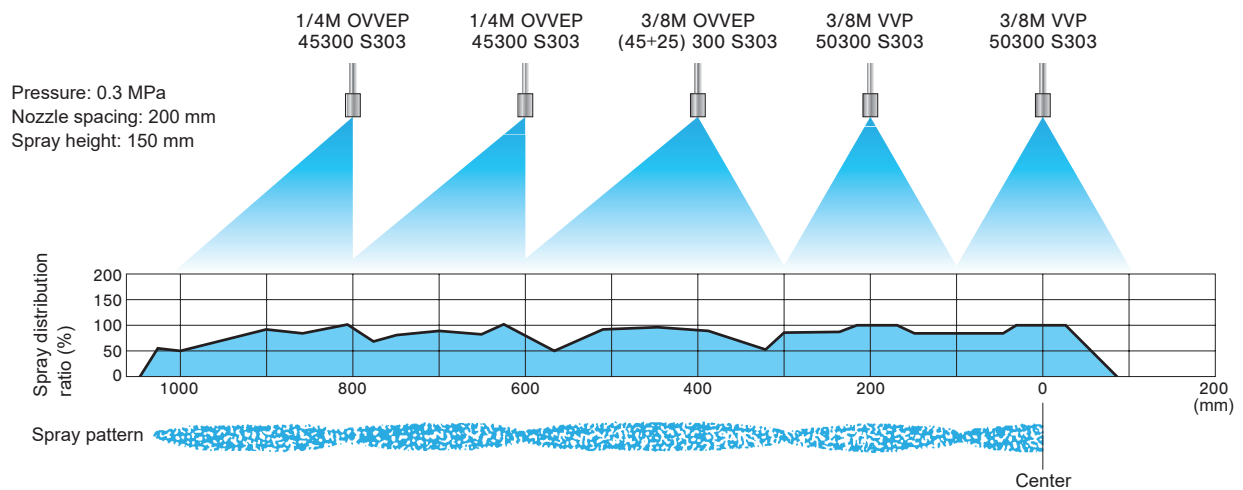
● Avoid wetting the back side of target



● Save spray liquid

Combined Use with Standard Flat Spray Nozzles

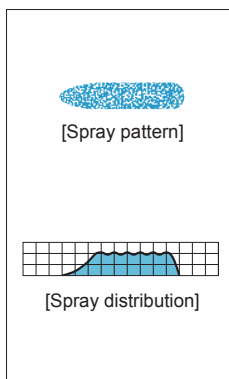
For applications such as cooling steel plates, the direction of flow can be controlled by using a combination of OVVEP series nozzles and standard flat spray nozzles.



Quick-detachable Off-center Even Flat Spray Nozzles

INOVVE

Flat Spray



- Off-center flat spray pattern with uniform distribution.
- In addition to the benefits of the OVVEP series, INOVVE is easy to install and remove—just turning the nozzle tip until it clicks. No need to adjust the spray direction.
- Made of highly chemical and heat resistant plastic.

[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]
Cleaning, rinsing, etching

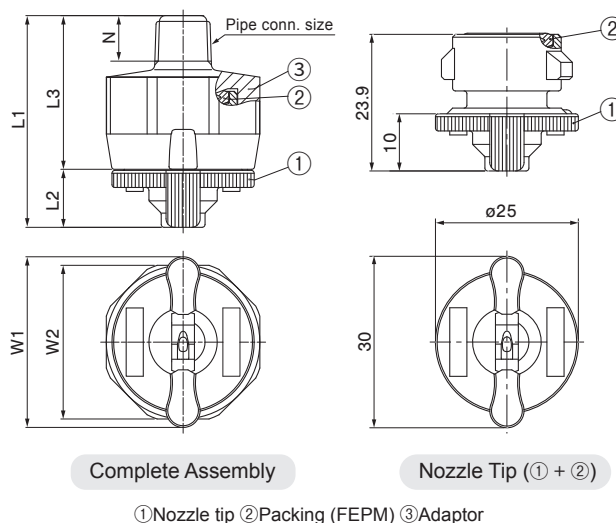
Structure	<ul style="list-style-type: none"> • Two-piece structure including a nozzle tip with packing and an adaptor. • Easy installation and removal of the nozzle tip with a twist of about 60°.
Material	<ul style="list-style-type: none"> • Nozzle tip: PP • Adaptor: PP or PPS [SPECIAL ORDER MATERIAL: PVDF] • Packing: FEPM

Pipe conn. size	Dimensions (mm)						Weight (g)	
	L1	L2	L3	W1	W2	N	PP	PPS
R1/8	37	10	27	30	27	8	9	12
R1/4	40	10	30	30	27	11.5	10	13
R3/8	40	10	30	30	27	12	11	14

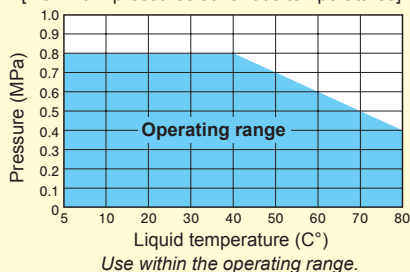
[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

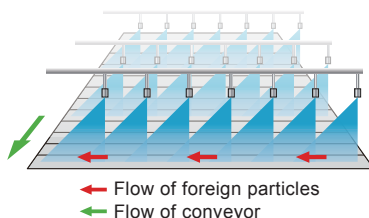
Unit: mm



[Maximum pressures at various temperatures]



Use within the operating range.



Spraying in one direction prevents accumulation of spray fluid and foreign particles.

Spray capacity code	Pipe connection size			Spray angle (°)			Spray capacity (L/min)				Mean droplet diameter (μm)	Free passage diameter (mm)	Nozzle tip color
	R1/8	R1/4	R3/8	0.15 MPa	0.3 MPa	0.5 MPa	0.15 MPa	0.3 MPa	0.5 MPa	0.7 MPa			
30	○	○	○	42	45	46	2.12	3.00	3.88	4.58	600	1.0	Blue
50	○	○	○	42	45	46	3.54	5.00	6.46	7.64	800	1.3	Pink

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M INOVVE 4530 PP (FEPM) + PP

1/4M	INOVVE 45	30	PP (FEPM)	+	PP
Pipe conn. size*		Spray capacity code	Nozzle tip material (packing: FEPM)		Adaptor material
<input type="checkbox"/> 1/8M <input type="checkbox"/> 1/4M <input type="checkbox"/> 3/8M		<input type="checkbox"/> 30 <input type="checkbox"/> 50			<input type="checkbox"/> PP <input type="checkbox"/> PPS (Color-coded by material)

③ Adaptor is available for purchase separately.

④ You can change a nozzle tip to a plug tip if needed.
See page 22 for Quick-detachable IN Plug series.

② Nozzle Tip Only (with packing)

Example: INOVVE 4530 PP (FEPM)

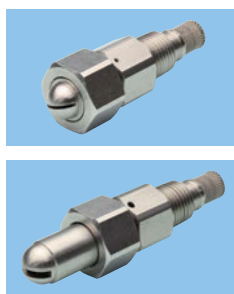
INOVVE 45	30	PP (FEPM)
	Spray capacity code	Nozzle tip material (packing: FEPM)
	<input type="checkbox"/> 30 <input type="checkbox"/> 50	

**"M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

Foaming Spray Nozzles

Made-to-Order

AWVV



[Spray pattern]

[Spray distribution]

- Flat fan spray nozzle for spraying detergent.
- Generates large amounts of foam due to the air being suctioned in by the liquid pressure.
- The long-lasting foam helps to increase the cleaning performance.
- The wide spray angle covers a larger cleaning area.
- A compressor is not required.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

- Cleaning: conveyors, outer surface of vehicles, factory floors/walls

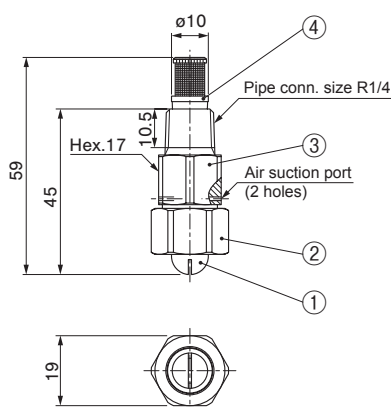
Flat Spray

Structure	<ul style="list-style-type: none"> • Made of metal. • Comprises a nozzle tip, cap, adaptor, and strainer.
Material	• S303
Weight	<ul style="list-style-type: none"> • Spray capacity code 10: 60g • Spray capacity code 30 and 50: 65g

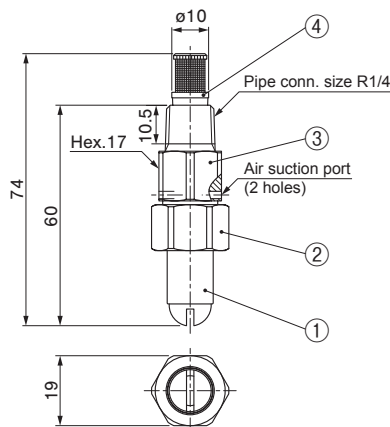
DRAWING

Unit: mm

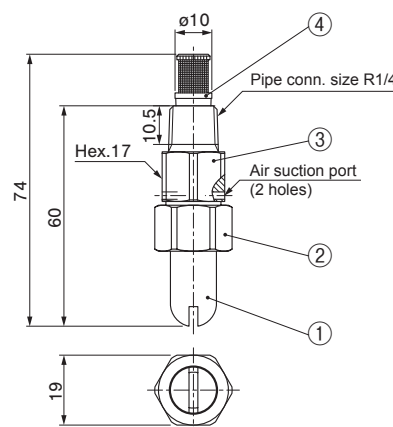
Spray capacity code 10



Spray capacity code 30



Spray capacity code 50



① Nozzle tip ② Cap ③ Adaptor ④ Strainer

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray angle code	Spray capacity code	Liquid	Spray angle ^{*1} (°)			Spray capacity ^{*2} (L/min)						Strainer mesh size
			0.1 MPa	0.3 MPa	0.6 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.4 MPa	0.5 MPa	0.6 MPa	
100	10	Water	50	105	116	0.58	0.82	1.00	1.15	1.29	1.41	50
		Detergent	55	100	116	0.58	0.82	1.00	1.15	1.29	1.41	50
	30	Water	75	105	113	1.73	2.45	3.00	3.46	3.87	4.24	50
		Detergent	82	100	113	1.73	2.45	3.00	3.46	3.87	4.24	50
80	10	Water	40	80	100	0.58	0.82	1.00	1.15	1.29	1.41	50
		Detergent	—	80	100	0.58	0.82	1.00	1.15	1.29	1.41	50
	30	Water	57	80	95	1.73	2.45	3.00	3.46	3.87	4.24	50
		Detergent	57	80	95	1.73	2.45	3.00	3.46	3.87	4.24	50
50	50	Water	57	80	95	2.89	4.08	5.00	5.77	6.45	7.07	50
		Detergent	57	80	95	2.89	4.08	5.00	5.77	6.45	7.07	50

*1) The spray angle for detergent is for reference only, spraying commercial dishwasher detergent that is diluted by a factor of 100.

"—" indicates a value outside of the operating range.

*2) Spray liquid is tap water. The performance guarantee does not apply when spraying detergent.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M AWVV 10010 S303W

1/4M	AWVV	100	10	S303	W
Pipe conn. size ^{*3}		Spray angle code	Spray capacity code	Material	Strainer
		100	10		
		80	30		
			50		

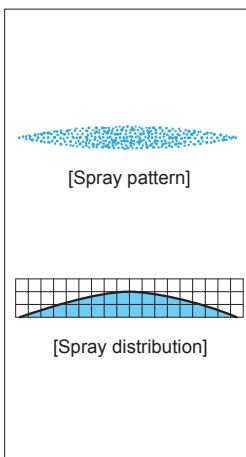
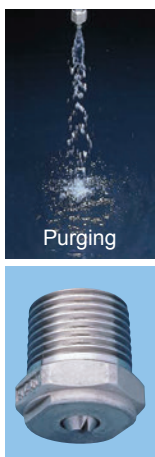
*3) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

This nozzle series is made-to-order.

Self-cleaning Flat Spray Nozzles

MOMOJet

Flat Spray



- When the liquid pressure is reduced to 0.03 MPa or lower, the nozzle tip retracts and purges any foreign particles that clog the nozzle. By increasing the water pressure to 0.2 MPa or higher, normal spraying resumes.
- The straight-through orifice makes this nozzle suitable for multi-nozzle set-up.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Cleaning: Paper making (wire, felt parts and rollers), steel plates, PCB

Cooling: Steel plates

Foam breaking: Waste water treatment

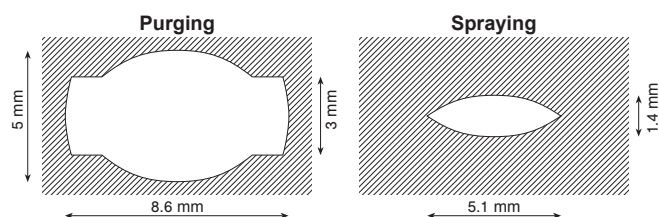
Others: Applications where recirculated water is being used

Structure	<ul style="list-style-type: none"> • By changing the liquid pressure, a built-in spring moves the split nozzle tip up and down and opens the orifice for purging. • Nozzle tips are made by metal injection molding.
Material	• S303
Weight	• 45 g

Precautions for Use of MOMOJet

When purging, the nozzle tip opens wide and the spray capacity increases.

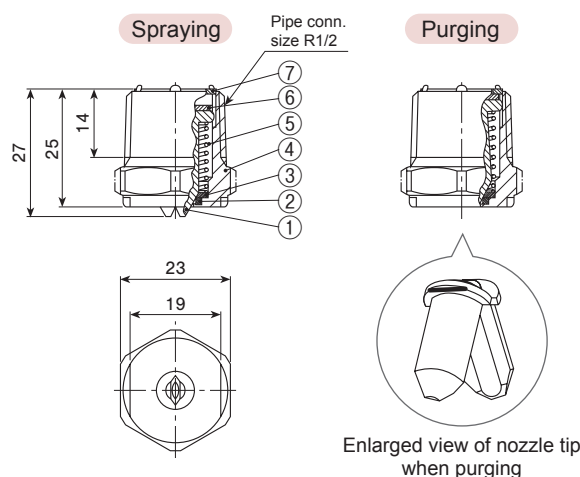
This should be taken into consideration when selecting a pump.



[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



- ① Nozzle tip ② Packing (EPDM) ③ Plate ④ Nozzle body
⑤ Spring ⑥ Packing (EPDM) ⑦ Ring

Spray capacity code	Spray angle (°)		Spray capacity (L/min)							Mean droplet diameter (μm)	Free passage diameter	
	0.3 MPa	0.7 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa		Spraying (mm)	Purging (mm)
20	80	86	1.63	2.00	2.58	3.06	3.65	4.47	5.16	300	0.8	3.0
40	80	83	3.27	4.00	5.16	6.11	7.30	8.94	10.3	?	1.2	3.3
60	80	83	4.90	6.00	7.75	9.17	11.0	13.4	15.5	490	1.3	3.5

Attention:

1. To start spraying, a flow rate of about 9 L/min at 0.02–0.03 MPa is required for all models. Make sure to select an appropriate pump.
2. MOMOJet is designed to start spraying when the pressure is greater than 0.1 MPa. Use MOMOJet at a pressure of 0.2 MPa or higher.
3. Since MOMOJet series nozzles have moving nozzle tips, the spray capacity is only guaranteed within +/-10% and the spray angle within +/-10° at standard pressure.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/2 MOMO 8020 S303

1/2* MOMO 80 20 S303

Spray angle code	Spray capacity code	Material
20	20	S303
40		
60		

*Indicates R1/2, nozzle thread size.

ALSO AVAILABLE!

Self-cleaning
Solid Stream Jet

MOMOJet "C" SERIES

See page 98 of this catalog.

Air & Steam Flat Spray Nozzles

VZ

Flat Spray



[Note] Water is sprayed here to better show the spray pattern.



[Spray pattern]

- Produces a flat spray pattern of air or steam.
- Air flow volume can be adjusted by changing the nozzle tip.
- An effective spray angle cannot be maintained long, as air and steam disperse very quickly.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Compressed air: Cleaning, dust suppression, drying, air curtain

Steam: Humidification, temperature control, moisture control

Structure	<ul style="list-style-type: none"> • Three-piece structure including a nozzle tip, cap, and adaptor. • Worn-out nozzle tips can be replaced separately. • The cap and adaptor are interchangeable with those of three-piece structure standard flat spray nozzles for liquids.
Material	<ul style="list-style-type: none"> • S303 <p>SPECIAL ORDER MATERIAL: S316</p>

[Complete Assembly]

Pipe conn. size	Dimensions (mm)					Weight (g)
	L1	H1	H2	N	a	
R1/4	43	19	17	10.5	6.5	41
R3/8	48.5	23	21	11	9.5	69

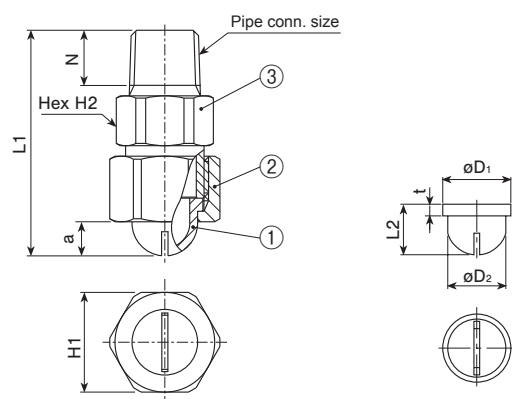
[Nozzle Tip]

Pipe conn. size ¹⁾	Dimensions (mm)				Weight (g)
	L2	øD1	øD2	t	
R1/4	11	14.5	12.5	2.5	5.1
R3/8	14	18	16	2.5	8

*1) Pipe connection size of the complete assembly

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Complete Assembly

Nozzle Tip

① Nozzle tip ② Cap ③ Adaptor

Air capacity code	Pipe conn. size		Air capacity (L/min, Normal)							Steam capacity (kg/hr)						Free passage diameter (mm)
	R1/4	R3/8	0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa		
150	○		55.7	77.6	116	154	230	307	2.62	3.56	5.27	6.97	10.3	13.7	0.2	
200	○		73.1	102	152	202	302	402	3.44	4.67	6.92	9.14	13.6	17.9	0.4	
250	○		90.5	126	188	250	374	498	4.26	5.78	8.57	11.3	16.8	22.2	0.5	
300	○		108	150	224	298	446	594	5.08	6.90	10.2	13.5	20.0	26.5	0.6	
350	○		125	175	261	346	518	690	5.90	8.00	11.9	15.7	23.2	30.7	0.7	
400	○		143	199	297	394	590	786	6.72	9.12	13.5	17.9	26.5	35.0	0.8	
450	○		160	223	333	443	662	882	7.54	10.2	15.2	20.0	29.7	39.3	0.9	
500	○		178	248	369	491	734	977	8.36	11.3	16.8	22.2	32.9	43.5	1.1	
550		○	199	278	414	551	823	1,096	9.38	12.7	18.8	24.9	36.9	48.8	0.9	
600		○	219	305	455	605	905	1,205	10.3	14.0	20.7	27.4	40.6	53.7	1.0	
650		○	235	328	489	650	972	1,295	11.1	15.0	22.3	29.4	43.6	57.7	1.1	
700		○	253	353	526	700	1,047	1,394	11.9	16.2	24.0	31.7	46.9	62.1	1.1	
750		○	272	380	566	753	1,126	1,500	12.8	17.4	25.8	34.1	50.5	66.8	1.2	
900		○	326	454	677	901	1,347	1,794	15.3	20.8	30.8	40.7	60.4	79.9	1.5	
1130		○	406	566	844	1,122	1,678	2,235	19.1	25.9	38.4	50.8	75.2	99.5	1.9	

[Note] The above air and steam capacity are for reference only and are not guaranteed.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M VZ 150 S303

1/4M	VZ	150	S303
Pipe conn. size ²⁾	Air capacity code	Material	
1/4M	150		
3/8M	1130		

② Nozzle Tip Only

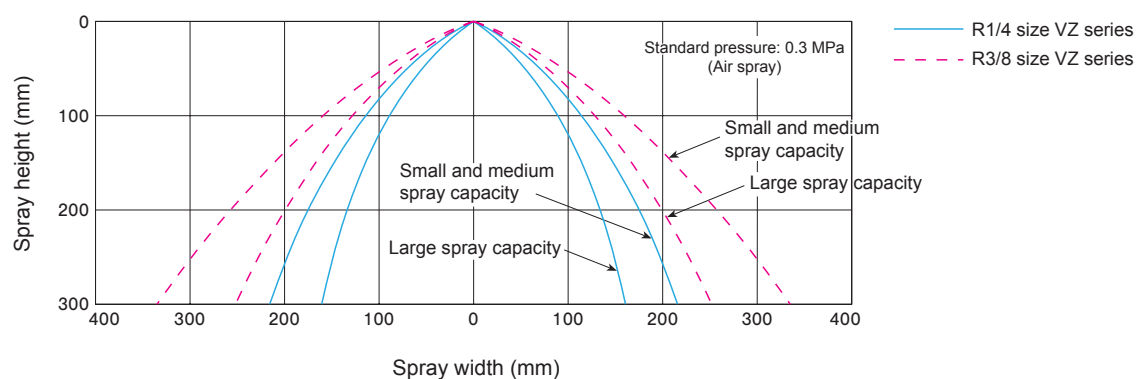
Example: 1/4 VZ 150 S303

1/4	VZ	150	S303
Pipe conn. size ¹⁾	Air capacity code	Material	
1/4	150		
3/8	1130		

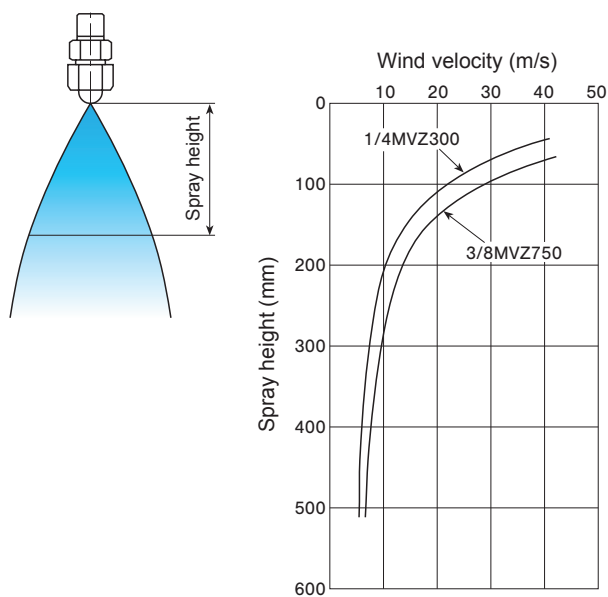
*2) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Spray Height and Width of VZ Series Air & Steam Flat Spray Nozzles

The graph below shows the spray width at various spray heights.



Shown below is the wind velocity at various spray heights.

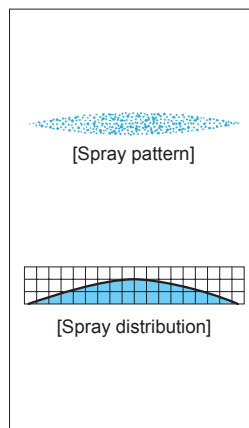


Flat Spray Nozzles with ON/OFF Control

SO-VV: Made-to-Order

SO-V/SO-VV

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Anti-drip design.
- Quick ON/OFF spray response.
- Spray ON/OFF can be regulated by turning the pilot air ON/OFF.

[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]
Coating: Release agent, lubricant, food additive such as seasoning
Moisture control: Paper, food

SO-V SERIES (with ceramic orifice)

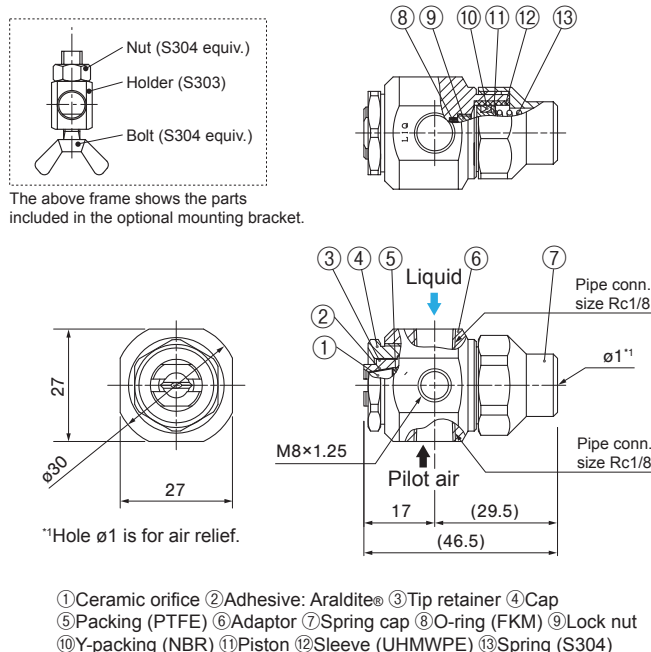
Structure	<ul style="list-style-type: none"> • Spray ON/OFF can be regulated by switching the pilot air ON/OFF. The pilot air activates an internal piston to regulate the spray.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303
Weight	<ul style="list-style-type: none"> • 150 g

Max. operating pressure: 0.5 MPa

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



SO-VV SERIES

Made-to-Order

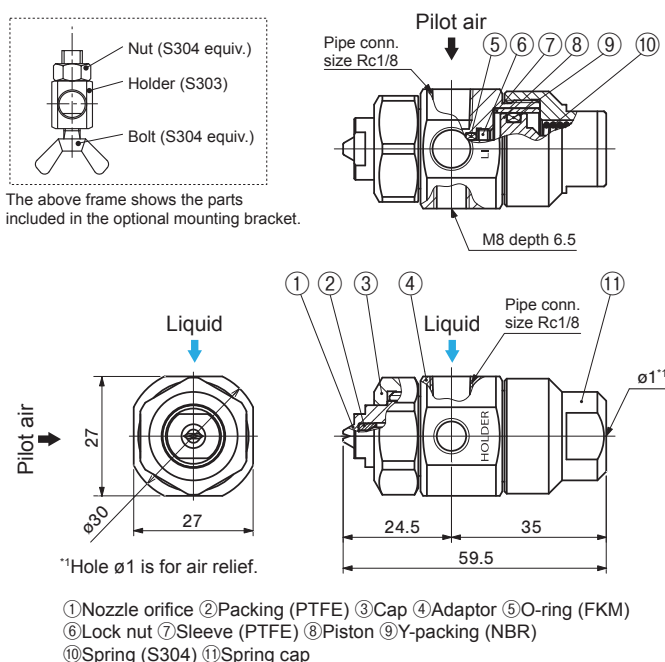
Structure	<ul style="list-style-type: none"> • Spray ON/OFF can be regulated by switching the pilot air ON/OFF. The pilot air activates an internal piston to regulate the spray.
Material	<ul style="list-style-type: none"> • S303
Weight	<ul style="list-style-type: none"> • 170 g

Max. operating pressure: 1.0 MPa

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Flat Spray Nozzles with ON/OFF Control

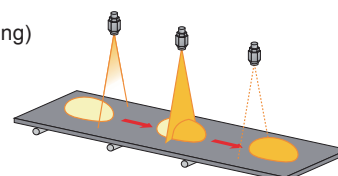
SO-V/SO-VV SERIES

SO-V Series

Spray angle code	Spray capacity code	Spray angle (°)		Spray capacity (L/min)						Mean droplet diameter (μm)	Free passage diameter (mm)
		0.15 MPa	0.3 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa		
115	03	101	115	—	0.17	0.21	0.24	0.30	0.39	140	0.2
	04	102	115	—	0.23	0.28	0.33	0.40	0.52	150	0.2
	05	102	115	—	0.29	0.35	0.41	0.50	0.65	160	0.3
	07	103	115	—	0.40	0.49	0.57	0.70	0.90	170	0.3
	10	103	115	0.41	0.58	0.71	0.82	1.00	1.29	180	0.4
	15	104	115	0.61	0.87	1.06	1.23	1.50	1.94	200	0.5
	20	104	115	0.82	1.15	1.41	1.63	2.00	2.58	270	0.6
90	02	76	90	—	0.12	0.14	0.16	0.20	0.26	145	0.2
	03	76	90	—	0.17	0.21	0.24	0.30	0.39	150	0.2
	04	77	90	—	0.23	0.28	0.33	0.40	0.52	160	0.3
	05	77	90	—	0.29	0.35	0.41	0.50	0.65	170	0.3
	07	78	90	—	0.40	0.49	0.57	0.70	0.90	180	0.4
	10	78	90	0.41	0.58	0.71	0.82	1.00	1.29	190	0.5
	15	79	90	0.61	0.87	1.06	1.23	1.50	1.94	210	0.6
	20	79	90	0.82	1.15	1.41	1.63	2.00	2.58	280	0.7
80	02	67	80	—	0.12	0.14	0.16	0.20	0.26	150	0.2
	03	67	80	—	0.17	0.21	0.24	0.30	0.39	160	0.3
	04	67	80	—	0.23	0.28	0.33	0.40	0.52	170	0.3
	05	67	80	—	0.29	0.35	0.41	0.50	0.65	180	0.3
	07	68	80	—	0.40	0.49	0.57	0.70	0.90	190	0.4
	10	68	80	0.41	0.58	0.71	0.82	1.00	1.29	200	0.5
	15	69	80	0.61	0.87	1.06	1.23	1.50	1.94	220	0.7
	20	69	80	0.82	1.15	1.41	1.63	2.00	2.58	290	0.8
65	02	52	65	—	0.12	0.14	0.16	0.20	0.26	155	0.2
	03	52	65	—	0.17	0.21	0.24	0.30	0.39	160	0.3
	04	52	65	—	0.23	0.28	0.33	0.40	0.52	170	0.3
	05	52	65	—	0.29	0.35	0.41	0.50	0.65	180	0.4
	07	53	65	—	0.40	0.49	0.57	0.70	0.90	190	0.5
	10	54	65	0.41	0.58	0.71	0.82	1.00	1.29	200	0.6
	15	54	65	0.61	0.87	1.06	1.23	1.50	1.94	220	0.8
	20	55	65	0.82	1.15	1.41	1.63	2.00	2.58	310	0.9
50	03	37	50	—	0.17	0.21	0.24	0.30	0.39	180	0.3
	04	37	50	—	0.23	0.28	0.33	0.40	0.52	190	0.4
	05	38	50	—	0.29	0.35	0.41	0.50	0.65	210	0.4
	07	38	50	—	0.40	0.49	0.57	0.70	0.90	220	0.5
	10	40	50	0.41	0.58	0.71	0.82	1.00	1.29	230	0.6
	15	40	50	0.61	0.87	1.06	1.23	1.50	1.94	250	0.8
	20	41	50	0.82	1.15	1.41	1.63	2.00	2.58	340	1.0
40	05	30	40	—	0.29	0.35	0.41	0.50	0.65	230	0.4
	07	30	40	—	0.40	0.49	0.57	0.70	0.90	250	0.5
	10	31	40	0.41	0.58	0.71	0.82	1.00	1.29	270	0.7
	20	32	40	0.82	1.15	1.41	1.63	2.00	2.58	380	1.0
25	05	18	25	—	0.29	0.35	0.41	0.50	0.65	270	0.5
	07	18	25	—	0.40	0.49	0.57	0.70	0.90	290	0.6
	10	18	25	0.41	0.58	0.71	0.82	1.00	1.29	310	0.8
	15	19	25	0.61	0.87	1.06	1.23	1.50	1.94	440	1.0
15	05	9	15	—	0.29	0.35	0.41	0.50	0.65	310	0.5
	07	9	15	—	0.40	0.49	0.57	0.70	0.90	330	0.7
	10	9	15	0.41	0.58	0.71	0.82	1.00	1.29	350	0.8
	15	10	15	0.61	0.87	1.06	1.23	1.50	1.94	510	1.0

Example of Use

Coating (seasoning)



SO-VV Series

Spray angle code	Spray capacity code	Spray angle (°)			Spray capacity (L/min)								Mean droplet diameter (μm)	Free passage diameter (mm)
		0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
115	05	102	115	124	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	180	0.3
	07	103	115	124	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	200	0.3
	10	103	115	124	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	220	0.4
90	05	77	90	100	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	190	0.3
	07	78	90	100	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	210	0.4
	10	78	90	99	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	230	0.5
80	05	67	80	90	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	200	0.3
	07	68	80	89	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	220	0.4
	10	68	80	89	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	240	0.5
65	05	52	65	74	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	210	0.4
	07	53	65	74	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	230	0.5
	10	54	65	73	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	250	0.6
50	05	38	50	59	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	230	0.4
	07	38	50	58	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	250	0.5
	10	40	50	58	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	270	0.6
40	05	30	40	48	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	250	0.4
	07	30	40	48	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	280	0.5
	10	31	40	47	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	300	0.7
25	05	18	25	32	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	350	0.5
	07	18	25	32	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	390	0.6
	10	18	25	32	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	420	0.8
15	05	9	15	22	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	680	0.5
	07	9	15	21	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	740	0.7
	10	9	15	21	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	820	0.8

Operation Time Chart

The pilot air ON/OFF controls the spray operation.

Pilot air	OFF	ON	OFF	ON	OFF
Liquid	Stop	Spray	Stop	Spray	Stop

Mounting Bracket (Optional)

This mounting bracket allows for easy installation of SO-V/SO-VV series nozzles to a pole in the desired spray direction. Available in two sizes for pole diameters of 8 mm and 10 mm.



When ordering the optional Mounting Bracket, please specify "BIM ø8 MBW" for ø8 mounting bracket, or "BIM ø10 MBW" for ø10 mounting bracket.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

SO-V

Example: 1/8 SO-V 11503 S303

1/8"² SO-V	115	03	S303
	Spray angle code	Spray capacity code	Material
	115	02	
	15	20	

SO-VV

Example: 1/8 SO-VV 11505 S303

1/8"² SO-VV	115	05	S303
	Spray angle code	Spray capacity code	Material
	115	05	
	15	10	

The SO-VV series is made-to-order.

*2) Indicates Rc1/8 for the liquid and pilot air connection thread size.

ALSO AVAILABLE!

Solid Stream Jet
with ON/OFF Control

SO-CC
SO-CM
SERIES

See page 102 for more details.

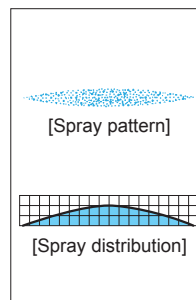
CAUTIONS

- Supply liquid pressure at 0.5 MPa or less for the SO-V series, and 1.0 MPa or less for the SO-VV series.
- Supply pilot air pressure between 0.2 and 0.5 MPa.
- For better shut off and to prevent dripping, purge the air between the solenoid valve and the nozzle when it is shut off, using a 3-way solenoid valve.

Universal-jointed Flat Spray Nozzles

UT+VP

Flat Spray



- Flat spray pattern with a mountain-shaped spray distribution and gradually tapered edges.
- Spray direction is adjustable within a range of 40 degrees as needed.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

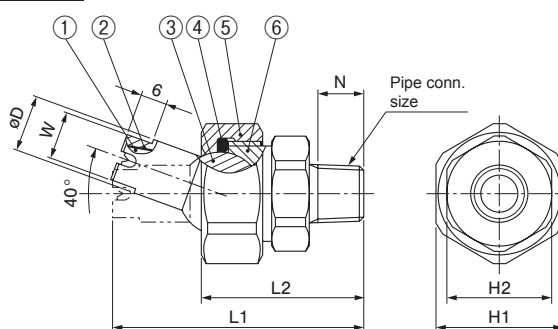
Cleaning: Automotives, containers, films, felts, filters, screens, bottles, crushed stone, earth and sand, metal parts, machines, steel plates, steel pieces
Spraying: Oils, lubricants, liquids, solutions, insecticides, herbicides

Structure	<ul style="list-style-type: none"> • Has a ceramic orifice in the nozzle tip. • Includes three parts: Nozzle tip, cap, and adaptor. Worn-out nozzle tips can be replaced separately. • Nozzle tip has an integrated universal ball joint to adjust the spray direction.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303

Pipe conn. size	Dimensions (mm)							Weight (g)
	L1	L2	H1	H2	W	øD	N	
R1/4	57.5	37	29	24	11	13	10.5	120
R3/8	63.5	44	35	30	14	17	11	200

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Nozzle tip (①Ceramic orifice ②Adhesive: Araldite® ③Ball)
④O-ring (NBR) ⑤Cap ⑥Adaptor

Spray angle code	Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)								Free passage diameter (mm)
		R1/4	R3/8	0.15 MPa	0.3 MPa	0.7 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	
80	30	○		70	80	87	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	1.0
	50	○		71	80	86	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	1.4
	80	○		72	80	86	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	1.7
	100		○	72	80	85	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	2.0
	140		○	73	80	85	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	2.5
	170		○	73	80	85	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	2.7
65	30	○		56	65	72	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	1.1
	50	○		57	65	71	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	1.5
	80	○		58	65	71	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	1.9
	100		○	58	65	70	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	2.1
	140		○	59	65	69	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	2.5
	170		○	59	65	69	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	2.8
50	30	○		42	50	56	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	1.2
	50	○		43	50	55	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	1.6
	80	○		43	50	55	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	2.0
	100		○	44	50	54	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	2.2
	140		○	44	50	54	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	2.7
	170		○	45	50	54	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	3.0

[Note] 1. For spray droplet diameter, please see the chart of VP series nozzles on page 10.
2. The spray nozzle performance for this nozzle is NOT guaranteed because it is set at an angle.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M UT+VP 8030 S303

1/4M	UT+VP	80	30	S303
Pipe conn. size*		Spray angle code	Spray capacity code	Material
1/4M		80	30	
3/8M		65	5	
		50	170	

Please contact us to order only the nozzle tip.

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

ALSO AVAILABLE!

Universal-jointed
Solid Stream Jet

**UT+CP
SERIES**

See page 104 of this catalog.

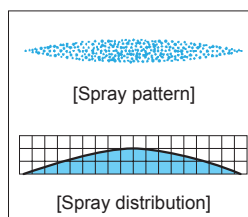
Quick-installation Nozzles

QB

Flat Spray



- Flat spray pattern with stable distribution and tapered spray pattern edges.
- Easy to install. Just drill a hole (ø14.3 mm) into the pipe and insert the nozzle.
- Quick-detachable design helps to reduce maintenance time significantly.
- Spray direction is adjustable within 50 degrees as desired.
- Nozzle tips are color-coded by spray capacity for easy identification.
- Adaptors, color-coded by size, are available in 1", 1 1/4", 1 1/2", 2", 25A, and 30A.
- O-ring seals between the pipe and adaptor for pressures of up to 0.4 MPa.
- Double locked with an optional fitting spring lock.



[STANDARD PRESSURE]
0.3 MPa

[APPLICATIONS]

Pre-treatment for painting of cars, electric appliances for the home
Cleaning: water rinse after acid treatment of steel plates, water rinsing process in food factory

Structure	<ul style="list-style-type: none"> • Includes a nozzle tip, ball section, and adaptor. Worn-out nozzle tips can be replaced separately.
Material	<ul style="list-style-type: none"> • Main parts: FRPP • Packing: FEPM • O-ring: NBR • Spring clip and lock: S304

[QB for metal pipes]

Pipe size (inch) ^{*1}	Color of adaptor	Dimensions (mm)						Weight (g)
		L1	L2	L3	L4	øD1	øD2	
1		105	89	72	55	34	48	61
1 1/4		114	98	76	55	42.7	48	
1 1/2		120	104	79	55	48.6	48	
2		132	116	85	55	60.5	48	

*1) Use stainless steel pipes compliant with JIS G 3459.

