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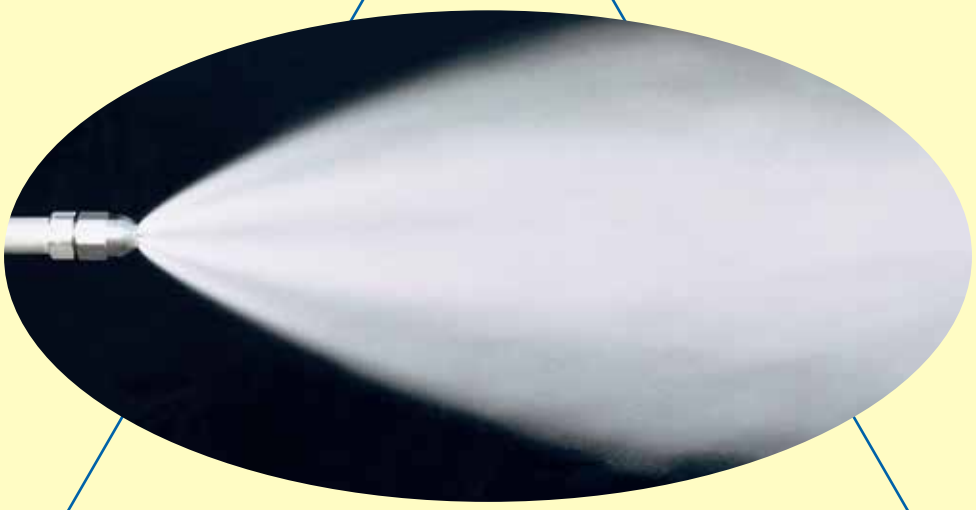
IKEUCHI

Catalog on Pneumatic Spray Nozzles



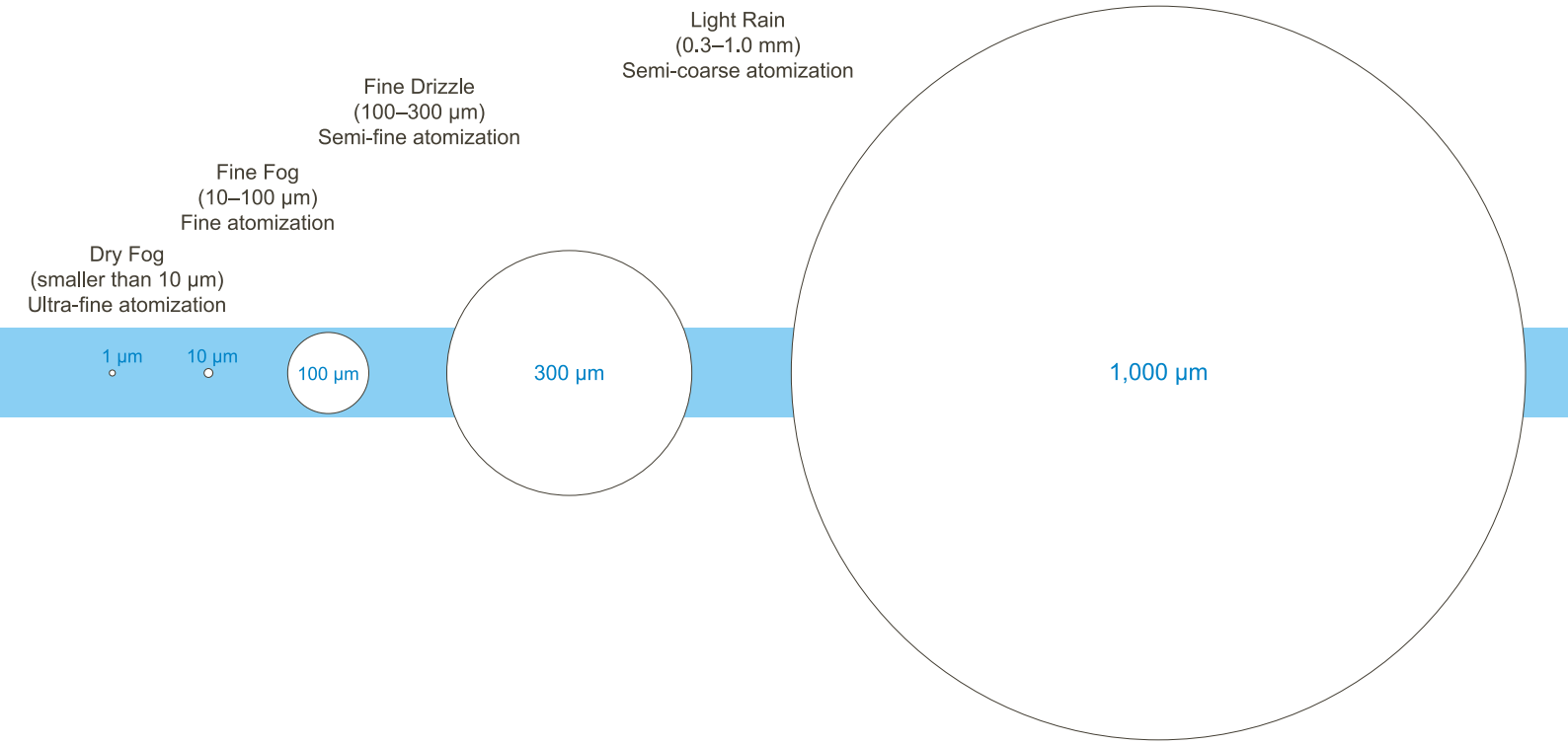
"The Fog Engineers"

H. IKEUCHI & CO., LTD.

18PA

Classification of Spray Droplet Size

There are many opinions on the classification of spray droplet sizes, but IKEUCHI, "The Fog Engineers", have classified them as below.



Rain–Storms
(Over 1.0 mm)
Coarse atomization

4,000 µm

CONTENTS

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

What are Pneumatic Spray Nozzles? (before selection)

The pneumatic spray nozzle utilizes a high-velocity flow of compressed air and has the following features as compared with hydraulic spray nozzles.

【Features】

1. Excellent atomizing performance

The minimum average droplet size produced by hydraulic spray nozzles is around 50 μm*1 but pneumatic spray nozzles can generate average droplet sizes smaller than 10 μm.*1

2. Large turn-down ratio

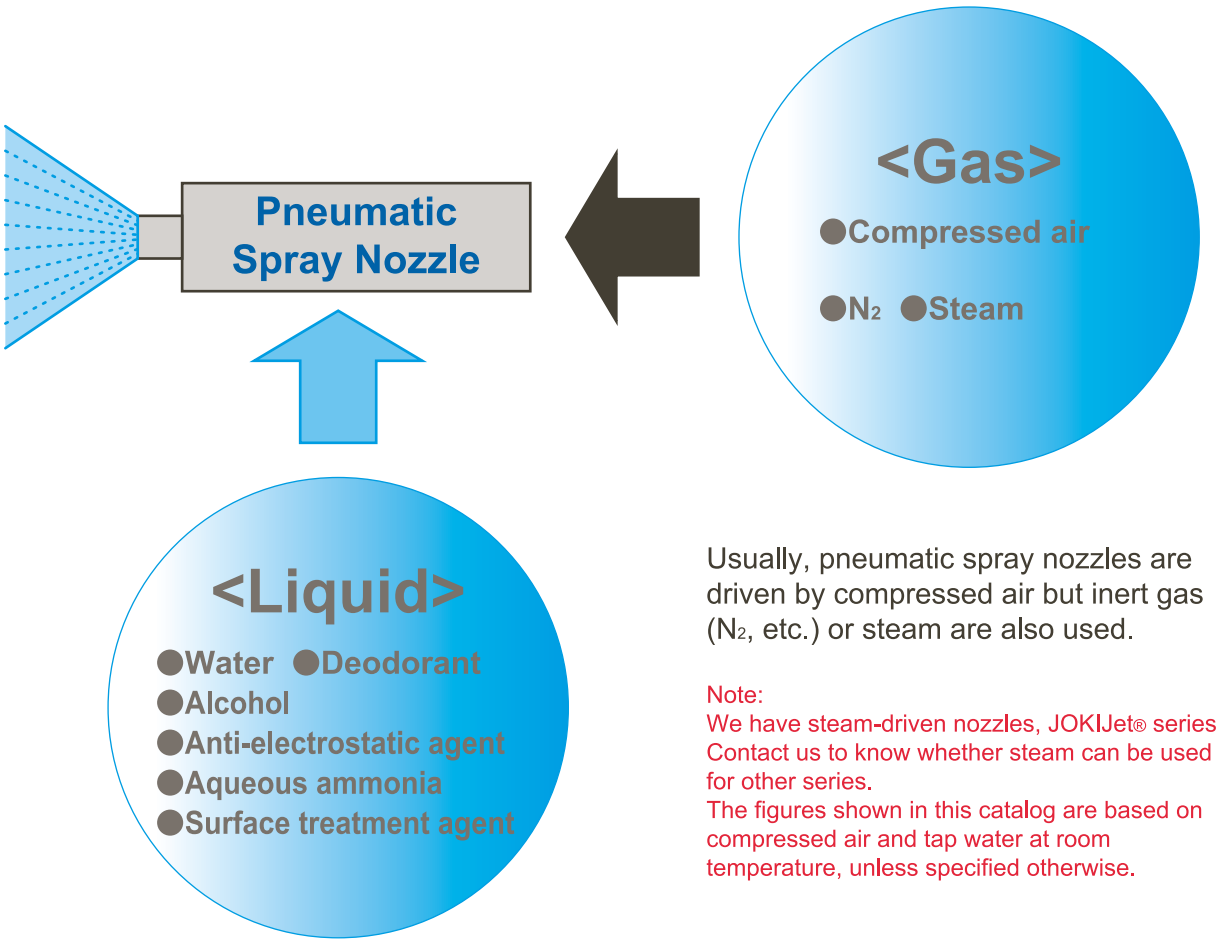
Pneumatic spray nozzles have large turn-down ratios of spray flow-rate*2 with little variation in droplet size and spray distribution, which makes them ideal for spray flow adjustable nozzles.

3. Large free passage diameter

Pneumatic spray nozzles have larger free passage diameters as compared with hydraulic spray nozzles, which is effective for reducing clogging problems.

*1) Droplet sizes measured by immersion sampling method (see page 6 for the droplet measuring method).
*2) Spray flow rate is expressed as spray capacity in this catalog. Please see page 8 for the turn-down ratio.

**Various types of pneumatic spray nozzles are available.
Please read technical information on the following pages and select optimal spray nozzles that meet your specific purpose.**

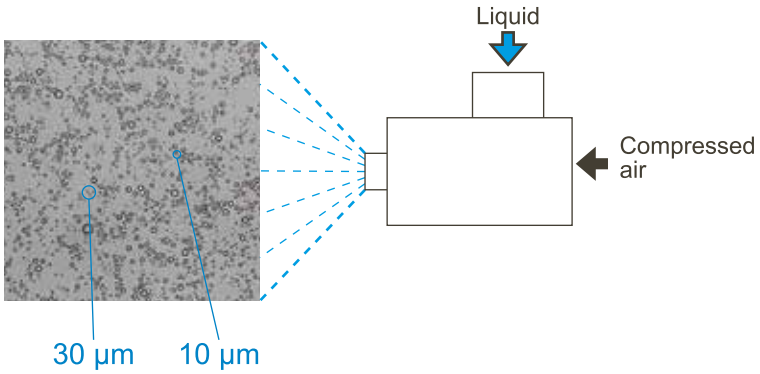


Usually, pneumatic spray nozzles are driven by compressed air but inert gas (N_2, etc.) or steam are also used.