[QB for PVC pipes]

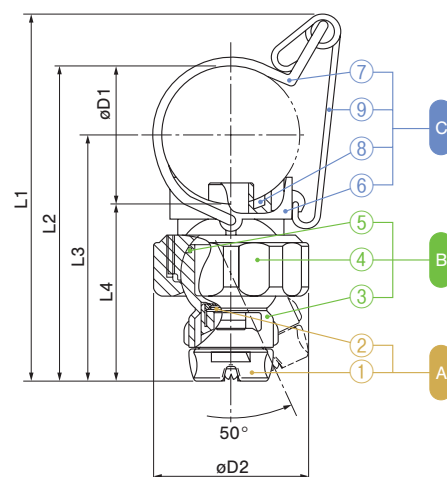
Pipe size (ND) ^{*2}	Color of adaptor	Dimensions (mm)						Weight (g)
		L1	L2	L3	L4	øD1	øD2	
25A		103	87	71	55	32	48	61
30A		109	93	74	55	38	48	
40A		120	104	79	55	48.6	48	
50A		132	116	85	55	60.5	48	

*2) Use PVC pipes compliant with JIS K 6742.

40A, 50A adaptors for PVC pipes are the same as 1 1/2", 2" adaptors for metal pipes.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



(A) Nozzle tip (① Nozzle tip ② Packing [FEPM])

(B) Ball section (③ Ball adaptor ④ Cap ⑤ O-ring [NBR])

(C) Adaptor (⑥ Adaptor ⑦ Spring clip ⑧ O-ring [NBR] ⑨ Spring lock^{*3})

*3) ⑨ is optional at extra cost.

Spray angle code	Spray capacity code	Pipe size		Spray capacity (L/min)				Mean droplet diameter (μm)	Free passage diameter (mm)	Color of nozzle tip
		(inch)	(ND)	0.1 MPa	0.2 MPa	0.3 MPa	0.4 MPa			
80	80	1, 1 1/4 (1*1/4), 1 1/2 (1*1/2), or 2	25A, 30A, (40A), or (50A)	4.62	6.53	8.00	9.24	430	1.7	
	100			5.77	8.16	10.0	11.5		2.0	
	120			6.93	9.80	12.0	13.9		2.3	
	160			9.24	13.1	16.0	18.5		2.7	
	180	or 2	or (50A)	10.4	14.7	18.0	20.8	610	2.8	
	200			11.5	16.3	20.0	23.1		2.8	
	240			13.9	19.6	24.0	27.7		3.2	
	280			16.2	22.9	28.0	32.3		3.6	
	390			22.5	31.8	39.0	45.0		4.3	

Quick-installation Nozzles

QB SERIES

Flat Spray

Spray angle code	Spray capacity code	Pipe size		Spray capacity (L/min)				Mean droplet diameter (μm)	Free passage diameter (mm)	Color of nozzle tip
		(inch)	(ND)	0.1 MPa	0.2 MPa	0.3 MPa	0.4 MPa			
65	80	1, 1 1/4 (1*1/4), 1 1/2 (1*1/2),	25A, 30A, (40A), or (50A)	4.62	6.53	8.00	9.24	460	1.8	
	100			5.77	8.16	10.0	11.5		2.2	
	120			6.93	9.80	12.0	13.9		2.4	
	160			9.24	13.1	16.0	18.5		2.8	
	180			10.4	14.7	18.0	20.8	650	3.0	
	200			11.5	16.3	20.0	23.1		3.3	
	240			13.9	19.6	24.0	27.7		3.6	
	280			16.2	22.9	28.0	32.3		3.8	
40	390			22.5	31.8	39.0	45.0		4.5	
	80	or 2	or (50A)	4.62	6.53	8.00	9.24	560	2.2	
	100			5.77	8.16	10.0	11.5		2.5	
	120			6.93	9.80	12.0	13.9		2.8	
	160			9.24	13.1	16.0	18.5		3.2	
	180			10.4	14.7	18.0	20.8	800	3.3	
	200			11.5	16.3	20.0	23.1		3.6	
	240			13.9	19.6	24.0	27.7		3.9	
	280			16.2	22.9	28.0	32.3		4.3	
	390			22.5	31.8	39.0	45.0		5.1	

[Note] IN-series nozzle tips (including INVV on page 21, INJX on page 67) are not compatible with the QB series.

CAUTIONS

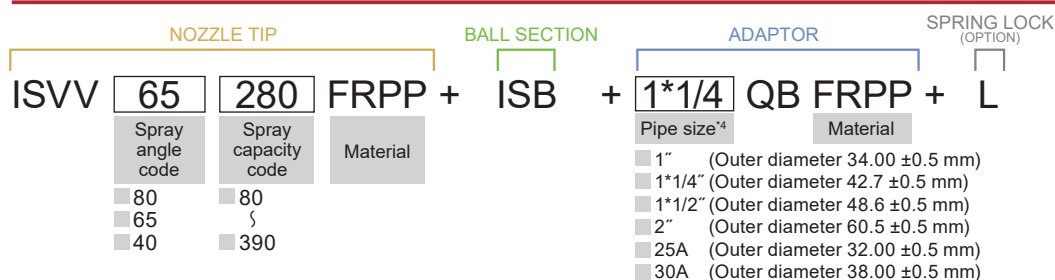
Maximum operating pressure is 0.4 MPa.

Do not use under conditions where sudden or drastic changes in water pressure may occur.

HOW TO ORDER



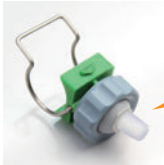

To inquire about or order a specific nozzle please refer to this coding system.

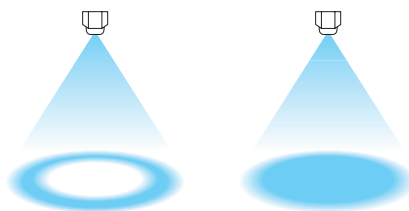
Example: ISVV 65280 FRPP + ISB + 1*1/4 QB FRPP + L



- *4) 1. Please check the dimensions of øD1 (outer diameter).
2. Order 1*1/2" adaptor for 40A, and 2" adaptor for 50A.

Related Products

Product	Picture	Features														
Hollow Cone Spray Nozzle BAA+QB Series		<ul style="list-style-type: none">• Make an air washer nozzle for air conditioning humidification, by combining a AA series nozzle, a hollow cone spray nozzle, with a QB series adaptor and ball parts.• Includes a spring lock to firmly secure the nozzle in place.• No-whirler design with a large free passage diameter minimizes clogging. <p>[Note] The spray direction is NOT adjustable, the ball is fixed in place.</p>														
Ball Joint Adaptor QBP Series	<div><p>(Photo below shows QBP adaptor with a spray nozzle)</p><div><p>Easy to attach a nozzle!</p></div></div>	<ul style="list-style-type: none">• IKEUCHI's spray nozzles with R1/4, R3/8, or R1/2 thread are attachable.• The ball joint makes the spray direction adjustable within 50 degrees as needed.• Easy installation onto a pipe with a spring clip fastener.• Main material: FRPP <table><tr><th colspan="4">Pipe size</th></tr><tr><td rowspan="4">QBP for metal pipes (inch)</td><td>1</td><td rowspan="4">QBP for PVC pipes (ND)*</td><td>25A</td></tr><tr><td>1 1/4</td><td>30A</td></tr><tr><td>1 1/2</td><td>40A</td></tr><tr><td>2</td><td>50A</td></tr></table> <p>*40A, 50A adaptors for PVC pipes are the same as 1 1/2", 2" adaptors for metal pipes.</p>	Pipe size				QBP for metal pipes (inch)	1	QBP for PVC pipes (ND)*	25A	1 1/4	30A	1 1/2	40A	2	50A
Pipe size																
QBP for metal pipes (inch)	1	QBP for PVC pipes (ND)*	25A													
	1 1/4		30A													
	1 1/2		40A													
	2		50A													
IS PLUG		<ul style="list-style-type: none">• The IS plug can be attached to the QB series instead of the QB nozzle tip.• When ordering, use the item name: IS PLUG PP (FEPM). FEPM packing is included.														



Product Lineup

Cone Spray Nozzles

Hollow Cone Spray Nozzles

pp.52–

- Extremely Fine Fog/ Ultra-low Flow Rate Nozzles : **KB, KBN**
- Semi-fine Atomization Low Flow Rate Nozzles: **K, KKBP**
- Low Flow Rate Nozzles: **KD**
- Medium Capacity Nozzles: **AAP**
- Alumina Ceramic Nozzles: **AP-AL92**
- Flange Connection, Large Capacity Nozzles: **TAA**

Full Cone Spray Nozzles

pp.61–

- Standard Metal Nozzles: **JJXP**
- Quick-detach Metal Nozzles: **INJJX-SS**
- Standard Plastic Nozzles: **JJXP-PVDF, JJXP-HTPVC / PVC**
- Quick-detach Plastic Nozzles: **INJJX**
- Ceramic Orifice and Whirler Inserted: **JUP**
- Alumina Ceramic Nozzles: **JUXP-AL92**
- Low Flow Rate Nozzles: **JJRP, J**
- Flange Connection, Large Capacity Nozzles: **TJJX**
- Wide-angle Full Cone Spray Nozzles: **BBXP**
- Narrow-angle Full Cone Spray Nozzles: **NJJP**
- Clog-resistant Vaneless Nozzles: **AJP, AJP-AL92**

Square Spray Nozzles

pp.81–

- Square Full Cone Spray Nozzles: **SSXP**

Special Cone Spray Nozzles

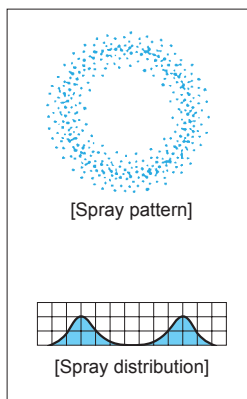
pp.83–

- SPILLBACK Nozzles for Gas Cooling: **SPB**
- Seven-head Full Cone Spray Nozzles: **7KB, 7JJXP**
- Multi-orifice Semi-fine Fog Nozzles: **TSP**

Extremely Fine Fog and Ultra-low Flow Rate Hollow Cone Spray Nozzles

KB

Hollow Cone



- Ultra-low flow rate hollow cone spray nozzle with the finest atomization among hydraulic nozzles.
- Capable of generating an extremely fine spray.
- The whirl chamber is formed by a ceramic orifice and closer,^{*1} which provides excellent wear resistance.

[STANDARD PRESSURE]

0.7 MPa

[APPLICATIONS]

Humidifying: Air handling units, greenhouses
Cooling: Gas, thin plates, poultry
Spraying: Alcohol, chemicals

Structure	<ul style="list-style-type: none"> • Nozzle orifice and closer are made of ceramics.^{*1} • Male parallel pipe thread (G1/4B). • All models include a built-in strainer. • It can accommodate an optional check valve.
Material	<ul style="list-style-type: none"> • Nozzle orifice & closer: ceramic^{*1} • Metal parts: S303 or B (brass)

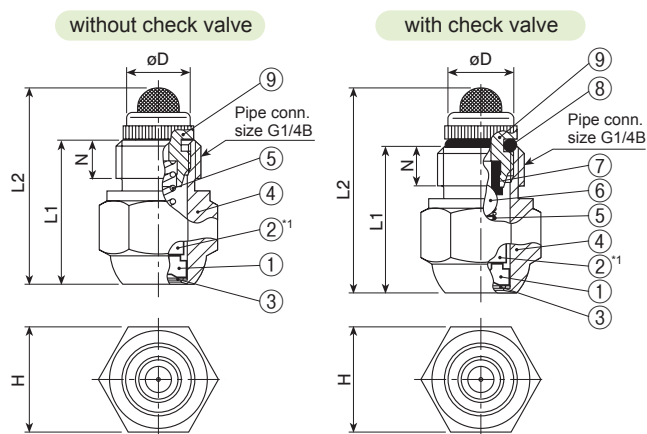
Series	Dimensions (mm)					Weight (g)	
	L1	L2	H	øD	N	S303	B
KB (w/o check valve)	22.5	31	17 (S303) 16 (B)	10.5	6	24.8	25
KB**CV (w/ check valve)	22.5	32	17 (S303) 16 (B)	10.5	6	25.3	25.5

*1) For KB nozzles with N in the spray capacity code (page 53), the closer is made of polyester elastomer instead of ceramic.

[Note]

1. Appearance and dimensions may differ slightly depending on material and nozzle code.
2. An O-ring is required for connecting to a pipe. If used at high pressure, an adaptor is also required. Both are available as option. See page 53.

DRAWING



- ①Ceramic orifice ②Ceramic closer^{*1} ③Packing (PTFE) ④Nozzle body
⑤Spring ⑥Ball (S304) ⑦Packing (NBR) ⑧O-ring (NBR)
⑨Strainer (S303+S304 or B+S304 for mesh size #100,
S304+S316 or B+S304+S316 for mesh size #150, #200)

Spray angle code	Spray capacity code*2	Spray angle (°)			Spray capacity (L/hr) ³										Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size
		0.3 MPa	0.7 MPa	2 MPa	0.3 MPa	0.4 MPa	0.5 MPa	0.6 MPa	0.7 MPa	1 MPa	1.2 MPa	1.5 MPa	2 MPa				
80	063N	65	80	80	1.36	1.55	1.72	1.86	2.00	2.35	2.56	2.83	3.22	45	0.20	200	
	071	—	80	80	—	1.70	1.90	2.08	2.25	2.69	2.95	3.29	3.81		0.15	200	
	08	—	80	80	—	1.97	2.20	2.41	2.60	3.11	3.40	3.80	4.40	}	0.15	200	
	09	—	80	80	—	2.23	2.49	2.73	2.95	3.53	3.86	4.32	4.99		0.15	200	
	10N	65	80	80	2.19	2.51	2.78	3.03	3.25	3.84	4.18	4.63	5.30		0.25	200	
	125N	65	80	80	2.77	3.16	3.51	3.82	4.10	4.84	5.27	5.84	6.68	60	0.30	200	
	14	—	80	80	—	3.48	3.89	4.26	4.60	5.50	6.02	6.73	7.78	50	0.15	200	
	16N	65	80	80	3.51	4.02	4.47	4.88	5.25	6.22	6.79	7.55	8.66		0.35	150	
	20N	65	80	80	4.41	5.06	5.62	6.13	6.60	7.82	8.53	9.49	10.9	}	0.40	150	
	22N	65	80	80	4.84	5.55	6.18	6.74	7.25	8.59	9.37	10.4	12.0		0.40	150	
	25	70	80	80	5.40	6.24	6.97	7.64	8.25	9.87	10.8	12.1	14.0		0.25	150	
	28	70	80	80	6.05	6.99	7.82	8.56	9.25	11.1	12.1	13.5	15.7		0.30	150	
	32	70	80	80	6.94	8.01	8.96	9.82	10.6	12.7	13.9	15.5	17.9	75	0.30	150	
	38	70	80	80	8.25	9.52	10.7	11.7	12.6	15.1	16.5	18.4	21.3	65	0.40	150	
	45	70	80	80	9.79	11.3	12.6	13.9	15.0	17.9	19.6	21.9	25.3		0.40	100	
	50	70	80	80	10.9	12.6	14.0	15.4	16.6	19.9	21.8	24.3	28.1		0.40	100	
	56	70	80	80	12.2	14.1	15.7	17.2	18.6	22.3	24.4	27.2	31.5		0.40	100	
	63	72	80	80	13.7	15.8	17.7	19.4	21.0	25.1	27.5	30.7	35.5	}	0.40	100	
	71	72	80	80	15.5	17.8	20.0	21.9	23.6	28.2	30.9	34.6	39.9			0.50	100
	80	72	80	80	17.5	20.2	22.6	24.7	26.7	31.9	35.0	39.0	45.1		0.50	100	
	90	73	80	80	19.6	22.7	25.4	27.8	30.0	35.9	39.3	43.9	50.8	110	0.50	100	
	100	73	80	80	21.8	25.2	28.2	30.9	33.3	39.9	43.7	48.8	56.4	90	0.50	100	
1250	73	80	80	27.2	31.5	35.2	38.5	41.6	49.8	54.5	60.9	70.4		0.50	100		
180	74	80	80	39.2	45.3	50.6	55.5	59.9	71.6	78.5	87.6	101	}	0.60	100		
200	74	80	80	43.6	50.4	56.3	61.7	66.6	79.7	87.3	97.5	113			0.60	100	
320	75	80	80	69.7	80.5	90.0	98.6	107	127	140	156	180	210	0.60	100		
60	063	—	60	60	—	1.51	1.69	1.85	2.00	2.39	2.62	2.93	3.38	45	0.15	200	
	14	—	60	60	—	3.48	3.89	4.26	4.60	5.50	6.02	6.73	7.78	}	0.15	200	
	32	—	60	60	—	8.01	8.96	9.82	10.6	12.7	13.9	15.5	17.9			0.30	150
	56	50	60	60	12.2	14.1	15.7	17.2	18.6	22.3	24.4	27.2	31.5	90	0.40	100	
	140	53	60	60	30.5	35.2	39.4	43.2	46.6	55.7	61.0	68.2	78.8	130	0.50	100	
	280	54	60	60	61.0	70.5	78.8	86.4	93.2	112	122	136	158	190	0.60	100	

*2) The KB series nozzles with "N" in the spray capacity code can be used at pressures of 0.2 to 10 MPa. See the next page for more features and information.

*3) The spray capacity of KB series is listed in liters per hour (L/hr), not in L/min. The spray capacity code does not correspond with the spray capacity at standard pressure.

Features of the KB series, identified with "N" in the spray capacity code

● Anti-clogging design

- It features a larger orifice diameter, about 1.3–2.6 times the size compared to the conventional KB models, making it clog-resistant.

● Available for a wide range of pressures, from low (0.2 MPa) to high (10 MPa)

- Capable of spraying from 0.2 MPa, for a low spray capacity.
- Also designed to withstand pressures of up to 10 MPa, making it suitable for finer atomization.*⁴

*4) When spraying at pressures of 2 MPa or higher, use S303 nozzles.

■ Spray capacity (at 0.2 MPa and 3–10 MPa)

Spray angle code	Spray capacity code	Spray capacity (L/hr)						Mean drop. dia. at 10 MPa (μm)
		0.2 MPa	3 MPa	5 MPa	6 MPa	7 MPa	10 MPa	
80	063N	1.13	3.88	4.89	5.31	5.70	6.70	33
	10N	1.82	6.40	8.11	8.83	9.48	11.2	
	125N	2.29	8.07	10.2	11.1	12.0	14.1	
	16N	2.89	10.5	13.4	14.6	15.7	18.6	
	20N	3.64	13.2	16.8	18.4	19.8	23.4	
	22N	3.99	14.5	18.5	20.2	21.7	25.7	40

Check Valve (Option)

To avoid any dripping after shut-off, the KB series nozzles are available with an optional built-in ball check valve.

The standard operating pressure for check valves is 0.4 MPa. Supply pressure minus the operating pressure of the check valve (0.4 MPa) is the atomizing pressure. KB series nozzles with check valves are not guaranteed for spray angle and spray capacity.

HOW TO ORDER


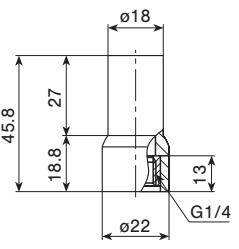

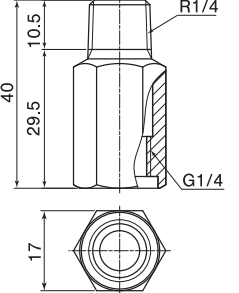

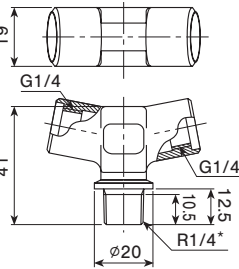
To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M KB 80071 S303 CV-RW

1/4M KB	80	071	S303	CV	-RW
Pipe conn. size ^{*5}	Spray angle code	Spray capacity code	Material	Check valve	Strainer
	80	063N	S303	CV (with check valve)	
	60	320	B	(Blank indicates "without check valve")	

*5) "M" indicates male parallel pipe thread ("G" of the ISO standard) in the KB series.

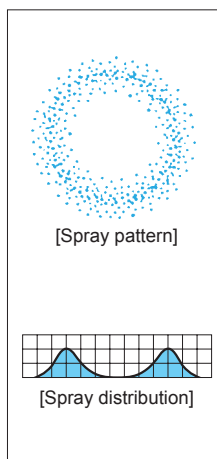
Optional Accessories for KB series

Product	Picture	Structure (unit: mm)	Features
Fitting for PVC Pipe 13AKB Adaptor			<ul style="list-style-type: none"> Fitting for KB series nozzle to 13A (1/2") Tee connectors. Material: PVC
1/4M(R)x1/4F(G) KB Adaptor (O-ring required)			<ul style="list-style-type: none"> Adaptor to convert thread connection from G1/4 to R1/4. Material: S303 or B (To order, use product ID #168846 for S303, and #409389 for B.) O-ring is required. (ID #44)
Two-way Adaptor			<ul style="list-style-type: none"> Adaptor for connecting 2 pcs. of KB series nozzles. Material: chrome-plated brass <p>*Two types of threads for pipe connection are available: male tapered thread or male parallel thread.</p>

Extremely Fine Fog and Ultra-low Flow Rate Hollow Cone Spray Nozzles

KBN

Hollow Cone



- Ultra-low flow rate hollow cone spray nozzle with the finest atomization among hydraulic nozzles.
- Minimal clogging with free passage diameter 1.3–2.6 times bigger than that of conventional nozzles.
- High-purity alumina ceramic tip provides stable performance with longer life even under high pressure conditions.

[STANDARD PRESSURE]

1.0 MPa

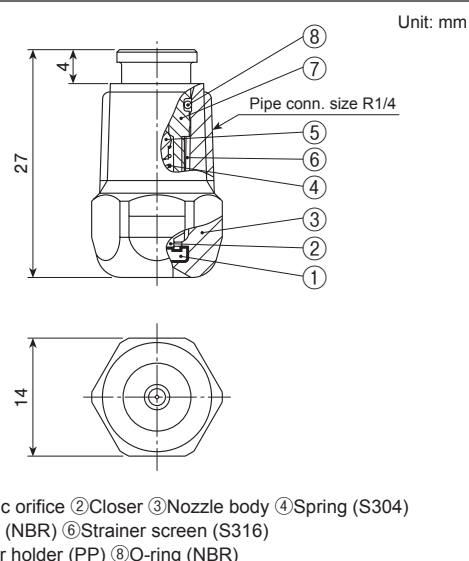
[APPLICATIONS]

Cooling: Poultry farms, outside cooling
Humidifying: Air handling units, greenhouses
Spraying: Alcohol, disinfectant
Others: Dust suppression, irrigation for greenhouse

Structure	<ul style="list-style-type: none"> • One-piece plastic nozzle molded around a high-purity ceramic orifice. • Thread is R1/4 (BSPT 1/4 male) or NPT 1/4 male. • All models includes a built-in strainer and check valve.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Closer: polyester elastomer • Nozzle body: PA
Weight	• 4 g

Max. operating pressure: 7.0 MPa

DRAWING



[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray angle code	Spray capacity code	Spray angle (°)				Spray capacity (L/hr)									Mean drop. dia. (μm)	Free pass. dia. (mm)	Strainer mesh size	Nozzle body color
		0.5 MPa	1 MPa	1.3 MPa	2 MPa	0.5 MPa	0.8 MPa	1 MPa	1.3 MPa	2 MPa	3.5 MPa	5 MPa	6 MPa	7 MPa				
80	063	50	80	80	80	1.13	1.72	2.00	2.35	2.99	3.99	4.75	5.19	5.58	35	0.2	200	
	125	60	80	80	80	2.29	3.51	4.10	4.84	6.19	8.31	9.94	10.9	11.7	~	0.3	100	
	22	65	80	80	80	3.99	6.18	7.25	8.59	11.1	15.0	18.0	19.7	21.3	65	0.4	100	

[Note]

1. The spray capacity of the KBN series is listed in liters per hour (L/hr), not in L/min.
2. A check valve which closes and opens at 0.3 MPa is built into all nozzles.
3. KBN series nozzles are not guaranteed for spray angle and spray capacity because of the check valve.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M KBN 80 125 TPACVW

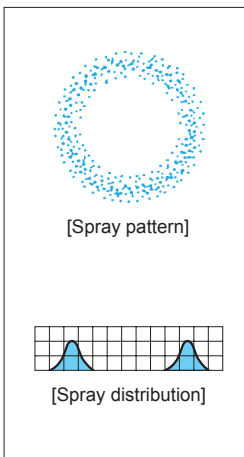
1/4M	KBN	80	125	TPACVW
Pipe conn. size*		Spray angle code	Spray capacity code	Material (CV indicates check valve, W indicates strainer)
1/4M			063	
1/4M (NPT)			125	
			22	

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4 (BSPT 1/4 male).
In case NPT 1/4 male thread is required, please specify the pipe connection size as 1/4M (NPT).

Semi-fine Atomization and Low Flow Rate Hollow Cone Spray Nozzles

K

Hollow Cone



- Low flow rate hollow cone spray nozzle.
- Semi-fine atomization.
- The whirl chamber is formed by a ceramic orifice and closer, which provides excellent wear-resistance.

[STANDARD PRESSURE]

0.3 MPa

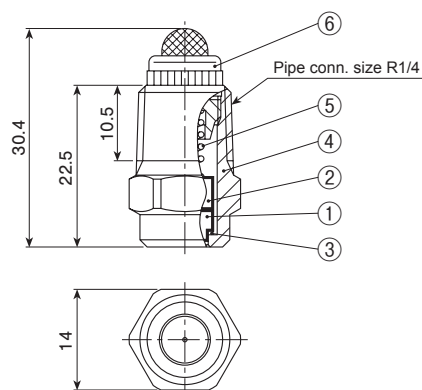
[APPLICATIONS]

Humidifying: Air handling units
Cooling: Gas, metals
Spraying: Chemicals

Structure	<ul style="list-style-type: none"> • Nozzle orifice and closer are made of ceramic. • All models include a built-in strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice and closer: ceramic • Nozzle body: S303 <p>SPECIAL ORDER MATERIAL: S316</p>
Weight	• 17.5g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Unit: mm

- ①Ceramic orifice ②Ceramic closer ③Packing (PTFE)
④Nozzle body ⑤Spring (S316)
⑥Strainer (S303+S304 for mesh size #50 and #100,
S303+S304+S316 for mesh size #150)

Spray capacity code	Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (μm)	Free passage diameter (mm)	Strainer mesh size
	0.15 MPa	0.3 MPa	0.7 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa	2.5 MPa			
006	—	80	80	—	—	0.06	0.08	0.09	0.11	0.13	0.15	0.16	80	0.4	150
008	—	80	80	—	—	0.08	0.10	0.12	0.14	0.17	0.20	0.22		0.4	150
010	—	80	80	—	—	0.10	0.13	0.15	0.18	0.22	0.25	0.27		0.5	100
012	—	80	80	—	—	0.12	0.15	0.18	0.21	0.26	0.30	0.33		0.5	100
015	—	80	80	—	0.12	0.15	0.19	0.22	0.27	0.32	0.37	0.41		0.6	100
020	70	80	80	0.14	0.16	0.20	0.26	0.30	0.35	0.43	0.49	0.55		0.7	50
025	70	80	80	0.18	0.21	0.25	0.32	0.37	0.44	0.54	0.62	0.69		0.7	50
030	70	80	80	0.22	0.25	0.30	0.38	0.45	0.53	0.65	0.74	0.82		0.9	50
040	70	80	80	0.29	0.33	0.40	0.51	0.60	0.71	0.86	0.99	1.10		0.9	50
050	70	80	80	0.36	0.41	0.50	0.64	0.75	0.89	1.08	1.23	1.37	200	1.0	50
060	70	80	80	0.43	0.49	0.60	0.77	0.90	1.06	1.29	1.48	1.65	220	1.0	50
070	70	80	80	0.50	0.58	0.70	0.89	1.05	1.24	1.51	1.73	1.92		1.0	50
080	70	80	80	0.58	0.66	0.80	1.02	1.20	1.42	1.72	1.97	2.20		1.2	50
100	70	80	80	0.72	0.82	1.00	1.28	1.50	1.77	2.15	2.47	2.74		1.3	50
120	70	80	80	0.86	0.99	1.20	1.53	1.80	2.13	2.58	2.96	3.29		1.3	50
140	70	80	80	1.01	1.15	1.40	1.79	2.10	2.48	3.01	3.46	3.84		1.5	50
160	70	80	80	1.15	1.32	1.60	2.04	2.40	2.84	3.44	3.95	4.39		1.5	50
180	70	80	80	1.29	1.48	1.80	2.30	2.69	3.19	3.87	4.44	4.94	380	1.7	50

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M K 006N S303 W

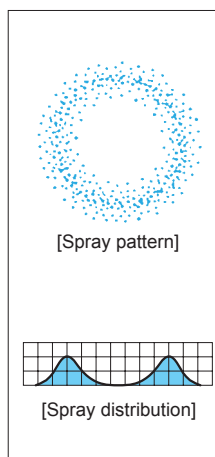
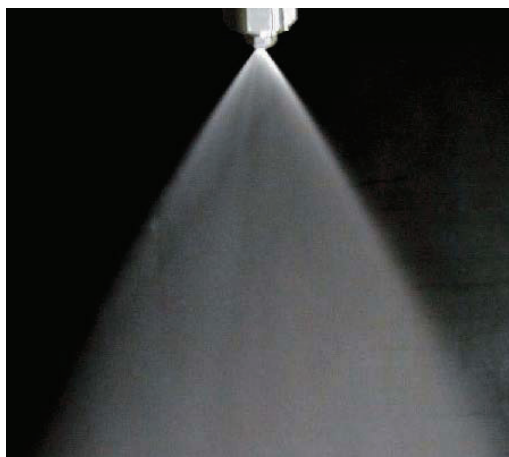
1/4M	K	006	N	S303	W
Pipe conn. size*		Spray capacity code		Material	Strainer
		006			
		180			

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Semi-fine Atomization and Low Flow Rate Hollow Cone Spray Nozzles

KKBP

Hollow Cone



- Low flow rate hollow cone spray nozzle.
- Unique whirler design with large free passage diameter minimizes clogging.
- Semi-fine atomization.
- Compact, lightweight design with a small number of parts.
- Maintenance is easy as whirler is detachable.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Humidifying: Air handling units

Cooling: Gas, metals

Spraying: Chemicals

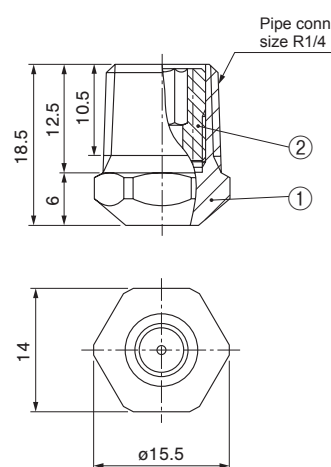
Snow making (for snow machines)

Structure	<ul style="list-style-type: none"> • Includes a nozzle body and whirler.
Material	<ul style="list-style-type: none"> • Nozzle body: S303 • Whirler: S316L equivalent <p>SPECIAL ORDER MATERIAL: S316 or S316L</p>
Weight	<ul style="list-style-type: none"> • 15g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Spray capacity code	Spray angle (°)			Spray capacity (L/min)								Mean droplet diameter (μm)	Free passage diameter (mm)
	0.2 MPa	0.3 MPa	1.0 MPa	0.2 MPa	0.3 MPa	0.5 MPa	1 MPa	1.5 MPa	2 MPa	3 MPa	5 MPa		
050	63	65	68	0.41	0.50	0.64	0.89	1.08	1.24	1.51	1.93	160	1.0
060	65	68	70	0.49	0.60	0.77	1.07	1.30	1.49	1.82	2.32	160	1.0
070	60	63	65	0.58	0.70	0.89	1.25	1.52	1.74	2.12	2.71	160	1.2
080	63	65	68	0.66	0.80	1.02	1.43	1.73	1.99	2.42	3.09	160	1.2
100	55	58	60	0.82	1.00	1.28	1.78	2.17	2.49	3.03	3.87	250	1.4
120	58	60	63	0.99	1.20	1.53	2.14	2.60	2.99	3.63	4.64	260	1.4
140	55	58	60	1.15	1.40	1.79	2.50	3.04	3.49	4.24	5.41	160	1.6
160	55	58	60	1.32	1.60	2.05	2.85	3.47	3.98	4.84	6.19	160	1.6
180	50	53	55	1.48	1.80	2.30	3.21	3.90	4.48	5.45	6.96	160	1.8
200	53	55	58	1.65	2.00	2.56	3.57	4.34	4.98	6.05	7.73	360	1.8

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M KKBP 050 S303

1/4M	KKBP	050	S303
Pipe conn. size*		Spray capacity code	Material
		050	
		200	

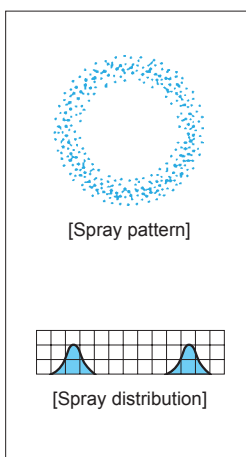
*"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Low Flow Rate Hollow Cone Spray Nozzles

Made-to-Order

KD

Hollow Cone



- Low flow rate hollow cone spray nozzle in a three-piece structure.
- Combines compact design and semi-fine atomization capability.
- The whirl chamber is made up of a ceramic orifice and whirler, which provides excellent wear-resistance.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

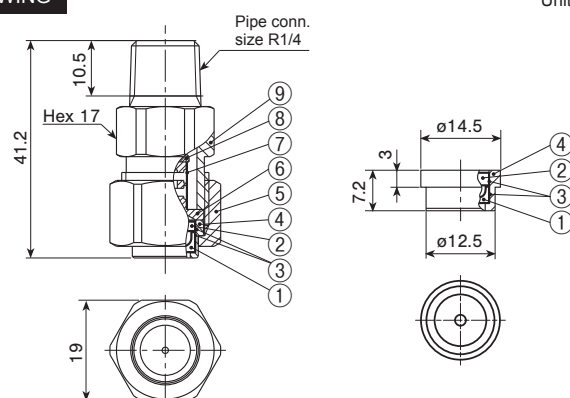
Cooling: Gas
Spraying: Chemicals, dust suppression

Structure	<ul style="list-style-type: none"> • Nozzle orifice and whirler are made of ceramic. • Includes three parts: Nozzle tip, cap, and adaptor. Worn-out nozzle tips can be replaced separately. • Small spray capacity models (KD03, 033 and 042) come with or without a strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice and whirler: ceramic • Metal parts: S303 <p>SPECIAL ORDER MATERIAL: S316 or others</p>
Weight	<ul style="list-style-type: none"> • Complete assembly*: 46 g • Nozzle tip: 3 g

*1) With strainer, add 5 g to the above weight and 2 mm to the total length.

DRAWING

Unit: mm



Complete Assembly

Nozzle Tip
(① + ② + ③ + ④)

①Ceramic orifice ②Ceramic whirler ③Adhesive: Araldite® ④Tip retainer
⑤Cap ⑥Strainer holder ⑦Strainer screen (S316) ⑧Strainer cap ⑨Adaptor

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray capacity code	Pipe conn. size	Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (μm)	Free passage diameter (mm)
	R1/4	0.15 MPa	0.3 MPa	0.7 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa		
03	●	—	80	85	—	—	0.25	0.30	0.38	0.44	0.52	0.63	0.72	130	0.7
033	●	—	80	88	—	—	0.27	0.33	0.42	0.49	0.58	0.69	0.79	0.7	0.7
037	○	—	70	75	—	—	0.31	0.37	0.47	0.55	0.64	0.77	0.88	1.0	1.0
042	●	90	93	97	—	0.30	0.35	0.42	0.53	0.62	0.73	0.88	1.00	0.7	0.7
057	○	78	85	90	—	0.41	0.47	0.57	0.72	0.84	0.99	1.19	1.36	1.1	1.1
068	○	90	95	99	—	0.49	0.56	0.68	0.86	1.01	1.18	1.42	1.62	200	1.1
084	○	90	95	103	0.50	0.61	0.70	0.84	1.05	1.21	1.42	1.69	1.92	1.1	1.1
116	○	66	70	72	0.70	0.84	0.96	1.16	1.45	1.68	1.96	2.34	2.65	260	1.3
146	○	74	78	80	0.88	1.06	1.21	1.46	1.85	2.16	2.54	3.05	3.49	310	1.8
176	○	71	73	75	1.06	1.27	1.46	1.76	2.22	2.60	3.06	3.68	4.20	1.7	1.7
182	○	81	87	91	1.10	1.32	1.51	1.82	2.30	2.69	3.17	3.81	4.34	1.8	1.8
211	○	83	88	92	1.27	1.53	1.75	2.11	2.67	3.12	3.67	4.41	5.04	1.8	1.8
224	○	75	80	82	1.34	1.62	1.85	2.24	2.83	3.31	3.90	4.69	5.35	1.7	1.7
262	○	75	80	83	1.57	1.90	2.17	2.62	3.31	3.87	4.56	5.48	6.25	1.7	1.7
316	○	93	97	97	1.90	2.29	2.62	3.16	3.99	4.67	5.50	6.61	7.54	1.8	1.8
394	○	83	87	91	2.36	2.85	3.26	3.94	4.98	5.82	6.86	8.24	9.40	420	1.7

●: Available with or without strainer (mesh size #50) ○: Only available without strainer

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M KD 03 S303W

Pipe conn. size ²	Spray capacity code	Material	Strainer
1/4M	03	S303	W
○	○		
394	394		

② Nozzle Tip Only

Example: 1/4 KD 03 S303

Spray capacity code	Material
03	S303
○	
394	

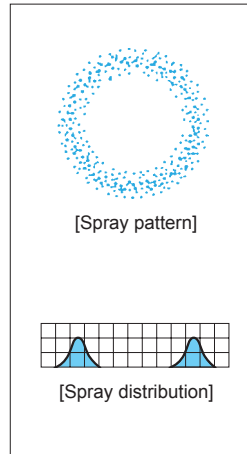
*2) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

This nozzle series is made-to-order.

Medium Capacity Hollow Cone Spray Nozzles

AAP

Hollow Cone



- Hollow cone spray nozzle with relatively fine atomization and stable spray pattern at both low and high pressure.
- No-whirler design minimizes clogging.
- Spraying axis at 90° angle from the nozzle inlet.

[STANDARD PRESSURE]

0.2 MPa

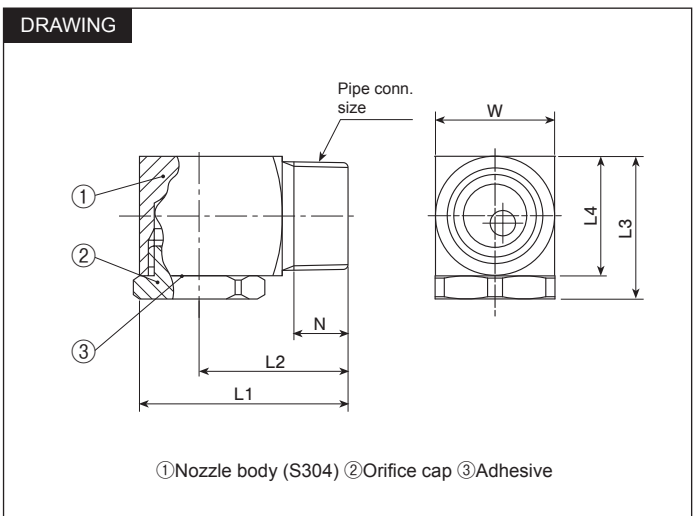
[APPLICATIONS]

Cleaning: Gas, air, machines, pre-paint treatment
Cooling: Gas, air handling unit, roofs, machineries, foods, warm water
Spraying: Aeration, humidification

Structure	<ul style="list-style-type: none"> • Includes a nozzle body and orifice cap. • Orifice cap is screwed into the nozzle body.
Material	<ul style="list-style-type: none"> • Nozzle body: S304 • Orifice cap: S303 <p>SPECIAL ORDER MATERIAL: S316 or S316L</p>

Pipe conn. size	Dimensions (mm)						Weight (g)
	L1	L2	L3	L4	W	N	
R1/4	32	23	20.5	16	16	10.5	49
R3/8	36	26	23.5	19	19	11	72
R1/2	46	33.5	31	25	25	14	160

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.