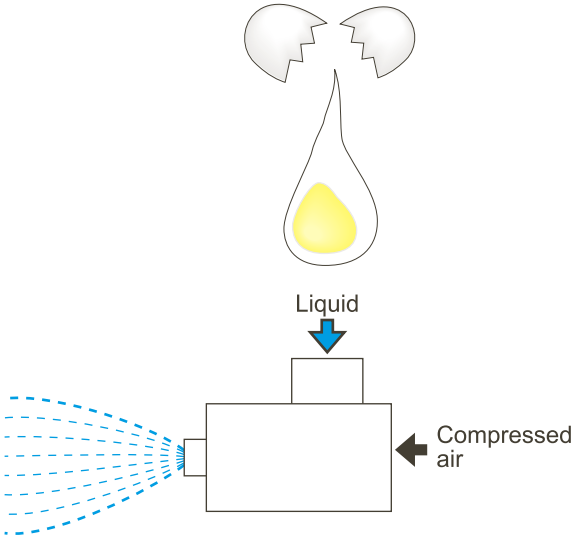
Note:
We have steam-driven nozzles, JOKIJet® series. Contact us to know whether steam can be used for other series.
The figures shown in this catalog are based on compressed air and tap water at room temperature, unless specified otherwise.

【Applications】

Where fine atomization is required···

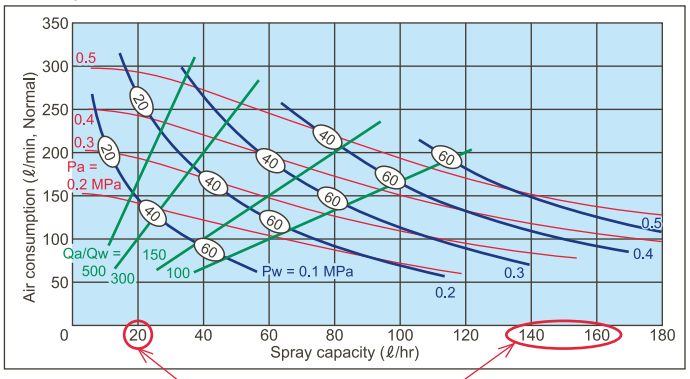


Where viscous liquid is sprayed···



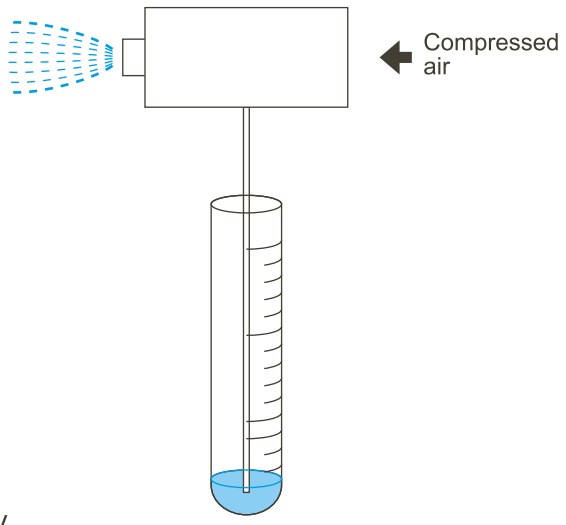
Where a large turn-down ratio is required···

Example: BIMV11022



One spray nozzle can cover a wide range of spray capacity.

Where extremely small spray capacity is required···



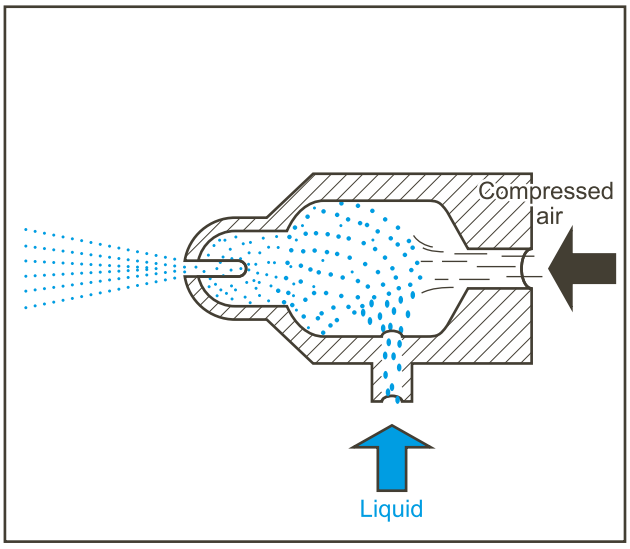
Technical Information on Pneumatic Spray Nozzles

1. Air-liquid mixing systems

Three air-liquid mixing systems are available for atomizing liquid.

Internal mixing type

Compressed air and liquid are mixed inside the nozzle. Generally, this type is excellent for atomizing liquid.



This internal mixing type is further classified into three types.

1. Inner air type

Compressed air flows in the center of the nozzle, while liquid flows along its circumference. This type provides an important benefit with a larger free passage diameter which minimizes clogging.

2. Outer air type

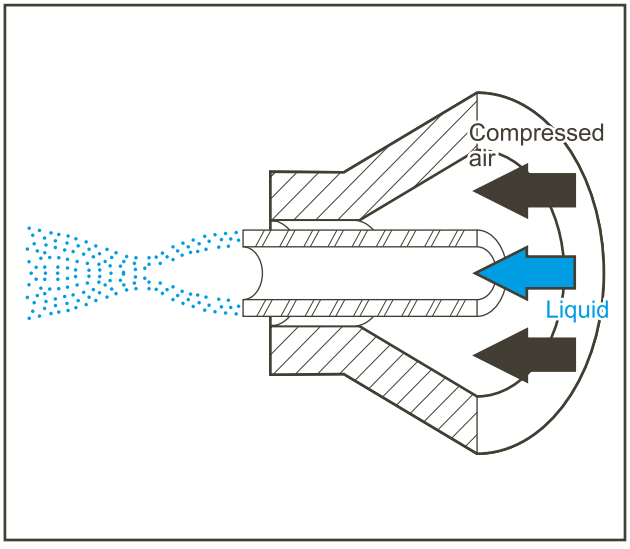
Liquid flows in the center of the nozzle, while compressed air flows along its circumference. This type of nozzle is selected for wide range of applications. Larger orifice size can be designed on demand while the spray droplets become a little coarser.

3. Pre-mix type

Even at a low air-water ratio, the increased velocity of the droplets results in a strong impact force. Furthermore, the turn-down ratio is larger and this type is suitable for cooling objects in high temperature range.

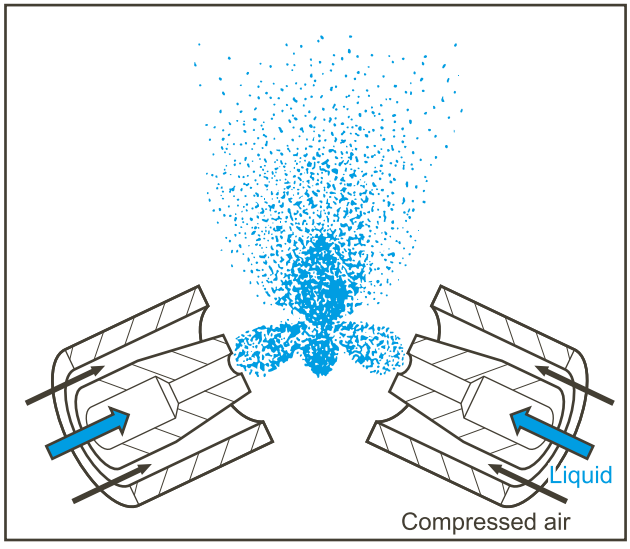
External mixing type

Compressed air and liquid are mixed outside the nozzle. Hence, this type clogs the least. This is also classified into inner air type and outer air type.



Impinging type

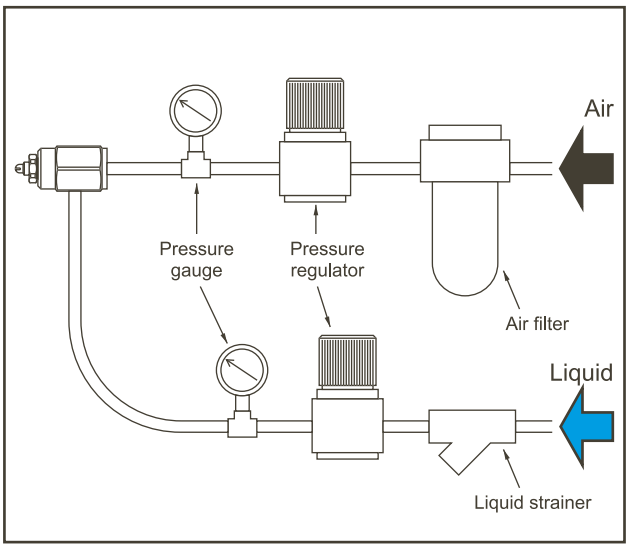
Air-stream entraining fine fog jets out from the nozzle and impinges against another air-stream of the same nature for shattering the fog into even finer, more-uniform droplets. This is an original method of IKEUCHI, "The Fog Engineers."



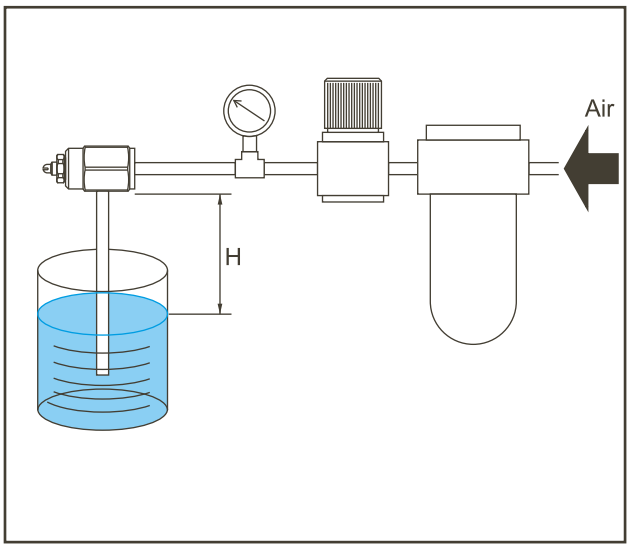
2. Liquid feeding system

Two liquid feeding systems are available.
One is the liquid pressure system (using pressurized liquid) and the other one is the liquid siphon system (using liquid sucked up by compressed air).

Liquid pressure system

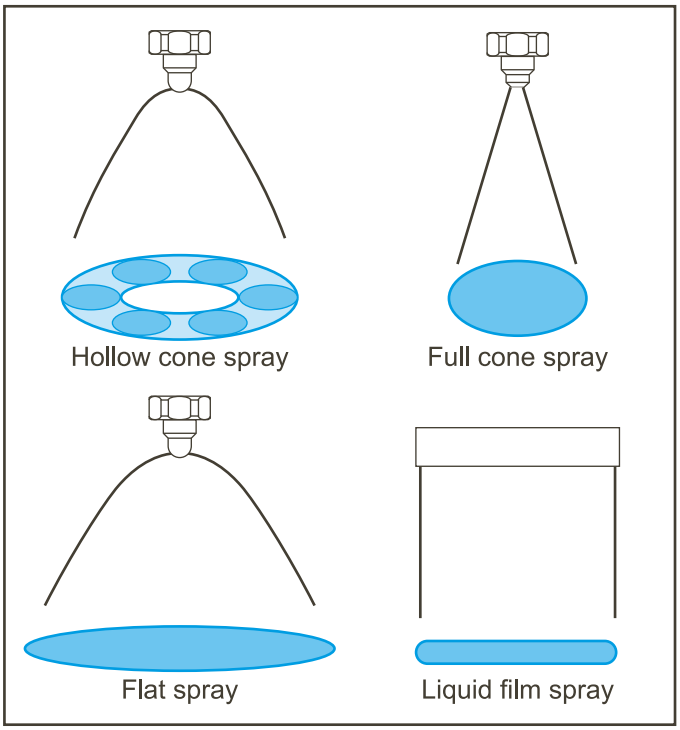


Liquid siphon system



Spray capacity differs depending on liquid siphon height (H).

3. Spray pattern



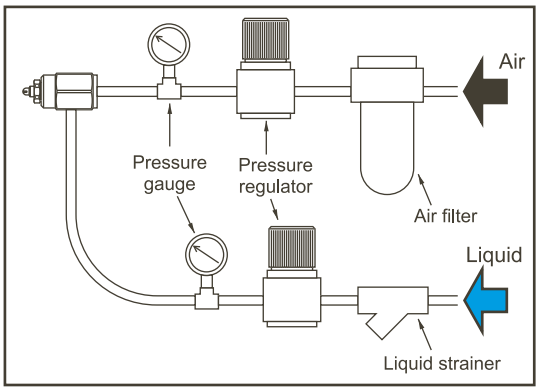
Spray pattern means the cross sectional shape of spray.
As illustrated, spray patterns are available in cone spray (hollow cone spray and full cone spray), flat spray, and liquid film spray.
It is important to select a spray pattern suited for each application, thus, delivering the optimal nozzle performance.

Hollow cone sprays and full cone sprays are suitable for humidification, cooling gases, chemical reactions and moisture control, etc., while flat sprays and liquid film spray are suitable for cooling, coating, etc.

The spray patterns of pneumatic spray nozzles deform significantly as the distance from the nozzle becomes greater.

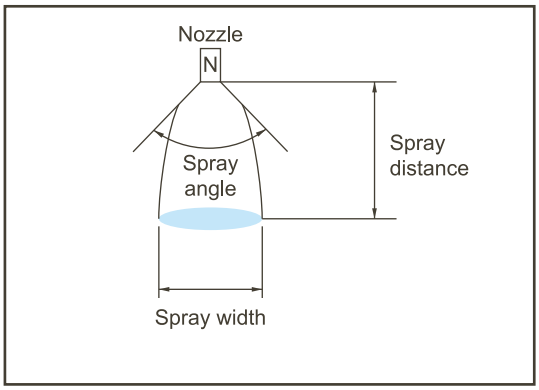
Technical Information on Pneumatic Spray Nozzles

4. Spray pressure



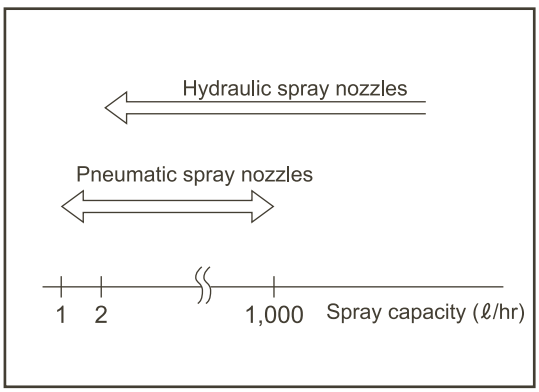
For each series of pneumatic spray nozzles, the most commonly used pressures or pressures at which the characteristics can be achieved are defined as the standard pressures.
The figures in this catalog are based on compressed air and tap water at room temperature and the pressures are measured at the immediate upstream of each nozzle.

5. Spray angle



The spray angle is measured at the top of the spray made by straight lines extending along the outer edges of the spray.
Pneumatic spray nozzle's flow velocity is so fast that the specified spray angle is maintained only at the top of spray.
For nozzle alignment, please refer to the spray width data indicated in each table.

6. Spray capacity

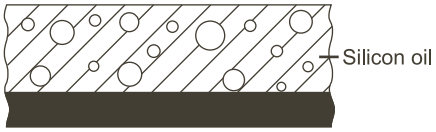
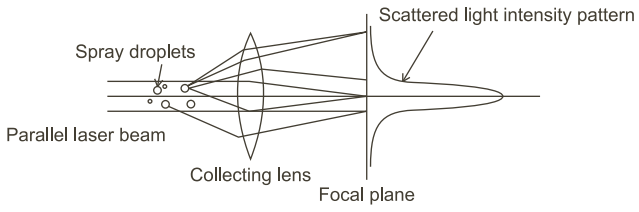
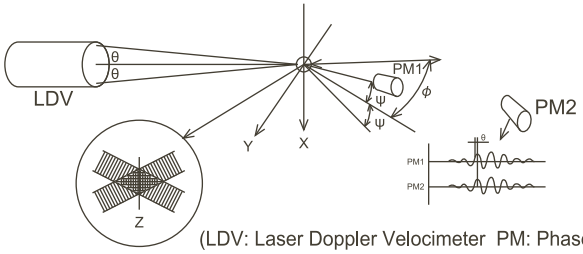


The spray capacity is the water volume flow rate sprayed from the nozzle. One of the features of pneumatic spray nozzle is to spray at extremely small capacity such as 1.7 cc/min. or 0.1 ℓ/hr.
Spray capacities shown in this catalog are based on tap water at room temperature.
(The air consumption is expressed as the normal volume at atmospheric pressure.)

Standard pressure and spray capacity inspection standard (at each standard pressure) are set for each pneumatic spray nozzle series.
Only the nozzles that pass the inspection will be shipped.

7. Spray droplet size

1) Principles and features of each droplet measuring method

Measuring method		Principle and features	Proper range of droplet size measurement
Immersion sampling method		Droplets are collected on a glass plate coated with silicon oil and are immediately photographed at high magnification for subsequent scanning. As the collected droplets remain suspended in the silicon oil, they are measured as perfect spheres. However, ultra-fine droplets are incapable of breaking the surface tension of the oil and will evaporate without settling. Thus, the average droplet size determined by this method is larger than the actual value. 	10–5,000 μm
Laser analyzer	**Fraunhofer diffraction method**	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. 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 phenomenon (multi-scatter) such 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. 	1–1,000 μm
	Laser Doppler method	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. 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. However, the measurement is made only at one point.  (LDV: Laser Doppler Velocimeter PM: Phase monitor)	0.5–2,500 μm

Technical Information on Pneumatic Spray Nozzles

2) Mean droplet diameter

■Example of calculation of Sauter mean droplet diameter

Range (μm)	Mean value (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}

$$\bar{d}_{32} = \frac{\Sigma nd^3}{\Sigma nd^2} = 300\ \mu m$$

Mean droplet diameter is one of the important factors in selecting nozzles and designing nozzle-related equipment. Commonly used definitions include the following three.

●Sauter Mean Droplet Diameter ($\bar{d}_{32}$)·····$\Sigma nd^3/\Sigma nd^2$

●Volume Mean Droplet Diameter ($\bar{d}v$)·····$(\Sigma nd^3/\Sigma n)^{1/3}$

●Mass Median Droplet Diameter ($D_{V.5}$)·····$\int_0^{D_{v.5}} dv/v = \int_{D_{v.5}}^{\infty} dv/v = 50\%$

It is often used in chemical processes such as cooling, evaporation, combustion and drying, where efficiency is determined by the ratio of volume to surface area, i.e. specific surface. Because a small portion of large droplets is more influential over the rate of reaction than a large portion of small droplets, it is advisable to use Sauter Mean Droplet Diameter as the representative droplet size.
Sauter Mean Diameter is used in this catalog.

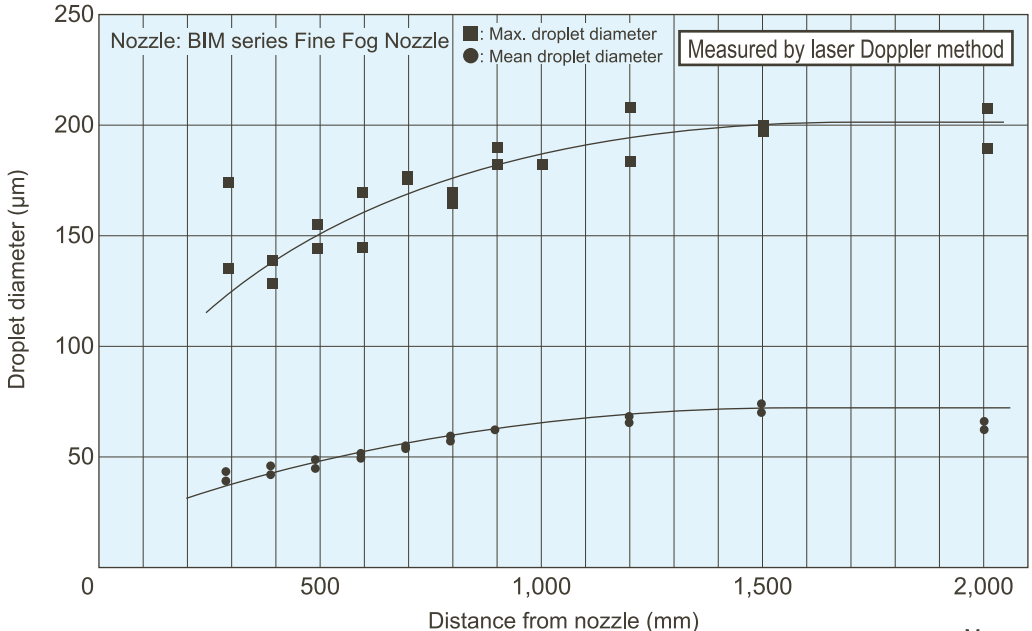
3) Correlation of spray droplet diameter

Measured results differ depending on each measuring method. Assuming the droplet diameter measured by the immersion sampling method as 1, the correlation of Sauter mean droplet diameters among three measuring methods is shown on the right.

Nozzle type \ Measuring method		Immersion sampling method	Fraunhofer diffraction method	Laser Doppler method
Hydraulic spray nozzles	Flat spray, Full cone spray	1	0.45	0.7–0.9
	Hollow cone spray	1	0.45	0.7–0.9
Pneumatic spray nozzles	Fine & semi-fine atomization	1	0.45	0.7–0.9
	Ultra-fine atomization	1	0.45	0.7–0.9

4) Evaluation of droplet diameter

Good care must be exercised in evaluating droplet diameter because droplet diameters differ depending on each measuring method as described above. In comparing spray droplet diameters of several different spray nozzles, needless to say, the measuring method applied must be uniform and, when the laser method is applied, measurement distance, droplet concentration, etc. must also be as consistent as possible.
Too high a concentration would result in multiple scattering in the Fraunhofer laser diffraction and laser Doppler methods, which would then prevent correct evaluation of droplet diameter. Therefore, it is desirable to avoid measuring at proximity of the nozzle and to measure at a standardized distance from the nozzle.

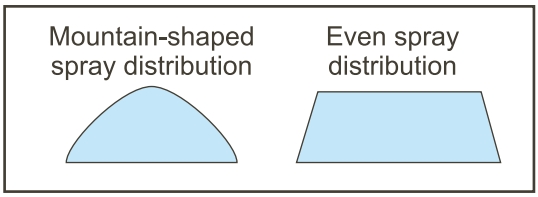


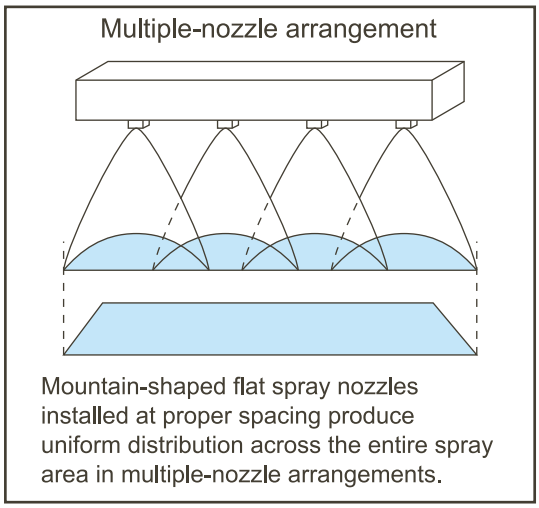
Droplet diameters at various distances from the nozzle

Measured at
Air pressure: 0.49 MPa
Liquid pressure: 0.46 MPa

8. Spray distribution

The spray distribution means the distribution of spray capacity in the spray width direction.
A mountain-shaped distribution is useful in producing uniform spray distribution across the entire spray width by overlapping patterns in multiple-nozzle arrangements, while even spray distribution is suitable for applications that require uniform spray distribution by one nozzle. The spray distribution changes depending on operational conditions such as spray height, pressure, and other conditions.