Spray capacity code	Pipe conn. size			Spray angle (°)			Spray capacity (L/min)							Mean droplet diameter (µm)	Free passage diameter (mm)
	R1/4	R3/8	R1/2	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		
01	○			71	75	77	0.40	0.51	0.72	0.87	1.00	1.22	1.55	260	2.0
02	○			71	75	77	0.80	1.03	1.43	1.74	2.00	2.43	3.11		2.5
03	○			71	75	77	1.21	1.54	2.15	2.61	3.00	3.65	4.66	}	3.2
04	○			76	80	82	1.61	2.05	2.87	3.48	4.00	4.86	6.21		3.7
05	○			76	80	82	2.01	2.57	3.58	4.35	5.00	6.08	7.77	500	4.2
06		○		76	80	82	2.41	3.08	4.30	5.22	6.00	7.29	9.32	470	4.8
07		○		76	80	82	2.81	3.59	5.02	6.10	7.00	8.51	10.9		5.0
08		○		76	80	82	3.21	4.11	5.73	6.97	8.00	9.72	12.4	}	5.2
10		○		76	80	83	4.02	5.14	7.17	8.71	10.0	12.2	15.5		5.4
12		○		76	80	83	4.82	6.16	8.60	10.4	12.0	14.6	18.6	650	5.9
14			○	76	80	83	5.62	7.19	10.0	12.2	14.0	17.0	21.7	580	6.8
18			○	76	80	83	7.23	9.24	12.9	15.7	18.0	21.9	28.0	}	7.5
23			○	76	80	83	9.24	11.8	16.5	20.0	23.0	28.0	35.7	800	8.0

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M AAP 01 S303

1/4M	AAP	01	S303
Pipe conn. size*1		Spray capacity code	Material*2
1/4M		01	
3/8M		}	
1/2M		23	

*1) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

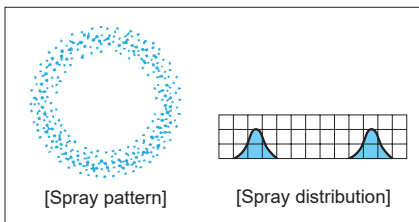
*2) S303 refers to the material of the orifice cap and the nozzle body is S304.

Alumina Ceramic and Medium Capacity Hollow Cone Spray Nozzles

Made-to-Order

AP-AL92

Hollow Cone



- Hollow cone spray nozzle made of alumina ceramic with excellent wear-resistance and relatively fine atomization.
- Spray pattern is stable at both low and high pressures.
- No-whirler design minimizes clogging.
- Spraying axis at 90° angle from the nozzle inlet.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

Cleaning: Gas, air, machines, pre-paint treatment

Cooling: Gas, air handling unit, roofs, machinery, foods, warm water

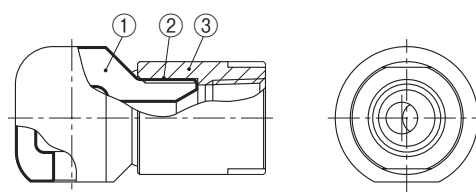
Spraying: Aeration, humidification

Structure	<ul style="list-style-type: none"> • Alumina ceramic one-piece structure. • No obstructions in the nozzle interior.
Material	<ul style="list-style-type: none"> • Nozzle body: 92% Alumina • Socket: S316

The AP-AL92 series is available with a socket made of S316 to prevent damage to the delicate alumina threads.

The S316 socket is female threaded turning the male nozzle thread into a female connection.

DRAWING



① Nozzle body ② Adhesive: Araldite®H ③ Socket (S316)

Nozzle thread size	Spray angle (°) at 0.2 MPa	Spray capacity (L/min) at 0.2 MPa	Mean droplet diameter (μm)	Free passage diameter (mm)
R1/2	80	14.0–23.0	580–800	6.4–8.1
R3/4	80	26.0–40.0	670–850	9.2–11.0
R1	85	45.0–70.0	750–1,000	11.9–14.4
R1½	85	80.0–150	1,000–1,400	15.9–19.4
R2	85	200–250		24.2–26.1
R2½	85	300–400	1,500–1,800	31.0–32.9
R3	85	500–600		39.7–42.6

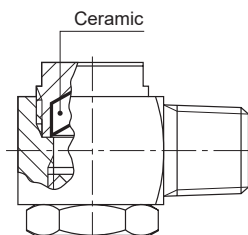
HOW TO ORDER

IKEUCHI will help select the best model for the specific applications and requirements of each customer. Contact us for more details.

Metal AP Series Made-to-Order

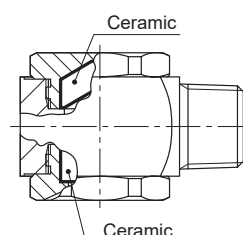
For applications requiring wear resistant nozzles, such as spraying slurry, the AP series with highly wear-resistant ceramics are available. Contact us for details.

AP SERIES



- Metal hollow cone spray nozzle using ceramic for the inner bottom part of the nozzle body.

AP SERIES with ceramic orifice

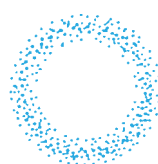


- Metal hollow cone spray nozzle including a ceramic orifice and ceramic inner bottom part.

Flange-connection, Large Capacity Hollow Cone Spray Nozzles

Made-to-Order

TAA



[Spray pattern]



[Spray distribution]

- Stable hollow cone spray pattern, even at low pressures, because of the unique vortex chamber design.
- Made of highly wear-resistant SiC (silicon nitride bonded silicon carbide).
- Flange connection.
- Lightweight, weighing less than half of comparable metal nozzles.

[STANDARD PRESSURE]

0.07 MPa

[APPLICATIONS]

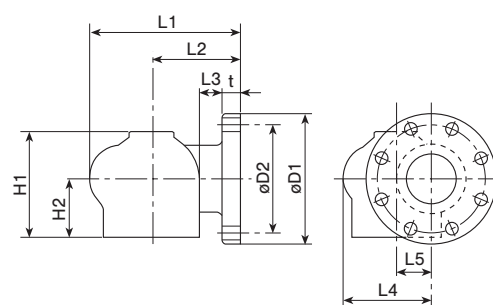
- Absorption tower of flue gas desulfurization equipment
- Spraying slurry

Hollow Cone

Structure	<ul style="list-style-type: none"> • One-piece cast-molded ceramic. • Flanged connection.
Material	<ul style="list-style-type: none"> • SiC (silicon nitride bonded silicon carbide) <p>SPECIAL ORDER MATERIAL: SiSiC (sintered reaction-bonded silicon carbide)</p>

Flange size (inch)	Spray capacity code	Dimensions (mm)										Flange bolt holes (JIS 10K)		Weight (kg)
		L1	L2	L3	L4	L5	H1	H2	øD1	øD2	t	Number of holes	Diameter (mm)	
2	200	151	99	37	74	28	102	57	155	120	22	4	19	1.8
	300	169	106	37	90	35	112	62	155	120	22	4	19	2.0
3	400	184	114	37	100	38	129	71	185	150	24	8	19	3.1
	500	202	122	37	116	45	145	82	185	150	24	8	19	3.7
	650	210	125	36	124	49	150	85	185	150	24	8	19	4.0
	800	210	125	36	124	49	150	85	185	150	24	8	19	4.0
4	1000	253	154	55	143	56	177	100	210	175	24	8	19	6.0
	1200	271	161	55	159	63	187	105	210	175	24	8	19	6.8

DRAWING



[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray capacity code	Flange connection size (inch)			Spray angle (°)			Spray capacity (L/min)					Mean droplet diameter (μm)	Free passage diameter (mm)
	2	3	4	0.03 MPa	0.07 MPa	0.1 MPa	0.03 MPa	0.05 MPa	0.07 MPa	0.1 MPa	0.15 MPa		
200	○			62	67	69	133	170	200	237	288	1,800	28
300	○			62	67	69	199	255	300	356	432	2,100	31
400		○		62	67	69	266	340	400	474	576	2,100	38
500		○		62	67	69	332	425	500	592	720		41
650		○		62	67	69	432	552	650	770	936		50
800		○		75	80	82	532	680	800	950	1,154	3,600	57
1000			○	75	80	82	665	850	1,000	1,187	1,442	3,600	68
1200			○	75	80	82	798	1,020	1,200	1,424	1,731	3,800	68

[Note] 1. Since TAA series nozzles are cast molded, the spray capacity is guaranteed within +/-10% and the spray angle within +/-7° under standard pressure.
2. The tightening torque to connect the flange must not exceed 30 N-m per bolt.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 2 TAA 200 SiC

2	TAA	200	SiC
Flange connection size		Spray capacity code	Material
<input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4		<input type="radio"/> 200 <input type="radio"/> 300 <input type="radio"/> 400 <input type="radio"/> 500 <input type="radio"/> 650 <input type="radio"/> 800 <input type="radio"/> 1000 <input type="radio"/> 1200	

This nozzle series is made-to-order.

TWAA, TAA-PP SERIES Made-to-Order

Also available are TWAA series nozzles for two-directional spray and TAA series nozzles made of chemical-resistant PP.

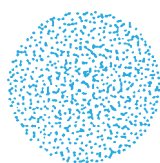
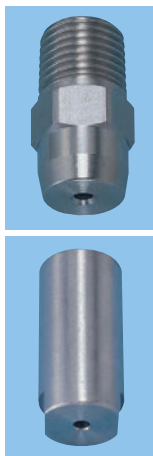
Series	Picture	Structure	Features	Series	Picture	Structure	Features
TWAA-Sic			<ul style="list-style-type: none"> • Two-directional (opposite directions) jet nozzle made of SiC ceramic. 	TAA-PP			<ul style="list-style-type: none"> • Hollow cone spray nozzle made of PP. • Chemical-resistant and lightweight.

Standard Type Full Cone Spray Nozzles

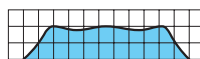
Some Models are Made-to-Order

JJXP

Full Cone



[Spray pattern]



[Spray distribution]

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

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

Cleaning: Gas, incinerator fumes, machinery, eliminators, screens, tanks, parts, crushed stone, earth and sand

Cooling: Gas, machineries, tanks, steel

Spraying: Waste water treatment, aeration, foam breaking, fire prevention and extinguishing, dust suppression, sea water desalination equipment

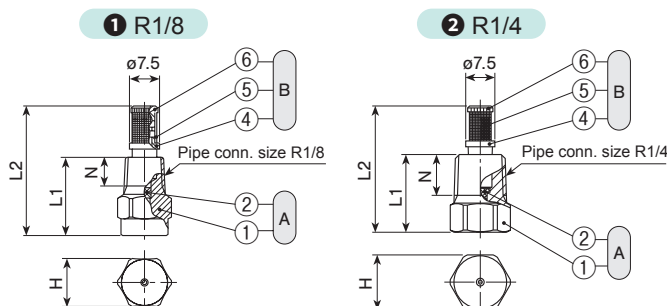
Structure	<ul style="list-style-type: none"> • One-piece structure with a press-fitted X-shaped whirler. Size R1/4 with spray capacity codes 040–060 and size R3/8 standard models include a C-ring.
Material	<ul style="list-style-type: none"> • Sizes R1/8–Rc1: S303 • Sizes Rc1 1/2 or larger: S316 • Depending on nozzle code, S316L equivalent or SCS16 whirlers are also used. <p>SPECIAL ORDER MATERIAL^{*1}: S316L, S316L, PP, or PTFE (PP and PTFE for Rc3/8 sizes and larger only)</p> <p>^{*1}) Thread size of special order material may differ depending on the material.</p>

DWG No.	Pipe conn. size ²	Dimensions (mm)							Weight (g)
		L1	L2	L3	H	W	øD	N	
①	R1/8 (005)	20	32.5	—	12	—	—	7	9.5 ³
	R1/8 (010–030)	20	—	—	12	—	—	7	11
②	R1/4 (005)	20	32.5	—	14	—	—	10.5	18 ³
	R1/4 (010–030)	20	—	—	14	—	—	10.5	18
③	R1/4 (040–060)	28	—	—	14	—	—	10.5	21
④	R3/8	34	—	6	—	17	20	11	50
	Rc3/8	43	—	6	—	17	20	11	61
	Rc1/2	54	—	8	—	22	25	14	140
	Rc3/4	69	—	10	—	27	32	15	270
	Rc1	89	—	14	—	34	40	17	515
⑤	Rc1 1/2	124	—	20	—	50	58	19	1,520
	Rc2 (250–350)	160	—	24	—	60	70	23	2,600
	Rc2 (400–500)	118.5	—	24	—	60	70	23	2,050
	Rc2 1/2	147.5	—	27	—	80	90	27	4,360
	Rc3 (920)	163.5	—	30	—	90	105	30	6,700
	Rc3 (1200)	170.5	—	30	—	90	105	30	6,500

^{*2}) Figures in () after the pipe connection size indicate the spray capacity code.

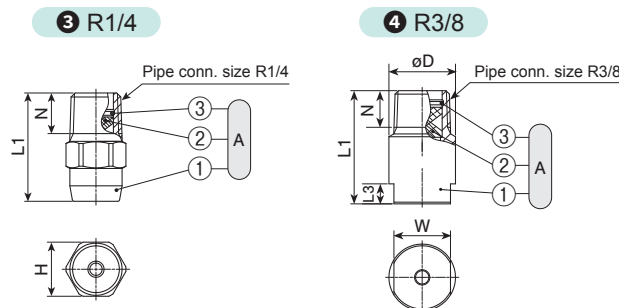
^{*3}) For JJXP005 with strainer, add 2 g to the above weight.

DRAWING

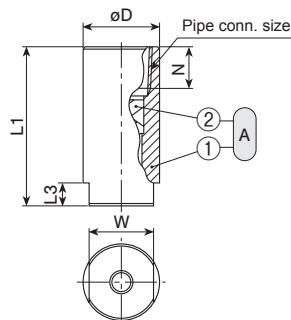


R1/8 (005) with strainer: **A + B**
R1/8 (010–030): **A** only

R1/4 (005) with strainer: **A + B**
R1/4 (010–030): **A** only



⑤ Rc3/8 and over



A Nozzle (① Nozzle body ② Whirler ③ C-ring)
B Strainer (④ Strainer holder ⑤ Strainer screen [S316] ⑥ Strainer cap)

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Standard Type Full Cone Spray Nozzles

JJXP SERIES

Full Cone

Spray capacity code	Pipe connection size				Spray angle (°)			Spray capacity (L/min)									Mean drop. dia. (μm)	Free pass. dia. (mm)
	R1/8	R1/4	R3/8	Rc3/8	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 connection size ^{*4}							Spray angle (°)			Spray capacity (L/min)									Mean drop. dia. (μm)	Free pass. dia. (mm)
	Rc 1/2	Rc 3/4	Rc 1	Rc 1 1/2	Rc 2	Rc 2 1/2	Rc 3	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	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	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	14.1
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

●: Available with or without strainer (mesh size #100) ○: Only available without strainer

*4) The JJXP series with thread size Rc2 1/2 and Rc3 are made-to-order.

For spraying slurry, the nozzle material should be wear-resistant. For such applications, the **JJXP-AL92 series** nozzles made of high-purity alumina are available (see page 70).

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8M JJXP 005 S303 W

1/8M	JJXP	005	S303	W
Pipe conn. size ^{*5}		Spray capacity code	Material ^{*6}	Strainer
1/8M		005	S303	W (with strainer: JJXP005 only)
3F		1200	S316	(Blank indicates "without strainer")

*5) "M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/8M = R1/8.

*6) See "Material" information on page 61 for standard material (S303 or S316) for each size.

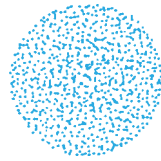
The JJXP series with thread size Rc2 1/2 and Rc3 are made-to-order.

Quick-detachable Standard Flat Spray Nozzles

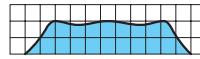
Stainless Steel

INJJX-SS

Full Cone



[Spray pattern]



[Spray distribution]

- Full cone spray pattern with a round impact area and uniform distribution.
- The unique design accommodates easy installation and removal.
- Quick-detachable design helps to significantly reduce maintenance time.
- X-shaped whirler provides a large free passage diameter, minimizing clogging.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

Cleaning: Machinery, eliminators, screens, tanks, parts, crushed stone, earth and sand, steel plates and pieces

Cooling: Tanks, roofs

Spraying: Waste water treatment, aeration, foam breaking, dust suppression

Structure	<ul style="list-style-type: none"> • Includes a nozzle section (nozzle tip + whirler + cap + packing) and an adaptor. • Worn-out nozzle tips and other parts are available separately for replacement. • Easy installation and removal of the nozzle section with a twist of about 90°. • Tip or packing will not fall out when the nozzle section is removed.
Material	<ul style="list-style-type: none"> • Nozzle orifice: S303 • Whirler, cap and adaptor: S316L equivalent • Packing: FEPM
Weight	<ul style="list-style-type: none"> • Complete assembly: 62 g • Nozzle tip: 18 g

Max. temperature: 150°C

Max. operating pressure: 2.0 MPa

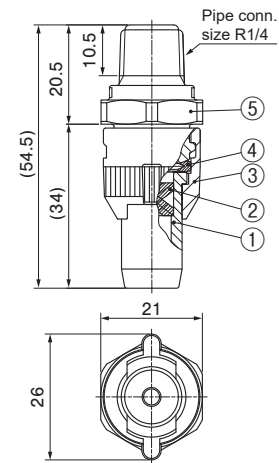
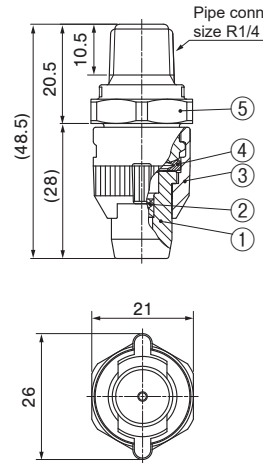
[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm

Spray capacity code
010, 020, and 030

Spray capacity code
040, 050, and 060



① Nozzle tip ② Whirler ③ Cap ④ Packing (FEPM) ⑤ Adaptor

Spray capacity code	Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (μm)	Free passage diameter (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		
010	50	55	45	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	1.93	290	0.7
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

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/4M INJJX 010 S303 (FEPM) + S316L-IN

1/4M INJJX 010 S303 (FEPM) + S316L-IN

Pipe conn. size*	Spray capacity code	Nozzle tip material	Packing material	Material of cap & adaptor
	010			
	060			

② Nozzle Tip Only

Example: 1/4 JJX 010 S303

1/4 JJX 010 S303

Spray capacity code	Material
010	
060	

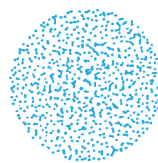
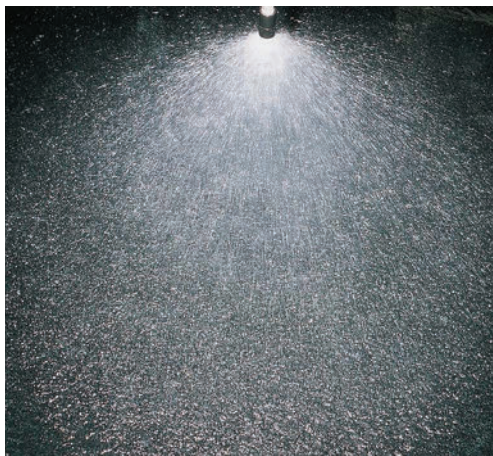
③ Adaptor (R1/4), cap, and packing are available separately for purchase.

**"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

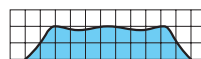
Standard Type Full Cone Spray Nozzles

JJXP-PVDF

Full Cone



[Spray pattern]



[Spray distribution]

- Full cone spray pattern with a round impact area and uniform distribution.
- X-shaped whirler provides a large free passage diameter, minimizing clogging.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

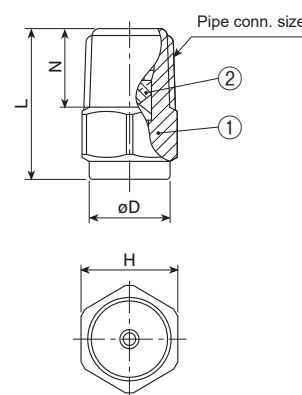
Cleaning: Machinery, screens, tanks, crushed stone, earth and sand
Cooling: Machinery, tanks
Spraying: Waste water treatment, aeration, foam breaking, dust suppression, etching, chemicals

Structure	• One-piece structure with a press-fitted X-shaped whirler.
Material	• PVDF

Pipe conn. size	Dimensions (mm)				Weight (g)
	L	H	øD	N	
R1/8	18	12	11	8	2.2
R1/4	22	14	12	11.5	4.1

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



① Nozzle body ② Whirler

Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)										Mean droplet diameter (μm)	Free passage diameter (mm)
	R1/8	R1/4	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

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8M JJXP 010 PVDF

1/8M	JJXP	010	PVDF
Pipe conn. size*		Spray capacity code	Material
■ 1/8M		■ 010	
■ 1/4M		}	
		■ 030	

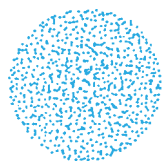
*"M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

Standard Type Full Cone Spray Nozzles

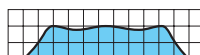
JJXP-HTPVC JJXP-PVC

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

Full Cone



[Spray pattern]



[Spray distribution]

- Full cone spray pattern with a round impact area and uniform distribution.
- X-shaped whirler provides a large free passage diameter, minimizing clogging.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

Spraying: Etchants, chemicals
Cleaning: Printed circuit boards

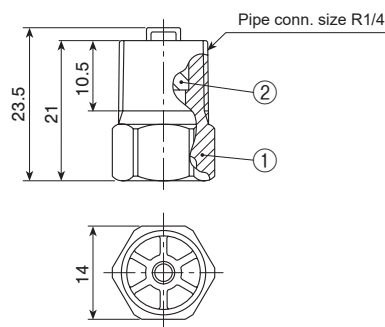
JJXP-HTPVC SERIES

Structure	• One-piece structure with an X-shaped whirler.
Material	• HTPVC
Weight	• 2.5 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



① Nozzle body ② Whirler

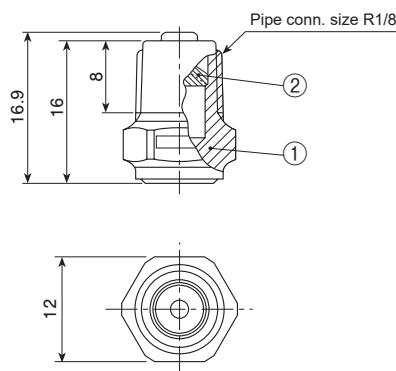
JJXP-PVC

Structure	• One-piece structure with an X-shaped whirler.
Material	• PVC
Weight	• 1.4 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



① Nozzle body ② Whirler

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 droplet diameter (μm)	Free passage diameter (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	2.1
050	65	70	60	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34	9.64	350	2.1
060	70	75	65	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	11.6	520	2.1

■ JJXP-PVC [1/8M JJXP 2*75/2 PVC]

Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (μm)	Free passage diameter (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

To inquire about or order a specific nozzle please refer to this coding system.

JJXP-HTPVC

Example: 1/4M JJXP 040 HTPVC

1/4M JJXP 040 HTPVC

Pipe
conn.
size*

Spray
capacity
code

Material

- 040
- 050
- 060

JJXP-PVC

1/8M JJXP 2*75/2 PVC

Pipe
conn.
size*

Spray angle &
capacity code

Material

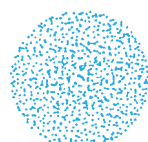
**M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Quick-detachable Standard Full Cone Spray Nozzles

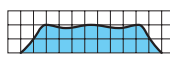
Plastic

INJJX

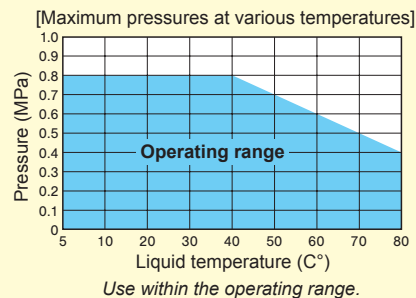
Full Cone



[Spray pattern]



[Spray distribution]



- Full cone spray nozzle with a removable whirler.
- Made of highly chemical and heat resistant plastic.
- Quick-detachable design helps to significantly reduce maintenance time.
- Nozzle tips are color-coded by spray capacity for easy identification.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

- Cleaning • Etching • Stripping
- Chemical treatment
- For periodic maintenance or for applications where precise spray alignment is required

Structure	<ul style="list-style-type: none"> • Two-piece structure including a nozzle tip, with whirler and packing, and an adaptor. • Easy installation and removal of the nozzle tip with a twist of about 60°.
Material	<ul style="list-style-type: none"> • Nozzle tip and whirler: PP • Adaptor: PP or PPS [SPECIAL ORDER MATERIAL: PVDF] • Packing: FEPM

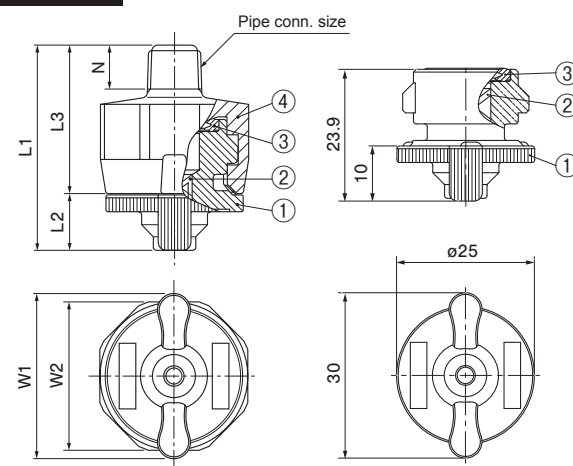
Pipe conn. size	Dimensions (mm)						Weight (g)	
	L1	L2	L3	W1	W2	N	PP	PPS
R1/8	37	10	27	30	27	8	9.2	12
R1/4	40	10	30	30	27	11.5	9.6	13
R3/8	40	10	30	30	27	12	10.5	14

[Note]

- INJJX series nozzles are not compatible with the discontinued ISJJX series.
- Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Complete Assembly

Nozzle Tip (① + ② + ③)

① Nozzle tip ② Whirler ③ Packing (FEPM) ④ Adaptor

Spray capacity code	Pipe conn. size			Spray angle (°)			Spray capacity (L/min)								Mean drop. dia. (μm)	Free pass. dia. (mm)	Nozzle tip color
	R1/8	R1/4	R3/8	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	1.48	1.67	290	0.8	Green
015	○	○	○	60	65	55	—	0.79	1.09	1.32	1.50	1.77	2.18	2.50		1.0	Grey
020	○	○	○	60	65	55	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34		1.5	Black
025	○	○	○	60	65	55	—	1.32	1.82	2.20	2.50	2.95	3.62	4.17		1.5	Yellow
030	○	○	○	60	65	55	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00		1.5	Blue
040	○	○	○	60	65	55	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67		2.0	Purple
050	○	○	○	65	70	60	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34		2.0	Green
060	○	○	○	70	75	65	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	520	2.0	Pink

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

① Complete Assembly

Example: 1/8M INJJX 040 PP (FEPM) + PP

1/8M	INJJX	040	PP (FEPM) +	PP
Pipe conn. size*		Spray capacity code	Nozzle tip material (packing: FEPM)	Adaptor material
1/8M		010		PP
1/4M		015		PPS
3/8M		060		(Color-coded by material)

② Nozzle Tip Only (including packing and whirler)

Example: INJJX 040 PP (FEPM)

INJJX	040	PP (FEPM)
	Spray capacity code	Nozzle tip material (packing: FEPM)
	010	
	015	
	060	

③ Adaptor is available for purchase separately.

④ You can change a nozzle tip to a plug tip if needed.
See page 22 for Quick-detachable IN PLUG series.

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

ALSO AVAILABLE!

Quick-detachable
Standard
Flat Spray Nozzles

INVV SERIES

See page 21 of this catalog.

Stainless steel
quick-detachable

INJJX-SS SERIES

See page 63 of this catalog.

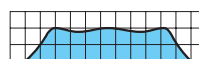
Ceramic Orifice and Whirler Inserted Full Cone Spray Nozzles

Made-to-Order

JUP



[Spray pattern]



[Spray distribution]

- Full cone spray pattern with a round impact area and uniform distribution.
- Ceramic disc whirler and orifice forming a vortex chamber provide excellent wear resistance.
- Medium spray capacity range.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

Cleaning: Gas, incinerator fumes, machinery, eliminators, screen, tanks, crushed stone, earth and sand

Cooling: Gas, machinery, tanks, steel

Spraying: Waste water treatment, aeration, foam breaking, dust suppression

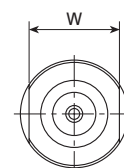
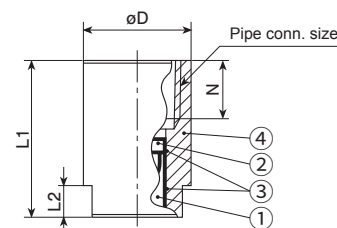
Full Cone

Structure	<ul style="list-style-type: none"> • One-piece nozzle with a ceramic whirler and orifice that form a ceramic vortex chamber inside.
Material	<ul style="list-style-type: none"> • Nozzle orifice & whirler: ceramic • Nozzle body: <ul style="list-style-type: none"> Sizes Rc1 or smaller: S303 Sizes Rc1 1/2 or larger: S316 <p>SPECIAL ORDER MATERIAL: S316 (for sizes Rc1 or smaller), S316L</p>

Pipe conn. size	Dimensions (mm)					Weight (g)
	L1	L2	W	øD	N	
Rc3/8	30	6	17	20	11	41
Rc1/2	39	8	22	25	14	115
Rc3/4	49	10	27	32	15	167
Rc1	59	14	34	40	17	300
Rc1 1/2	80	20	50	58	19	860

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



- ① Ceramic orifice ② Ceramic whirler
③ Adhesive: Araldite® ④ Nozzle body

Spray capacity code	Pipe connection size					Spray angle (°)			Spray capacity (L/min)							Mean drop. dia. (µm)	Free pass. dia. (mm)
	Rc3/8	Rc1/2	Rc3/4	Rc1	Rc1 1/2	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		
03	○					50	60	52	—	1.57	2.17	2.62	3.00	3.55	4.37	380	1.2
04	○					50	60	52	—	2.09	2.89	3.50	4.00	4.73	5.83	~	1.4
05	○					55	65	55	—	2.61	3.61	4.37	5.00	5.91	7.29	490	1.5
06		○				50	60	52	2.46	3.13	4.33	5.24	6.00	7.09	8.75	470	2.0
07		○				55	63	55	2.87	3.65	5.05	6.12	7.00	8.27	10.2	~	2.0
08		○				55	65	55	3.28	4.18	5.78	6.99	8.00	9.46	11.7	~	2.0
10		○				60	70	58	4.10	5.22	7.22	8.74	10.0	11.8	14.6	~	2.2
12		○				63	70	60	4.92	6.26	8.66	10.5	12.0	14.2	17.5	600	2.3
14			○			63	70	60	5.74	7.31	10.1	12.2	14.0	16.5	20.4	580	2.8
16			○			63	70	60	6.56	8.35	11.6	14.0	16.0	18.9	23.3	~	2.8
18			○			70	77	65	7.38	9.40	13.0	15.7	18.0	21.3	26.2	~	3.0
20			○			75	80	68	8.20	10.4	14.4	17.5	20.0	23.6	29.2	~	3.0
23			○			75	80	68	9.43	12.0	16.6	20.1	23.0	27.2	33.5	~	3.2
26			○			78	83	70	10.7	13.6	18.8	22.7	26.0	30.7	37.9	~	3.2
30			○			78	83	72	12.3	15.7	21.7	26.2	30.0	35.5	43.7	730	3.4

Ceramic Orifice and Whirler Inserted Full Cone Spray Nozzles

JUP SERIES

Full Cone

Spray capacity code	Pipe connection size					Spray angle (°)			Spray capacity (L/min)							Mean drop. dia. (µm)	Free pass. dia. (mm)
	Rc3/8	Rc1/2	Rc3/4	Rc1	Rc1½	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		
35				○		80	83	70	14.4	18.3	25.3	30.6	35.0	41.4	51.0	700	4.0
40				○		80	83	70	16.4	20.9	28.9	35.0	40.0	47.3	58.3	700	4.0
45				○		83	85	70	18.5	23.5	32.5	39.3	45.0	53.2	65.6	700	4.0
50				○		83	85	72	20.5	26.1	36.1	43.7	50.0	59.1	72.9	700	4.0
55				○		83	85	72	22.6	28.7	39.7	48.1	55.0	65.0	80.2	900	4.0
60					○	75	80	70	24.6	31.3	43.3	52.4	60.0	70.9	87.5	800	5.0
70					○	78	83	70	28.7	36.5	50.5	61.2	70.0	82.7	102	700	5.0
80					○	80	83	72	32.8	41.8	57.8	69.9	80.0	94.6	117	700	5.0
90					○	82	85	72	36.9	47.0	65.0	78.7	90.0	106	131	1,000	5.0

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 3/8F JUP 03 S303

3/8F	JUP	03	S303
Pipe conn. size*1		Spray capacity code	Material*2
3/8F		03	S303
3/8F		03	S316
1*1/2F		90	

*1) "F" indicates female thread ("Rc" of the ISO standard), e.g. 1*1/2F = Rc1 1/2.

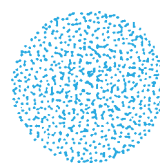
*2) See "Material" information on page 68 for standard material (S303 or S316) for each size.

This nozzle series is made-to-order.

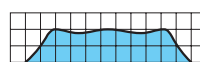
Alumina Ceramic Full Cone Spray Nozzles

Made-to-Order

JUXP-AL92



[Spray pattern]



[Spray distribution]

- X-shaped whirler provides a large free passage diameter, minimizing clogging.
- Made of high-purity alumina ceramic, offering excellent wear resistance.
- Spray capacity ranges from medium to large.

[STANDARD PRESSURE]
0.2 MPa

[APPLICATIONS]

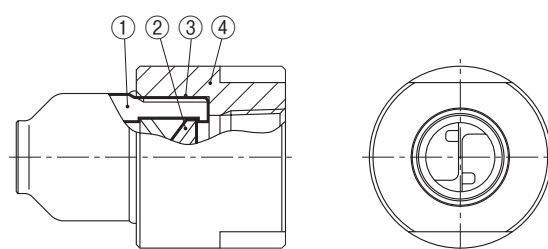
- Absorption tower of flue gas desulfurization equipment
- Spraying slurry

Full Cone

Structure	<ul style="list-style-type: none"> • Alumina ceramic one-piece structure.
Material	<ul style="list-style-type: none"> • Nozzle body: 92% Alumina • Socket: S316

The JUXP-AL92 series is available with a socket made of S316 to prevent damage to the delicate alumina threads. The S316 socket is female threaded turning the male nozzle thread into a female connection.

DRAWING



①Nozzle body ②Whirler ③Adhesive: Araldite®H ④Socket (S316)

Nozzle thread size	Spray angle (°) at 0.2 MPa	Spray capacity (L/min) at 0.2 MPa	Mean droplet diameter (μm)	Free passage diameter (mm)
R1	75–95	23.0–45.0	630–950	4.7–5.0
R1½	75–95	50.0–90.0	800–1,150	6.0–6.6
R2	85–95	100–200	1,000–1,350	8.4–10.3
R2½	80–100	250–550	1,200–1,550	12.6–13.4
R3	80 or 90	600–700	1,500–1,800	17.6–17.8

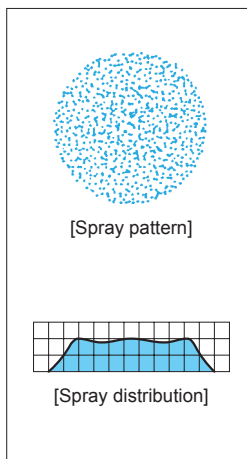
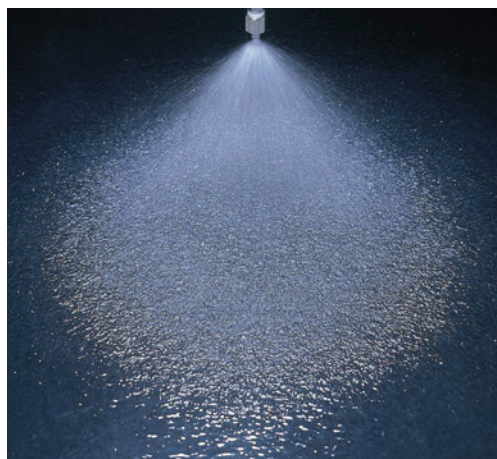
HOW TO ORDER

IKEUCHI will help select the best model for the specific applications and requirements of each customer. Contact us for more details.

Low Flow Rate Full Cone Spray Nozzles

JJRP

Full Cone



- Low flow rate full cone spray nozzles made of excellent wear-resistant PTFE or injection molded PVDF.
- Disc whirler is designed to provide uniform spray distribution at small spray capacity.

[STANDARD PRESSURE]
0.2 MPa

[APPLICATIONS]
Spraying: Etchants, acid liquids
Cleaning with pure water

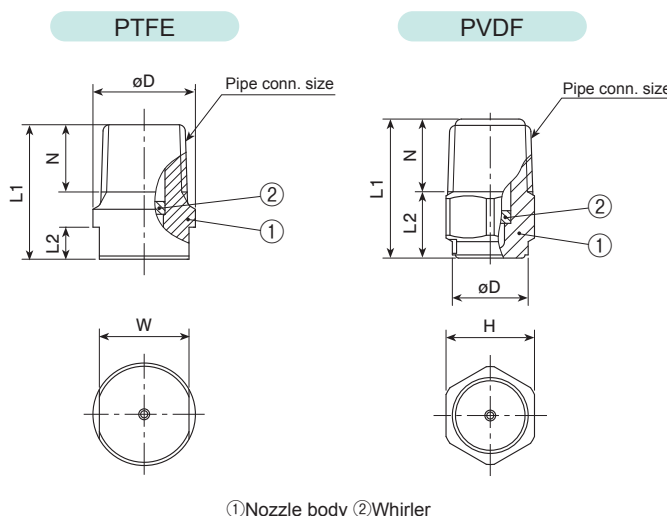
Structure	• One-piece structure with a press-fitted disc whirler.
Material	• PTFE or PVDF

Material	Pipe conn. size	Dimensions (mm)						Weight (g)
		L1	L2	H	W	øD	N	
PTFE	R1/8	16	4	—	10	12	7	2
	R1/4	21	5	—	14	16	10.5	6 ^{*1}
PVDF	R1/8	18	10	12	—	11	8	2
	R1/4	22	10.5	14	—	12	11.5	4.1

*1) JJRP with spray capacity code 040-060 weigh 5g.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Spray capacity code	Pipe connection size				Spray angle (°)			Spray capacity (L/min)								Mean drop. dia. (μm)	Free pass. dia. (mm)
	PTFE		PVDF														
	R1/8	R1/4	R1/8	R1/4	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	}	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
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

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

JJRP-PTFE

Example: 1/8M JJRP 005 PTFE

Pipe conn. size ^{*2}	JJRP	Spray capacity code	Material
1/8M	005	PTFE	
1/4M	005		
	060		

JJRP-PVDF

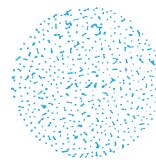
Example: 1/8M JJRP 007 PVDF

Pipe conn. size ^{*2}	JJRP	Spray capacity code	Material
1/8M	007	PVDF	
1/4M	007		

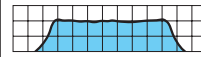
*2) "M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

Low Flow Rate Full Cone Spray Nozzles

J



[Spray pattern]



[Spray distribution]
(for spray capacity codes 010 and higher)

- Full cone spray pattern with a round impact area and even distribution.
- Spray capacity codes 006 and 008 produce a round impact area and mountain-shaped spray distribution.
- Features lowest flow rate among our full cone spray nozzles.
- Ceramic orifice and closer provide excellent wear-resistance.