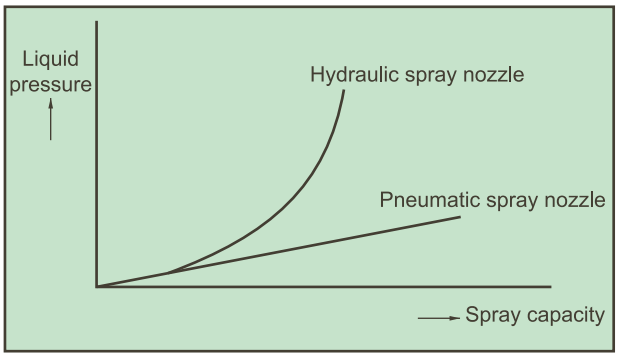




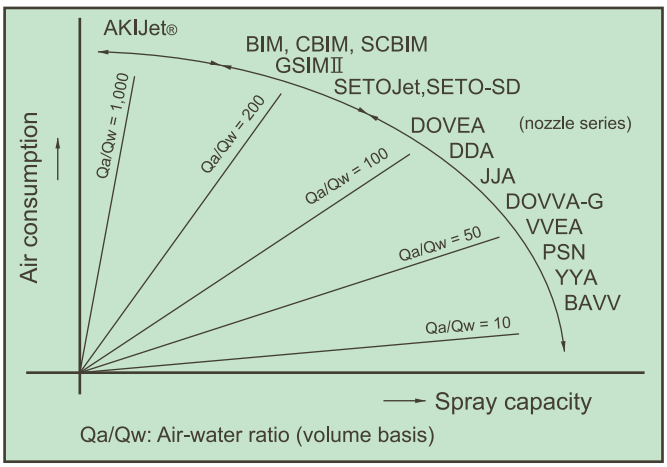
Mountain-shaped flat spray nozzles installed at proper spacing produce uniform distribution across the entire spray area in multiple-nozzle arrangements.

9. Turn-down ratio

The turn-down ratio means the ratio between the adjustable minimum spray capacity and the maximum spray capacity. The spray capacity of hydraulic spray nozzles is proportional to square root of the pressure and the variation of spray capacity greatly depends on the power of pump, so the turn-down ratio is small. On the other hand, pneumatic spray nozzles enable users to obtain large turn-down ratios by adjusting both air and liquid pressures. Hence, pneumatic spray nozzles are the most suitable for cooling combustion gas or applications requiring the nozzles producing small droplets and having large turn-down ratios.



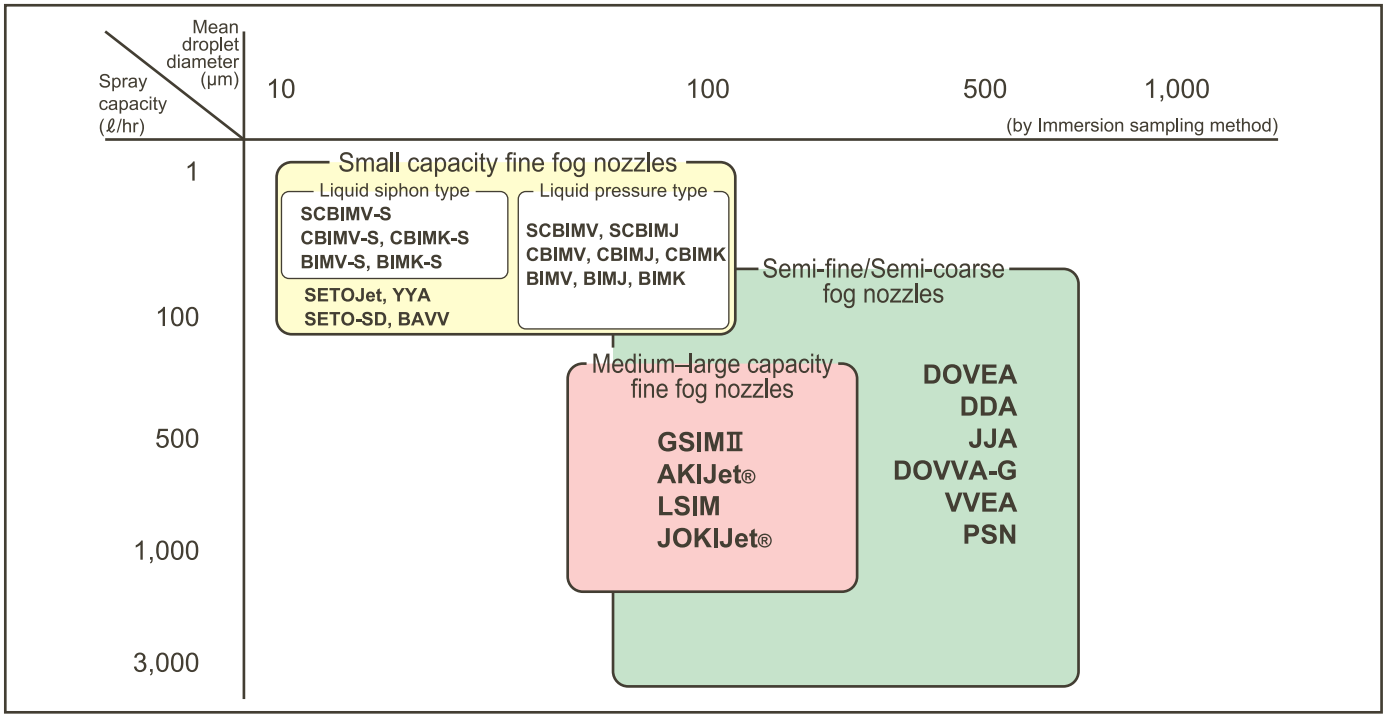
10. Air-water ratio



Air-water ratio means the rate of air consumption divided by spray capacity. This is expressed as either a volume ratio or weight ratio. If the nozzles used are the same, the spray droplet size becomes smaller as the air-water ratio becomes higher.

The air-water ratio in this catalog is based on volume ratio, unless specified otherwise.

How to Select Pneumatic Spray Nozzles



Air type	Nozzle type	Spray pattern	Liquid feeding system	Series	Air-liquid mixing system	Spray capacity	units	Spray angle (°)	Air consumption (ℓ/min, Normal)	Page
Compressed air	Small capacity Fine fog nozzle	Flat spray	Liquid pressure	BIMV, CBIMV, SCBIMV	Internal mixing inner air type	0.25–107	ℓ/hr	110–45	2.6–245	13, 31 35, 38
			Liquid siphon	BIMV-S, CBIMV-S, SCBIMV-S		0.1–4.7		80	3.75–92	15, 33 36, 39
		Hollow cone spray	Liquid pressure	BIMK, CBIMK		2.0–107		60	13–245	17, 32
			Liquid siphon	BIMK-S, CBIMK-S		1.8–4.7		60	27–92	19, 33
		Full cone spray	Liquid pressure	BIMJ, CBIMJ, SCBIMJ		0.25–107		20	2.6–245	21, 32 35, 38
	Medium–large capacity Fine fog nozzle	Full cone spray	Liquid pressure	GSIMⅡ	Internal mixing outer air type	70–1,600		60, 20	340–5,800	43
			Liquid pressure & Liquid siphon	AKIJet®	Impinging type			—		78
			Liquid pressure	AKIJet®-S						80
	Semi-fine/ Semi-coarse fog nozzle	Flat spray	Liquid pressure	VVEA	Internal mixing pre-mix type	0.23–3.5	ℓ/min	80, 60	11–128	63
			Liquid pressure	DOVEA		0.42–40		110–55	30–630	49
			Liquid pressure	DDA		0.14–57.3		125–75	17–610	54
			Liquid pressure	DOVVA-G		1–25		70, 55	100–1,700	60
		Full cone spray	Liquid pressure	JJA		1.1–24		—	70–720	57
		Liquid film spray	Liquid pressure	PSN		8–28		—	520–1,700	66
	Clog-resistant nozzle	Flat spray	Liquid pressure	YYA	External mixing type	2.2–10.0	ℓ/hr	80	27–45	76
			Liquid pressure & Liquid siphon	SETOV	External mixing outer air type	1.7–10.6		65, 55	27–75	72
		Full cone spray	Liquid pressure & Liquid siphon	SETOJet	(07503R-I+SD: Internal mixing outer air type)	2.0–111		—	38–290	69
				SETO-SD		0.9–26.4			36–200	74
Blower air	Ultra-low pressure nozzle	Flat spray	Liquid pressure	BAVV	Internal mixing inner air type	9.0–123	ℓ/hr	60	76–254	84
		Full cone spray	Liquid pressure	LSIM	Internal mixing outer air type	0–1,000	ℓ/hr	20	1,500–6,000	86
Steam	Steam driven nozzle	Full cone spray	Liquid pressure	JOKIJet®	External mixing outer air type	10–1,200	ℓ/hr	—	—	89

Small capacity fine fog nozzle: spray capacity measured at air pressure of 0.3 MPa & liquid pressure of 0.1–0.3 MPa, air consumption at air pressure of 0.2–0.4 MPa
Medium–Large capacity fine fog nozzle: spray capacity measured at air pressure of 0.3 MPa & liquid pressure of 0.2–0.5 MPa, air consumption at air pressure of 0.3–0.4 MPa
Semi-fine/Semi-coarse fog nozzle (except PSN): spray capacity and air consumption measured at air pressure of 0.1–0.4 MPa & liquid pressure of 0.07–0.7 MPa
Semi-fine/Semi-coarse fog nozzle (PSN series): spray capacity and air consumption measured at air & liquid pressure of 0.1–0.4 MPa, slit length 1,000 mm, slit opening 0.05 mm
Clog-resistant nozzle: spray capacity and air consumption measured at air pressure of 0.3 MPa & liquid pressure of 0–0.05 MPa
Ultra-low pressure nozzle (BAVV series): spray capacity measured at liquid pressure of 0.02–0.04 MPa, air consumption at air pressure of 0.02 MPa
Ultra-low pressure nozzle (LSIM series): spray capacity measured at liquid pressure of 0–2 MPa, air consumption at air pressure of 0.02–0.06 MPa
Steam-driven nozzle: spray capacity measured at steam pressure of 0.1–0.6 MPa, liquid pressure of 0.1–0.5 MPa

Note: See the respective pages for spray capacity, spray pressure, and other details for each series.

Spray Nozzle Materials

The standard and optional materials available for nozzles are shown in the material section of each nozzle series, using the material codes listed below.
Listed below are the materials of nozzles and parts, and resistance characteristics of each material against common chemicals. For special applications, please contact us.

Metals

[Material code ····· Material]

S303 ····· Stainless steel 303

S304 ····· Stainless steel 304

S316 ····· Stainless steel 316

S316L ····· Stainless steel 316L

S321 ····· Stainless steel 321

SCS13 ····· Die-cast stainless steel equivalent to S304

SCS14 ····· Die-cast stainless steel equivalent to S316

Plastics

[Material code ····· Material]

PP ····· Polypropylene

PPS ····· Polyphenylene sulfide

HTPVC ····· Heat-treated polyvinyl chloride

PTFE ····· Polytetrafluoroethylene

PE ····· Polyethylene

Rubbers

[Material code ····· Material]

FKM ····· Fluororubber

NBR ····· Nitrile rubber

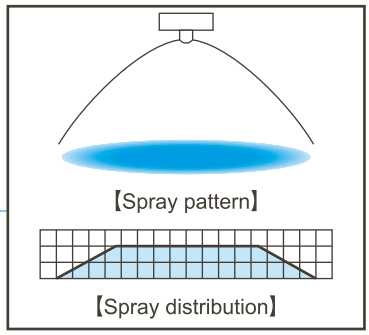
Items \ Materials		Metals					Plastics					Rubbers	
		S303	S304	S316	S316L	S321	PP	PPS	HTPVC	PTFE	PE	NBR	FKM
Chemical resistance	Hydrochloric acid	×	×	×	×	×	○	○	○	○	○	×	○
	Concentrated hydrochloric acid	×	×	×	×	×	△	○	○	○	○	×	○
	Sulfuric acid (35%)	×	×	×	×	×	○	○	○	○	○	×	○
	Concentrated sulfuric acid	×	×	○	○	○	×	△	○	○	△	×	○
	Nitric acid (35%)	○	○	○	○	○	×	△	○	○	○	×	○
	Concentrated nitric acid	△	○	△	△	△	×	×	×	○	×	×	○
	Acetic acid	△	○	○	○	○	○	○	○	○	△	○	○
	Sodium hydroxide (caustic soda)	○	○	○	○	○	○	○	○	○	○	○	△
	Aqueous ammonia	○	○	○	○	○	○	○	○	○	○	○	×
	Acetone	○	○	○	○	○	○	○	×	○	×	×	×
	Trichloroethylene	○	○	○	○	○	△	○	×	○	△	△	○
	Ethyl alcohol	○	○	○	○	○	○	○	○	○	△	○	○
Heat resistance	Suitable (°C)	400	400	400	400	400	80	170	50	100	60	90	150
	Short-term use only (°C)	800	800	800	800	800	90	180	70	150	80	120	200

○: Suitable △: Possible for short term use ×: Unusable

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

How to Read Product Tables

●Spray nozzle specifications are shown in the respective tables.



●Spray pattern and spray distribution

Table

●Spray angle code (110)

●Air consumption code (02)

ℓ/min, Normal: ℓ/min at Normal Conditions (0℃, 1 atm)

●Air consumption (estimated value) at the specified pressures
(Estimated air consumption is 25 ℓ/min, Normal when air pressure is 0.4 MPa and liquid pressure is 0.15 MPa)

●Spray width at the specified pressures (280 mm at air pressure of 0.2 MPa and liquid pressure of 0.1 MPa)

●Minimum passage diameters of each part (approx. value)

Spray angle code	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal)										Spray width*3 (mm)			Mean droplet dia. (μm)	Free passage diameter (mm)		
			Liquid pressure (MPa)										Liquid press. (MPa)			Laser Doppler method	Spray orifice	Adaptor	
			0.1		0.15		0.2		0.25		0.3								
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25			Liquid	Air
110	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	280	340	—	20–100	0.2	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	230	340				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	300	360	—	20–100	0.3	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	230	270	430				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	250	350				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	320	380	—	20–100	0.5	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	240	300	450				
		0.4							14.8	82	21.8	74	—	270	370				
		0.2									—	—	340	400	—	20–100	0.8	1.8	1.9
		0.3											270	320	470				
		0.4												280	380				

●Calculated spray capacity at the specified pressures (Calculated spray capacity is 4.7 ℓ/hr when air pressure is 0.3 MPa and liquid pressure is 0.15 MPa)

●At air pressure of 0.2 MPa and liquid pressure of 0.3 MPa, defined spray pattern does not develop (coarse droplets, wheezing, etc.)

●Range of Sauter mean droplet diameters measured by laser Doppler method

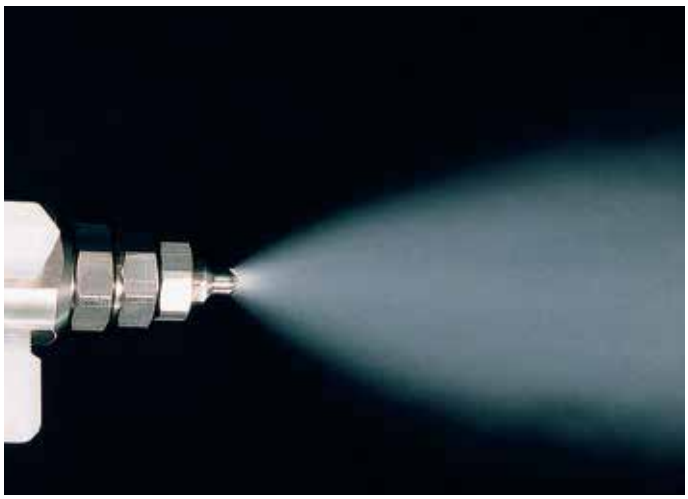
Description for thread size and type

ISO Standard	Thread description
R1/4	1/4" male taper pipe thread
Rc1/4	1/4" female taper pipe thread

Threads noted in this catalog are taper pipe threads (PT), unless specified otherwise. In this catalog, the connection thread size and type is described according to ISO standard.

Small Capacity Fine Fog Nozzles

BIM/CBIM/SCBIM series Nozzles



- BIM/CBIM/SCBIM series produce fine atomization with a mean droplet diameter of 10–100 µm measured by laser Doppler method.
- Unique design of BIM/CBIM series greatly minimizes clogging.
  Designed using fewer parts than typical nozzles for easier maintenance and lower price.
- Available in three spray patterns: BIMV/CBIMV/SCBIM flat spray, BIMK/CBIMK hollow cone spray, and BIMJ/CBIMJ/SCBIMJ full cone spray.
  Versatile pneumatic spray nozzles—you can select a suitable type depending on the intended use.
- Available with integrated spray header combining air and liquid conduits, ring-shaped header, and other compact headers to fit your site.

Contents

Small Capacity Fine Fog Nozzles

Small Capacity Fine Fog Nozzles Flat Spray
—Liquid Pressure Type—

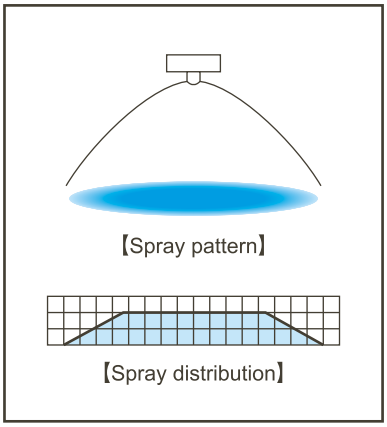
BIMV

Features

■Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100 μm or less.*1
■Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
■Spray angle of 110°, 80°, or 45°.
■Produces two different spray distributions: uniform spray distribution throughout spray pattern area (when spraying at a low air-water ratio), or a mountain-shaped distribution having gradually tapered edges (at a high air-water ratio).

*1) Droplet diameter measured by laser Doppler method

BIMV with SNB-type adaptor



Applications

■Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea
■Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete
■Cleaning: Printed circuit boards, glass tubes

Structure & Materials

■Comprising four parts: Spray tip, core, cap, and adaptor. (Details of adaptors are shown on pages 23 and 24.)
■Materials: S303 (Optional material: S316L)

Dimensions & Pipe Conn. Sizes

■Dimensions and pipe connection sizes are shown on page 24.

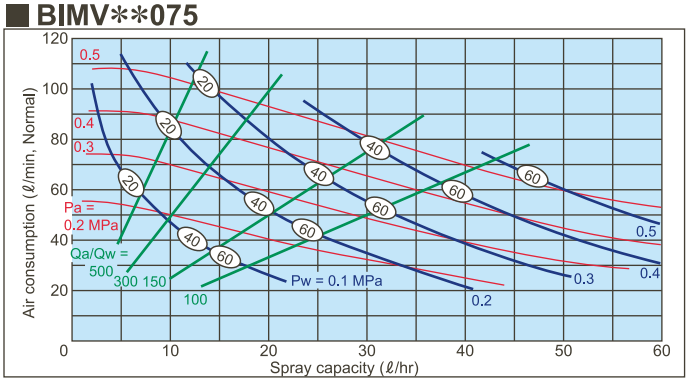
Accessories

■Mounting bracket for easy installation is shown on page 26.

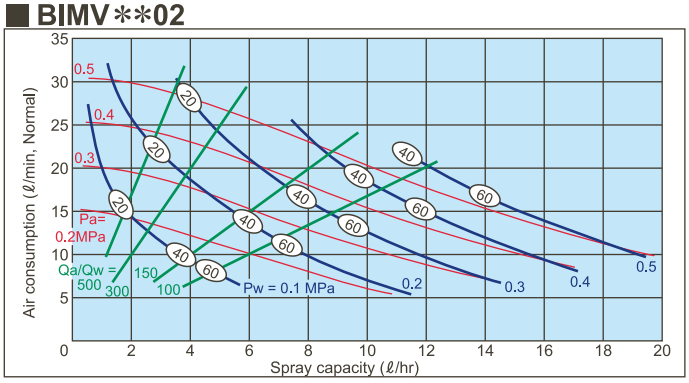
Flow-rate Diagrams

■How to read the chart
①The spray capacity shown is for one nozzle.
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.
③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.
④** to be filled by spray angle code of 110, 80, or 45.
⑤These flow-rate diagrams are applicable to adaptors type T and N only.

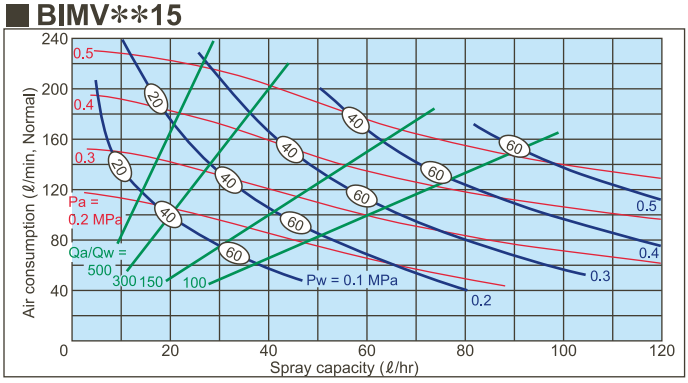
■ BIMV**075



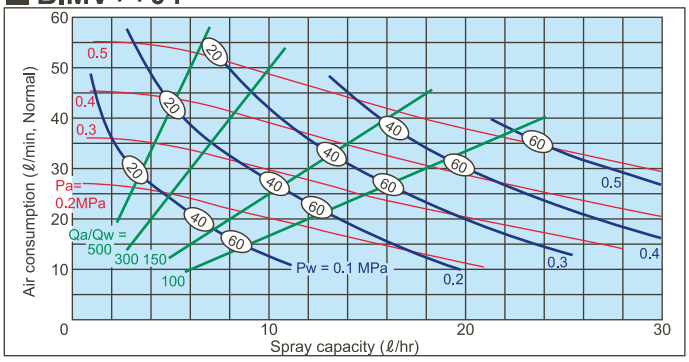
■ BIMV**02



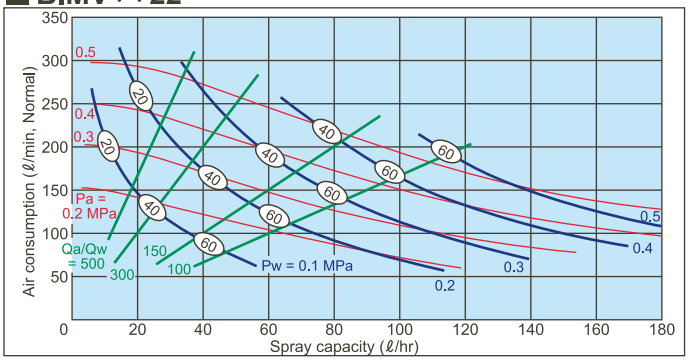
■ BIMV**15



■ BIMV**04

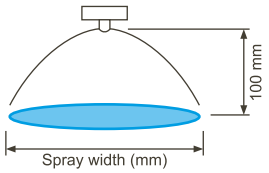


■ BIMV**22



Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal)										Spray width*3 (mm)			Mean droplet dia. (μm)	Free passage diameter (mm)		
			Liquid pressure (MPa)																
			0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler method	Spray orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25			Liquid	Air
110	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	280	340	—	20–100	0.2	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	230	340				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	300	360	—	20–100	0.3	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	230	270	430				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	250	350				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	320	380	—	20–100	0.5	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	240	300	450				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	270	370				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	340	400	—	20–100	0.8	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	270	320	470				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	280	380				
	22	0.2	22.3	140	45.6	116	92.1	77	—	—	—	—	350	420	—	20–100	0.9	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	280	330	490				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	300	400				
80	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	200	260	—	20–100	0.3	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	170	210	300				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	200	250				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	200	260	—	20–100	0.4	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	170	210	310				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	200	260				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	200	270	—	20–100	0.6	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	170	210	310				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	200	260				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	210	280	—	20–100	0.9	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	180	220	320				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	200	270				
	22	0.2	22.3	140	45.6	116	92.1	77	—	—	—	—	210	280	—	20–100	1.1	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	180	220	330				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	210	280				
45	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	100	130	—	20–100	0.4	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	80	110	150				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	100	130				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	100	130	—	20–100	0.5	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	80	110	150				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	100	130				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	100	140	—	20–100	0.9	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	80	110	160				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	100	140				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	110	150	—	20–100	1.2	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	90	120	170				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	110	150				
	22	0.2	22.3	140	45.6	116	92.1	77	—	—	—	—	110	160	—	20–100	1.6	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	90	120	180				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	110	150				

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.