[STANDARD PRESSURE]

0.5 MPa for spray capacity codes 006 and 008.
0.2 MPa for spray capacity codes 010 and higher.

[APPLICATIONS]

Spraying: Oils, lubricants, glues, etchants
Cleaning: Galvanizing, gas
Cooling: Machinery, gas

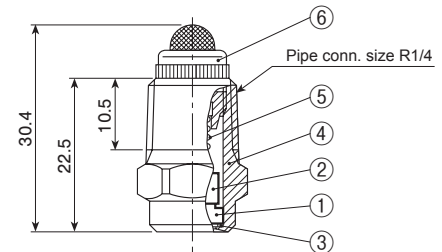
Full Cone

Structure	<ul style="list-style-type: none"> • Nozzle orifice and closer are made of ceramic. Spray capacity code 006 has a high-purity ceramic orifice. • All models include a built-in strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice and closer: ceramic • Nozzle body: S303 <p>SPECIAL ORDER MATERIAL: S316</p>
Weight	• 17.5g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



- ①Ceramic orifice ②Ceramic closer ③Packing (PTFE)
④Nozzle body ⑤Spring (S316)
⑥Strainer (S303+S304 for mesh size #50 and #100, S303+S304+S316 for mesh size #150 and #200)

Spray capacity code	Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (μm)	Free passage diameter (mm)	Strainer mesh size
	0.1 MPa	0.2 MPa	0.5 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa			
006	—	—	70	—	—	—	0.07	0.09	0.10	0.12	0.14	0.16	170~190	0.15	200
008	—	—	70	—	—	—	0.09	0.12	0.14	0.16	0.19	0.22	140	0.2	200
010	—	70	65	—	0.09	0.10	0.12	0.15	0.17	0.20	0.24	0.28	160	0.3	200
012	—	70	65	—	0.10	0.12	0.14	0.18	0.21	0.25	0.29	0.33	190	0.3	200
015	—	70	65	—	0.13	0.15	0.18	0.23	0.26	0.31	0.37	0.42	170	0.3	200
020	60	70	65	0.14	0.17	0.20	0.24	0.30	0.35	0.41	0.49	0.56	∅	0.3	200
025	65	70	67	0.18	0.22	0.25	0.30	0.38	0.44	0.51	0.61	0.70	230	0.3	200
030	67	70	68	0.22	0.26	0.30	0.36	0.45	0.52	0.61	0.73	0.83	220	0.4	150
040	67	70	68	0.29	0.35	0.40	0.48	0.60	0.70	0.82	0.98	1.11	∅	0.4	150
050	68	70	68	0.36	0.44	0.50	0.60	0.75	0.87	1.02	1.22	1.39	290	0.5	150
060	68	70	68	0.43	0.52	0.60	0.72	0.90	1.05	1.23	1.47	1.67	280	0.5	150
070	68	70	68	0.51	0.61	0.70	0.84	1.05	1.22	1.43	1.71	1.95	∅	0.6	150
080	68	70	68	0.58	0.70	0.80	0.95	1.19	1.38	1.61	1.92	2.18	350	0.7	150
100	68	70	68	0.72	0.87	1.00	1.19	1.49	1.72	2.01	2.40	2.72	∅	0.7	100
120	68	70	68	0.87	1.05	1.20	1.43	1.79	2.07	2.42	2.88	3.27	∅	0.8	50
140	68	70	68	1.01	1.22	1.40	1.67	2.09	2.41	2.82	3.36	3.81	440	0.9	50

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M J 006N S303 W

1/4M J	006	N S303	W
Pipe conn. size*	Spray capacity code	Material	Strainer
	006 ∅ 140		

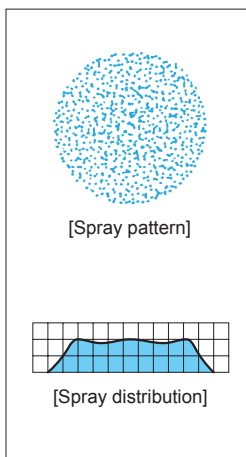
***M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Flange-connection, Large Capacity Full Cone Spray Nozzles

Made-to-Order

TJJX

Full Cone



- Full cone spray pattern with a round impact area and uniform distribution.
- Flange connection.
- X-shaped whirler provides a large free passage diameter, minimizing clogging.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

Cooling: Gas, liquids

Reacting: Chemical plants

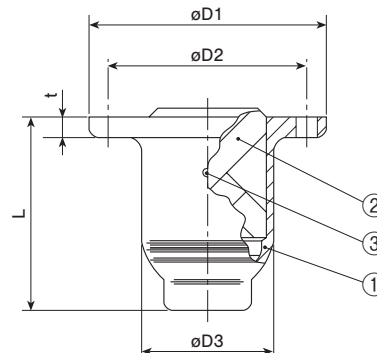
Spraying: Aeration, sea water desalination equipment

Structure	<ul style="list-style-type: none"> • Includes a nozzle body, X-shaped whirler, and lock bolt for securing the whirler to the nozzle body. The whirler is removable. • Flanged connection.
Material	<ul style="list-style-type: none"> • Nozzle body: S304, S316, SCS13, or SCS14 • Whirler: SCS13 or SCS14 • Lock bolt: S316 <p>SPECIAL ORDER MATERIAL: S316L, SCS16</p>

Flange size (inch)	Dimensions (mm)					Flange bolt holes (JIS 10K)		Weight (kg)
	L	øD1	øD2	øD3	t	Number of holes	Diameter (mm)	
4	171	210	175	117	18	8	19	9.3
5	211	250	210	143	20	8	23	11.4
6	253	280	240	169	22	8	23	22.7

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



① Nozzle body ② Whirler ③ Lock bolt

Spray capacity code	Flange connection size (inch)			Spray angle (°)			Spray capacity (L/min)							Mean droplet diameter (μm)	Free passage diameter (mm)
	4	5	6	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	628	794	1,091	1,315	1,500	1,770	2,180	1,850	28
2000	○			100	100	85	838	1,059	1,455	1,753	2,000	2,360	2,907	28	
2500		○		90	90	75	1,047	1,324	1,819	2,191	2,500	2,950	3,634	36	
3000		○		100	100	85	1,257	1,588	2,183	2,629	3,000	3,540	4,361	36	
3500			○	90	90	75	1,466	1,853	2,547	3,067	3,500	4,130	5,087	43	
4000			○	95	95	80	1,675	2,118	2,911	3,505	4,000	4,720	5,814	43	

[Note] Please contact IKEUCHI for TJJX series nozzles with larger flow rate and/or larger flange size.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.


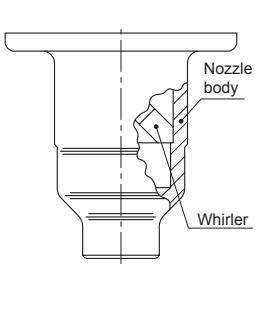
Example: 4 TJJX 1500 S304

4	TJJX	1500	S304
Flange conn. size		Spray capacity code	Material
4		1500	S304
5		2000	S316
6		4000	SCS13
			SCS14

This nozzle series is made-to-order.

TJJX-SiC SERIES **Made-to-Order**

For spraying slurry, wear resistance of nozzles must be considered. **TJJX-SiC series** nozzles made of highly wear-resistant SiC (silicon nitride bonded silicon carbide) are available for such applications. Please contact us for details.

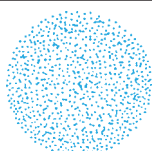
Series	Picture	Structure	Features	Applications
TJJX-SiC			<ul style="list-style-type: none"> • Full cone spray pattern with a round impact area and uniform distribution. • X-shaped whirler provides a large free passage diameter, minimizing clogging. • Whole nozzle is fired as one piece. • Made of highly wear-resistant SiC. Lightweight, weighing less than half of comparable metal nozzles. <p>[Note] Since TJJX-SiC series nozzles are cast molded, the spray capacity is guaranteed within $\pm 10\%$ and the spray angle within $\pm 7^\circ$ under standard pressure.</p>	<ul style="list-style-type: none"> • Spraying recirculated water for water granulation • Other applications: spraying slurry

Wide-angle Full Cone Spray Nozzles

Some Models are Made-to-Order

BBXP BBXP-PVDF/PVC

Full Cone



[Spray pattern]



[Spray distribution]

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

[STANDARD PRESSURE]

0.2 MPa for spray capacity codes 008–060.

0.35 MPa for spray capacity codes 10 and higher.

[APPLICATIONS]

Cleaning: Gas, incinerator fumes, machinery, eliminators, screen, tanks, parts, crushed stone, earth and sand

Cooling: Gas, machineries, tanks, steel plates

Spraying: Water treatment, aeration, foam breaking, fire extinguishing, dust suppression, sea water desalination equipment

BBXP SERIES

(Size Rc4: Made-to-Order)

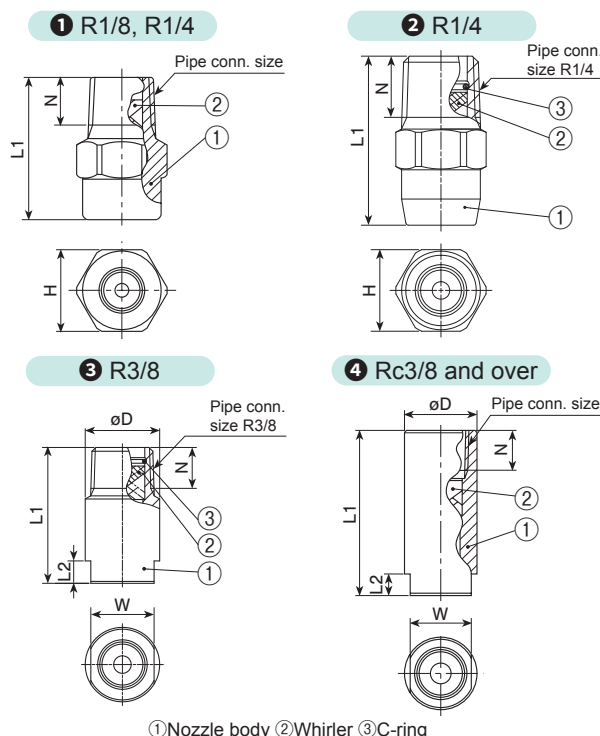
Structure	<ul style="list-style-type: none"> • One-piece structure with a press-fitted X-shaped whirler. Size R1/4 with spray capacity codes 040–060 and size R3/8 standard models include a C-ring.
Material	<ul style="list-style-type: none"> • Sizes R1/8– Rc1: S303 • Sizes Rc1 1/2 or larger: S316 <p>SPECIAL ORDER MATERIAL: S316L or others</p>

DWG No.	Pipe conn. size ¹	Dimensions (mm)						Weight (g)
		L1	L2	H	W	øD	N	
①	R1/8	21	—	12	—	—	7	11
	R1/4 (015, 020)	21	—	14	—	—	10.5	20
	R1/4 (030)	21.5	—	14	—	—	10.5	20
②	R1/4 (040–060)	29	—	14	—	—	10.5	21
③	R3/8	36.5	6	—	17	20	11	55
	Rc3/8	45.5	6	—	17	20	11	75
	Rc1/2	56	8	—	22	25	14	140
④	Rc3/4	73	10	—	27	32	15	300
	Rc1	94	14	—	34	40	17	585
	Rc1 1/2	131	20	—	50	58	19	1,760
	Rc2	168	24	—	60	70	23	2,980
	Rc2 1/2	199	27	—	80	90	27	5,890
	Rc3	220	30	—	90	105	30	9,400
	Rc4	278	40	—	115	130	36	16,100

*1) Figures in () after the pipe connection size indicate the spray capacity code.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



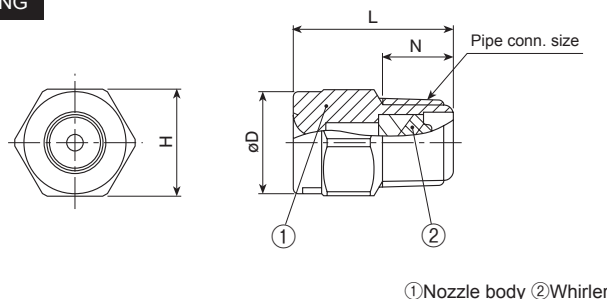
BBXP-PVDF SERIES

Structure	<ul style="list-style-type: none"> • One-piece structure with a press-fitted X-shaped whirler.
Material	<ul style="list-style-type: none"> • PVDF

Pipe conn. size	Dimensions (mm)				Weight (g)
	L	H	øD	N	
R1/8	18	12	11	8	2
R1/4	22	14	12	11.5	4.1

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

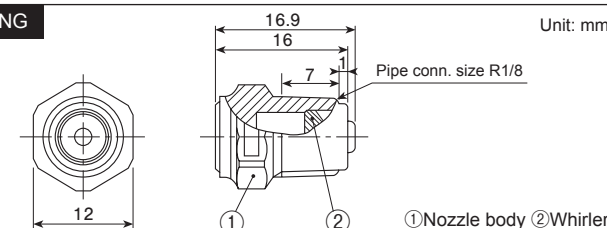


BBXP-PVC

Structure	<ul style="list-style-type: none"> • One-piece structure with an X-shaped whirler.
Material	<ul style="list-style-type: none"> • PVC
Weight	<ul style="list-style-type: none"> • 1.4 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Wide-angle Full Cone Spray Nozzles BBXP/BBXP-PVDF/BBXP-PVC SERIES

Full Cone

BBXP Series (metal)

Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)										Mean drop. dia. (µm)	Free pass. dia. (mm)
	R1/8	R1/4	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	0.7	
020	○	○	110	120	112	—	1.06	1.46	1.75	2.00	2.51	2.91	3.34	3.86	340	0.9	
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	1.4	
050	○	○	112	120	113	—	2.65	3.64	4.38	5.00	6.28	7.27	8.34	9.64	350	1.7	
060	○	○	114	120	114	2.51	3.18	4.37	5.26	6.00	7.54	8.72	10.0	11.6	430	1.7	

Spray capacity code	Pipe connection size ²										Spray angle (°)			Spray capacity (L/min)										Mean drop. dia. (µm)	Free pass. dia. (mm)
	R 3/8	Rc 3/8	Rc 1/2	Rc 3/4	Rc 1	Rc 1½	Rc 2	Rc 2½	Rc 3	Rc 4	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	2.0	
12	○	○									124	120	112	4.00	5.06	6.95	8.37	9.55	12.0	13.9	15.9	18.4			
14	○	○									124	120	112	4.67	5.90	8.10	9.77	11.1	14.0	16.2	18.6	21.5			
16	○	○									125	120	113	5.33	6.74	9.25	11.2	12.7	16.0	18.5	21.2	24.6			
18			○								123	120	111	6.00	7.58	10.4	12.6	14.3	18.0	20.8	23.9	27.6	420	2.8	
20			○								123	120	111	6.67	8.43	11.6	14.0	15.9	20.0	23.1	26.5	30.7	340	2.8	
23			○								124	120	112	7.67	9.69	13.3	16.0	18.3	23.0	26.6	30.5	35.3			
26			○								124	120	112	8.67	11.0	15.1	18.1	20.7	26.0	30.1	34.5	39.9	480	2.8	
30				○							123	120	111	10.0	12.6	17.4	20.9	23.9	30.0	34.7	39.8	46.0	340	3.8	
40				○							124	120	112	13.3	16.9	23.2	27.9	31.8	40.0	46.3	53.1	61.4			
50				○							125	120	113	16.7	21.0	29.0	34.9	39.8	50.0	57.8	66.3	76.7			
60					○						124	120	112	20.0	25.3	34.7	41.9	47.7	60.0	69.4	79.6	92.1	340	5.4	
80					○						125	120	113	26.7	33.7	46.3	55.8	63.7	80.0	92.5	106	123			
100						○					123	120	111	33.3	42.1	57.9	69.8	79.6	100	115	135	155	340	7.2	
150						○					124	120	112	50.0	63.2	86.9	105	120	150	175	200	230			
200							○				124	120	112	66.7	84.3	115	140	160	200	230	265	310	710	8.9	
300							○				125	120	113	100	125	175	210	240	300	350	400	460	900	10.2	
400								○			124	120	112	135	170	235	280	320	400	465	530	615	340	14.3	
500								○			125	120	113	170	210	290	350	400	500	580	665	770			
600									○		124	120	112	200	255	350	420	480	600	695	795	920	340	19.0	
700									○		125	120	113	235	295	405	490	550	700	810	930	1,070			
900										○	124	120	112	300	380	520	630	720	900	1,041	1,195	1,380	340	19.8	
1200										○	125	120	113	400	505	695	840	955	1,200	1,390	1,590	1,840			

*2) BBXP900 and BBXP1200 (with thread size Rc4) are made-to-order.

BBXP-PVDF Series

Spray capacity code ³	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)										Mean droplet diameter (μm)	Free passage diameter (mm)	Nozzle body color
	R1/8	R1/4	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	Black	
015	○	○	—	120	112	—	—	1.09	1.32	1.50	1.88	2.18	2.50	2.89	340	0.8	Gray	
020	○		110	120	113	—	1.06	1.46	1.75	2.00	2.51	2.91	3.34	3.86	340	1.2	Black	

*3) Nozzle body color differs depending on the spray capacity code: BBXP008 and BBXP020 are black (BLA), BBXP015 is gray (GRA).

BBXP-PVC [1/8M BBXP 030 PVC-IN]

Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (µm)	Free passage diameter (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		
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

To inquire about or order a specific nozzle please refer to this coding system.

BBXP (metal)

Example: 1/8M BBXP 015 S303

1/8M	BBXP	015	S303
Pipe conn. size ⁴		Spray capacity code	Material ⁵
1/8M		015	S303
1/4M		1200	S316

BBXP-PVDF

Example: 1/8M BBXP 020 PVDF (BLA)

1/8M	BBXP	020	PVDF	(BLA)
Pipe conn. size ⁴		Spray capacity code	Material	Nozzle color
1/8M		008		BLA (BBXP008, 020)
1/4M		015		GRA (BBXP015)
		020		

BBXP-PVC

1/8M BBXP 030 PVC-IN

Pipe conn. size ⁴	Spray capacity code	Material
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The BBXP series with thread size Rc4 are made-to-order.

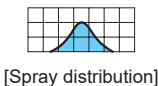
*4) "M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/8M = R1/8.

*5) See "Material" information on page 75 for standard material (S303 or S316) for each size.

Narrow-angle Full Cone Spray Nozzles

NJJP

Full Cone



- Narrow-angle full cone spray pattern with a round impact area and uniform distribution.
- Unique design produces fine atomization without a whirler.
- No-whirler design with a large free passage diameter minimizes clogging.

[STANDARD PRESSURE]
0.3 MPa

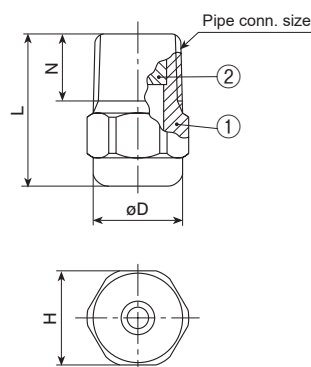
[APPLICATIONS]
Cleaning: Pipes, bottles, containers, filters
Cooling: Steel plates

Structure	<ul style="list-style-type: none"> • One-piece structure with a press-fitted orifice tip. • No obstructions in the nozzle interior.
Material	<ul style="list-style-type: none"> • S303 <p>SPECIAL ORDER MATERIAL: S316</p>

Pipe conn. size	Dimensions (mm)				Weight (g)
	L	H	øD	N	
R1/4	24	14	13.5	10.5	19.5
R3/8	32	19	18	11	48

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



① Nozzle body ② Orifice tip

Spray angle code	Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)						Mean droplet diameter (μm)	Free passage diameter (mm)
		R1/4	R3/8	0.15 MPa	0.3 MPa	0.7 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
30	06	○		26	30	32	4.80	5.26	6.00	7.42	8.54	9.91	750	2.3
	08	○		26	30	32	6.40	7.02	8.00	9.90	11.4	13.2	925	2.7
	14		○	26	30	32	11.2	12.3	14.0	17.3	19.9	23.1	970	3.8
	20		○	26	30	32	16.0	17.5	20.0	24.7	28.5	33.0	1,200	4.4
15	06	○		12	15	16	4.80	5.26	6.00	7.42	8.54	9.91	925	2.3
	08	○		12	15	16	6.40	7.02	8.00	9.90	11.4	13.2	970	2.7
	14		○	12	15	16	11.2	12.3	14.0	17.3	19.9	23.1	1,200	3.8
	20		○	12	15	16	16.0	17.5	20.0	24.7	28.5	33.0	1,200	4.4

[Note] Please use NJJP series nozzles with water pressures of 0.15 MPa or higher for a stable spray pattern.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

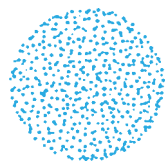
Example: 1/4M NJJP 30 06 S303

1/4M	NJJP	30	06	S303
Pipe conn. size*		Spray angle code	Spray capacity code	Material
1/4M		30	06	
3/8M		15	14	
			20	

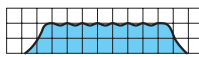
**"M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

Clog-resistant Vaneless Full Cone Spray Nozzles

AJP/AJP-PPS



[Spray pattern]



[Spray distribution]

- Full cone spray pattern with a round impact area and uniform distribution.
- Without using a whirler, the liquid is atomized by collision inflow inside the nozzle.
- No-whirler design with a large free passage diameter minimizes clogging.
- Nozzle sprays at a 90° angle to the nozzle inlet.
- Highly chemical and wear resistant AJP-PPS series is available for spraying hydrochloric acid and other chemicals.

[STANDARD PRESSURE] 0.2 MPa

[APPLICATIONS]

Cleaning: Pre-paint treatment, washing booths, machine parts, gas, incinerator fumes

Cooling: Steel plates, copper pieces, gas

Spraying: Aeration, foam breaking

Others: Applications where re-circulated water is being used or clogging is a concern

Full Cone

AJP SERIES

Structure	<ul style="list-style-type: none"> • Includes a nozzle body and orifice cap. • Orifice cap for sizes R1/8, R3/8, and R1/2 is pressed into the nozzle body. Orifice cap for the other sizes are screwed in. • No obstructions in the nozzle interior.
Material	<ul style="list-style-type: none"> • Nozzle body: S304, S303, or SCS13, depending on the spray capacity code. • Orifice cap: S303 <p>SPECIAL ORDER MATERIAL: S316</p>

Pipe conn. size	Dimensions (mm)						Weight (g)
	L1	L2	L3	L4	W	N	
R1/8	23	16	16	14	14	7	25
R1/4	32	23	20.5	16	16	10.5	55
R3/8	36	26	23.5	19	20	11	70
R1/2	46	33.5	31	25	25	14	180
R3/4	55	39	38	32	32	15	340
R1	70	50	48	40	40	18	670
R1 1/2	100	70	72	58.5	58.5	20	2,400

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

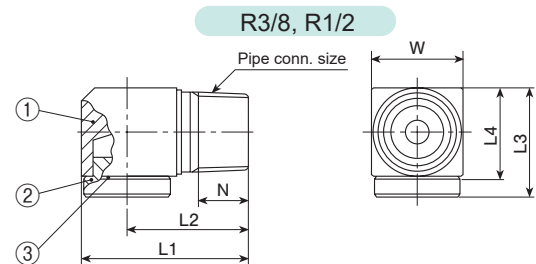
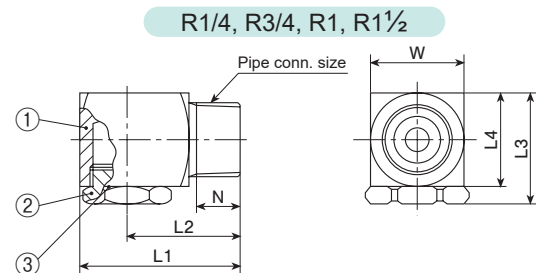
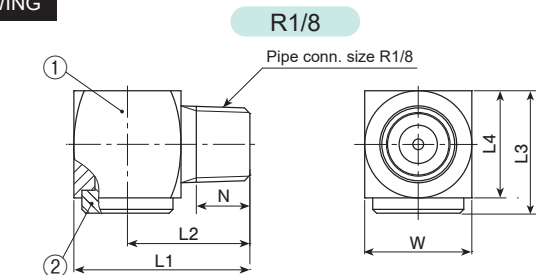


Cautions for use (sizes R1/8, R3/8, and R1/2)

In extreme temperatures, high or low, the AJP press-fitted orifice cap for sizes R1/8, R3/8 and R1/2 may come off.

- For these conditions, order the AJP nozzles in S316 with the screw-in orifice caps.
- Do not use AJP size R1/8 in these conditions, the screw-in orifice cap is not available for size R1/8.

DRAWING



① Nozzle body ② Orifice cap ③ Adhesive

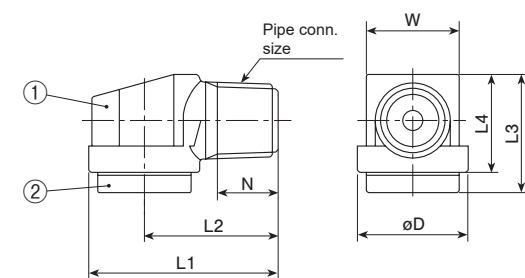
AJP-PPS SERIES

Structure	<ul style="list-style-type: none"> • Includes a nozzle body and orifice cap. • Orifice cap and nozzle body are ultrasonically welded together. • No obstructions in the nozzle interior.
Material	• PPS

Pipe conn. size	Dimensions (mm)							Weight (g)
	L1	L2	L3	L4	W	N	øD	
R1/4	32.5	23	20.5	17	16	19	10.5	6.8
R3/8	37	26	23	20	19	22	11	10.3

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



① Nozzle body ② Orifice cap

Clog-resistant Vaneless Full Cone Spray Nozzles

AJP/AJP-PPS SERIES

Full Cone

Spray capacity code	Pipe connection size									Spray angle (°)			Spray capacity (L/min)								Mean drop. dia. (µm)	Free pass. dia. (mm)
	AJP (metal)						AJP-PPS															
	R1/8	R1/4	R3/8	R1/2	R3/4	R1	R 1½	R1/4	R3/8	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			
02 03	○ ○									64 65	75 75	69 69	— —	1.02 1.53	1.43 2.14	1.74 2.61	2.00 3.00	2.35 3.53	2.89 4.33	640	1.5 1.9	
04 05		○ ○						○ ○		65 65	75 75	68 68	1.59 1.99	2.04 2.55	2.86 3.57	3.48 4.35	4.00 5.00	4.70 5.88	5.77 7.21	}	2.2 2.5	
06 07		○ ○						○ ○		70 70	80 80	73 73	2.39 2.79	3.06 3.57	4.29 5.00	5.22 6.09	6.00 7.00	7.06 8.23	8.66 10.1		2.8 3.1	
08 10			○ ○						○	70 70	80 80	73 73	3.19 3.98	4.08 5.10	5.71 7.14	6.96 8.70	8.00 10.0	9.54 11.9	11.9 14.9	740	3.1 3.5	
12 14			○ ○						○	75 75	85 85	78 78	4.78 5.57	6.12 7.14	8.57 10.0	10.4 12.2	12.0 14.0	14.3 16.7	17.9 20.9	}	4.0 4.4	
16			○						○	75	85	78	6.37	8.16	11.4	13.9	16.0	19.1	23.8		820	4.8
18 20				○ ○						76 76	85 85	79 79	7.17 7.96	9.18 10.2	12.9 14.3	15.7 17.4	18.0 20.0	21.6 23.9	27.1 30.1	}	5.0 5.4	
23				○						76	85	79	9.16	11.7	16.4	20.0	23.0	27.5	34.6		900	5.7
26 30				○ ○						76 76	85 85	79 79	10.4 11.9	13.3 15.3	18.6 21.4	22.6 26.1	26.0 30.0	31.1 35.9	39.1 45.1	}	6.0 6.4	
35 40				○ ○						83 83	90 90	85 85	13.9 15.9	17.9 20.4	25.0 28.6	30.4 34.8	35.0 40.0	41.9 47.9	52.6 60.1		7.1 7.7	
45 50				○ ○						83 83	90 90	85 85	17.9 19.9	23.0 25.5	32.1 35.7	39.1 43.5	45.0 50.0	53.9 59.9	67.6 75.1	}	8.5 9.0	
55 60					○ ○					83 83	90 90	85 85	21.9 23.9	28.1 30.6	39.3 42.9	47.8 52.2	55.0 60.0	65.9 71.8	82.6 90.2		1,000	9.0 9.4
70 80					○ ○					83 83	90 90	85 85	27.9 31.9	35.7 40.8	50.0 57.1	60.9 69.6	70.0 80.0	83.8 95.8	105 120	}	10.2 11.1	
90					○					83	90	85	35.8	45.9	64.3	78.3	90.0	108	135		11.4	
100 120						○ ○				83 83	90 90	85 85	39.8 47.8	51.0 61.2	71.4 85.7	87.0 104	100 120	120 144	150 180	}	12.2 13.0	
150						○				83	90	85	59.7	76.5	107	130	150	180	225		15.0	
180 200							○ ○			83 83	90 90	85 85	71.7 79.6	91.8 102	129 143	157 174	180 200	216 239	270 301	}	15.5 17.9	
250							○			83	90	85	99.5	128	179	217	250	299	376		1,350	19.8

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

AJP (metal)

Example: 1/4M AJP 04 S303

1/4M	AJP	04	S303
Pipe conn. size*1		Spray capacity code	Material of orifice cap*2
1/8M		02	
1/4M		04	
3/8M		06	
1/2M		08	
5/8M		10	
3/4M		12	
7/8M		14	
1M		16	
1 1/8M		18	
1 1/4M		20	
1 3/8M		22	
1 1/2M		24	
1 5/8M		26	
1 3/4M		28	
1 7/8M		30	
2M		32	
2 1/8M		34	
2 1/4M		36	
2 3/8M		38	
2 1/2M		40	
2 5/8M		42	
2 3/4M		44	
2 7/8M		46	
3M		48	
3 1/8M		50	
3 1/4M		52	
3 3/8M		54	
3 1/2M		56	
3 5/8M		58	
3 3/4M		60	
3 7/8M		62	
4M		64	
4 1/8M		66	
4 1/4M		68	
4 3/8M		70	
4 1/2M		72	
4 5/8M		74	
4 3/4M		76	
4 7/8M		78	
5M		80	
5 1/8M		82	
5 1/4M		84	
5 3/8M		86	
5 1/2M		88	
5 5/8M		90	
5 3/4M		92	
5 7/8M		94	
6M		96	
6 1/8M		98	
6 1/4M		100	
6 3/8M		102	
6 1/2M		104	
6 5/8M		106	
6 3/4M		108	
6 7/8M		110	
7M		112	
7 1/8M		114	
7 1/4M		116	
7 3/8M		118	
7 1/2M		120	
7 5/8M		122	
7 3/4M		124	
7 7/8M		126	
8M		128	
8 1/8M		130	
8 1/4M		132	
8 3/8M		134	
8 1/2M		136	
8 5/8M		138	
8 3/4M		140	
8 7/8M		142	
9M		144	
9 1/8M		146	
9 1/4M		148	
9 3/8M		150	
9 1/2M		152	
9 5/8M		154	
9 3/4M		156	
9 7/8M		158	
10M		160	
10 1/8M		162	
10 1/4M		164	
10 3/8M		166	
10 1/2M		168	
10 5/8M		170	
10 3/4M		172	
10 7/8M		174	
11M		176	
11 1/8M		178	
11 1/4M		180	
11 3/8M		182	
11 1/2M		184	
11 5/8M		186	
11 3/4M		188	
11 7/8M		190	
12M		192	
12 1/8M		194	
12 1/4M		196	
12 3/8M		198	
12 1/2M		200	
12 5/8M		202	
12 3/4M		204	
12 7/8M		206	
13M		208	
13 1/8M		210	
13 1/4M		212	
13 3/8M		214	
13 1/2M		216	
13 5/8M		218	
13 3/4M		220	
13 7/8M		222	
14M		224	
14 1/8M		226	
14 1/4M		228	
14 3/8M		230	
14 1/2M		232	
14 5/8M		234	
14 3/4M		236	
14 7/8M		238	
15M		240	
15 1/8M		242	
15 1/4M		244	
15 3/8M		246	
15 1/2M		248	
15 5/8M		250	
15 3/4M		252	
15 7/8M		254	
16M		256	
16 1/8M		258	
16 1/4M		260	
16 3/8M		262	
16 1/2M		264	
16 5/8M		266	
16 3/4M		268	
16 7/8M		270	
17M		272	
17 1/8M		274	
17 1/4M		276	
17 3/8M		278	
17 1/2M		280	
17 5/8M		282	
17 3/4M		284	
17 7/8M		286	
18M		288	
18 1/8M		290	
18 1/4M		292	
18 3/8M		294	
18 1/2M		296	
18 5/8M		298	
18 3/4M		300	
18 7/8M		302	
19M		304	
19 1/8M		306	
19 1/4M		308	
19 3/8M		310	
19 1/2M		312	
19 5/8M		314	
19 3/4M		316	
19 7/8M		318	
20M		320	
20 1/8M		322	
20 1/4M		324	
20 3/8M		326	
20 1/2M		328	
20 5/8M		330	
20 3/4M		332	
20 7/8M		334	
21M		336	
21 1/8M		338	
21 1/4M		340	
21 3/8M		342	
21 1/2M		344	
21 5/8M		346	
21 3/4M		348	
21 7/8M		350	
22M		352	
22 1/8M		354	
22 1/4M		356	
22 3/8M		358	
22 1/2M		360	
22 5/8M		362	
22 3/4M		364	
22 7/8M		366	
23M		368	
23 1/8M		370	
23 1/4M		372	
23 3/8M		374	
23 1/2M		376	
23 5/8M		378	
23 3/4M		380	
23 7/8M		382	
24M		384	
24 1/8M		386	
24 1/4M		388	
24 3/8M		390	
24 1/2M		392	
24 5/8M		394	
24 3/4M		396	
24 7/8M		398	
25M		400	
25 1/8M		402	
25 1/4M		404	
25 3/8M		406	
25 1/2M		408	
25 5/8M		410	
25 3/4M		412	
25 7/8M		414	
26M		416	
26 1/8M		418	
26 1/4M		420	
26 3/8M		422	
26 1/2M		424	
26 5/8M		426	
26 3/4M		428	
26 7/8M		430	
27M		432	
27 1/8M		434	
27 1/4M		436	
27 3/8M		438	
27 1/2M		440	
27 5/8M		442	
27 3/4M		444	
27 7/8M		446	
28M		448	
28 1/8M		450	
28 1/4M		452	
28 3/8M		454	
28 1/2M		456	
28 5/8M		458	
28 3/4M		460	
28 7/8M		462	
29M		464	
29 1/8M		466	
29 1/4M		468	
29 3/8M		470	
29 1/2M		472	
29 5/8M		474	
29 3/4M		476	
29 7/8M		478	
30M		480	
30 1/8M		482	
30 1/4M		484	
30 3/8M		486	
30 1/2M		488	
30 5/8M		490	
30 3/4M		492	
30 7/8M		494	
31M		496	
31 1/8M		498	
31 1/4M		500	
31 3/8M		502	
31 1/2M		504	
31 5/8M		506	
31 3/4M		508	
31 7/8M		510	
32M		512	
32 1/8M		514	
32 1/4M		516	
32 3/8M		518	
32 1/2M		520	
32 5/8M		522	
32 3/4M		524	
32 7/8M		526	
33M		528	
33 1/8M		530	
33 1/4M		532	
33 3/8M		534	
33 1/2M		536	
33 5/8M		538	
33 3/4M		540	
33 7/8M		542	
34M		544	
34 1/8M		546	
34 1/4M		548	
34 3/8M		550	
34 1/2M		552	
34 5/8M		554	
34 3/4M		556	
34 7/8M		558	
35M		560	
35 1/8M		562	
35 1/4M		564	
35 3/8M		566	
35 1/2M		568	
35 5/8M		570	
35 3/4M		572	
35 7/8M		574	
36M		576	
36 1/8M		578	
36 1/4M		580	
36 3/8M		582	
36 1/2M		584	
36 5/8M		586	
36 3/4M		588	
36 7/8M		590	
37M		592	
37 1/8M		594	
37 1/4M		596	
37 3/8M		598	
37 1/2M		600	
37 5/8M		602	
37 3/4M		604	
37 7/8M		606	
38M		608	
38 1/8M		610	
38 1/4M		612	
38 3/8M		614	
38 1/2M		616	
38 5/8M		618	
38 3/4M		620	
38 7/8M		622	
39M		624	
39 1/8M		626	
39 1/4M		628	
39 3/8M		630	
39 1/2M		632	
39 5/8M		634	
39 3/4M		636	
39 7/8M		638	
40M		640	
40 1/8M		642	
40 1/4M		644	
40 3/8M		646	
40 1/2M		648	
40 5/8M		650	
40 3/4M		652	
40 7/8M		654	
41M		656	
41 1/8M		658	
41 1/4M		660	
41 3/8M		662	
41 1/2M		664	
41 5/8M		666	
41 3/4M		668	
41 7/8M		670	
42M		672	
42 1/8M		674	
42 1/4M		676	
42 3/8M		678	
42 1/2M		680	
42 5/8M		682	
42 3/4M		684	
42 7/8M		686	
43M		688	
43 1/8M		690	
43 1/4M		692	
43 3/8M		694	
43 1/2M		696	
43 5/8M		698	
43 3/4M		700	
43 7/8M		702	
44M		704	
44 1/8M		706	
44 1/4M		708	
44 3/8M		710	
44 1/2M		712	
44 5/8M		714	
44 3/4M		716	
44 7/8M		718	
45M		720	
45 1/8M		722	
45 1/4M		724	
45 3/8M		726	
45 1/2M		728	
45 5/8M		730	
45 3/4M		732	
45 7/8M		734	
46M		736	
46 1/8M		738	
46 1/4M		740	
46 3/8M		742	
46 1/2M		744	
46 5/8M		746	
46 3/4M		748	
46 7/8M		750	
47M		752	
47 1/8M		754	
47 1/4M		756	
47 3/8M		758	
47 1/2M		760	
47 5/8M		762	
47 3/4M		764	
47 7/8M		766	
48M		768	
48 1/8M		770	
48 1/4M		772	
48 3/8M		774	
48 1/2M		776	
48 5/8M		778	
48 3/4M		780	
48 7/8M		782	
49M		784	
49 1/8M		786	
49 1/4M		788	
49 3/8M		790	

Clog-resistant Alumina Ceramic Full Cone Spray Nozzles

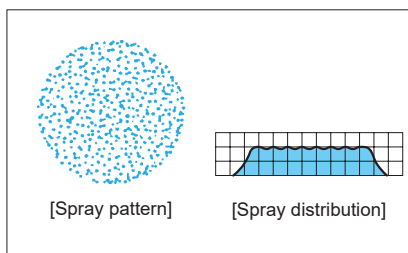
Made-to-Order

AJP-AL92

Clog-resistant full cone nozzle made of highly wear- and chemical-resistant alumina ceramic.



- Full cone spray pattern with a round impact area and uniform distribution.
- Without using a whirler, the liquid is atomized by collision inflow inside the nozzle.
- No-whirler design with a large free passage diameter minimizes clogging.
- Nozzle sprays at a 90° angle to the nozzle inlet. This right angle nozzle is suitable for installation in small spaces.



[STANDARD PRESSURE]

0.2 MPa

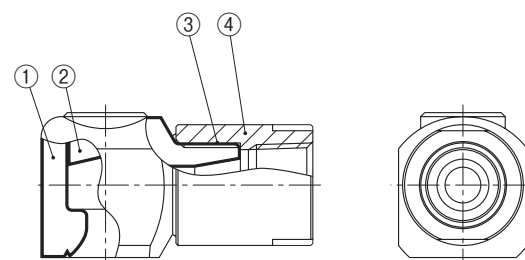
[APPLICATIONS]

- Spraying slurry
- Absorption tower of flue gas desulfurization equipment
- Spraying water in cooling tower
- Applications where re-circulated water is being used or clogging is a concern

Structure	<ul style="list-style-type: none"> • Alumina ceramic one-piece structure. • No obstructions in the nozzle interior.
Material	<ul style="list-style-type: none"> • Nozzle body: 92% Alumina • Socket: S316

The AJP-AL92 series is available with a socket made of S316 to prevent damage to the delicate alumina threads. The S316 socket is female threaded turning the male nozzle thread into a female connection.

DRAWING



①Nozzle body ②Plate ③Adhesive: Araldite®H ④Socket (S316)

Nozzle thread size	Spray angle (°) at 0.2 MPa	Spray capacity (L/min) at 0.2 MPa	Mean droplet diameter (μm)	Free passage diameter (mm)
R1/2	85 or 90	18.0–50.0	800–1,400	5.1–9.5
R3/4	90	55.0–90.0		9.6–12.9
R1	90	100–150		13.3–16.1
R1½	90	180–250		17.2–21.3

HOW TO ORDER

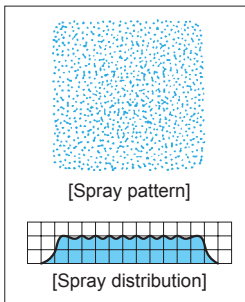
IKEUCHI will help select the best model for the specific applications and requirements of each customer. Contact us for more details.

Square Spray Nozzles

Some Models are Made-to-Order

SSXP
SSXP-HTPVC

Full Cone



- Square full cone spray pattern with uniform distribution.
- Wide spray angle of 90–100° provides large spray coverage.
- Square full cone spray pattern leaves no gaps in multi-nozzle arrangements.
- X-shaped whirler provides a large free passage diameter, minimizing clogging.

[STANDARD PRESSURE]

SSXP (metal): 0.2 MPa

SSXP-HTPVC: 0.15 MPa

[APPLICATIONS]

Cleaning: Gas, incinerator fumes, machinery, eliminators, screen, tanks, crushed stone, earth and sand

Cooling: Gas, machinery, tanks, steel

Spraying: Waste water treatment, foam breaking, fire extinguishing, dust suppression

SSXP SERIES

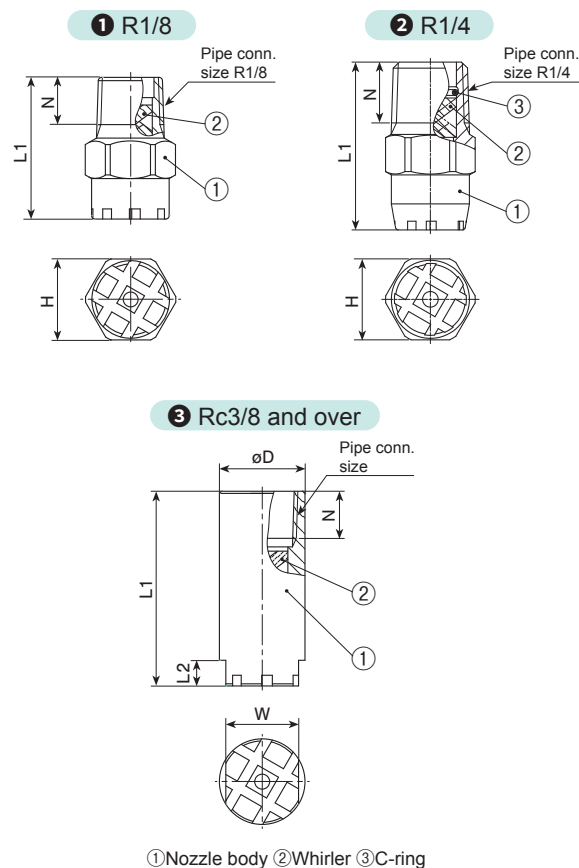
(Sizes Rc1 1/2 or larger: Made-to-Order)

Structure	<ul style="list-style-type: none"> • One-piece structure with a press-fitted X-shaped whirler. Size R1/4 standard models include a C-ring. 							
Material	<ul style="list-style-type: none"> • Sizes R1/8–Rc1: S303 • Sizes Rc1 1/2 or larger: S316 (SCS14) <p>SPECIAL ORDER MATERIAL: S316L (SCS16)</p>							

DWG No.	Pipe conn. size	Dimensions (mm)						Weight (g)
		L1	L2	H	W	øD	N	
①	R1/8	21	—	12	—	—	7	11.5
②	R1/4	29	—	14	—	—	10.5	20
③	Rc3/8	45.5	6	—	17	20	11	70
	Rc1/2	56	8	—	22	25	14	150
	Rc3/4	73	10	—	27	32	15	300
	Rc1	94	14	—	34	40	17	575
	Rc1 1/2	131	20	—	50	58	19	1,690
	Rc2	168	24	—	60	70	23	2,910
	Rc2 1/2	199	27	—	80	90	27	5,860
	Rc3	220	30	—	90	105	30	9,420

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



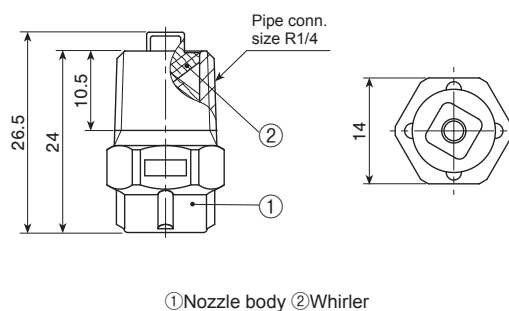
SSXP-HTPVC

Structure	• One-piece structure with an X-shaped whirler.
Material	• HTPVC
Weight	• 3.1 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



■ SSXP Series (metal)

Spray capacity code	Pipe conn. size		Spray angle (°)			Spray capacity (L/min)									Mean droplet diameter (µm)	Free passage diameter (mm)
	R1/8	R1/4	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		
020	○		86	90	81	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34	3.86	330	0.9
030	○		86	90	81	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00	5.79	380	1.2
040		○	90	95	85	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67	7.72	360	1.3
050		○	91	95	86	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34	9.64	?	1.7
060		○	91	95	86	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	11.6	490	1.7

Spray capacity code	Pipe connection size*1									Spray angle (°)			Spray capacity (L/min)									Mean drop. dia. (µm)	Free pass. dia. (mm)
	Rc 3/8	Rc 1/2	Rc 3/4	Rc 1	Rc 1 1/2	Rc 2	Rc 2 1/2	Rc 3		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		
070	○									94	100	89	2.93	3.71	5.09	6.14	7.00	8.26	10.2	11.7	13.5	440	2.0
080	○									95	100	90	3.35	4.24	5.82	7.01	8.00	9.44	11.6	13.3	15.4	?	2.0
10	○									96	100	91	4.19	5.29	7.28	8.77	10.0	11.8	14.5	16.7	19.3	?	2.6
12	○									97	100	92	5.03	6.35	8.73	10.5	12.0	14.2	17.4	20.0	23.1	630	2.6
16		○								95	100	90	6.70	8.47	11.6	14.0	16.0	18.9	23.3	26.7	30.9	?	2.8
20		○								96	100	91	8.36	10.6	14.6	17.5	20.0	23.6	29.1	33.4	38.6	710	3.5
30			○							96	100	91	12.6	15.9	21.8	26.3	30.0	35.4	43.6	50.0	57.9	?	3.8
40			○							97	100	92	16.8	21.2	29.1	35.1	40.0	47.2	58.1	66.7	77.2	?	4.8
50				○						95	100	90	20.9	26.5	36.4	43.8	50.0	59.0	72.7	83.4	96.4	750	5.4
60				○						96	100	91	25.1	31.8	43.7	52.6	60.0	70.8	87.2	100	115	?	5.4
80				○						97	100	92	33.5	42.4	58.2	70.1	80.0	94.4	115	135	155	1,000	6.0
100					○					96	100	91	41.9	52.9	72.8	87.7	100	120	145	170	195	?	7.1
150					○					97	100	92	62.8	79.4	110	130	150	180	220	250	290	?	10.2
300						○				97	100	92	125	160	220	265	300	355	435	500	580	1,350	12.7
500							○			97	100	92	210	265	365	440	500	590	730	835	965	1,500	16.8
700								○		97	100	92	290	370	510	615	700	826	1,020	1,170	1,350	1,700	19.6

*1) The SSXP series with thread size Rc1 1/2 and larger are made-to-order.

■ SSXP-HTPVC [1/4M SSXP 1.5*65/4.5 HTPVC]

Spray angle (°)			Spray capacity (L/min)								Mean droplet diameter (µm)	Free passage diameter (mm)
0.05 MPa	0.15 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		
56	65	65	2.72	3.74	4.50	5.14	6.06	7.46	8.56	9.90	450	2.2

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

SSXP (metal)

Example: 1/8M SSXP 020 S303

1/8M	SSXP	020	S303
Pipe conn. size ²		Spray capacity code	Material ³
1/8M		020	S303
?		?	S316
3F		700	

SSXP-HTPVC

1/4M SSXP 1.5*65/4.5 HTPVC

Pipe conn. size ²	Spray angle & capacity code	Material
------------------------------	-----------------------------	----------

The SSXP series with thread size Rc1 1/2 and larger are made-to-order.

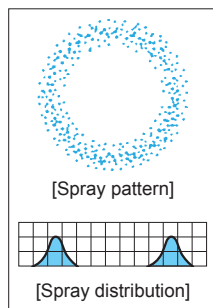
*2) "M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/8M = R1/8.

*3) See "Material" information on page 81 for standard material (S303 or S316) for each size.

SPILLBACK Nozzles for Gas Cooling

SPB

Single-head Return-flow Nozzles SPB-R SERIES



[STANDARD PRESSURE]

Supply pressure: 2.0 MPa (with return flow valve totally closed)

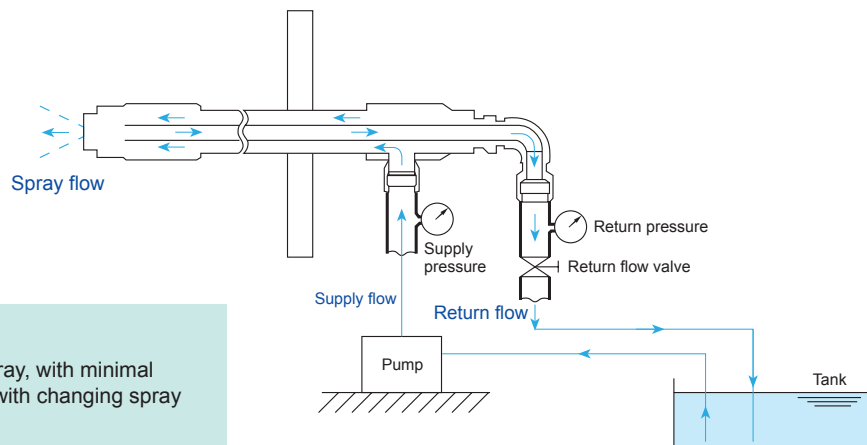
[APPLICATIONS]

Cooling: Incinerators, cement factories, glass factories, blast furnaces, iron works
Moisture control: Blast furnaces

Multi-tip head return-flow nozzles are also available.
Please contact us for further information.

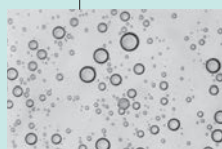
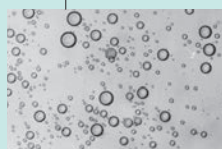
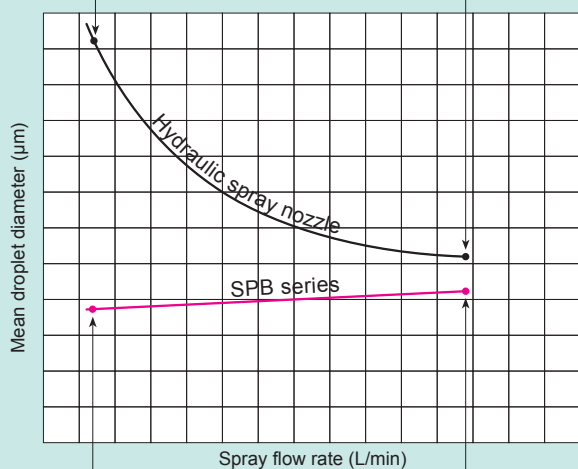
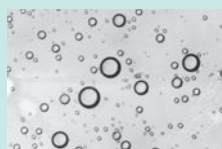
- Variable capacity hollow cone spray nozzles, generate fine atomization with uniform spray distribution (single-head).
- Spray capacity can be controlled by simply adjusting the return pressure while the supply pressure is kept constant. Spray capacity is maximized by fully closing the return flow valve and minimized by fully opening the return flow valve. The turn-down ratio of the spray capacity is 1:10 (except for SPB8530R).
- Part of the supplied liquid flows back when the return flow valve is opened, causing the supply flow to increase. The increase of supply flow is within 40–50% of the maximum spray capacity.
- Minimal variation in spray droplet diameter, regardless of the spray flow rate, makes the SPILLBACK nozzles ideal for gas cooling where the temperature of the inlet gas varies.
- Multi-tip head SPILLBACK nozzles are suitable for applications requiring a large spray capacity and minimal increase in spray droplet diameter.

System diagram (example)



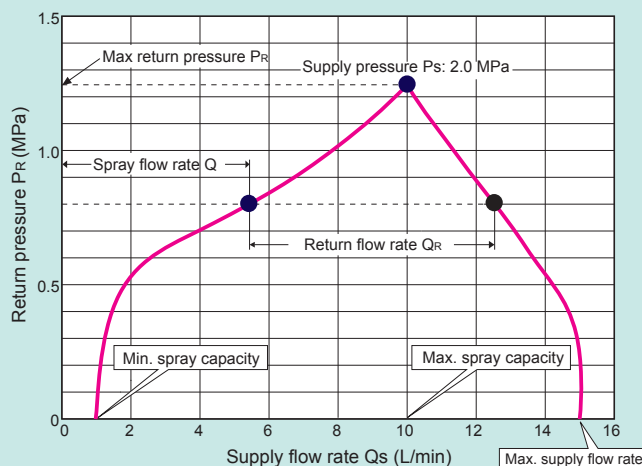
Fine Atomization

SPB series produces a fully vaporized spray, with minimal variation in spray droplet diameter, even with changing spray flow rate.



Turn-down Ratio of 1:10

The spray capacity is maximized by fully closing the return flow valve and minimized by fully opening the return flow valve. (Min. spray capacity: Max. spray capacity = 1:10, except for SPB8530R)



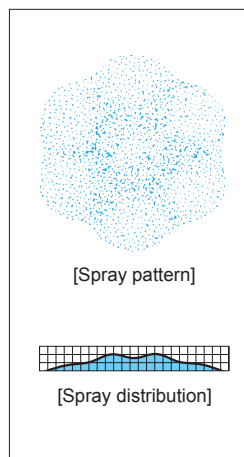
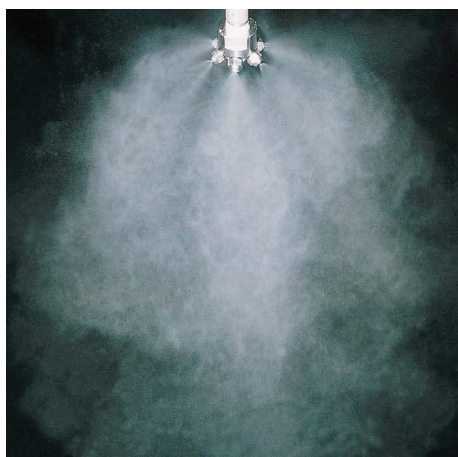
Supply flow rate Q_s = Spray flow rate Q (Spray capacity) + Return flow rate Q_R

Seven-head Full Cone Spray Nozzles

Extremely Fine Atomization

7KB

Full Cone



- Full cone spray nozzle with an almost round-shaped spray area.
- Produces fine atomization.
- Seven (7) KB hollow cone spray nozzles are installed on a very compact adaptor header.
- KB series nozzles with ceramic whirl chambers and orifices provide excellent wear-resistance.

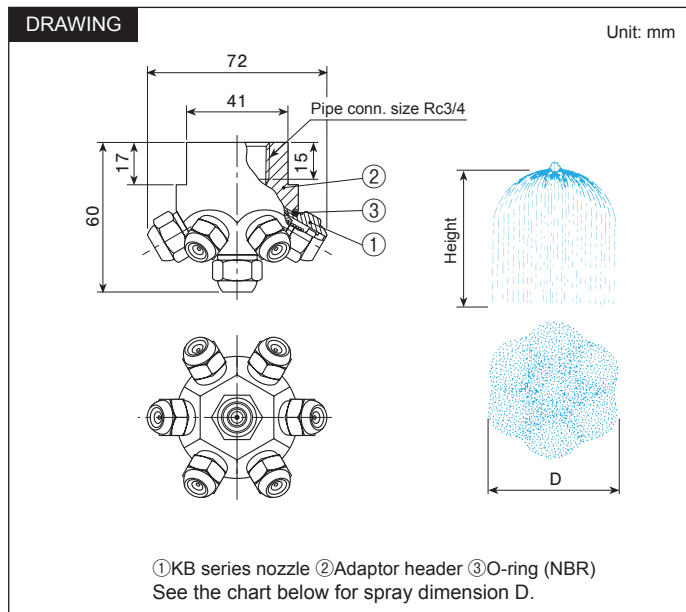
[STANDARD PRESSURE]
0.7 MPa

[APPLICATIONS]

- Gas cooling • Cleaning
- Moisture control • Humidification
- Dust suppression

Structure	<ul style="list-style-type: none"> • Seven (7) KB series hollow cone spray nozzles, with a 60° spray angle, are screwed into an adaptor header. • Nozzle orifice and closer are made of ceramic. • Each KB series nozzle has a built-in strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice & closer: ceramic • Metal parts: S303 <p>SPECIAL ORDER MATERIAL: S316</p>
Weight	• 370 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.



Spray capacity code	Spray angle (°)			Spray dimension D (m) at each spray height (at 0.7 MPa)				Spray capacity (L/min)									Mean drop. dia. (µm)	Free pass. dia. (mm)	Strainer mesh size
	0.3 MPa	0.7 MPa	1 MPa	0.5 m	1.0 m	1.5 m	2.0 m	0.3 MPa	0.4 MPa	0.5 MPa	0.6 MPa	0.7 MPa	1 MPa	1.2 MPa	1.5 MPa	2 MPa			
023	—	180	180	0.51	0.65	0.66	—	—	0.18	0.20	0.22	0.23	0.28	0.31	0.34	0.39	45	0.15	200
054	—	180	180	0.56	0.75	0.80	0.80	—	0.41	0.45	0.50	0.54	0.64	0.70	0.79	0.91	50	0.15	200
124	—	180	180	0.61	0.82	0.88	0.88	—	0.93	1.05	1.15	1.24	1.48	1.62	1.81	2.09	75	0.30	150
544	173	180	180	0.80	1.14	1.32	1.40	3.56	4.11	4.60	5.04	5.44	6.50	7.12	7.96	9.19	∅	0.50	100
1087	174	180	180	0.99	1.37	1.60	1.70	7.12	8.22	9.19	10.1	10.9	13.0	14.2	15.9	18.4	210	0.60	100

[Note] 7KB series nozzles are guaranteed only for the spray capacity at standard pressure.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 3/4F 7KB 023 S303

3/4F 7KB 023 S303

Pipe conn. size* Spray capacity code Material

023
∅
1087

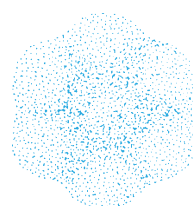
*"F" indicates female thread ("Rc" of the ISO standard), e.g. 3/4F = Rc3/4.

Seven-head Full Cone Spray Nozzles

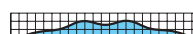
Made-to-Order

7JJXP

Full Cone



[Spray pattern]



[Spray distribution]

- Full cone spray nozzle with an almost round-shaped spray area.
- Seven (7) JJXP full cone spray nozzles are installed on a very compact adaptor header.
- Mean spray droplet diameter is about half the size of other single-head full cone spray nozzles with the same spray capacity.
- X-shaped whirler provides a large free passage diameter, minimizing clogging.

[STANDARD PRESSURE]

0.2 MPa

[APPLICATIONS]

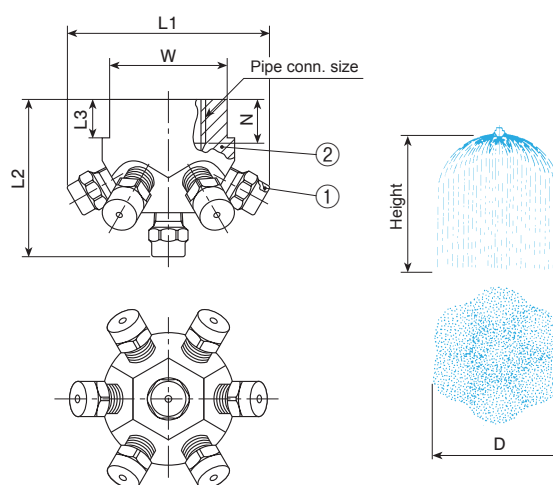
- Gas cooling • Cleaning • Moisture control
- Dust suppression

Structure	<ul style="list-style-type: none"> • Seven (7) JJXP series full cone spray nozzles are screwed into an adaptor header. • JJXP series full cone spray nozzles have a one-piece structure with a press-fitted X-shaped whirler.
Material	<ul style="list-style-type: none"> • S303 <p>SPECIAL ORDER MATERIAL: S316</p>

Pipe conn. size ^{*1}	Dimensions (mm)					Weight (g)
	L1	L2	L3	W	N	
Rc3/4	71	55	13	40	15	380
Rc1 (280)	89	67.5	17	46	17	620
Rc1 (490, 840)	103	75	20	55	17	1,080
Rc1½	128	92.5	20	70	19	1,860
Rc2	166	121.5	27	85	23	3,650

*1) Figures in () after the pipe connection size indicate the spray capacity code.

DRAWING



①JJXP series nozzle ②Adaptor header

See the chart below for spray dimension D.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray capacity code	Pipe conn. size				Spray angle (°)			Spray dimension D (m) at each spray height (at 0.2 MPa)							Spray capacity (L/min)										Mean drop. dia. (μm)	Free pass. dia. (mm)
	Rc 3/4	Rc 1	Rc 1½	Rc 2	0.05 MPa	0.2 MPa	0.5 MPa	1 m	1.5 m	2 m	2.5 m	3 m	3.5 m	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa			
70 140	○ ○				— —	175 185	165 175	1.9 2.7	2.4 3.3	2.8 3.8	3.0 4.2	3.1 4.5	3.1 4.7	— —	5.11 10.2	6.16 12.3	7.00 14.0	8.26 16.5	10.2 20.4	11.7 23.4	13.5 27.0	15.9 31.9	17.9 35.8	290 ?	0.7 1.4	
280		○			180	185	175	3.4	3.9	4.4	4.8	5.2	5.4	14.8	20.4	24.6	28.0	33.0	40.7	46.7	54.0	63.7	71.7	380	1.7	
490		○			180	185	180	4.3	4.8	5.4	5.8	6.2	6.4	26.0	35.6	43.0	49.0	57.8	71.4	81.9	94.5	112	125	480	1.9	
840		○			200	205	200	5.2	5.8	6.3	6.8	7.2	7.5	44.5	61.1	73.5	84.0	99.4	122	140	162	191	215	660	2.6	
1120			○		190	195	180	5.6	6.3	6.9	7.4	7.8	8.1	59.3	81.2	98.0	112	132	163	187	216	255	287	?	3.5	
1400			○		200	205	190	6.0	6.7	7.3	7.8	8.3	8.6	74.2	102	123	140	165	204	234	270	319	358	740	3.5	
1820				○	195	200	185	6.2	6.9	7.5	8.0	8.5	8.8	96.6	132	160	182	215	265	304	351	414	466	?	4.7	
2450				○	205	210	195	6.4	7.1	7.7	8.2	8.7	9.0	130	179	215	245	289	356	409	473	558	627	?	4.7	
3150				○	210	215	200	6.6	7.3	7.9	8.4	8.9	9.2	167	229	277	315	372	458	525	608	717	806	950	4.7	

[Note] 7JJXP series nozzles are guaranteed only for the spray capacity at standard pressure.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 3/4F 7JJXP 70 S303


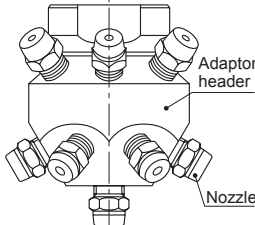
3/4F	7JJXP	70	S303
Pipe conn. size ^{*2}		Spray capacity code	Material
3/4F		70	
2F		3150	

*2) "F" indicates female thread ("Rc" of the ISO standard), e.g. 3/4F = Rc3/4.

This nozzle series is made-to-order.

13JJXP SERIES **Made-to-Order**

13-head Full Cone Spray Nozzles

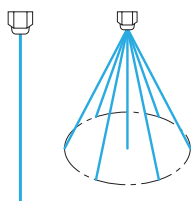
Series	Picture	Structure	Features	Applications
13JJXP			<ul style="list-style-type: none"> Full cone spray nozzle with an almost round-shaped spray area. Thirteen (13) JJXP series full cone spray nozzles are screwed into a very compact adaptor header. <p>This nozzle series is made-to-order.</p>	<ul style="list-style-type: none"> Gas cooling Moisture control

Full Cone

Multi-orifice Semi-fine Fog Nozzles for Fire Extinguishing

Made-to-Order
TSP

Series	Picture		Structure	
TSP				 [Spray pattern]
				 [Spray distribution]
			Unit: mm	[STANDARD PRESSURE] 5.0 MPa
	Features			Applications
<ul style="list-style-type: none">• Produces a hollow cone spray pattern from the tip of the nozzle and flat spray patterns from the side slits of the nozzle, resulting in a nearly round impact area at a spray height of 2–3 m.• With an ultra-wide spray angle produced from multiple nozzle orifices, a single TSP nozzle provides a large spray width coverage from 2.8 m up to 4 m.• Produces semi-fine atomization with a mean droplet diameter of 100–200 μm.• Compact design.			<ul style="list-style-type: none">• Fire extinguishing, dust suppression, spraying• Tank cleaning	
<div>This nozzle series is made-to-order.</div>				



Product Lineup

Solid Stream Spray Nozzles and others

Solid Stream Spray Nozzles	pp.88–
<ul style="list-style-type: none"> ● Standard Solid Stream Nozzles: CCP / CP ● Convex Round Inlet Solid Stream Nozzles: CCRP / CRP ● Paper Trimming Nozzles: CM-FB / 2CM-FB, CMP-T / CTM / CM 	
Multi-orifice Solid Stream Spray Nozzles	pp.96–
<ul style="list-style-type: none"> ● Multi-orifice Solid Stream Nozzles: 2CCP•7CCP / 2CP•7CP 	
Special Spray Nozzles	pp.98–
<ul style="list-style-type: none"> ● Self-cleaning Solid Stream Nozzles: MOMOJet "C" ● Pipe Cleaning Nozzles: RSP ● High-pressure Rotating Pipe Cleaning Nozzles: RSP-R ● Solid Stream Nozzles with ON/OFF Control: SO-CC / SO-CM ● Universal-jointed Solid Stream Nozzles: UT + CP ● Surface Washing Nozzles ● Ejector Nozzles: EJX ● Slit Laminar Nozzles: SLNH-H / SLNHA-H 	
Accessories	pp.108–
<ul style="list-style-type: none"> ● Universal ball joints: UT, WUT 	

Standard Solid Stream Jet

Some Models are Made-to-Order

CCP/CP



[Spray pattern]

[Spray distribution]

- Highest impact solid stream nozzle. Interior design featuring minimal pressure drop generates much larger flow of solid stream jet as compared with other solid stream nozzles having the same orifice diameters.

[STANDARD PRESSURE]

3.0 MPa

[APPLICATIONS]

High pressure cleaning:
Wire and felt parts of paper making machines, vehicles, returnable containers, machinery, parts
Trimming: Paper making

Solid Stream

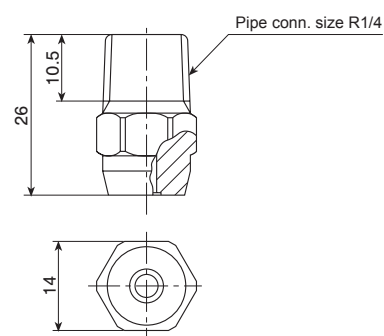
CCP SERIES (all metal)

Structure	<ul style="list-style-type: none"> • Metal one-piece structure.
Material	<ul style="list-style-type: none"> • S303 <p>[Note] Use CCP series nozzles for pressures below 3.5 MPa.</p> <p>SPECIAL ORDER MATERIAL: S316</p>
Weight	<ul style="list-style-type: none"> • 20 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



CP SERIES (with ceramic orifice)

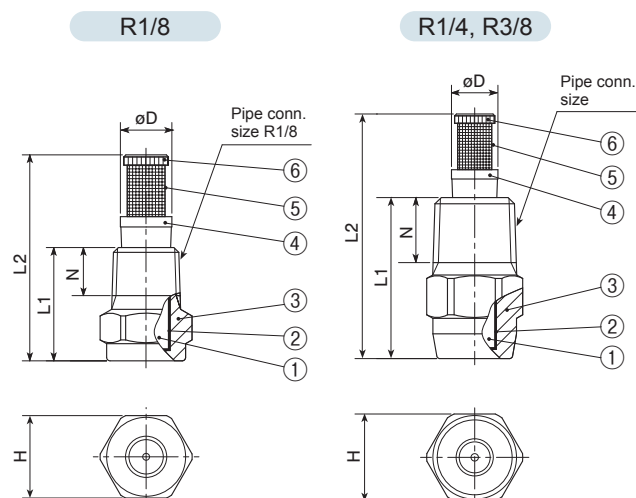
CP $\phi 0.1$ to $\phi 0.8$ (page 90): made-to-order

Structure	<ul style="list-style-type: none"> • One-piece structure with a ceramic orifice insert. High-purity ceramic is used for the orifice of R1/8 and R1/4 models with spray capacity codes 25–210 and the small orifice diameter CP series with code 0.5–0.8. • Small spray capacity models come with or without a strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303 <p>SPECIAL ORDER MATERIAL: S316</p>

Pipe conn. size	Dimensions (mm)					Weight (g)*1
	L1	L2	H	ϕD	N	
R1/8	16.5	30	12	7.5	7	7.1
R1/4	26	39.5	14	7.5	10.5	19.5
R3/8	30	—	19	—	11	38

*1) With strainer, add 2 g for R1/8 and 5 g for R1/4 to the above weight.

DRAWING



[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Standard Solid Stream Jet

CCP/CP SERIES

Solid Stream

Spray capacity code	Pipe connection size				Spray capacity (L/min)													Free pass. dia. (mm)	Strainer mesh size
	CCP	CP			0.1 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	3 MPa	4 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa		
	R1/4	R1/8	R1/4	R3/8															
25		●	●		0.45	0.78	1.01	1.19	1.43	2.02	2.47	2.85	3.19	3.64	4.03	4.51	5.52	0.8	50
31		●	●		0.56	0.98	1.26	1.49	1.78	2.52	3.09	3.57	3.99	4.55	5.05	5.64	6.91	0.9	50
37		○	○		0.68	1.17	1.51	1.79	2.14	3.03	3.71	4.28	4.79	5.46	6.06	6.77	8.30	1.0	—
43		○	○		0.79	1.37	1.77	2.09	2.50	3.54	4.33	5.00	5.59	6.37	7.06	7.91	9.67	1.1	—
49		○	○		0.90	1.56	2.02	2.39	2.86	4.04	4.94	5.71	6.38	7.28	8.07	9.04	11.1	1.2	—
56		○	○		1.02	1.76	2.27	2.69	3.22	4.54	5.56	6.42	7.18	8.19	9.08	10.2	12.4	1.2	—
62		○	○		1.13	1.95	2.52	2.99	3.57	5.05	6.18	7.14	7.98	9.10	10.1	11.3	13.8	1.3	—
68		○	○		1.24	2.15	2.78	3.28	3.93	5.55	6.80	7.85	8.79	10.0	11.1	12.4	15.2	1.4	—
74		○	○		1.35	2.35	3.03	3.58	4.29	6.06	7.42	8.56	9.58	10.9	12.1	13.6	16.6	1.4	—
80		○	○		1.47	2.54	3.28	3.88	4.65	6.56	8.04	9.28	10.4	11.8	13.1	14.7	18.0	1.5	—
87		○	○		1.58	2.74	3.54	4.18	5.00	7.07	8.66	10.0	11.2	12.8	14.1	15.8	19.4	1.6	—
93		○	○		1.69	2.93	3.79	4.48	5.36	7.58	9.28	10.7	12.0	13.7	15.2	17.0	20.8	1.6	—
99		○	○		1.81	3.13	4.04	4.78	5.72	8.08	9.89	11.4	12.8	14.6	16.2	18.1	22.1	1.7	—
111		○	○		2.03	3.51	4.53	5.36	6.43	9.09	11.1	12.9	14.4	16.4	18.2	20.3	24.9	1.8	—
124		○	○		2.26	3.92	5.06	5.99	7.15	10.1	12.4	14.3	16.0	18.2	20.2	22.6	27.7	1.9	—
136	○	○	○		2.48	4.30	5.55	6.57	7.85	11.1	13.6	15.7	17.6	20.0	22.2	24.8	30.4	2.0	—
148		○	○		2.70	4.68	6.04	7.15	8.57	12.1	14.8	17.1	19.2	21.8	24.2	27.1	33.2	2.0	—
161		○	○		2.94	5.09	6.57	7.78	9.28	13.1	16.1	18.6	20.8	23.7	26.2	29.3	35.9	2.1	—
173		○	○		3.16	5.47	7.06	8.36	9.99	14.1	17.3	20.0	22.4	25.5	28.3	31.6	38.7	2.2	—
186		○	○		3.40	5.88	7.59	8.98	10.1	15.2	18.6	21.4	24.0	27.3	30.3	33.9	41.5	2.3	—
198		○	○		3.61	6.26	8.08	9.56	11.4	16.2	19.8	22.8	25.5	29.1	32.3	36.1	44.2	2.4	—
210		○	○		3.83	6.64	8.57	10.1	12.1	17.2	21.0	24.3	27.1	30.9	34.3	38.4	47.0	2.4	—
223	○		○		4.07	7.05	9.10	10.8	12.9	18.2	22.3	25.7	28.7	32.8	36.3	40.6	49.8	2.5	—
247			○		4.51	7.81	10.1	11.9	14.3	20.2	24.7	28.6	31.9	36.4	40.4	45.2	55.3	2.6	—
272			○		4.97	8.60	11.1	13.1	15.7	22.2	27.2	31.4	35.1	40.0	44.4	49.7	60.8	2.7	—
297			○		5.42	9.39	12.1	14.3	17.1	24.2	29.7	34.3	38.3	43.7	48.5	54.2	66.4	2.9	—
322	○		○		5.88	10.2	13.1	15.6	18.6	26.3	32.2	37.1	41.5	47.3	52.5	58.7	71.9	3.0	—
346			○		6.32	10.9	14.1	16.7	20.0	28.3	34.6	40.0	44.7	51.0	56.5	63.2	77.4	3.1	—
371			○		6.77	11.7	15.1	17.9	21.4	30.3	37.1	42.8	47.9	54.6	60.6	67.7	82.9	3.2	—
396			○		7.23	12.5	16.2	19.1	22.8	32.3	39.6	45.7	51.1	58.2	64.6	72.2	88.5	3.3	—
420			○		7.67	13.3	17.1	20.3	24.3	34.3	42.0	48.5	54.3	61.9	68.7	76.8	94.0	3.4	—
445	○		○		8.12	14.1	18.2	21.5	25.7	36.3	44.5	51.4	57.5	65.5	72.7	81.3	99.5	3.5	—
470			○		8.58	14.9	19.2	22.7	27.1	38.4	47.0	54.3	60.7	69.2	76.7	85.8	105	3.6	—
495			○		9.04	15.7	20.2	23.9	28.6	40.4	49.5	57.1	63.8	72.8	80.8	90.3	111	3.7	—
519			○		9.48	16.4	21.2	25.1	30.0	42.4	51.9	60.0	67.0	76.4	84.8	94.8	116	3.8	—
544			○		9.93	17.2	22.2	26.3	31.4	44.4	54.4	62.8	70.2	80.1	88.8	99.3	122	3.9	—
569	○			○	10.4	18.0	23.2	27.5	32.8	46.4	56.9	65.7	73.4	83.7	92.9	104	127	4.0	—
594				○	10.8	18.8	24.2	28.7	34.3	48.5	59.4	68.5	76.6	87.4	96.9	108	133	4.1	—
717	○			○	13.1	22.7	29.3	34.6	41.4	58.6	71.7	82.8	92.6	106	117	131	160	4.5	—
767				○	14.0	24.3	31.3	37.0	44.3	62.6	76.7	88.5	99.0	113	125	140	171	4.6	—
890	○			○	16.2	28.1	36.3	43.0	51.4	72.7	89.0	103	115	131	145	163	199	5.0	—
1040	○			○	19.0	32.9	42.5	50.2	60.0	84.8	104	120	134	153	170	190	232	5.4	—

●: Available with or without strainer ○: Only available without strainer

CP Series with Small Orifice Diameter **Made-to-Order**

Small orifice diameter CP Series

Orifice diameter code	Pipe connection size		Spray capacity (L/min)												Strainer mesh size
	R1/8	R1/4	1 MPa	2 MPa	2.5 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa	
ø0.1	●	●	0.020	0.028	0.031	0.034	0.037	0.039	0.042	0.044	0.050	0.056	0.062	0.076	200
ø0.15	●	●	0.044	0.063	0.070	0.077	0.083	0.089	0.094	0.099	0.113	0.126	0.141	0.172	200
ø0.2	●	●	0.08	0.11	0.13	0.14	0.15	0.16	0.17	0.18	0.20	0.22	0.25	0.31	200
ø0.25	●	●	0.12	0.18	0.20	0.22	0.23	0.25	0.26	0.28	0.32	0.35	0.39	0.48	200
ø0.3	●	●	0.18	0.25	0.28	0.31	0.33	0.36	0.38	0.40	0.46	0.51	0.56	0.69	150
ø0.4	●	●	0.32	0.45	0.50	0.55	0.59	0.63	0.67	0.71	0.81	0.90	1.00	1.23	150
ø0.5	●	●	0.50	0.70	0.79	0.86	0.93	0.99	1.05	1.11	1.27	1.40	1.57	1.92	100
ø0.6	●	●	0.72	1.01	1.13	1.24	1.34	1.43	1.52	1.60	1.83	2.02	2.26	2.77	100
ø0.7	●	●	0.97	1.37	1.53	1.68	1.81	1.94	2.06	2.17	2.47	2.74	3.07	3.76	50
ø0.8	●	●	1.27	1.80	2.01	2.20	2.38	2.54	2.69	2.84	3.24	3.59	4.02	4.92	50

●: Available with or without strainer

[Note] The above nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

Solid Stream

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

CP/CCP Series with spray capacity code

Example: 1/8M CP 25 AL99-S303 W

1/8M	CP	25	AL99-S303	W
Pipe conn. size ²	Series	Spray capacity code	Material ³	Strainer
1/8M	CCP	25	S303	W (with strainer)
1/4M	CP	∅	AL99-S303	(Blank indicates "without strainer")
3/8M		1040		

Small orifice diameter CP Series

Example: 1/8M CP ø0.1 S303 W

1/8M	CP	ø0.1	S303	W
Pipe conn. size ²		Orifice diameter code	Material ³	Strainer
1/8M		ø0.1	S303	W (with strainer)
1/4M		∅	AL99-S303	(Blank indicates "without strainer")
		ø0.8		

*2) "M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

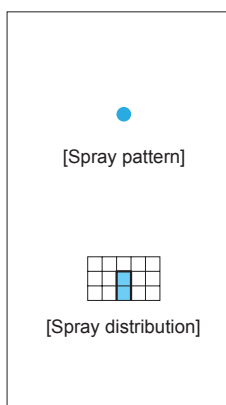
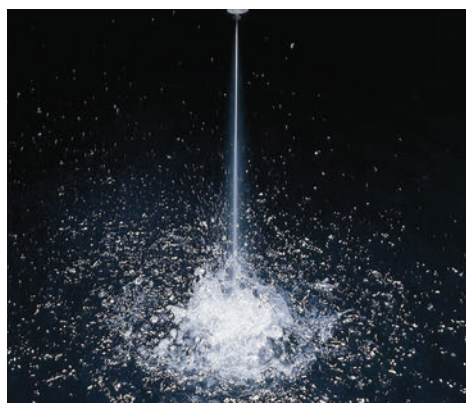
*3) Material code "AL99-S303" is for the CP series with spray capacity code 25–210 or orifice diameter code ø0.5–ø0.8.