How to order

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

<Example> BIMV 11002 S303 + N S303

BIMV [110] [02] S303 + [N] S303

Spray angle code
- ■110
- ■80
- ■45

Air consumption code
- ■02
- ■04
- ■075
- ■15
- ■22

Type of adaptor
- ■N
- ■T
- ■NDB
- ■UNDB
- ■SPB
- ■USPB
- ■SNB
- ■USNB

Details of adaptors are shown on pages 23 and 24.

Small Capacity Fine Fog Nozzles Flat Spray

—Liquid Siphon Type—

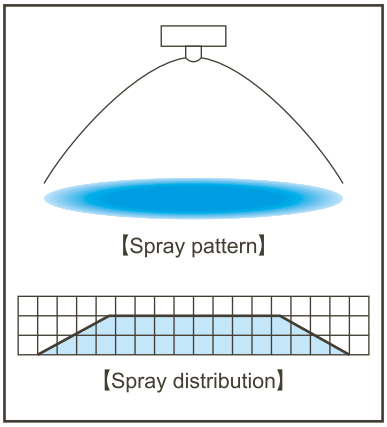
BIMV-S

Features

■Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*1
■Liquid siphon feed type (liquid pressure device is not required).
■Spray angle of 80°.
■Even spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method

BIMV-S with T-type adaptor



Applications

■Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea
■Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete
■Cleaning: Printed circuit boards, glass tubes

Structure & Materials

■Comprising four parts: Spray tip, core, cap, and adaptor. (Details of adaptors are shown on pages 23 and 24.)
■Materials: S303 (Optional material: S316L)

Dimensions & Pipe Conn. Sizes

■Dimensions and pipe connection sizes are shown on page 24.

Accessories

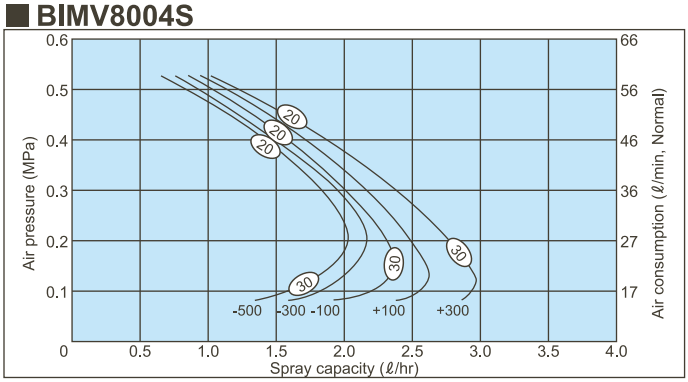
■Mounting bracket for easy installation is shown on page 26.

Flow-rate Diagrams

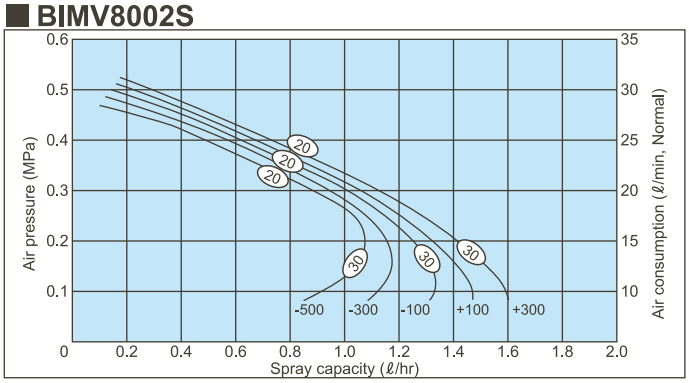
■How to read the chart

①The spray capacity shown is for one nozzle.
②Figures at foot of each curve indicate gravity head (+) and siphon height (–) in mm.
③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.
④These flow-rate diagrams are applicable to adaptors type T and N only.

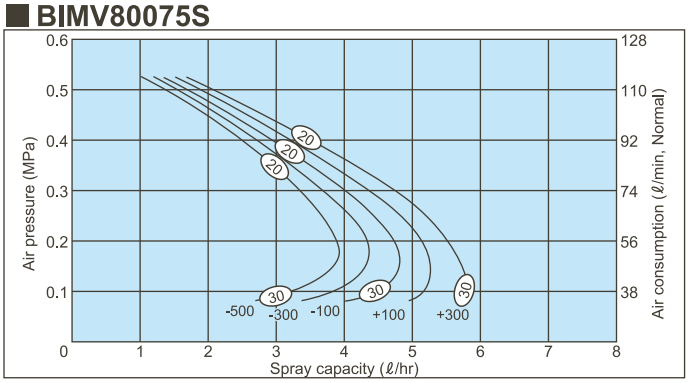
■ BIMV8004S



■ BIMV8002S

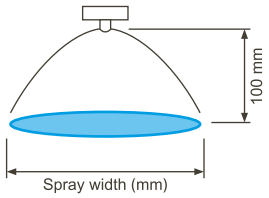


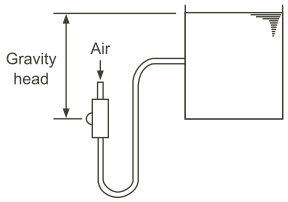
■ BIMV80075S

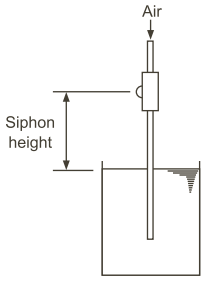


Spray angle code *2	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr)					Spray width*3 (mm)	Mean droplet diameter (μm)	Free passage diameter (mm)		
				Gravity head (mm)		Siphon height (mm)				Laser Doppler method	Spray orifice	Adaptor	
				+300	+100	-100	-300	-500				Liquid	Air
80	02	0.2 0.3 0.4	15 20 25	1.4 1.1 0.7	1.3 1.0 0.7	1.2 1.0 0.6	1.2 0.9 0.6	1.1 0.9 0.5	160 165 170	20–30	0.3	0.9	0.7
	04	0.2 0.3 0.4	27 36 46	2.8 2.4 1.9	2.5 2.1 1.7	2.3 2.0 1.6	2.2 1.9 1.5	2.0 1.8 1.4	165 170 175	20–30	0.5	0.9	0.9
	075	0.2 0.3 0.4	56 74 92	5.5 4.7 3.5	5.1 4.3 3.2	4.7 4.0 2.9	4.3 3.7 2.7	3.9 3.3 2.5	170 180 190	20–30	0.7	1.2	1.4

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*3) Measured at 100 mm from nozzle and liquid siphon height of 100 mm.







How to order

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

<Example> BIMV 8002S S303 + N S303

BIMV 80 **02** **S** S303 + **N** S303

- **02**: Air consumption code
  - ■02
  - ■04
  - ■075
- **S**: Siphon type
- **N**: Type of adaptor
  - ■N ■SPB
  - ■T ■USPB
  - ■NDB ■SNB
  - ■UNDB ■USNB

Details of adaptors are shown on pages 23 and 24.

Small Capacity Fine Fog Nozzles
Hollow Cone Spray —Liquid Pressure Type—

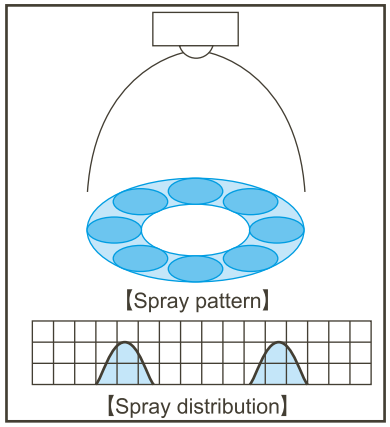
BIMK

Features

■Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100 μm or less.*1
■Features a large turn-down ratio under the liquid pressures of 0.1–0.3 MPa.
■Spray angle of 60°.

*1) Droplet diameter measured by laser Doppler method

BIMK with T-type adaptor



Applications

■Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea
■Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete

Structure & Materials

■Comprising four parts: Spray tip, core, cap, and adaptor. (Details of adaptors are shown on pages 23 and 24.)
■Materials: S303 (Optional material: S316L)

Dimensions & Pipe Conn. Sizes

■Dimensions and pipe connection sizes are shown on page 24.

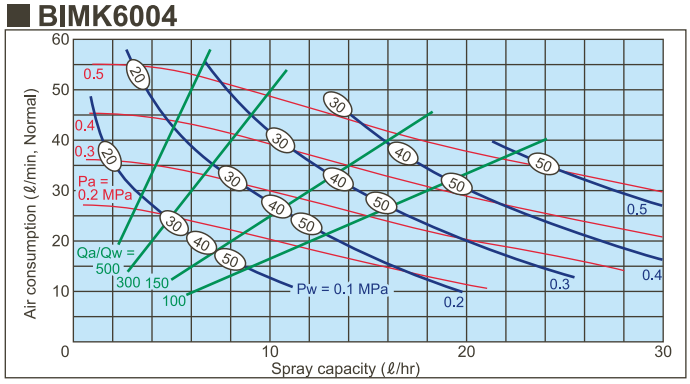
Accessories

■Mounting bracket for easy installation is shown on page 26.

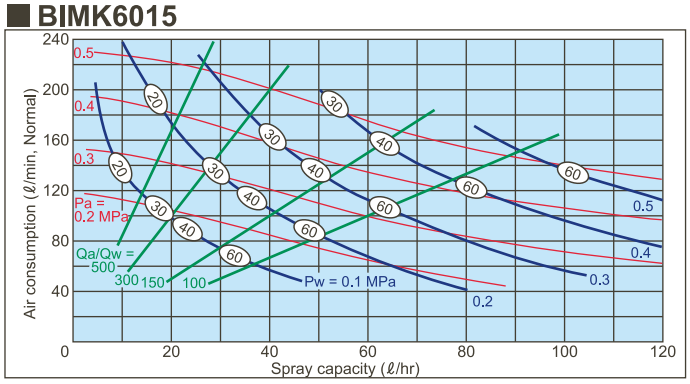
Flow-rate Diagrams

■How to read the chart
①The spray capacity shown is for one nozzle.
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.
③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.
④These flow-rate diagrams are applicable to adaptors type T and N only.