The small orifice diameter CP series is made-to-order.

Convex Round Inlet Solid Stream Jet

CCRP
CRP

Solid Stream



- High impact solid stream nozzle.
- The cone shaped inlet penetrates further into the supply pipe than regular nozzles. This prevents floating particles from flowing into the nozzle, thereby reducing clogging.
- The CRP series features high-purity alumina ceramic orifice providing stable performance with longer life.

[STANDARD PRESSURE]

2.0 MPa

[APPLICATIONS]

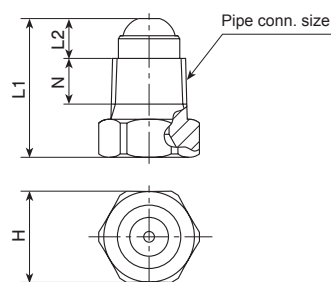
Cleaning: Wire and felt parts of paper making machines, machinery, parts, vehicles, returnable containers, bottles

CCRP SERIES (all metal)

Structure	• Metal one-piece structure.				
Material	• S303				
Pipe conn. size	Dimensions (mm)				Weight (g)
	L1	L2	H	N	
R1/8	18.5	5.5	12	6	8.5
R1/4	22.5	7	14	7.5	17

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

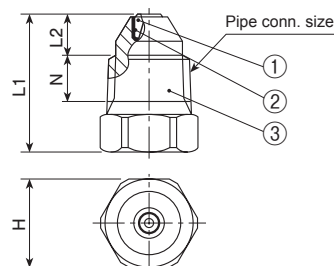


CRP SERIES (with ceramic orifice)

Structure	• One-piece structure with a high-purity ceramic orifice insert.				
Material	• Nozzle orifice: alumina ceramic • Nozzle body: S303				
Pipe conn. size	Dimensions (mm)				Weight (g)
	L1	L2	H	N	
R1/8	18	5	12	6	7
R1/4	22	6.5	14	7.5	15

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



①Ceramic orifice ②Adhesive: Araldite® ③Nozzle body

Orifice diameter code	Pipe connection size				Spray capacity (L/min)					
	CCRP		CRP		0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	3 MPa
	R1/8	R1/4	R1/8	R1/4						
ø0.5	○	○	○	○	0.20	0.26	0.31	0.37	0.52	0.63
ø0.6	○	○	○	○	0.29	0.37	0.44	0.53	0.74	0.91
ø0.7	○	○	○	○	0.39	0.51	0.60	0.72	1.01	1.24
ø0.8	○	○	○	○	0.51	0.66	0.78	0.94	1.32	1.62
ø0.9	○	○	○	○	0.65	0.84	0.99	1.18	1.67	2.05
ø1.0	○	○	○	○	0.80	1.03	1.22	1.46	2.07	2.53
ø1.1	○	○	○	○	0.97	1.25	1.48	1.77	2.50	3.06
ø1.2	○	○	○	○	1.15	1.49	1.76	2.10	2.98	3.64
ø1.3	○	○	○	○	1.35	1.75	2.07	2.47	3.49	4.28
ø1.4	○	○	○	○	1.57	2.02	2.40	2.86	4.05	4.96
ø1.5	○	○	○	○	1.80	2.32	2.75	3.29	4.65	5.69
ø1.7	○	○	○	○	2.31	2.99	3.53	4.22	5.97	7.31
ø2.0	○	○	○	○	3.20	4.13	4.89	5.84	8.26	10.1

[Note] The above nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8M CRP ø0.6 AL99-S303

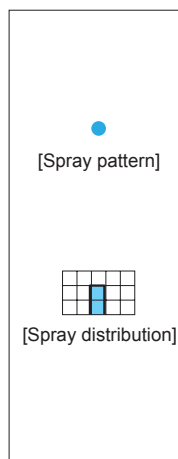
1/8M	CRP	ø0.6	AL99-S303
Pipe conn. size*	Series	Orifice diameter code	Material
1/8M	CRP	ø0.5	AL99-S303: CRP series
1/4M	CCRP	ø	S303: CCRP series
		ø2.0	

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

Paper Trimming Nozzles

2CM-FB: Made-to-Order

CM-FB/2CM-FB



- Non-turbulent clear solid stream nozzles with high cutting force.
- Flat surface of nozzle tip prevents paper dust from clogging the nozzle orifice.
- Small, tapered nose of the CM-FB series minimizes adhesion of paper dust to the nozzle body.
- The position of the nozzle orifices can be adjusted by turning the tab on the 2CM-FB series.

[STANDARD PRESSURE]

2.0 MPa

[APPLICATIONS]

Trimming: Paper making
Foot cutting, cleaning of precision machine parts,
injection of chemicals, deburring, foaming of beer

Solid Stream

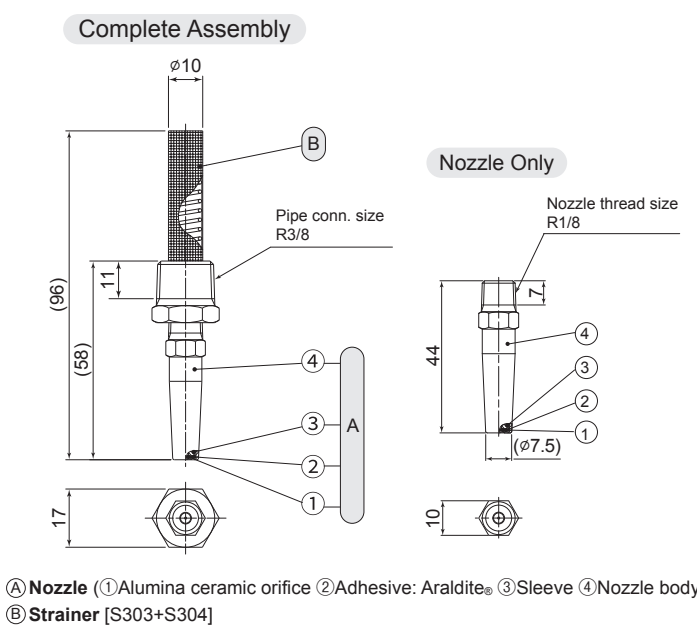
CM-FB SERIES (Single Orifice)

Structure	<ul style="list-style-type: none"> • Has a high-purity ceramic orifice in the nozzle. • Includes a nozzle and a strainer integrated with an adaptor. Worn-out nozzles can be replaced separately.
Material	<ul style="list-style-type: none"> • Nozzle orifice: alumina ceramic • Main metal parts: S303
Weight	<ul style="list-style-type: none"> • Complete assembly: 40 g • Nozzle only: 15 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



2CM-FB SERIES (Two Orifices)

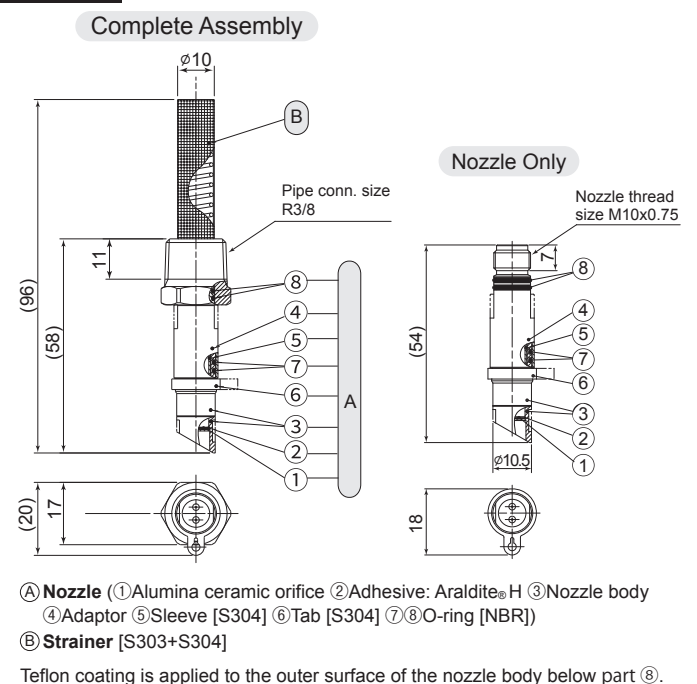
Made-to-Order

Structure	<ul style="list-style-type: none"> • Has a high-purity ceramic orifice in the nozzle. • Includes a nozzle and a strainer integrated with an adaptor. Worn-out nozzles can be replaced separately.
Material	<ul style="list-style-type: none"> • Nozzle orifice: alumina ceramic • Main metal parts: S303 • O-ring: NBR • Coating of nozzle: Teflon (PTFE)
Weight	<ul style="list-style-type: none"> • Complete assembly: 45 g • Nozzle only: 21 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Paper Trimming Nozzles

CM-FB/2CM-FB SERIES

■CM-FB Series (single-orifice nozzles)

Orifice diameter code	Spray capacity (L/min)						Strainer mesh size
	0.5 MPa	1 MPa	2 MPa	3 MPa	4 MPa	5 MPa	
ø0.3	0.09	0.12	0.17	0.21	0.24	0.27	80
ø0.4	0.15	0.22	0.31	0.37	0.43	0.48	80
ø0.5	0.24	0.34	0.48	0.58	0.67	0.75	80
ø0.6	0.34	0.49	0.69	0.84	0.97	1.09	80

[Note] The above nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

■2CM-FB Series (two-orifice nozzles)

Orifice diameter code	Spray capacity (L/min)				Strainer mesh size
	0.5 MPa	1 MPa	2 MPa	3 MPa	
ø0.3	0.17	0.24	0.34	0.42	80
ø0.4	0.30	0.43	0.61	0.75	80
ø0.5	0.48	0.67	0.95	1.17	80

[Note] The above nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

CM-FB

① Complete Assembly

Example: 3/8M CM ø0.4 FB S303 W

3/8M	CM	ø0.4	FB S303	W
Pipe conn. size*	Series	Orifice diameter code	Material	Strainer
		<div> <div>ø0.3</div> <div>ø0.6</div> </div>		

② Nozzle Only

Example: 1/8M CMP ø0.4 FB S303

1/8M	CMP	ø0.4	FB S303
Nozzle thread size*		Orifice diameter code	Material
		<div> <div>ø0.3</div> <div>ø0.6</div> </div>	

2CM-FB

① Complete Assembly

Example: 3/8M 2CM ø0.4 FB S303 W

3/8M	2CM	ø0.4	FB S303	W
Pipe conn. size*	Series	Orifice diameter code	Material	Strainer
		<div> <div>ø0.3</div> <div>ø0.4</div> <div>ø0.5</div> </div>		

② Nozzle Only

Example: M10x0.75M 2CMP ø0.4 FB S303

M10x0.75M	2CMP	ø0.4	FB S303
Nozzle thread size*		Orifice diameter code	Material
		<div> <div>ø0.3</div> <div>ø0.4</div> <div>ø0.5</div> </div>	

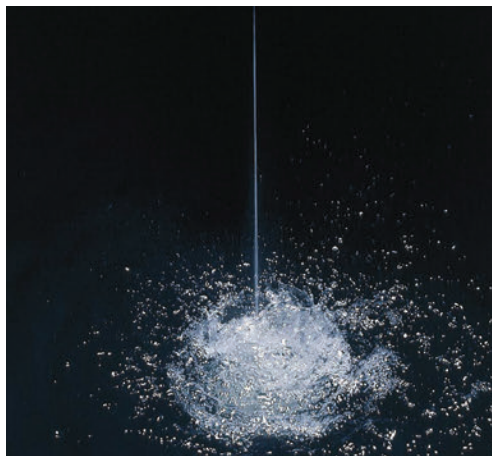
**"M" indicates male thread ("R" of the ISO standard), e.g. 3/8M = R3/8.

The 2CM-FB series is made-to-order.

Paper Trimming Nozzles

Some Models are Made-to-Order

CMP-T/CTM/CM



[Spray pattern]

[Spray distribution]

- Extra fine straight solid stream nozzles with high impact cutting force.

[STANDARD PRESSURE]

1.0 MPa

[APPLICATIONS]

Trimming: Paper making
Cutting: Food
Others: Cleaning of precision machine parts, injection of chemicals, deburring, foaming of beer (jet foamer)

Solid Stream

CMP-T SERIES (with alumina ceramic orifice)

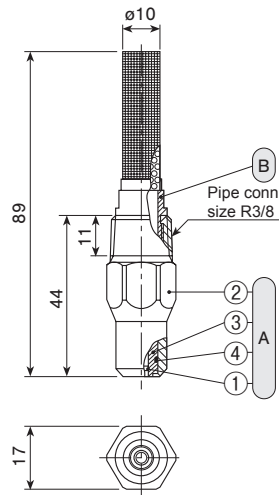
Structure	<ul style="list-style-type: none"> • Features a high-purity ceramic orifice. Polyamide sleeve molded around a ceramic orifice is pressed into the tip of the nozzle. • Includes a nozzle and a strainer. Worn-out nozzles can be replaced separately.
Material	<ul style="list-style-type: none"> • Nozzle orifice: alumina ceramic • Sleeve: PA • Metal parts: S303 • O-ring: NBR
Weight	<ul style="list-style-type: none"> • Complete assembly: 47 g • Nozzle only: 40 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

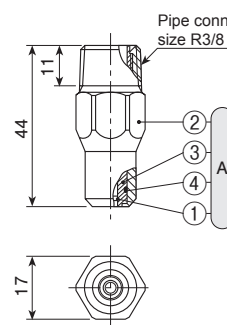
DRAWING

Unit: mm

Complete Assembly



Nozzle Only



① Nozzle (①Alumina ceramic orifice ②Nozzle body ③Sleeve ④O-ring [NBR])
⑤ Strainer

CTM SERIES (with tungsten carbide orifice)

Structure	<ul style="list-style-type: none"> • Features a tungsten carbide orifice. • Includes a nozzle and a strainer integrated with an adaptor. Worn-out nozzles can be replaced separately.
Material	<ul style="list-style-type: none"> • Nozzle orifice: tungsten carbide • Metal parts: S303

[Complete Assembly]

Orifice diameter code	Pipe conn. size	Dimensions (mm)						Weight (g)
		L2	L3	H1	H2	øD	N2	
ø0.2–ø0.9	R3/8	54	92	10	17	10	11	39
ø1.0–ø1.5	R3/8	52	90	14	17	10	11	47

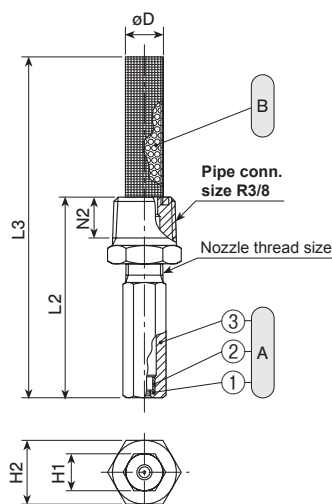
[Nozzle Only]

Orifice diameter code	Nozzle thread size	Dimensions (mm)			Weight (g)
		L1	H1	N1	
ø0.2–ø0.9	R1/8	40	10	7	16.5
ø1.0–ø1.5	R1/4	40	14	10.5	30

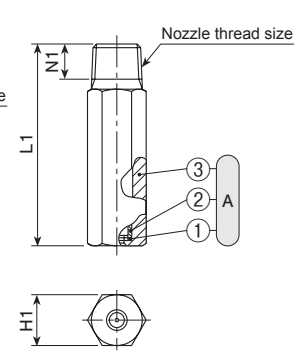
[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Complete Assembly



Nozzle Only



① Nozzle (①Tungsten carbide orifice ②Sleeve ③Nozzle body)
④ Strainer

Paper Trimming Nozzles

CMP-T/CTM/CM SERIES

CM SERIES (with ceramic orifice)

Structure	<ul style="list-style-type: none"> Features a ceramic orifice. Includes a nozzle and a strainer integrated with an adaptor. Worn-out nozzles can be replaced separately.
Material	<ul style="list-style-type: none"> Nozzle orifice: ceramic Metal parts: S303

[Complete Assembly]

Orifice diameter code	Pipe conn. size	Dimensions (mm)						Weight (g)
		L2	L3	H1	H2	øD	N2	
ø0.1–ø0.9	R3/8	54	92	10	17	10	11	39
ø1.0–ø1.5	R3/8	52	90	14	17	10	11	47

[Nozzle Only]

Orifice diameter code	Nozzle thread size	Dimensions (mm)			Weight (g)
		L1	H1	N2	
ø0.1–ø0.9	R1/8	40	10	7	16.5
ø1.0–ø1.5	R1/4	40	14	10.5	30

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

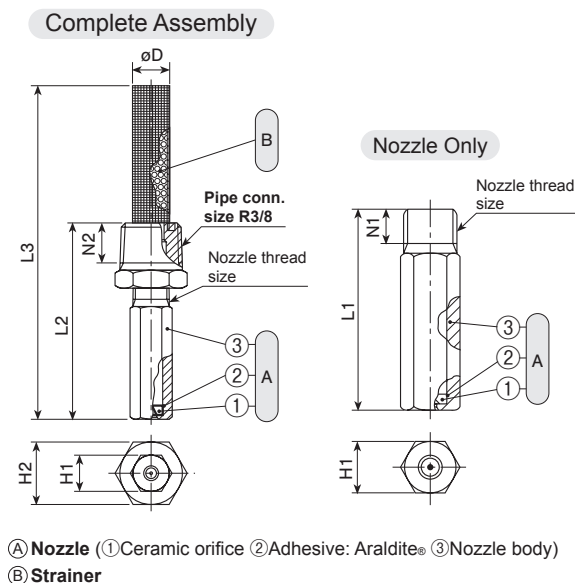
*1) Made-to-order model

Orifice diameter code	CMP-T	CTM	CM	Spray capacity (L/min)						Strainer mesh size
				0.5 MPa	1 MPa	2 MPa	3 MPa	4 MPa	5 MPa	
ø0.1			● ^{*1}	0.011	0.016	0.022	0.027	0.031	0.035	200
ø0.15			● ^{*1}	0.03	0.04	0.05	0.06	0.07	0.08	200
ø0.2		● ^{*1}	● ^{*1}	0.05	0.06	0.09	0.11	0.12	0.14	200
ø0.25		● ^{*1}	● ^{*1}	0.07	0.10	0.14	0.17	0.19	0.21	200
ø0.3	●	●	●	0.10	0.14	0.19	0.23	0.27	0.30	150
ø0.4	●	●	●	0.17	0.24	0.34	0.41	0.47	0.52	150
ø0.5	●	●	●	0.25	0.35	0.49	0.60	0.68	0.76	80
ø0.6	●	●	●	0.36	0.51	0.71	0.86	0.99	1.10	80
ø0.7	●	●	●	0.49	0.69	0.96	1.17	1.34	1.49	50
ø0.8	●	●	●	0.65	0.90	1.26	1.53	1.75	1.95	50
ø0.9	●	●	●	0.78	1.09	1.52	1.84	2.11	2.35	50
ø1.0	●	● ^{*1}	● ^{*1}	0.97	1.34	1.88	2.28	2.61	2.91	50
ø1.1		● ^{*1}	● ^{*1}	1.17	1.63	2.27	2.75	3.16	3.51	50
ø1.2		● ^{*1}	● ^{*1}	1.39	1.94	2.70	3.28	3.76	4.18	50
ø1.3		● ^{*1}	● ^{*1}	1.63	2.27	3.17	3.85	4.41	4.91	50
ø1.4		● ^{*1}	● ^{*1}	1.89	2.64	3.68	4.46	5.12	5.69	50
ø1.5		● ^{*1}	● ^{*1}	2.17	3.03	4.22	5.12	5.88	6.54	50

●: Available with strainer

[Note] The above nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

DRAWING



HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

CMP-T

① Complete Assembly

Example: 3/8M CMP ø0.3 T S303 W

3/8M	CMP	ø0.3	T	S303	W
Pipe conn. size ²		Orifice diameter code		Material	Strainer
		ø0.3			
		ø1.0			

② Nozzle Only

Example: 3/8M CMP ø0.3 T S303

3/8M	CMP	ø0.3	T	S303
Pipe conn. size ²		Orifice diameter code		Material
		ø0.3		
		ø1.0		

CTM

CM

The CTM/CM series with orifice diameter code ø0.1–ø0.25 and ø1.0–ø1.5 are made-to-order.

① Complete Assembly

Example: 3/8M CTM ø0.2 S303 W (PM-Strainer ø10)

3/8M	CTM	ø0.2	S303	W (PM-Strainer ø10)
Pipe conn. size ²	Series	Orifice diameter code ³	Material	Strainer
	CTM	ø0.1		
	CM	ø1.5		

② Nozzle Only

Example: 1/8M CTMP ø0.2 S303

1/8M	CTMP	ø0.2	S303
Nozzle thread size ²	Series	Orifice diameter code ³	Material
1/8M (for ø0.1–ø0.9)	CTMP	ø0.1	
1/4M (for ø1.0–ø1.5)	CMP	ø1.5	

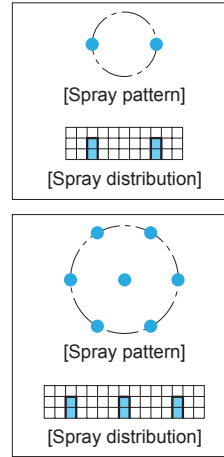
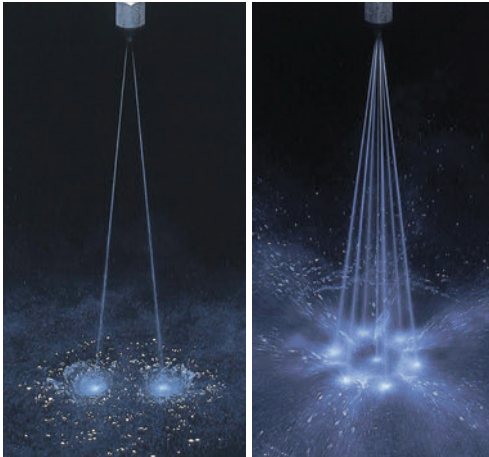
*2) "M" indicates male thread ("R" of the ISO standard), e.g. 3/8M = R3/8.

*3) ø0.1 and ø0.15 are only for the CM series.

Multi-orifice Solid Stream Jet

Made-to-Order

2CCP·7CCP/2CP·7CP



- Multiple solid streams with high impact force.
- 2-orifice and 7-orifice nozzles are available.
- Compact design.

[STANDARD PRESSURE]
1.0 MPa

[APPLICATIONS]

Cleaning: Wire and felt parts of paper making machines, dandy rolls, machine parts, bottles, vehicles, returnable containers

2CCP, 7CCP SERIES (all metal)

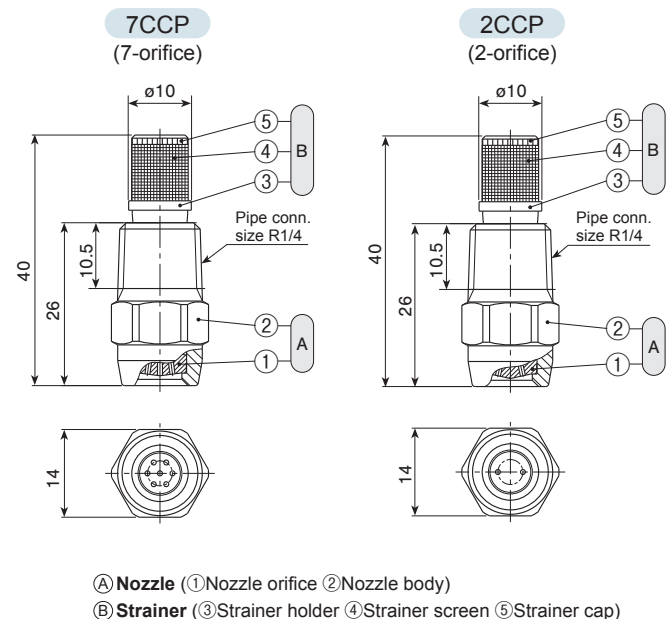
Structure	<ul style="list-style-type: none"> • Metal one-piece structure. Some models are available with strainer.
Material	<ul style="list-style-type: none"> • S303 SPECIAL ORDER MATERIAL: S420J2 (nozzle orifice only)
Weight*1	<ul style="list-style-type: none"> • 16g

*1) With strainer, add 2 g to the above weight.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



2CP, 7CP SERIES (with ceramic orifice)

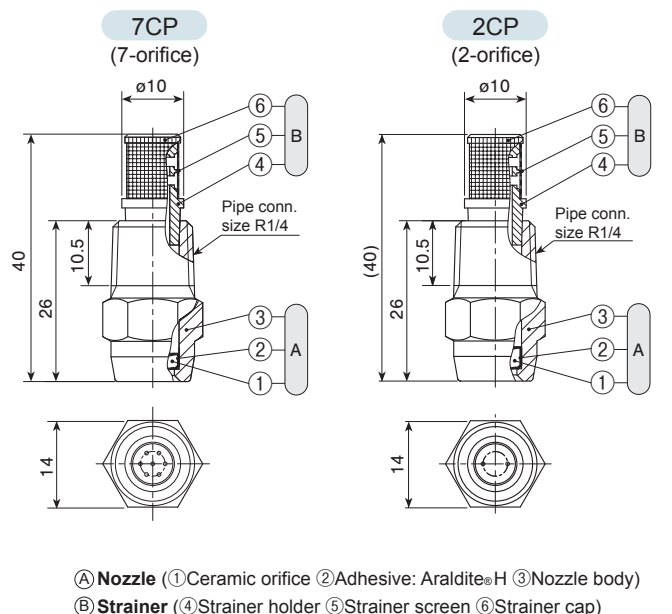
Structure	<ul style="list-style-type: none"> • One-piece structure with a ceramic orifice insert. Almost all models are available with strainer.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303
Weight*2	<ul style="list-style-type: none"> • 17g

*2) With strainer, add 5 g to the above weight.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Multi-orifice Solid Stream Jet

2CCP · 7CCP/2CP · 7CP series

■ 2CCP/2CP Series (two-orifice nozzles)

Spreading angle code	Spray capacity code	2CCP (metal)	2CP (with ceramic orifice)	Spreading angle ³ (°)			Spray capacity (L/min)							Free passage diameter (mm)	Strainer mesh size
				0.5 MPa	1 MPa	2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa	3 MPa		
25	09		●	25	25	25	0.47	0.61	0.72	0.86	1.05	1.22	1.49	0.5	100
	12		●	25	25	25	0.68	0.88	1.04	1.24	1.52	1.75	2.15	0.6	100
	17	●	●	25	25	25	0.92	1.19	1.41	1.68	2.06	2.38	2.91	0.7	50
	22	●	●	25	25	25	1.19	1.54	1.82	2.18	2.67	3.08	3.78	0.8	50
	34	○	○	25	25	25	1.87	2.42	2.86	3.42	4.19	4.84	5.92	1.0	—
15	09		●	15	15	15	0.47	0.61	0.72	0.86	1.05	1.22	1.49	0.5	100
	12		●	15	15	15	0.68	0.88	1.04	1.24	1.52	1.75	2.15	0.6	100
	17	●	●	15	15	15	0.92	1.19	1.41	1.68	2.06	2.38	2.91	0.7	50
	22	●	●	15	15	15	1.19	1.54	1.82	2.18	2.67	3.08	3.78	0.8	50
	34	○	○	15	15	15	1.87	2.42	2.86	3.42	4.19	4.84	5.92	1.0	—
10	09		●	10	10	10	0.47	0.61	0.72	0.86	1.05	1.22	1.49	0.5	100
	12		●	10	10	10	0.68	0.88	1.04	1.24	1.52	1.75	2.15	0.6	100
	17	●	●	10	10	10	0.92	1.19	1.41	1.68	2.06	2.38	2.91	0.7	50
	22	●	●	10	10	10	1.19	1.54	1.82	2.18	2.67	3.08	3.78	0.8	50
	34	○	○	10	10	10	1.87	2.42	2.86	3.42	4.19	4.84	5.92	1.0	—

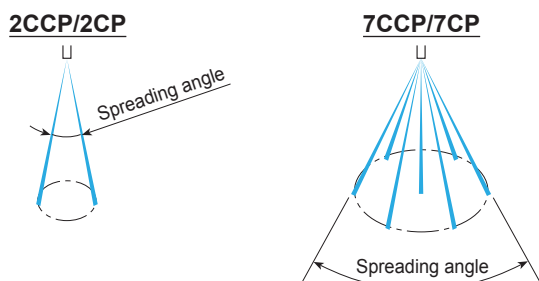
●: Available with or without strainer ○: Only available without strainer

■ 7CCP/7CP Series (seven-orifice nozzles)

Spreading angle code	Spray capacity code	7CCP (metal)	7CP (with ceramic orifice)	Spreading angle ³ (°)			Spray capacity (L/min)							Free passage diameter (mm)	Strainer mesh size
				0.5 MPa	1 MPa	2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa	3 MPa		
15	30		●	15	15	15	1.65	2.13	2.52	3.01	3.69	4.26	5.21	0.5	100
	43		●	15	15	15	2.38	3.07	3.63	4.34	5.32	6.14	7.52	0.6	100
	59	●	●	15	15	15	3.22	4.16	4.92	5.88	7.20	8.32	10.2	0.7	50
	76	●	●	15	15	15	4.18	5.40	6.38	7.63	9.34	10.8	13.2	0.8	50
	119	○	○	15	15	15	6.52	8.41	9.96	11.9	14.6	16.8	20.6	1.0	—

●: Available with or without strainer ○: Only available without strainer

*3) The spreading angle is the angle between the solid streams. For a seven-orifice nozzle it is the angle between the two streams directly opposite to each other and the furthest apart.



HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Two-orifice Nozzles

Example: 1/4M 2CP 2517 S303W

Pipe conn. size ⁴	Series	Spreading angle code	Spray capacity code	Material	Strainer
1/4M	2CP	25	17	S303	W
	2CCP	25	09		W (with strainer)
	2CP	15			(Blank indicates "without strainer")
		10	34		

Seven-orifice Nozzles

Example: 1/4M 7CP 1559 S303W

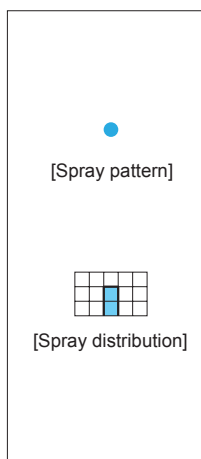
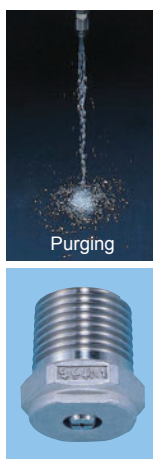
1/4M	7CP	15	59	S303	W
Pipe conn. size ^{*4}	Series	Spray capacity code	Material	Strainer	
	■ 7CCP	■ 30		■ W (with strainer)	
	■ 7CP	└		■ (Blank indicates "without strainer")	
		■ 119			

*4) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

These nozzle series are made-to-order.

Self-cleaning Solid Stream Jet

MOMOJet "C"



- High impact solid stream.
- When the liquid pressure is reduced to 0.03 MPa or lower, the nozzle tip retracts and purges any foreign particles that clog the nozzle. By increasing the water pressure to 0.2 MPa or higher, normal spraying resumes.
- The straight-through orifice makes this nozzle suitable for multi-nozzle set-up.

[STANDARD PRESSURE]

1.0 MPa

[APPLICATIONS]

Cleaning: Paper making (wire, felt parts and rollers) steel plates, PCB

Cooling: Steel plates

Foam breaking: Waste water treatment

Others: Applications where recirculated water is being used

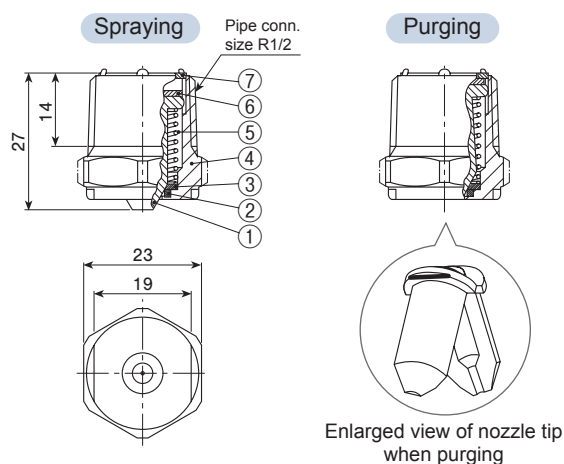
Solid Stream

Structure	<ul style="list-style-type: none"> • By changing the liquid pressure, a built-in spring moves the split nozzle tip up and down and opens the orifice for purging.
Material	<ul style="list-style-type: none"> • S303
Weight	<ul style="list-style-type: none"> • 52g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



- ①Nozzle tip ②Packing (EPDM) ③Plate ④Nozzle body
⑤Spring ⑥Packing (EPDM) ⑦Ring

Spray capacity code	Spray capacity (L/min)					Free passage diameter (mm)	
	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	Spraying	Purging
10	0.55	0.71	0.84	1.00	1.41	0.7	1.8
16	0.88	1.13	1.34	1.60	2.26	0.9	1.9
23	1.26	1.63	1.93	2.30	3.25	1.1	2.0
32	1.75	2.26	2.68	3.20	4.53	1.2	2.0
47	2.58	3.32	3.93	4.70	6.65	1.5	2.2
65	3.56	4.60	5.44	6.50	9.19	1.8	2.4

Attention:

1. To start spraying, a flow rate of about 9 L/min at 0.02–0.03 MPa is required for all models. Make sure to select an appropriate pump.
2. MOMOJet is designed to start spraying when the pressure is greater than 0.1 MPa. Use MOMOJet at a pressure of 0.2 MPa or higher.
3. Since MOMOJet series nozzles have moving nozzle tips, the spray capacity is only guaranteed within +/-10% at standard pressure.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/2 MOMOC 10 S303

1/2* MOMOC 10 S303

Spray capacity code	Material
10	
5	
65	

*Indicates R1/2, nozzle thread size.

ALSO AVAILABLE!

Self-cleaning
Flat Spray Nozzles

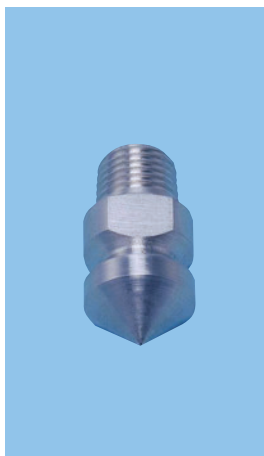
**MOMOJet
SERIES**

See page 41 of this catalog.

Pipe Cleaning Nozzles

Made-to-Order

RSP



- Cleaning the inside of pipes and tubes, moving by spraying solid stream jets in different directions as driving force.
- High impact jets effectively remove scale and dirt inside pipes.

[STANDARD PRESSURE]

Not specified, the RSP series is a made-to-order nozzle.

[APPLICATIONS]

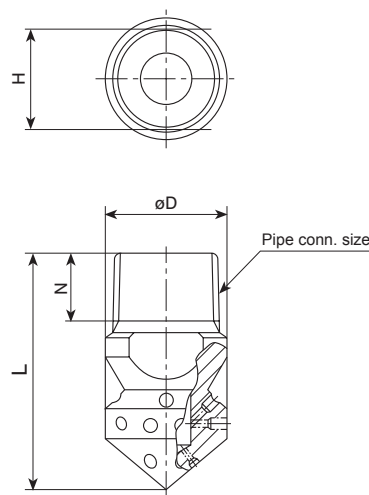
Cleaning the inside of pipes, water and sewage drains, tubes of heat exchangers and cooling machines
Removing scale and rust

Structure	• One-piece structure, made of metal.
Material	• S303 SPECIAL ORDER MATERIAL: S420J2

Pipe conn. size	Dimensions (mm)				Weight (g)
	L	H	øD	N	
R1/8	26	10.5	12	7	14
R1/4	34	14	17	9	30
R3/8	38	16	19	11	48
R1/2	42	22	25	14	88

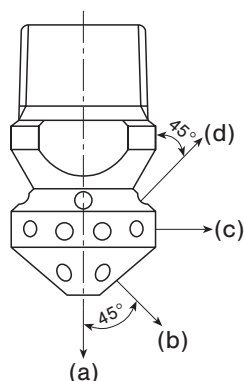
[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



HOW TO ORDER

The RSP series is made-to-order. Please select pipe connection size, orifice diameter, and the number of orifices for each direction according to **HOW TO SELECT RSP SERIES** on the next page.



Example: 1/2M RSP 0.6 + 0.6×3 / 0.6×4 + 0.6×4 S303

1/2M RSP 0.6 + 0.6×3 / 0.6×4 + 0.6×4 S303

Pipe conn. size*

- 1/8M
- 1/4M
- 3/8M
- 1/2M

A: Orifice diameter for directions (a)
B: Orifice diameter for directions (b)
C: Orifice diameter for directions (c)
D: Orifice diameter for directions (d)
N₁–N₃: Number of orifices for each direction

[Note] To indicate that there are no orifices in a certain direction, use "0".

For example, if there are 6 orifices of diameter 0.7 mm for direction (d) only, the nozzle description would be:

1/8M RSP 0 + 0 / 0 + 0.7×6 S303

*"M" indicates male thread ("R" of the ISO standard), e.g. 1/8M = R1/8.

HOW TO SELECT RSP SERIES

1. Pipe connection size

Refer to the table to select the pipe connection size suitable for the spray capacity required.