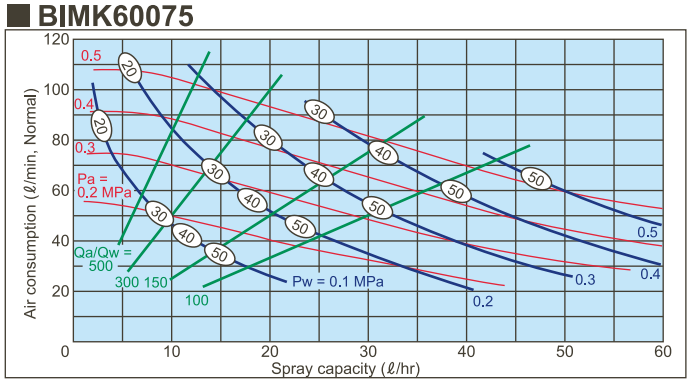
■ BIMK6004



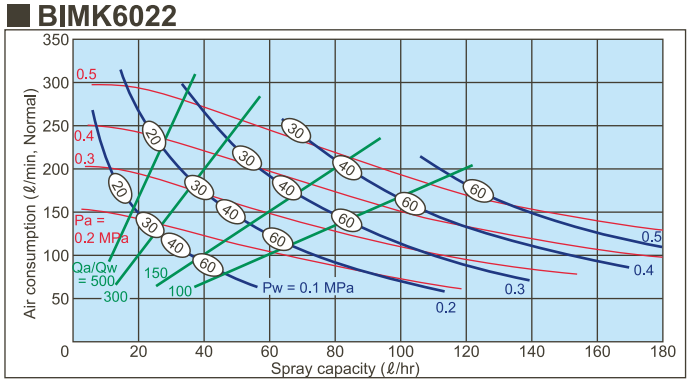
■ BIMK6015



■ BIMK60075

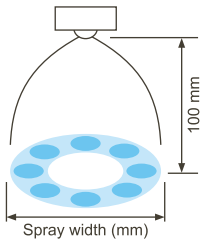


■ BIMK6022



Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal)										Spray width*3 (mm)			Mean droplet diameter (μm)	Free passage diameter (mm)		
			Liquid pressure (MPa)																
			0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler method	Spray orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25			Liquid	Air
60	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	140	160	—	20–100	0.5	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	130	160	170				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	150	170				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	170	—	20–100	0.7	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	130	160	180				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	150	170				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	150	170	—	20–100	0.9	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	140	170	180				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	160	180				
	22	0.2	22.3	140	45.6	116	92.1	77	—	—	—	—	160	180	—	20–100	1.1	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	140	170	190				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	160	180				

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.



How to order

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

<Example> BIMK 6004 S303 + N S303

BIMK 60 **04** S303 + **N** S303

Air consumption code
- ■04
- ■075
- ■15
- ■22

Type of adaptor
- ■N ■SPB
- ■T ■USPB
- ■NDB ■SNB
- ■UNDB ■USNB

Details of adaptors are shown on pages 23 and 24.

Small Capacity Fine Fog Nozzles
Hollow Cone Spray —Liquid Siphon Type—

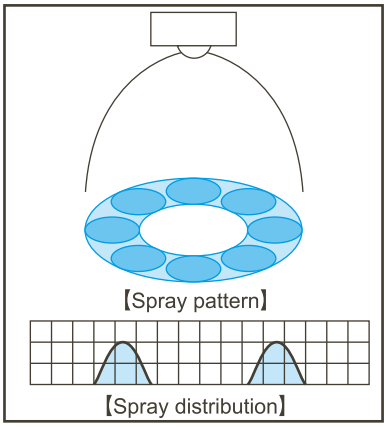
BIMK-S

Features

■Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*1
■Liquid siphon feed type (liquid pressure device is not required).
■Spray angle of 60°.

*1) Droplet diameter measured by laser Doppler method

BIMK-S with T-type adaptor



Applications

■Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea
■Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete

Structure & Materials

■Comprising four parts: Spray tip, core, cap, and adaptor. (Details of adaptors are shown on pages 23 and 24.)
■Materials: S303 (Optional material: S316L)

Dimensions & Pipe Conn. Sizes

■Dimensions and pipe connection sizes are shown on page 24.

Accessories

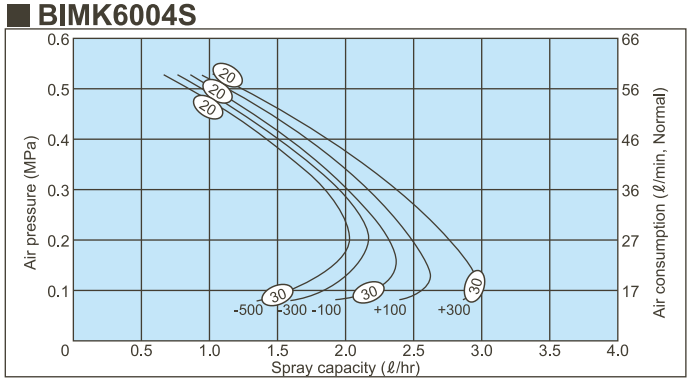
■Mounting bracket for easy installation is shown on page 26.

Flow-rate Diagrams

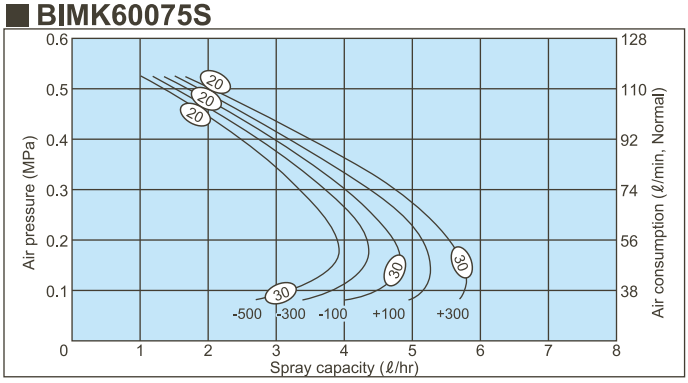
■How to read the chart

①The spray capacity shown is for one nozzle.
②Figures at foot of each curve indicate gravity head (+) and siphon height (–) in mm.
③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler methed.
④These flow-rate diagrams are applicable to adaptors type T and N only.

■ BIMK6004S

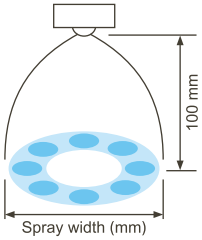


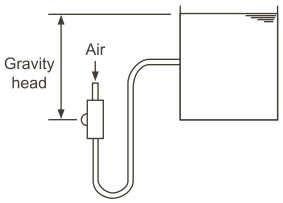
■ BIMK60075S

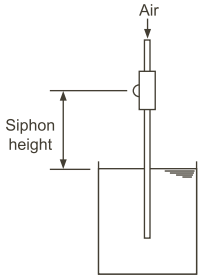


Spray angle code *2	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr)					Spray width*3 (mm)	Mean droplet diameter (μm)	Free passage diameter (mm)		
				Gravity head (mm)		Siphon height (mm)							
				+300	+100	-100	-300	-500		Laser Doppler method	Spray orifice	Adaptor	
												Liquid	Air
60	04	0.2 0.3 0.4	27 36 46	2.8 2.4 1.9	2.5 2.1 1.7	2.3 2.0 1.6	2.2 1.9 1.5	2.0 1.8 1.4	120 120 120	20–30	0.6	0.9	0.9
	075	0.2 0.3 0.4	56 74 92	5.5 4.7 3.5	5.1 4.3 3.2	4.7 4.0 2.9	4.3 3.7 2.7	3.9 3.3 2.5	120 120 120	20–30	0.8	1.2	1.4

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*3) Measured at 100 mm from nozzle and liquid siphon height of 100 mm.







How to order

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

<Example> BIMK 60075S S303 + N S303

BIMK 60 **075** S S303 + **N** S303

- 075: Air consumption code — ■04 ■075
- S: Siphon type
- N: Type of adaptor — ■N ■SPB ■T ■USPB ■NDB ■SNB ■UNDB ■USNB

Details of adaptors are shown on pages 23 and 24.

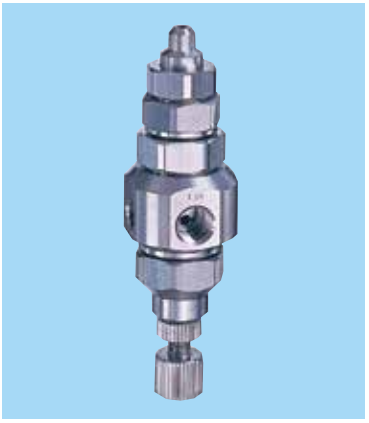
Small Capacity Fine Fog Nozzles
Full Cone Spray —Liquid Pressure Type—

BIMJ

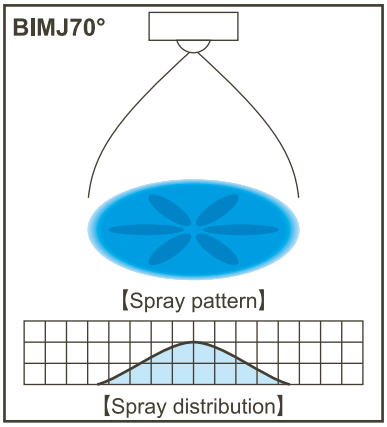
Features

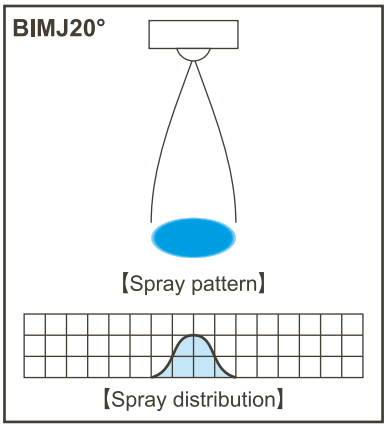
■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100 μm or less.*1
■Features a large turn-down ratio under the liquid pressures of 0.1–0.3 MPa.
■Spray angle of 70° or 20°.

*1) Droplet diameter measured by laser Doppler method



BIMJ with NDB-type adaptor





Applications

■Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea
■Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete

Structure & Materials

■Comprising four parts: Spray tip, core, cap, and adaptor. (Details of adaptors are shown on pages 23 and 24.)
■Materials: S303 (Optional material: S316L)

Dimensions & Pipe Conn. Sizes

■Dimensions and pipe connection sizes are shown on page 24.

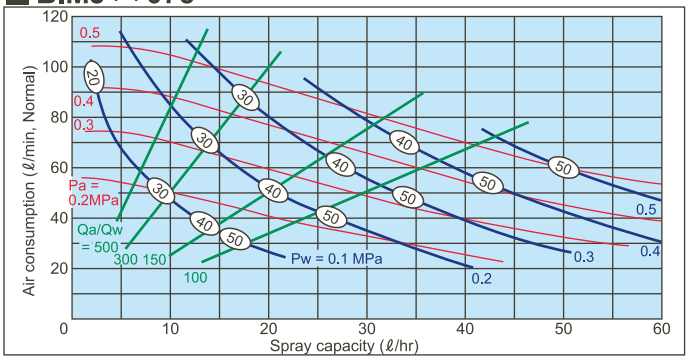
Accessories

■Mounting bracket for easy installation is shown on page 26.

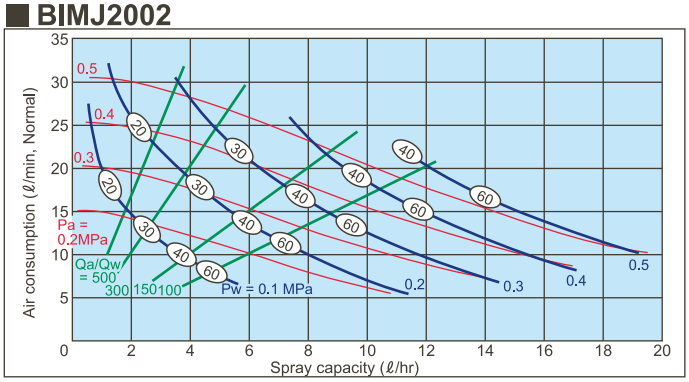
Flow-rate Diagrams

■How to read the chart
①The spray capacity shown is for one nozzle.
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.
③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.
④** to be filled by spray angle code of 70 or 20.
⑤These flow-rate diagrams are applicable to adaptors type T and N only.