Pipe conn. size	Max. spray capacity by pipe connection size (L/min)								
	1 MPa	3 MPa	5 MPa	7 MPa	10 MPa	15 MPa	20 MPa	25 MPa	30 MPa
R1/8	14	24	31	37	44	54	62	70	76
R1/4	56	96	124	147	176	216	249	278	305
R3/8	56	96	124	147	176	216	249	278	305
R1/2	61	105	135	160	191	234	270	302	331

2. Orifice diameter and the number of orifices

Refer to the table to select the orifice diameter and the number of orifices required.

Orifice diameter (mm)	Spray capacity per one orifice (L/min)								
	1 MPa	3 MPa	5 MPa	7 MPa	10 MPa	15 MPa	20 MPa	25 MPa	30 MPa
0.6	0.4	0.7	0.9	1.1	1.3	1.6	1.9	2.1	2.3
0.7	0.6	1.0	1.3	1.5	1.8	2.2	2.5	2.8	3.1
0.8	0.7	1.3	1.7	2.0	2.3	2.9	3.3	3.7	4.1
0.9	0.9	1.6	2.1	2.5	3.0	3.6	4.2	4.7	5.1
1.0	1.2	2.0	2.6	3.1	3.7	4.5	5.2	5.8	6.4
1.2	1.7	2.9	3.7	4.4	5.3	6.5	7.5	8.3	9.1
1.5	2.6	4.5	5.8	6.9	8.2	10.1	11.7	13.0	14.3
2.0	4.6	8.0	10.4	12.3	14.7	18.0	20.7	23.2	25.4

3. Spray direction and the number of orifices in each direction

Refer to the table and specify the desired number of orifices in each direction (b), (c), and (d).

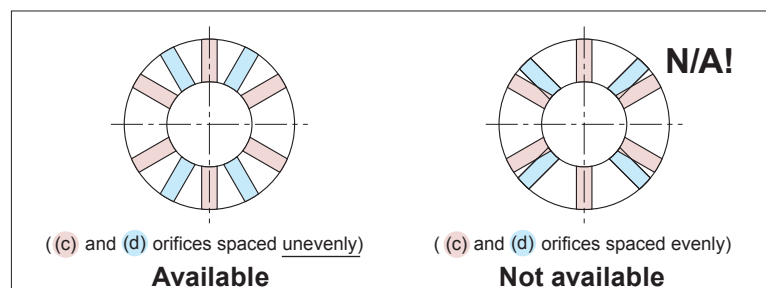
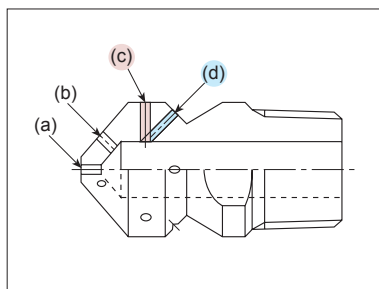
Pipe conn. size	Max. number of orifices in the direction of (b), [(c)+(d)] (see Remarks)							
	ø0.6	ø0.7	ø0.8	ø0.9	ø1.0	ø1.2	ø1.5	ø2.0
R1/8	6	6	6	6	6	4	—	—
R1/4	10	10	10	10	10	8	8	—
R3/8	10	10	10	10	10	8	8	6
R1/2	12	10	10	10	10	8	8	6

Remarks

- The number of orifices in direction (b), referred to as N1 on the previous page, should not exceed the value in the above table.
- The total number of orifices in directions (c) + (d) should not exceed the value in the above table.
- Odd numbers, except three (3), are not recommended. Seven (7) is not acceptable.
- The numbers of orifices for (c) and (d), referred to respectively as N2 and N3 on the previous page, should be the same or one should be a multiple number of the other.
For any other combinations, please contact us.

Note

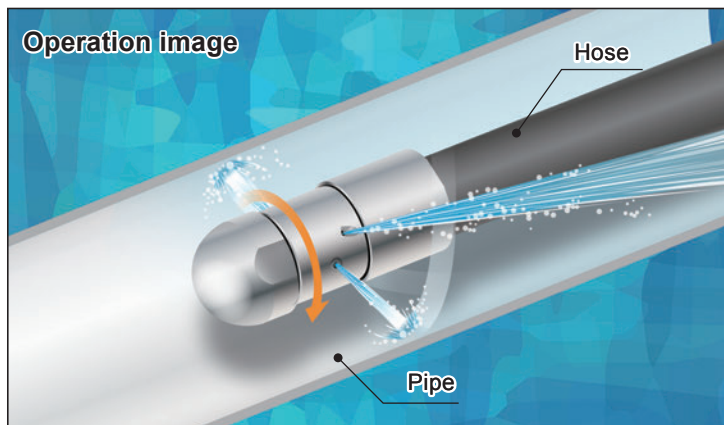
Should the numbers for (c) and (d) be 6 and 4, it is possible to make, but orifices for (c) and (d) are not evenly spaced. Please refer to the sketch below.



High-Pressure Rotating Pipe Cleaning Nozzles

RSP-R

Operation image



- Self-propelled in the pipe and rotating due to spray reaction force.
- Rotating solid stream jets with a high spray impact thoroughly clean the inner surface of a pipe.
- Compact design, made of special stainless steel with excellent wear resistance.

[STANDARD PRESSURE]

1.0 MPa

[APPLICATIONS]

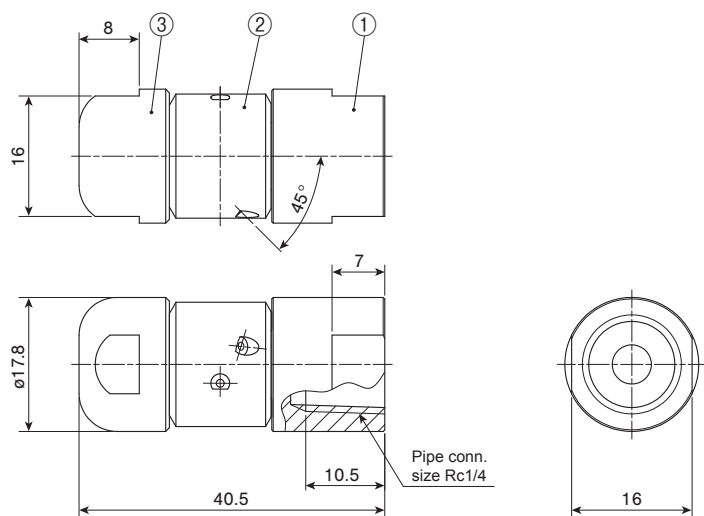
Cleaning the inside of pipes, water and sewage drains, tubes of heat exchangers and cooling machines
Removing scale and rust

Structure	<ul style="list-style-type: none"> • Made of metal. • Includes a connecting adaptor, nozzle body, and cap.
Material	<ul style="list-style-type: none"> • HS (Hardened stainless steel)
Weight	<ul style="list-style-type: none"> • 40 g

Max. temperature: 150°C

Max. operating pressure: 10.0 MPa

DRAWING



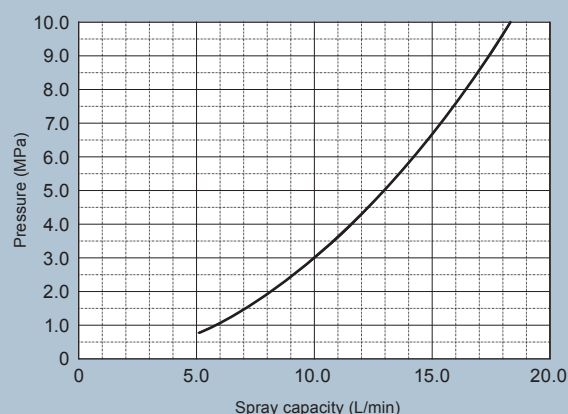
Unit: mm

①Connecting adaptor ②Nozzle body (rotating part) ③Cap (bearing)

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

Spray capacity (L/min)			
1 MPa	2 MPa	5 MPa	10 MPa
5.8	8.2	13.0	18.3

FLOW-RATE DIAGRAM



HOW TO ORDER

Please inquire or order using this product code.

1/4F RSP 58R HS

Pipe conn.
size*

Spray capacity
code

Material

*"F" indicates female thread ("Rc" of the ISO standard), e.g. 1/4F = Rc1/4.

Solid Stream Jet with ON/OFF Control

SO-CC/SO-CM SERIES

SO-CC Series

Orifice diameter code	Spray capacity (L/min)				
	0.1 MPa	0.3 MPa	0.5 MPa	0.8 MPa	1.0 MPa
ø0.3	0.04	0.07	0.09	0.11	0.13
ø0.4	0.07	0.12	0.16	0.20	0.22
ø0.5	0.11	0.18	0.24	0.30	0.34
ø0.6	0.15	0.27	0.34	0.43	0.49
ø0.7	0.21	0.36	0.46	0.58	0.65
ø0.8	0.27	0.47	0.60	0.76	0.85
ø0.9	0.34	0.59	0.76	0.96	1.07
ø1.0	0.42	0.73	0.94	1.19	1.33

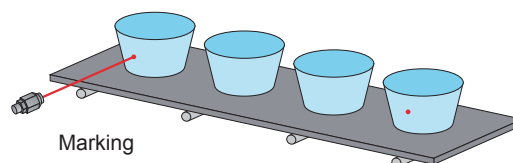
[Note] These nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

SO-CM Series

Orifice diameter code	Spray capacity (L/min)	
	0.3 MPa	0.5 MPa
ø0.3	0.08	0.10
ø0.4	0.14	0.17
ø0.5	0.20	0.25
ø0.6	0.29	0.36
ø0.7	0.39	0.49
ø0.8	0.51	0.65
ø0.9	0.61	0.78
ø1.0	0.75	0.97

[Note] These nozzles are manufactured for specific orifice diameters, therefore the spray capacity is not guaranteed.

Example of Use



Operation Time Chart

The pilot air ON/OFF controls the spray operation.

Pilot air	OFF	ON	OFF	ON	OFF
Liquid	Stop	Spray	Stop	Spray	Stop

Mounting Bracket (Optional)

This mounting bracket allows for easy installation of SO-CC/SO-CM series nozzles to a pole in the desired spray direction. Available in two sizes for pole diameters of 8 mm and 10 mm.

When ordering the optional Mounting Bracket, please specify "BIM ø8 MBW" for ø8 mounting bracket, or "BIM ø10 MBW" for ø10 mounting bracket.



HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/8 SO-CC ø0.3 S303

1/8 ^{*2}	SO-CC	ø0.3	S303
	Series	Orifice diameter code	Material
	SO-CC	ø0.3	
	SO-CM	ø0.4	
		ø0.5	
		ø0.6	
		ø0.7	
		ø0.8	
		ø0.9	
		ø1.0	

*2) Indicates Rc1/8 for the liquid and pilot air connection thread size.

The SO-CC series is made-to-order.

ALSO AVAILABLE!

Flat Spray Nozzles with ON/OFF Control

SO-V
SO-VV
SERIES

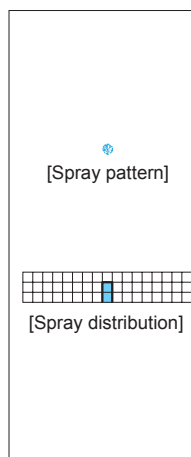
See page 44 for more details.

CAUTIONS

- Supply liquid pressure at 0.5 MPa or less for the SO-CM series, and 1.0 MPa or less for the SO-CC series.
- Supply pilot air pressure between 0.2 and 0.5 MPa.
- For better shut off and to prevent dripping, purge the air between the solenoid valve and the nozzle when it is shut off, using a 3-way solenoid valve.

Universal-jointed Solid Stream Jet

UT+CP



- High impact force solid stream flow.
- Internal design keeps flow resistance to a minimum, generating a large flow volume.
- Spray direction is adjustable over a range of 40 degrees as desired.

[STANDARD PRESSURE]

0.3 MPa

[APPLICATIONS]

Cleaning: High pressure cleaning, wire and felt parts of paper making machines, vehicles, returnable containers, machinery, parts

Trimming: Paper making

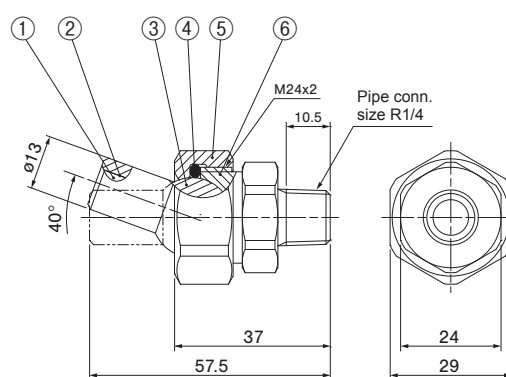
Solid Stream

Structure	<ul style="list-style-type: none"> • Has a ceramic orifice (high-purity ceramic orifice for spray capacity codes 37–136) in the nozzle tip. • Includes three parts: Nozzle tip, cap, and adaptor. • Worn-out nozzle tips can be replaced separately. • Nozzle tip has an integrated universal ball joint to adjust the spray direction.
Material	<ul style="list-style-type: none"> • Nozzle orifice: ceramic • Metal parts: S303
Weight	<ul style="list-style-type: none"> • 125 g

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING

Unit: mm



Nozzle tip (①Ceramic orifice ②Adhesive: Araldite® ③Ball)
④O-ring (NBR) ⑤Cap ⑥Adaptor

Spray capacity code	Spray capacity (L/min)								Free passage diameter (mm)
	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	
37	0.68	0.83	0.96	1.17	1.51	1.79	2.14	3.03	1.0
49	0.90	1.10	1.28	1.56	2.02	2.39	2.86	4.04	1.2
80	1.47	1.80	2.08	2.54	3.28	3.88	4.65	6.56	1.5
111	2.03	2.48	2.87	3.51	4.53	5.36	6.43	9.09	1.8
136	2.48	3.04	3.51	4.30	5.55	6.57	7.85	11.1	2.0
247	4.51	5.52	6.38	7.81	10.1	11.9	14.3	20.2	2.6
322	5.88	7.20	8.31	10.2	13.1	15.6	18.6	26.3	3.0
445	8.12	9.95	11.5	14.1	18.2	21.5	25.7	36.3	3.5

[Note] Precision guarantee for the UT+CP series is only for spray angle; the axis of spray direction to be within 3° from nozzle centerline.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 1/4M UT+CP 37 AL99-S303

1/4M UT+CP 37 AL99-S303

Pipe conn. size*1

Spray capacity code

Material

37
S
445

S303
AL99-S303*2

Please contact us to order only the nozzle tip.

*1) "M" indicates male thread ("R" of the ISO standard), e.g. 1/4M = R1/4.

*2) When spray capacity code is 37–136, material code is described as "AL99-S303".

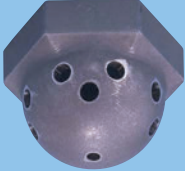
ALSO AVAILABLE!

Universal-jointed
Flat Spray Nozzles

**UT+VP
SERIES**

See p.47 of this catalog.

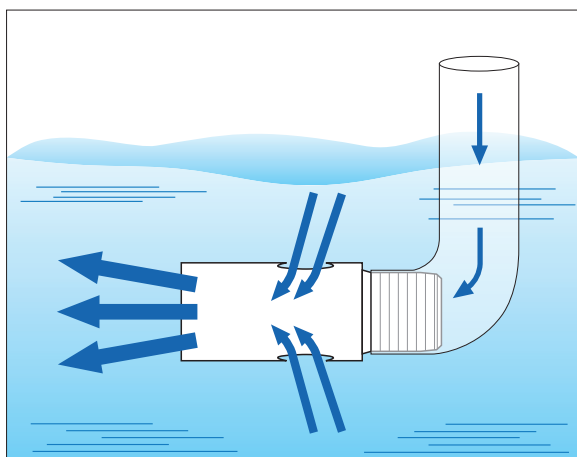
Surface Washing Nozzles

Series	Picture	Features	Applications
Surface washing nozzles		<ul style="list-style-type: none"> • Produces solid stream spray from a hemispherical nozzle body in a radial pattern. • High impact solid streams effectively stir the sand filter bed in water. 	<ul style="list-style-type: none"> • Cleaning sand filter bed at water purification plant

Ejector Nozzles for Solution Agitation

Some Models are Made-to-Order

EJX



- EJX shoots out 3 to 4 times the amount of liquid supplied, by suctioning additional liquid from its surroundings through negative pressure.

- Simple one-piece structure with a compact, lightweight design.

[STANDARD PRESSURE]
0.05 MPa

[APPLICATIONS]

- Solution agitation (even mixing, preventing deposition)
- Cleaning in liquids
- Submerged etching and plating

Solid Stream

Structure	• One-piece structure, made of metal or plastic.
Material	<ul style="list-style-type: none"> • S303 (S304 for sizes R1 and R1 1/2) • PP (PVC for sizes R1 and R1 1/2)

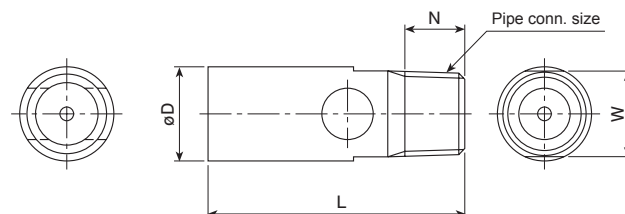
Pipe conn. size	Dimensions (mm)				Weight (g)	
	L	W	øD	N	S303 S304	PP PVC
R1/8	30	10 (11) ²	11	7	11	1.3 ¹
R1/4	48	14 (16) ²	16	10.5	26	3.2 ¹
R3/8	72	22	24	11	80	10
R1/2	93	27	31	14	170	20
R3/4	126	34	42	15	420	48
R1	172	60	76.3 (80) ²	18	2,200	460
R1 1/2	212	80	89.1 (90) ²	20	3,200	540

*1) Sizes R1/8 and R1/4 are made of PP and are injection molded.

*2) Dimensions in () show those of plastic EJX series nozzles.

[Note] Appearance and dimensions may differ slightly depending on material and nozzle code.

DRAWING



Supplied volume code	Pipe conn. size ³	Supply flow rate (L/min)						Discharge flow rate (L/min) [Reference only]						Free passage diameter (mm)
		0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	
1	R1/8	0.85	1.10	1.56	1.91	2.20	2.69	2.2	3.1	5.0	6.6	9.2	10	1.5
4	R1/4	3.10	4.00	5.66	6.93	8.00	9.80	8.1	11	18	24	34	38	2.8
9	R3/8	6.97	9.00	12.7	15.6	18.0	22.0	18	26	41	54	75	85	4.2
16	R1/2	12.4	16.0	22.6	27.7	32.0	39.2	33	46	72	95	134	151	5.7
30	R3/4	23.2	30.0	42.4	52.0	60.0	73.5	61	86	140	180	250	280	7.7
90	R1	69.7	90.0	127	156	180	220	180	260	410	540	760	850	13.3
160	R1 1/2	124	160	226	277	320	392	330	460	720	950	1,340	1,510	17.5

*3) The EJX series with thread size R1 and R1 1/2 are made-to-order.

HOW TO ORDER

To inquire about or order a specific nozzle please refer to this coding system.

Example: 3/8M EJX 1-9 PP

3/8M **EJX 1 -** **9** **PP**

Pipe conn. size⁴

- 1/8M
- 1/4M
- 1/2M
- 3/8M
- 1/2M
- 3/4M
- 1M
- 1 1/2M

Supplied volume code

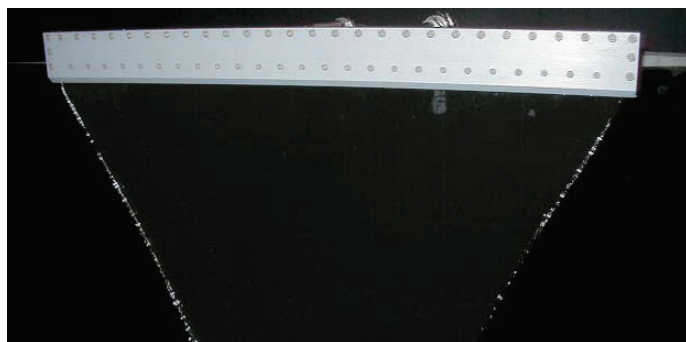
- 1
- 4
- 9
- 16
- 30
- 90
- 160

Material

- S303
- S304 (for sizes 1M and 1 1/2M)
- PP (PP-IN for sizes 1/8M and 1/4M)
- PVC (for sizes 1M and 1 1/2M)

*4) "M" indicates male thread ("R" of the ISO standard), e.g. 1 1/2M = R 1 1/2.

Sizes R1 and R1 1/2 are made-to-order.



[Spray pattern]



[Spray distribution]

- Water or air sprayed from slit nozzles is uniform in width direction.
- SLNH-H series for liquid spraying with even spray flow distribution. SLNHA-H series for air spraying with even spray impact distribution.
- Thin liquid film spray saves cost for chemicals and water.
- Compact and space-saving design.

[APPLICATIONS]

Blow-off drying, cleaning, developing, etching

Material • S304 or PVC

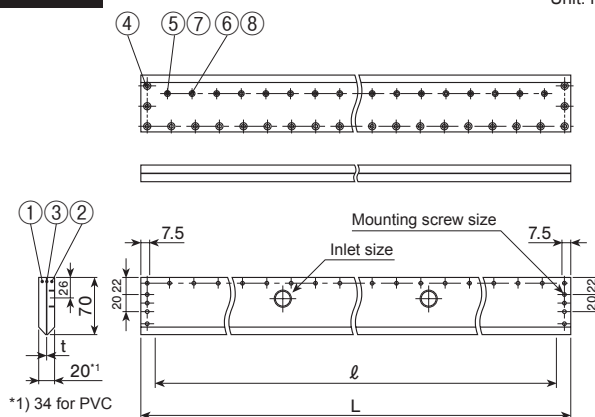
Series	Slit length ℓ (mm)	Slit opening t (mm)	Effective liquid film width (mm) at 10 mm height	Number of inlets	Thread size		Total length L ² (mm)	Weight (kg)	
					Inlet	Mounting		S304	PVC
SLNH-H (Liquid spraying)	460	0.1	410	2	Rc3/8	S304: M5 (depth 8 mm) PVC: M5 (depth 10 mm)	490	4.3	1.3
	600		550		Rc1/2		630	5.5	1.6
	700		650	3	Rc1/2		730	6.4	1.9
	780		730		Rc1/2		810	7.1	2.1
	1,200	0.3	1,150	3	Rc1/2		1,230	11.0	3.1
	460		410	2	Rc1/2		490	4.3	1.3
	600		550	3	Rc1/2		630	5.5	1.6
	700		650	3	Rc1/2		730	6.4	1.9
SLNHA-H (Air spraying)	780	0.1	730	4	Rc1/2		810	7.1	2.1
	1,200		1,150	5	Rc1/2		1,230	11.0	3.1
	530	0.1	—	2	Rc3/8		560	5.0	1.5
	700		—		Rc1/2		730	6.5	1.9
	810		—	3	Rc1/2		840	7.5	2.2
	900		—	3	Rc1/2		930	8.0	2.5
	1,400		—	3	Rc1/2		1,430	12.0	4.0

*2) S304: Customizable total length from 250 mm to 3,950 mm.
PVC: Customizable total length from 250 mm to 2,950 mm.

[Note] Appearance and dimensions are subject to change due to product improvement.

DRAWING

Unit: mm



*1) 34 for PVC

- ① Body plate A (S304) ② Body plate B (S304) ③ Packing (PE)
④ Bolt [M5x10] (S304 equivalent) ⑤ Bolt [M4x8] (S304 equivalent)
⑥ Bolt [M4x10] (S304 equivalent) ⑦ O-ring [P4] (FKM) ⑧ O-ring (FKM)

The above drawing is of the stainless steel SLNH-H series with slit length of 1500 mm or less.

Series	Slit length (mm)	Slit opening (mm)	Spray capacity (L/min) ^{*3}								
			0.01 MPa	0.02 MPa	0.03 MPa	0.04 MPa	0.05 MPa	0.06 MPa	0.07 MPa	0.08 MPa	0.1 MPa
SLNH-H (Liquid spraying)	460	0.1	7.2	10.7	13.4	15.7	17.8	19.7	21.4	23.1	26.1
	600		9.4	13.9	17.4	20.5	23.2	25.7	27.9	30.1	34.1
	700		11.0	16.2	20.3	23.9	27.0	29.9	32.6	35.1	39.7
	780		12.3	18.1	22.7	26.6	30.1	33.3	36.3	39.1	44.3
	1,200	0.3	18.9	27.8	34.9	40.9	46.4	51.3	55.9	60.2	68.1
	460		21.7	32.0	40.1	47.1	53.3	59.0	64.3	69.2	78.3
	600		28.3	41.7	52.3	61.4	69.5	77.0	83.8	90.3	102
	700		33.0	48.7	61.0	71.7	81.1	89.8	97.8	105	119
SLNHA-H (Air spraying)	780	0.1	36.8	54.2	68.0	79.8	90.4	100	109	117	133
	1,200		56.6	83.4	105	123	139	154	168	181	204
	530	0.1	201	353	465	564	656	736	812	884	1,011
	700		265	466	614	745	867	972	1,072	1,168	1,335
	810		306	539	710	862	1,003	1,125	1,240	1,351	1,545
	900		341	599	789	958	1,114	1,250	1,378	1,502	1,717
	1,400	0.1	530	932	1,228	1,491	1,733	1,945	2,144	2,336	2,671

*3) • The above spray capacity indicates liquid flow rate for the SLNH-H series, and air flow rate for the SLNHA-H series.

- The measure for air flow rate is L/min at normal conditions (0°C, 1 atm).
- The above spray capacities are for reference only and subject to design changes.

HOW TO ORDER

Total length can be tailored to your needs within the customizable range (see *2 above).
Inquiry drawing forms for each series and material are available to verify dimensional specifications.
Contact us for details.

These nozzle series are made-to-order.

Universal Ball Joints

UT



Metal UT with spray nozzle



Plastic UT with spray nozzle

- Allows for precise alignment and adjustment of the nozzle and spray direction after installation within a range of 50°.

Metal Ball Joints

- Accurate nozzle alignment is possible after connecting to a pipe.
- Available in variety of pipe connection sizes from 1/8" to 3/4".
- Stainless steel UT Ball Joints are designed to withstand pressures up to 15 MPa.

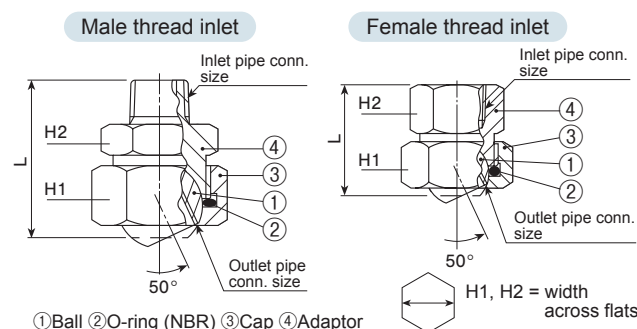
Plastic Ball Joints

- Spray direction is adjustable while spraying at a pressure up to 0.3 MPa.
- Easy installation, no tools required. No O-ring.
- Cost saving, injection-mold construction.
- Lightweight, weighing less than half of the metal ball joint.

UT SERIES (metal)

Material	<ul style="list-style-type: none"> • S303 or B (brass)
	SPECIAL ORDER MATERIAL: S316 or others

DRAWING



Ball joint code (Inlet x Outlet)	Inlet pipe conn. size	Outlet pipe conn. size	Dimensions (mm)			Weight (g)	
			L	H1	H2	S303	B
UT 1/8M × 1/8F	R1/8	Rc1/8	32.5	22	21	56	60
UT 1/4M × 1/8F	R1/4	Rc1/8	36.0	22	21	60	—
UT 1/4M × 1/4F	R1/4	Rc1/4	39.5	29	24	100	110
UT 3/8M × 1/4F	R3/8	Rc1/4	40.0	29	24	110	115
UT 3/8M × 3/8F	R3/8	Rc3/8	47.5	35	30	190	205
UT 1/2M × 1/2F	R1/2	Rc1/2	54.5	41	41	325	—
UT 3/4M × 3/4F	R3/4	Rc3/4	61.5	50	46	490	—
UT 1/8F × 1/8F	Rc1/8	Rc1/8	28.5	22	21	63	—
UT 1/4F × 1/8F	Rc1/4	Rc1/8	28.5	22	21	58	—
UT 1/4F × 1/4F	Rc1/4	Rc1/4	33.5	29	24	110	—
UT 3/8F × 1/4F	Rc3/8	Rc1/4	33.5	29	24	100	—
UT 3/8F × 3/8F	Rc3/8	Rc3/8	44.5	35	30	220	—
UT 1/2F × 1/2F	Rc1/2	Rc1/2	48.5	41	41	375	—
UT 3/4F × 3/4F	Rc3/4	Rc3/4	55.5	50	46	560	—

Note: UT-B (brass) series are not available for sizes of "—" in the weight column.

HOW TO ORDER

To inquire about or order a specific metal ball joint please refer to this coding system.

Example: UT 1/8M × 1/8F S303

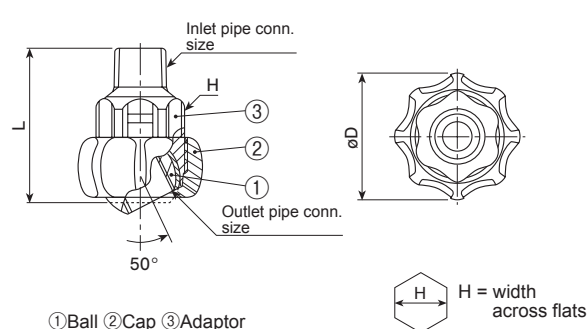
UT	1/8M	×	1/8F	S303
	Inlet pipe connection size*		Outlet pipe connection size*	Material
	1/8M 1/8F		1/8F	S303
	1/4M 1/4F		1/4F	B
	3/8M 3/8F		3/8F	
	1/2M 1/2F		1/2F	
	3/4M 3/4F		3/4F	

**"M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/8M = R1/8, 1/8F = Rc1/8.

UT SERIES (plastic)

Material	<ul style="list-style-type: none"> • Adaptor and Cap: FRPP • Ball: FRPP + PP + EPDM
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DRAWING



Ball joint code (Inlet x Outlet)	Inlet pipe conn. size	Outlet pipe conn. size	Dimensions (mm)			Weight (g)
			L	H	øD	
UT 1/8M × 1/8F	R1/8	Rc1/8	38.0	21	32	12
UT 1/4M × 1/8F	R1/4	Rc1/8	40.0	21	32	13
UT 1/4M × 1/4F	R1/4	Rc1/4	40.0	21	32	12
UT 3/8M × 1/8F	R3/8	Rc1/8	41.0	21	32	13
UT 3/8M × 1/4F	R3/8	Rc1/4	41.0	21	32	12

HOW TO ORDER

To inquire about or order a specific plastic ball joint please refer to this coding system.

Example: UT 1/8M × 1/8F FRPP-IN

UT	1/8M	×	1/8F	FRPP-IN
	Inlet pipe connection size*		Outlet pipe connection size*	Material
	1/8M		1/8F	
	1/4M		1/4F	
	3/8M			

**"M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/8M = R1/8, 1/8F = Rc1/8.



Metal UT Use UT-S303 only at pressures below 15 MPa, UT-B (brass) below 4 MPa.
Plastic UT Use UT-FRPP only at pressures below 1 MPa (at room temperature).

Do not use UT ball joint adaptors if sudden changes in water pressure can occur.
 When using KB and KKB series nozzles, a different type of UT Ball Joints are required. Please contact us for more details.

360° Rotatable Universal Joints

WUT



WUT Universal Joint with spray nozzle

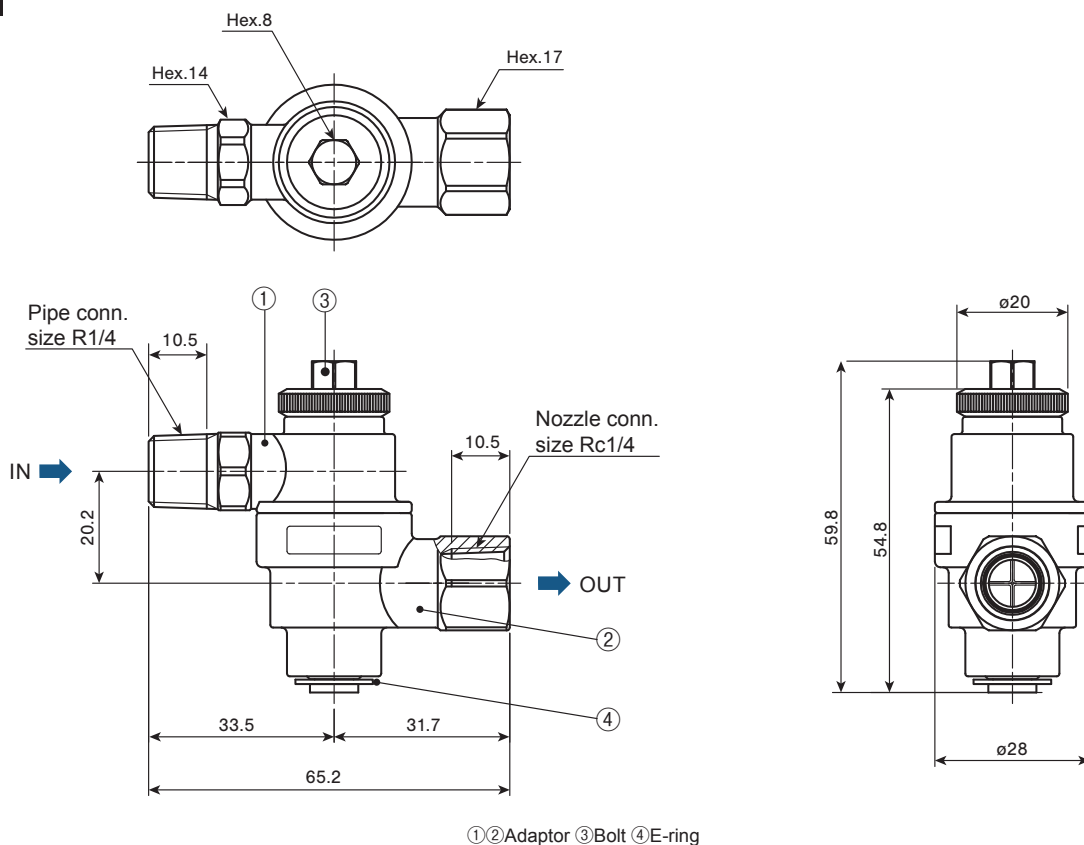


- Able to rotate 360° to adjust the spray direction. Desired position can be locked in place with bolt.
- Stabilizing function suppresses internal turbulences.
- Withstands pressures of up to 3.0 MPa.
- Safe design prevents parts from falling off when the lock is released.
- R1/4 threaded nozzle is attachable.

Material	<ul style="list-style-type: none"> • Adaptor: SCS13 • Bolt: S303 • E-ring: S304 equivalent • O-ring: NBR
Weight	<ul style="list-style-type: none"> • 146 g

DRAWING

Unit: mm



- ⚠ Cautions for use**
- Hand tightened bolts may loosen if there is a lot of vibration. Tighten with a torque-wrench to 6 N-m.
 - Max. operating pressure: 3.0 MPa
 - Max. temperature: 90°C
 - When used with a solid stream jet nozzle, slightly turbulent flow occurs.

HOW TO ORDER

Please inquire or order using this product code.

WUT 1/4M × 1/4F SCS13

Pipe connection size* Nozzle connection size* Material

*"M" indicates male thread ("R" of the ISO standard) and "F" indicates female thread ("Rc" of the ISO standard), e.g. 1/4M = R1/4, 1/4F = Rc1/4.

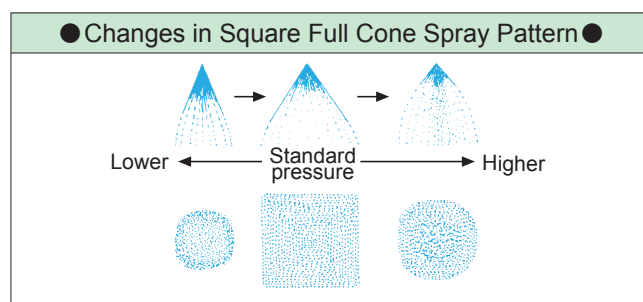
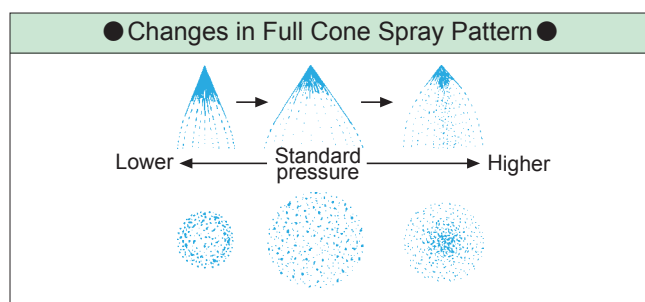
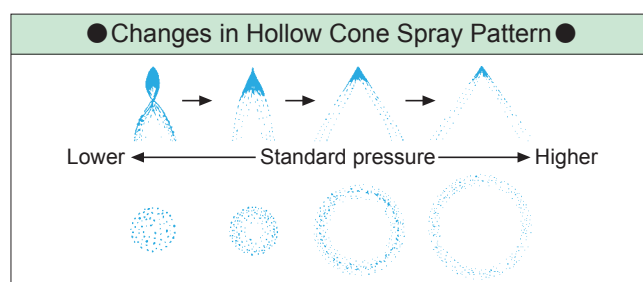
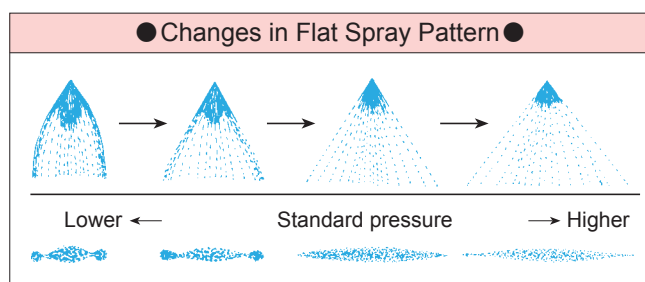
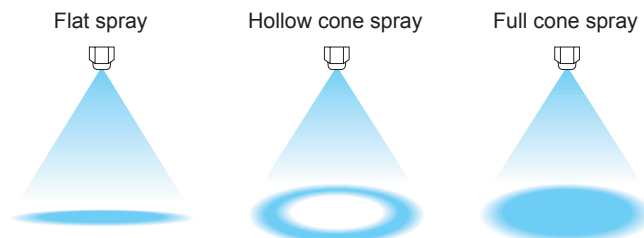
Technical Data for Nozzles

Spray Performance to Consider

Changes in Spray Pattern According to Water Pressure

The spray pattern describes the cross sectional shape of the spray. By selecting the spray pattern most suitable for the particular application the most efficient spray performance will be achieved.

The spray pattern changes with the gradual increase in spray pressure.



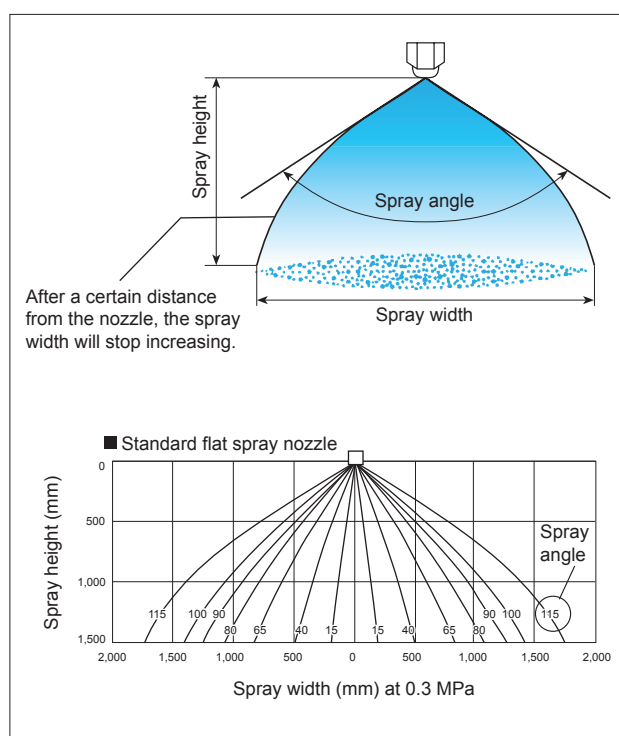
Spray Angle and Width

The spray angle is the angle of spray measured near the nozzle orifice.

The table below shows the calculated spray width, based on the spray angle.

The spray width varies depending on the spray height. As the spray goes farther from the nozzle, the droplets gradually lose momentum and the covered area will not continue to increase at a certain distance from the nozzle orifice.

Be aware that the actual spray width is smaller than the calculated values. This needs to be considered when designing a nozzle layout.



		Calculated values of spray width (mm)												
Spray angle		150°	140°	130°	115°	100°	90°	80°	65°	50°	40°	25°	15°	12°
Spray height (mm)	10	74.6	54.9	42.9	31.4	23.8	20	16.8	12.7	9.3	7.3	4.4	2.6	2.1
	20	149	110	85.8	62.8	47.7	40	33.6	25.5	18.7	14.6	8.9	5.3	4.2
	50	373	275	214	157	119	100	83.9	63.7	46.6	36.4	22.2	13.2	10.5
	70	522	385	300	220	167	140	117	89.2	65.3	51.0	31.0	18.4	14.7
	100	746	549	429	314	238	200	168	127	93.3	72.8	44.3	26.3	21.0
	150	1,120	824	643	471	358	300	252	191	140	109	66.5	39.5	31.5
	200	1,492	1,099	858	628	477	400	336	255	187	146	88.7	52.7	42.0
	250	1,866	1,374	1,072	785	596	500	420	319	233	182	111	65.8	52.6

Technical Data for Nozzles

■ Calculating Spray Capacity

Spray Capacity vs. Liquid Density

The spray capacities listed in this catalog are based on tap water at room temperature.
The spray capacity changes depending on the liquid density.

In general, the spray capacity increases when either the liquid density decreases or the spray pressure increases.

The spray capacity is inversely proportional to the square root of the liquid density.

To determine the spray capacity of a liquid having density (γ), multiply the spray capacity value shown in our catalog by $\frac{1}{\sqrt{\gamma}}$.

Spray Capacity vs. Liquid Pressure

The spray capacity increases and decreases proportionally to the square root of the liquid pressure.

If the spray capacity (Q_x) at a certain pressure (P_x) is not listed in the catalog, an approximate value can be calculated by using the following equation:

$$Q_x = Q \sqrt{\frac{P_x}{P}}$$

P: Known pressure

Q: Spray capacity at the pressure of P (see the catalog table)

P_x : Pressure to be applied

Q_x : Expected spray capacity (approximate value)

Example:

Calculate spray capacity for the capacity code 20 at a pressure of 0.4 MPa.

Spray capacity code	Spray angle (°)		Spray capacity (L/min)					
	0.3 MPa	0.7 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	0.9 MPa	1.1 MPa
20	80	96	1.63	2.00	2.58	3.06	3.54	4.02
40	80	83	3.27	4.00	5.16	6.11	7.07	8.04
60	80	83	4.90	6.00	7.75	9.17	10.60	12.02

Enter 0.3 MPa* as P and 2.00 L/min as Q.
(*Select the value nearest to P_x from the catalog table as P)

$$Q_x = 2.00 \times \sqrt{\frac{0.4}{0.3}} \approx 2.31 \text{ L/min}$$

■ Changes in Spray Distribution

Spray distribution is defined as the distribution of the spray flow in the direction of spray width.

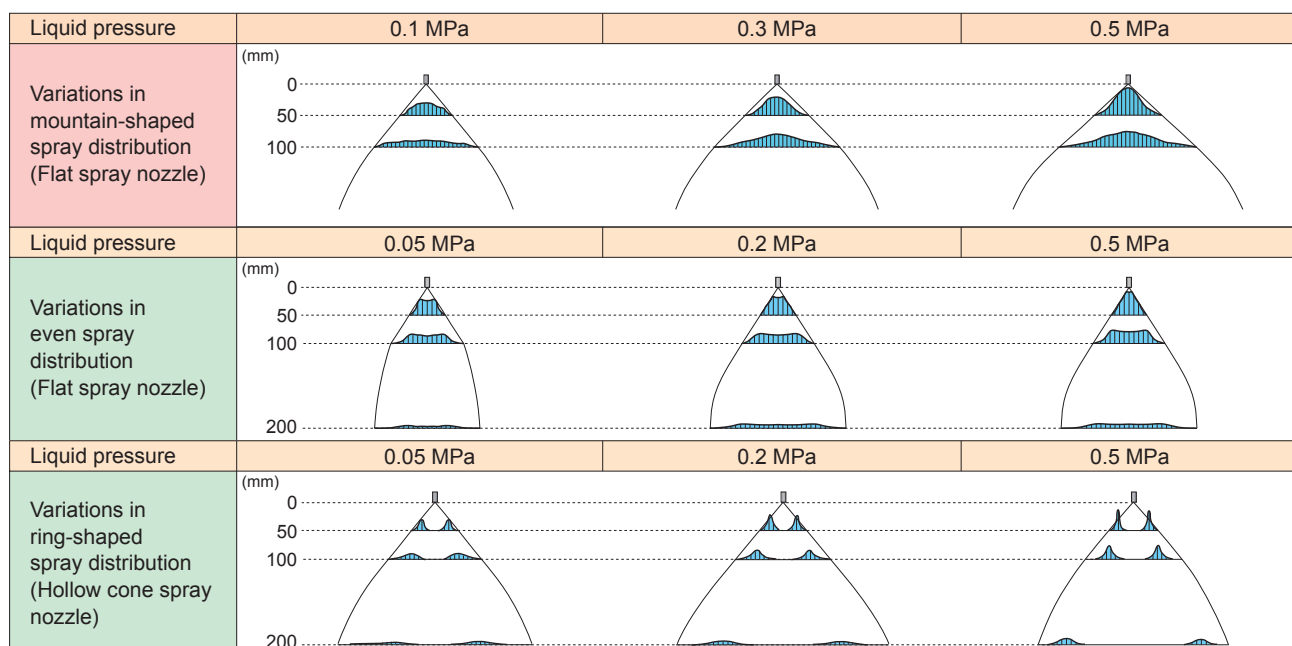
The spray distribution varies depending on the spray height and pressure.



Ring-shaped distribution



Even distribution

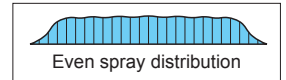
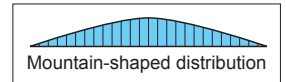


■ Spray Distribution in a Multi-nozzle Arrangement

The characteristics of the spray distribution differ depending on the type of flat spray nozzle.

A mountain-shaped spray distribution is strong in the center and gradually tapers and weakens towards the edges. It is useful in producing a uniform spray distribution across the entire spray width in a multi-nozzle arrangement by overlaying patterns, but the spray impact is not distributed evenly.

On the other hand, an even spray distribution, produced by an even flat spray nozzle, provides a spray flow rate and impact that is distributed evenly across the entire spray width. This distribution is suitable for cleaning when the cleaning power should be distributed evenly across the entire spray width with a single nozzle.

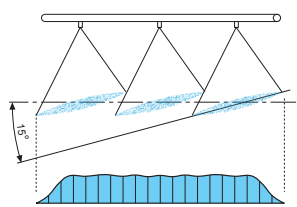


Standard Flat Spray Nozzle (Mountain-shaped Distribution)

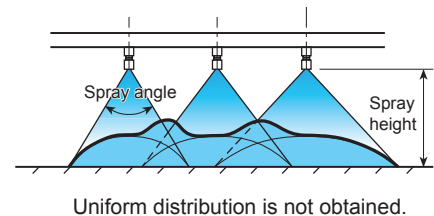
IKEUCHI's standard flat spray nozzles are designed to produce a mountain-shaped distribution in order to obtain a uniform spray distribution in a multi-nozzle arrangement. Spray distribution depends on the spray height, nozzle spacing, liquid pressure and nature, as well as the quality of the nozzles. It is not possible to achieve a uniform spray distribution if the individual nozzles have variations in product quality (see Fig. A).

IKEUCHI guarantees their spray nozzle for spray angle and spray capacity, which makes uniform distribution possible as designed (see Fig. B).

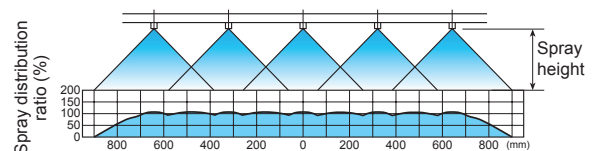
In a multi-nozzle set-up a more even spray distribution can be obtained by arranging the nozzles with an offset angle. This will avoid interferences where sprays would overlap.



(A) Spray distribution of nozzles with no quality guarantee



(B) Spray distribution of IKEUCHI nozzles with quality guarantee



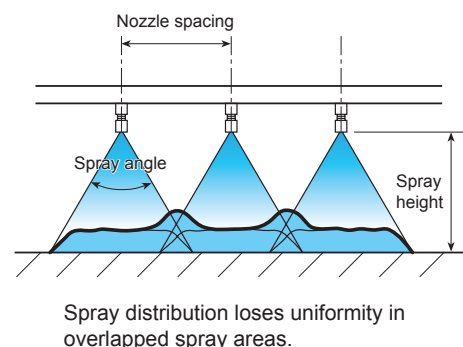
When using nozzles with a spray performance guarantee, uniform distribution can be obtained by overlapping mountain-shaped distribution.

Even Flat Spray Nozzle

These nozzles are designed to produce an even spray distribution with an even cleaning power across the width of the spray.

Please note that using even flat spray nozzles in multi-nozzle arrangements will not create a uniform spray distribution (see Fig. C).

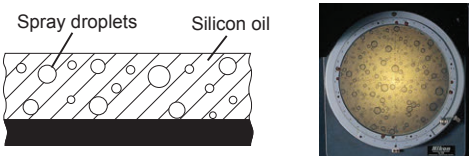
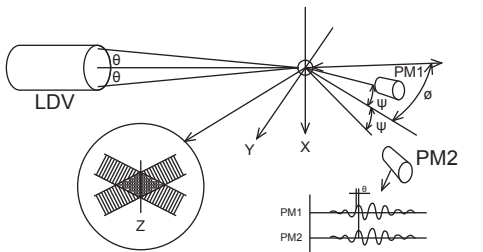
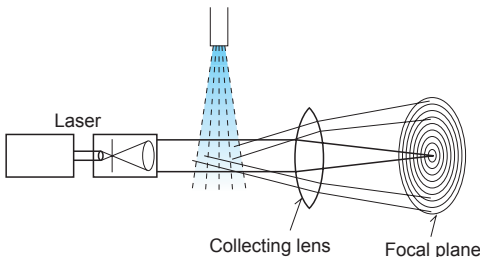
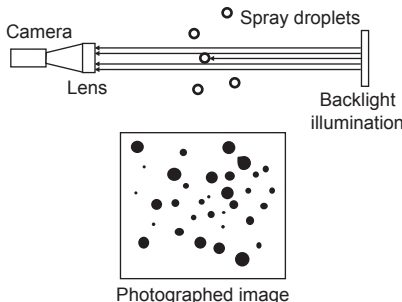
(C) Multi-nozzle arrangement using even flat spray nozzles



Technical Data for Nozzles

Methods to Measure Spray Droplet Diameter

We use the immersion sampling method and the laser analyzer method to measure spray droplet size. The values shown for spray droplet diameters in this catalog are measured with the immersion sampling method.

Measuring method		Range of measured droplet size
Principle and features		
Immersion Sampling Method		
<p>Droplets are collected on a glass plate coated with silicon oil and a magnified photo is taken immediately for subsequent scanning. The collected droplets remain suspended as perfect circles.</p> <p>However, ultra-fine droplets are unable to break the surface tension of the oil and evaporate. This results in an average droplet size larger than the actual value.</p>		10–5,000 μm
Laser Analyzer		
1. Laser Doppler Method		
<p>This method forms an interference fringe by crossing two laser beams. In detail, this method detects scattered light, which results from droplets having passed through this interference fringe, by two or more receivers located at a certain distance from the spray and determines droplet size from the phase difference at that time.</p> <p>This method is not as affected by droplet concentration because it measures droplets one by one and, as one more advantage, it can measure droplet velocity simultaneously.</p> <p>However, measurement is made only at a single point in the spray.</p>	 <p>(LDV: Laser Doppler Velocimeter PM: Phase monitor)</p>	0.5–2,500 μm
2. Fraunhofer Diffraction Method		
<p>A laser beam scatters at the surface of droplets in the laser beam path and the diffraction pattern due to interference of scattered light is focused behind the droplets.</p> <p>This method can simultaneously measure all droplets on the laser beam path but if the concentration of droplets is too high, it would result in a multi-scatter, meaning that a once-scattered laser beam is re-scattered due to another droplet, which could then cause the measured droplet size to be smaller than the actual droplet size.</p>		1–1,000 μm
Shadowgraph Method		
<p>Backlight illuminated shadows of droplets in various sizes are photographed and converted to circular shapes, from which the droplet diameters are calculated.</p> <p>This method enables the measurement of non-spherical coarse droplets that cannot be measured by the laser analyzer.</p> <p>On the other hand, it is not suitable for measuring fine droplets due to the low magnification of the camera. Also, when the droplets are dense, the overlapped multiple droplets could be measured as a single droplet, thus its droplet size may appear larger than the actual size.</p>		10–8,000 μm

Mean Droplet Diameter

The mean droplet diameter is an important factor in selecting nozzles and designing nozzle-related equipment. It varies depending on the type of spray nozzle, liquid pressure, and spray capacity.

If the spray conditions, such as spray pressure, capacity and angle, are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among hydraulic nozzles.

The smaller the mean droplet diameter, the larger the surface area that contacts air, increasing the contact efficiency and effect on chemical reactions, absorption, adsorption, etc.

Hollow cone spray nozzles are suitable for cooling and purifying gases, humidifying, and chemical reactions.

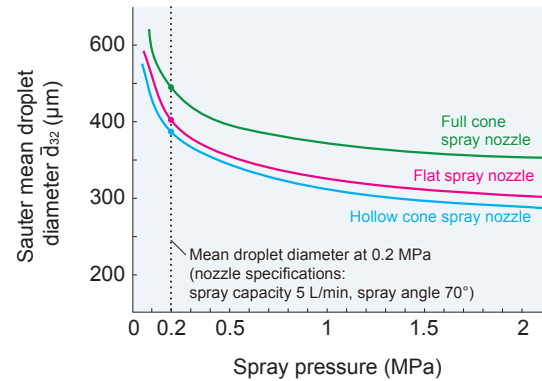
Generally, the following average value models are used for mean droplet sizes:

- Sauter Mean Diameter (\bar{d}_{32}) $\sum nd^3 / \sum nd^2$
- Volume Mean Diameter (\bar{d}_v) $(\sum nd^3 / \sum n)^{1/3}$
- Mass Median Diameter ($D_{v.5}$) $f_{0}^{D_{v.5}} dv/v =$
 $f_{D_{v.5}}^{\infty} dv/v = 50\%$

In chemical processes such as cooling, evaporation, combustion and drying, the surface-to-volume ratio, i.e. specific surface area, is used to determine the efficiency.

Because the rate of reaction is influenced more by a small number of large droplets than a large number of small droplets, it is advisable to use the Sauter Mean Diameter as a representative value for the droplet size.

The Sauter Mean Diameter is used most often and is the one used in this catalog.



Example of calculation of Sauter mean diameter

Range (μm)	Median d (μm)	Quantity n	nd ²	nd ³
0–100	50	1,664	4,160,000	208,000,000
100–200	150	2,072	46,620,000	6,993,000,000
200–300	250	444	27,750,000	6,937,500,000
300–400	350	161	19,722,500	6,902,875,000
400–500	450	73	14,782,500	6,652,125,000
500–600	550	35	10,587,500	5,823,125,000
600–700	650	17	7,182,500	4,668,625,000
700–800	750	4	2,250,000	1,687,500,000
Total		4,470	133,055,000	3.987275×10 ¹⁰

$$\bar{d}_{32} = \frac{\sum nd^3}{\sum nd^2} = 299.6711886 = 300 \mu\text{m}$$

Correlation of Spray Droplet Diameter

Results will differ, depending on the method used to measure. If the Sauter mean droplet diameter measured with the immersion sampling method equals 1, as relative coefficient number, this value will be different when measured with other methods, as shown on the right.

Measuring method Nozzle type	Immersion sampling method	Fraunhofer diffraction method	Laser Doppler method	Shadowgraph method
Hydraulic spray nozzles	1	0.45	0.7–0.9	0.8–0.9
Pneumatic spray nozzles				

Technical Data for Nozzles

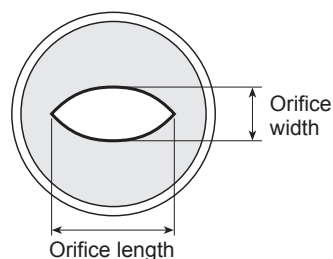
Spray Nozzle Characteristics

Free Passage Diameter and Clog Prevention

The free passage diameter gives the approximate minimum dimension for a liquid to freely pass through a nozzle.

Flat Spray Nozzle

The flat spray nozzle orifice is cat-eye shaped and the free passage diameter is the orifice width multiplied by a safety factor.

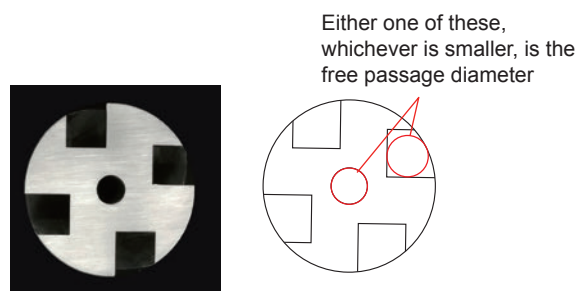


Cone Spray Nozzle

The typical full cone spray nozzle includes a whirler which forms a round spray area with uniform distribution. The smallest dimension of liquid passage in the nozzle depends on the whirler.

The diameter of a sphere that can pass through the whirler is defined as free passage diameter.

For hollow cone spray nozzles without whirler and solid stream spray nozzles, the free passage diameter is either the diameter of the nozzle inlet or of the orifice, whichever is smaller.



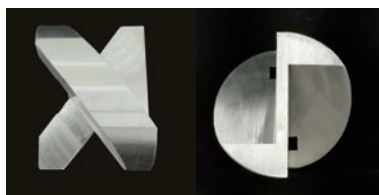
Clog Prevention

The whirler is the bottleneck in the liquid passage and where clogging can occur. There are several types of whirlers such as X-shaped, disc-shaped, and spiral shaped.

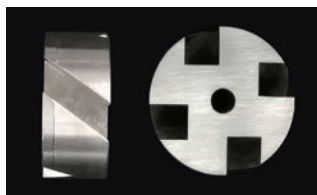
The X-shaped whirler has the largest free passage diameter and therefore has the least risk of clogging.

The hollow cone spray nozzles AAP (p. 58), the TAA series (p. 60), and the full cone spray nozzles AJP series (p. 78) have no whirler or other obstructions in the nozzle interiors and are therefore the most clog-resistant.

X-shaped whirler



Spiral-shaped whirler



Disc whirler

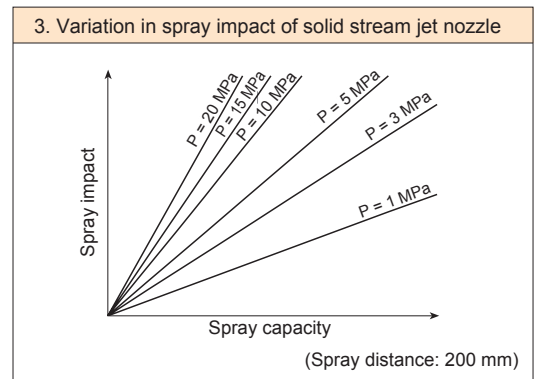
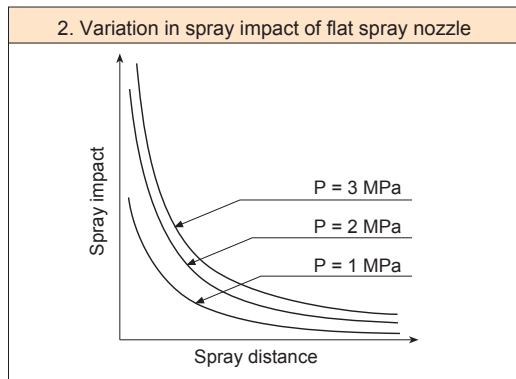
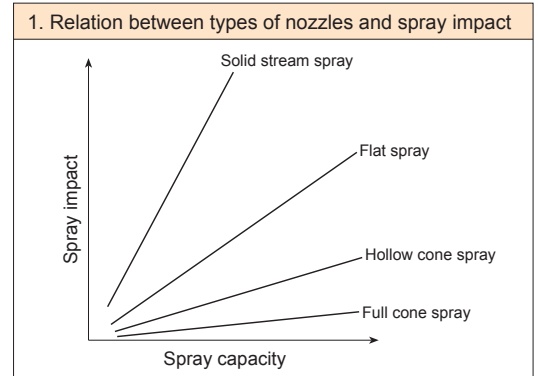


Spray Impact

Spray impact describes the force with which the spray droplets hit the target surface. The stronger the spray impact, the better the cleaning effect.

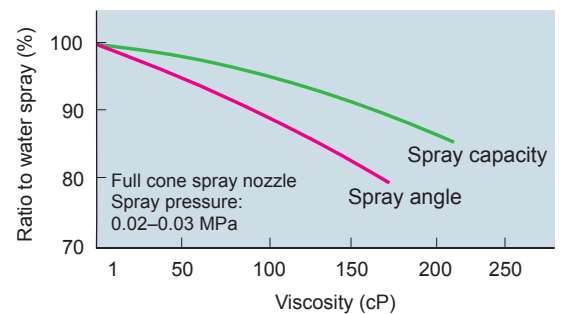
Solid stream jet nozzles have the strongest spray impact (see Fig. 1). The wider the spray angle and the larger the spray area becomes, the weaker the spray impact. The spray impact also decreases as the distance between the nozzle and the object increases (see Fig. 2).

Given the same pressure, the larger the spray capacity the nozzle has, the stronger the spray impact and cleaning effect (see Fig. 3).



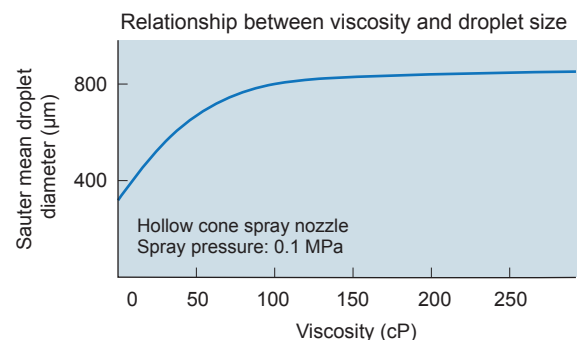
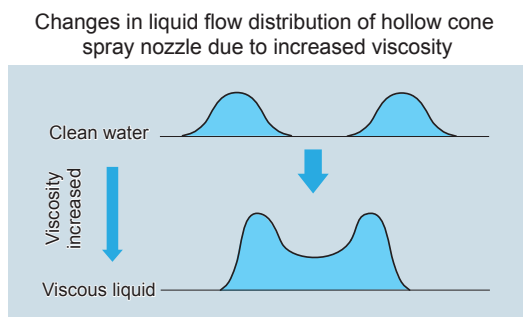
Viscosity

In general, as the liquid viscosity increases, the spray capacity and angle decrease, the spray distribution loses uniformity and the droplet size increases. High liquid viscosity increases the resistance inside the pipe supplying the nozzle, causing a drop in the liquid pressure which also needs to be considered.



Increased viscosity in hollow cone spray nozzles decreases the movement of the whirler, deteriorating the spray distribution. The spray capacity of a hollow cone spray nozzle increases but the spray angle decreases as the viscosity of the liquid increases.

Please contact us for details as the results may differ depending on the nozzle type.



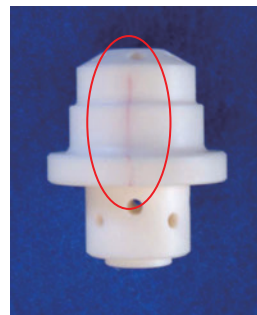
Technical Data for Nozzles

■ Heat Resistance

The temperature a spray nozzle can withstand varies greatly depending on the environmental conditions and the properties of the spray liquid. Please refer to page 7 for the heat resistance of materials. For nozzles including adhesives it is important to also consider the heat resistance of the adhesive.

The ceramic tips of CERJET® will crack if abruptly cooled down from high temperatures (200°C). Alumina ceramics will crack due to temperature changes of 100°C or more.

Nozzles made of special materials are available on request.



Nozzle cracked due to abrupt cooling

■ Pressure Resistance

Each nozzle series is carefully designed to withstand specific pressures. Depending on the operating system, sudden pressure can be three to five times as much as the spray pressure. Consider measures to prevent these sudden pressure increases or surges in water pressure. For high pressure use, metal nozzles are recommended over plastic nozzles.

■ Tightening torque

Cautions for the CERJET® nozzles with ceramic orifice:
Avoid screwing CERJET® nozzles in too tight. Possible nozzle body distortions can cause cracks in the ceramic orifice.
Tighten only to the recommended torque, not exceeding the following values:

8 N-m for size R1/8
15 N-m for size R1/4
(For stainless steel or brass body)

■ Chemical Resistance

When spraying chemicals or using spray nozzles in a corrosive environment, chemical-resistant materials must be used to avoid deterioration of nozzles.

Please refer to page 7 for the chemical resistance of materials.
For nozzles including adhesives, also consider the chemical resistance of the adhesive.

Besides the optional materials, nozzles are available in special materials upon request.

Advantages of Ceramic Nozzle

CERJET® is a metal nozzle with a ceramic orifice. The standard material used for the body is stainless steel 303. The ceramic orifice is highly resistant to wear and chemicals, not damaged by most acids and other highly corrosive chemicals, except hydrofluoric acid and alkali liquids of pH12 and above.

However, the epoxy resin adhesive Araldite® is used for bonding the ceramic orifices into the metal body. For those applications possibly corroding adhesives or metal nozzle bodies, it is recommended to use a CERTIIM® nozzle, an engineered plastic body molded around a ceramic orifice.

■ Wear Resistance

■ Nozzle Wear

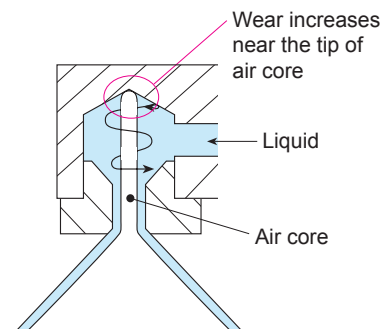
Nozzle tips and orifices are constantly subjected to the flow of high speed liquid exposing them to wear. If the liquid is circulated and re-used, slurry and other dirt particles will enter, wearing tips and orifices out even faster.

Increased wear will narrow the spray angle of a flat spray nozzle and worsen its spray distribution. In high-pressure cleaning, worn nozzles cause the pump pressure to drop and the cleaning effect will rapidly degraded.

In hollow cone spray nozzles an air core is generated in the center of a vortex. This can cause wear at the tip of the air core, especially if the spraying liquid contains slurry or the like. To maintain optimum nozzle performance selecting a wear-resistant material is recommended.



Orifice worn out by slurry



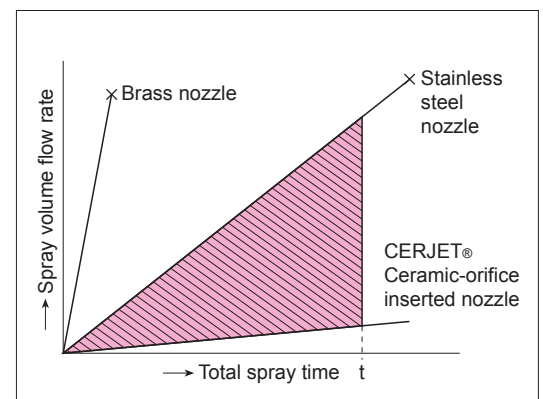
■ Difference in Wear-Resistance by Material

The figure shows the increase in flow for each nozzle due to worn orifices.

The shaded area indicates the excess spray flow from a stainless steel nozzle relative to a CERJET® during the same spray time (t).

The ceramic orifice of CERJET® spray nozzle has an outstanding wear-resistance, with a hardness of 7 on the Mohs scale. It can last 20–30 times longer than stainless steel nozzles and several hundred times longer than brass ones.

CERJET® is recommended for applications requiring wear-resistant nozzles, including high-pressure cleaning and for use with liquids containing slurry.

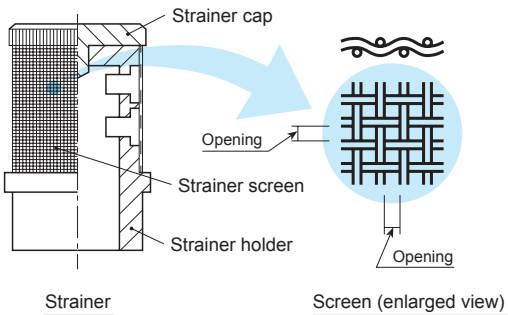


Technical Data for Nozzles

Strainer

Not all nozzles are equipped with strainers, some nozzles have the option of adding a strainer.
Strainer usually includes a strainer holder, a strainer screen, and a strainer cap.
When ordering a strainer be sure to select an appropriate mesh size according to the free passage diameter of the nozzle.

Strainer screen		Free passage diameter of nozzle (mm)
Mesh size	Opening (mm)	
#200	0.07	Less than 0.3
#150	0.10	0.3 to under 0.5
#100	0.15	0.5 to under 0.8
#50	0.30	0.8 to under 1.0



Nozzle Reaction Force

When spraying high-pressure water, a reaction force acts in the direction opposite to the direction of spray.
To calculate the approximate reaction force (F) use the following equation.

$$F = 0.745 \cdot Q \cdot \sqrt{P}$$

F: Reaction force (N)
Q: Spray capacity (L/min)
P: Spray pressure (MPa)

Rotation Reaction Force

In a full cone spray nozzle with whirler, a rotation torque (T) is generated as a reaction force to the vortex current produced by the whirler.

Rotation torque acts in the same direction as tightening the nozzle.

The rotation torque (T) can be calculated with 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 diameter of whirler (mm)
P: Spray pressure (MPa)

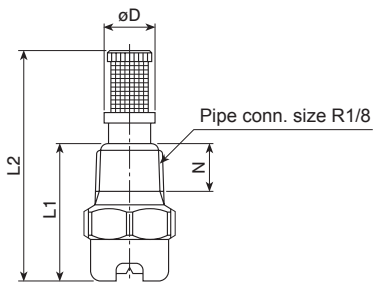
Diagonal Dimension Calculation

To calculate the approximate diagonal dimension of a hexagon, multiply the width across flats by 1.16.

Example:

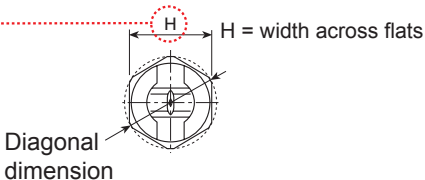
In the figure on the right, the dimension H is 12 mm, so the diagonal dimension would be 13.92 (12 × 1.16 = 13.92).

Example: Drawing of VVP series



Dimensions of VVP series

Dimensions (mm)				
L1	L2	H	øD	N
18.5	31	12	7.5	6.5



■ Reference Data

■ Conversion of Units

Length	μm	mm	cm	m	in	ft
	1	1×10 ³	1×10 ⁻⁴	1×10 ⁻⁶	3.94×10 ⁻⁵	3.28×10 ⁻⁶
	1×10 ³	1	0.1	1×10 ⁻³	3.94×10 ⁻²	3.28×10 ⁻³
	1×10 ⁴	10	1	1×10 ⁻²	3.94×10 ⁻¹	3.28×10 ⁻²
	1×10 ⁶	1×10 ³	100	1	3.94×10	3.28
	2.54×10 ⁴	25.4	2.54	2.54×10 ⁻²	1	8.33×10 ⁻²
	3.05×10 ⁵	3.05×10 ²	3.05×10	3.05×10 ⁻¹	12	1

Area	cm ²	m ²	in ²	ft ²
	1	1×10 ⁻⁴	0.155	1.08×10 ⁻³
	1×10 ⁴	1	1.55×10 ³	10.8
	6.45	6.45×10 ⁻⁴	1	6.94×10 ⁻³
	9.30×10 ²	9.30×10 ⁻²	1.44×10 ²	1

Volume	cm ³	L (Liter)	m ³ (kL)	ft ³	imperial gal.	U.S. gal.
	1	1×10 ⁻³	1×10 ⁻⁶	3.53×10 ⁻⁵	2.2×10 ⁻⁴	2.64×10 ⁻⁴
	1×10 ³	1	1×10 ⁻³	3.53×10 ⁻²	0.220	0.264
	1×10 ⁶	1×10 ³	1	353	220	264
	2.83×10 ⁴	28.3	2.83×10 ⁻²	1	6.23	7.48
	4.55×10 ³	4.55	4.55×10 ⁻³	0.16	1	1.2
	3.79×10 ³	3.79	3.79×10 ⁻³	0.134	0.833	1

Pressure	MPa	bar	kg/cm ²	psi (lb/in ²)	atm	mmHg	mmH ₂ O (mmAq)
	1	10	10.2	145	9.87	7.5×10 ³	1.02×10 ⁵
	0.1	1	1.02	14.5	0.987	750	1.02×10 ⁴
	0.098	0.981	1	14.2	0.968	736	1×10 ⁴
	6.89×10 ⁻³	0.069	0.070	1	0.068	51.7	703
	0.101	1.01	1.03	14.7	1	760	1.03×10 ⁴
	1.33×10 ⁻⁴	1.33×10 ⁻³	1.36×10 ⁻³	0.019	1.32×10 ⁻³	1	13.6
	9.81×10 ⁻⁶	9.81×10 ⁻⁵	1×10 ⁻⁴	1.42×10 ⁻³	9.68×10 ⁻⁵	0.074	1

Flow rate	L/min	m ³ /min	m ³ /hr	in ³ /hr	ft ³ /hr	Imperial gal./min	U.S. gal./min
	1	1×10 ⁻³	0.06	3.66×10 ³	2.12	0.22	0.264
	1×10 ³	1	60	3.66×10 ⁶	2.12×10 ³	220	264
	16.7	0.017	1	6.10×10 ⁴	35.3	3.67	4.40
	2.73×10 ⁻⁴	2.7×10 ⁻⁷	1.64×10 ⁻⁵	1	5.79×10 ⁻⁴	6.01×10 ⁻⁵	7.22×10 ⁻⁵
	0.472	4.72×10 ⁻⁴	0.028	1.73×10 ³	1	0.104	0.125
	4.55	4.55×10 ⁻³	0.273	1.66×10 ⁴	9.63	1	1.20
	3.79	3.79×10 ⁻³	0.227	1.39×10 ⁴	8.02	0.833	1

■ Others

Viscosity	1 P = 100 cP 1 St = 100 cSt
Weight	1 kg ≈ 2.21 lb 1 lb ≈ 0.454 kg
Temperature	[°F] ≈ ([°C] × 9/5) + 32 [°C] ≈ 5/9 ([°F] - 32)

■ Water flow rate and proper pipe size

Nominal size		Steel pipe		Flow rate (L/min) when pressure loss is 0.01–0.03 MPa per pipe length of 10 m
A	B	Inside dia. (mm)	Outside dia. (mm)	
6A	1/8B	6.5	10.5	1.3–2.2
8A	1/4B	9.2	13.8	3–5.2
10A	3/8B	12.7	17.3	7–12
15A	1/2B	16.1	21.7	12–21
20A	3/4B	21.6	27.2	22–38
25A	1B	27.6	34.0	38–65
32A	1 1/4B	35.7	42.7	70–120
40A	1 1/2B	41.6	48.6	120–210
50A	2B	52.9	60.5	215–370
65A	2 1/2B	67.9	76.3	410–700
80A	3B	80.7	89.1	680–1,200
100A	4B	105.3	114.3	1,200–2,100
125A	5B	130.8	139.8	2,100–3,600
150A	6B	155.2	165.2	3,300–5,700

■ How to Use the CAD Data Website

Some products have 3D/2D CAD data available for download from the website. Feel free to explore this service. The following is a brief introduction on the use of the CAD data website.

Free account registration is necessary to download data and update previews.

1. Jump to the Website and Search the Series

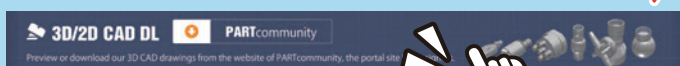
Via Smartphone

Scan the 2D code on the right.



Via PC

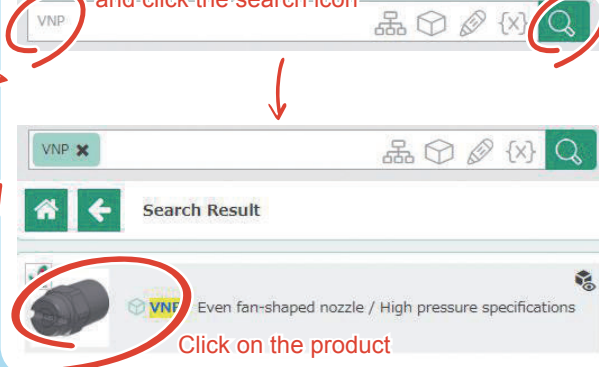
Access it through the download page of IKEUCHI's website.
<https://www.kirinoikeuchi.co.jp/eng/download/>



Click on the banner!



Enter the specific nozzle series in the box
and click the search icon



Click on the product

2. Choose Product Specifications

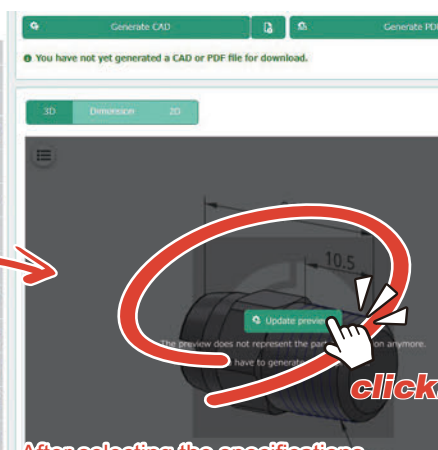
The product page will be displayed.

Select specifications such as thread size, spray angle/capacity code, material, then update the preview.

Selectable products: 1

Company	IKEUCHI
Description	VNP - Even fan-shaped nozzle / High pressure specifications
Bill of material	1/8MVP2599BR-S303
CNSORDERNO	1/8MVP2599BR-S303
Order number	
SERIES	VNP
Series	
PCS	1/8
Pipe outer size	
CJA	25
Classification of jet angle	
SCC	99
Spray capacity code	
MM	S303
Main material	
L1	16.5
Dimension	mm
H	12
Dimension	mm
N	7.0
Dimension	mm
MA	7
Material	9

The yellow boxes offer different
options in the drop-down menus



After selecting the specifications,
click here to update the preview

3. Generate and Download CAD data

Select the file format for the CAD data in the **Generate CAD** section.
After setting the format, download the data.





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