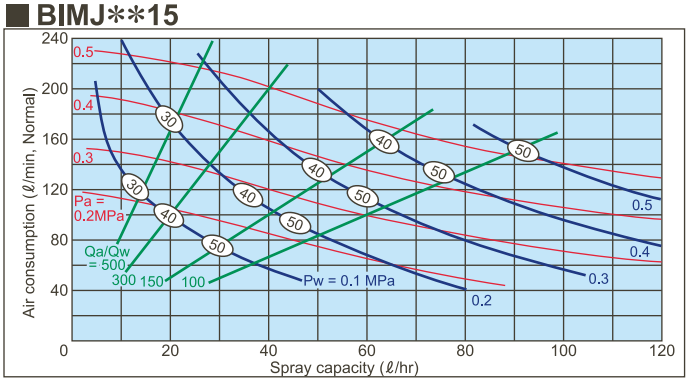
■ BIMJ**075



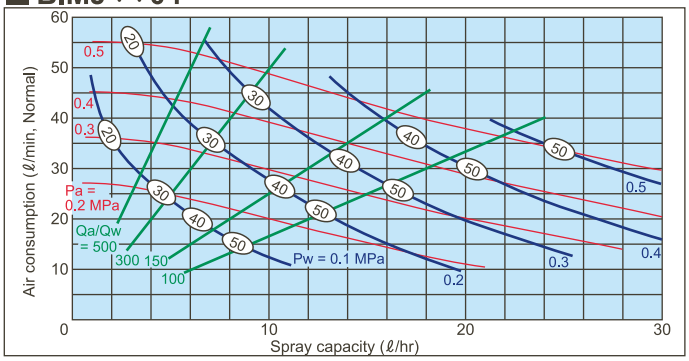
■ BIMJ2002



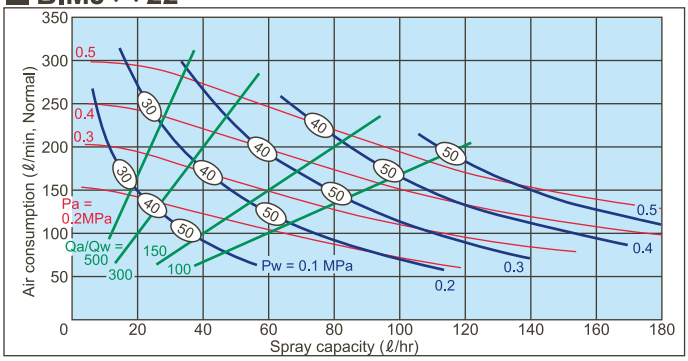
■ BIMJ**15



■ BIMJ**04

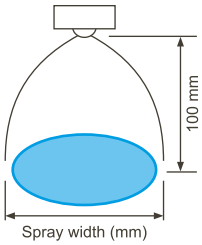


■ BIMJ**22



Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal)										Spray width*3 (mm)			Mean droplet diameter (μm)	Free passage diameter (mm)		
			Liquid pressure (MPa)																
			0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler method	Spray orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25			Liquid	Air
70	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	140	160	—	20–100	0.4	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	140	160	170				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	170	170				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	160	—	20–100	0.4	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	140	160	170				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	170	170				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	140	160	—	20–100	0.5	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	140	160	170				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	170	170				
	22	0.2	22.3	140	45.6	116	92.1	77	—	—	—	—	140	160	—	20–100	0.7	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	140	160	170				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	170	170				
20	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	25	25	—	20–100	1.1	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	30	30	25				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	30	30				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	30	25	—	20–100	1.6	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	35	35	30				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	35	35				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	30	25	—	20–100	2.0	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	35	35	30				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	35	35				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	35	30	—	20–100	2.7	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	40	40	35				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	40	40				
	22	0.2	22.3	140	45.6	116	92.1	77	—	—	—	—	35	30	—	20–100	3.1	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	40	40	35				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	40	40				

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.



How to order

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

<Example> BIMJ 2004 S303 + N S303

BIMJ [20] [04] S303 + [N] S303

Spray angle code
- ■70
- ■20

Air consumption code
- ■02 (for 20° only)
- ■04
- ■075
- ■15
- ■22

Type of adaptor
- ■N
- ■T
- ■NDB
- ■UNDB
- ■SPB
- ■USPB
- ■SNB
- ■USNB

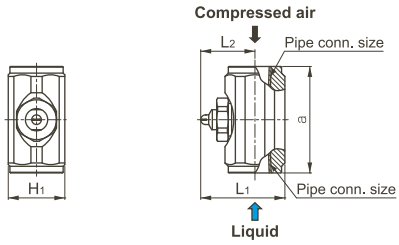
Details of adaptors are shown on pages 23 and 24.

The following eight types of adaptors are available for BIM Small Capacity Fine Fog Nozzles: BIMV, BIMV-S, BIMK, BIMK-S, BIMJ, which are introduced on pages 13 to 22.

Types of Adaptors

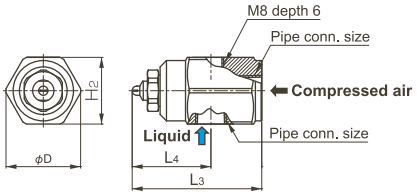
Type N

Liquid and air enter into adaptor from both sides.



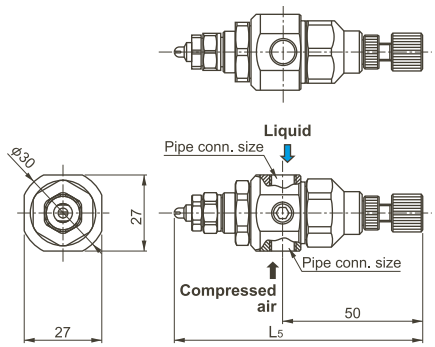
Type T

Air inlet is on the center line and liquid inlet is on a 90° angle line to the center line.
Suitable for use in a small space.



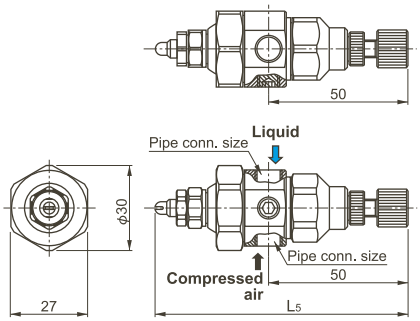
Type NDB

Spray capacity is adjustable with needle valve.



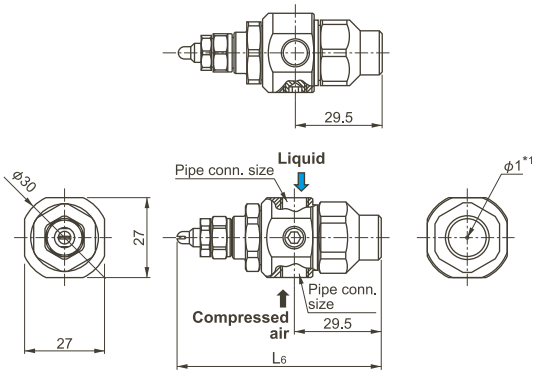
Type UNDB

Besides the features of the NDB-type adaptor, spray direction can be adjusted within +/- 15° by means of a ball joint.
It is ideal for fine-tuning of spray direction after pipe assemblies have been completed.



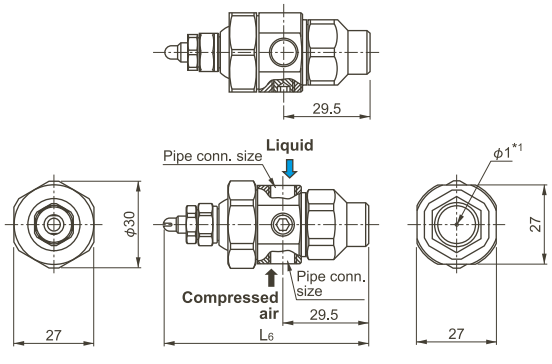
Type SNB

Spray ON/OFF can be regulated by turning compressed air ON/OFF, which actuates an internal piston, to open or close the nozzle.
Compressed air pressure over 0.2 MPa starts the spray.



Type USNB

Besides the features of the SNB-type adaptor, spray direction can be adjusted within +/- 15° by means of a ball joint.
It is ideal for fine-tuning of spray direction after pipe assemblies have been completed.

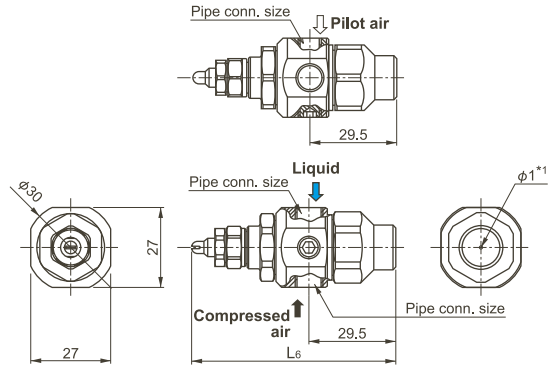


*1) Hole ϕ1 is for air relief.

Types of Adaptors

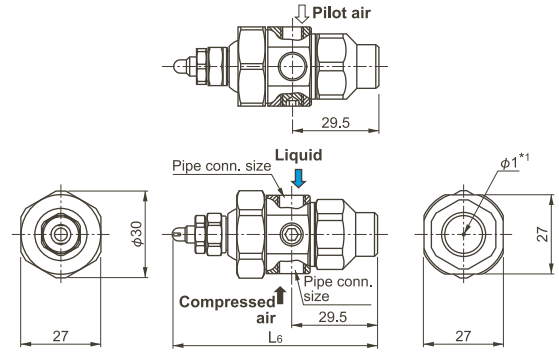
Type SPB

Spray ON/OFF can be regulated by switching the pilot air ON/OFF. The pilot air actuates an internal piston to regulate the spray.
(Pilot air pressure more than 0.2 MPa required)
This type of adaptor is suitable for applications to avoid scattering droplets of fog.



Type USPB

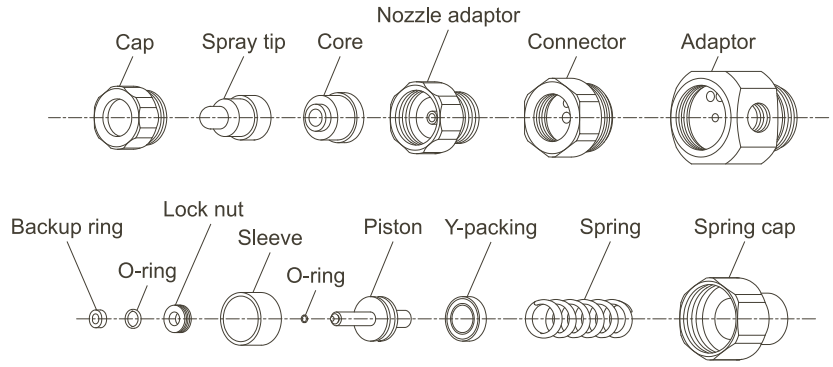
Besides the features of the SPB-type adaptor, spray direction can be adjusted within +/- 15° by means of a ball joint.
It is ideal for fine-tuning of spray direction after pipe assemblies have been completed.



*1) Hole ϕ1 is for air relief.

Structure of SPB adaptor

This exploded view shows a structure of SPB adaptor as an example.
Structure and components varies according to adaptor types.



CAUTIONS for NDB, UNDB, SPB, USPB, SNB, and USNB adaptors

Thin-walled nozzle adaptor tends to deform easily if installed directly by itself.

First assemble Core, Spray tip, Cap and Nozzle adaptor by hand with light pressure, then attach them to Connector (or UT Ball).
Use a well-fitting hexagon socket wrench instead of a regular spanner (wrench), as a spanner may deform the unit.

Pipe connection sizes and mass

Adaptor type	Air consumption code	Pipe connection sizes			Mass (g)
		Compressed air	Liquid	Pilot air	
N	02, 04, 075	Rc1/8	Rc1/8		55
	15, 22	Rc1/4	Rc1/4		130
T	02, 04, 075	Rc1/8	Rc1/8		80
	15, 22	Rc1/4	Rc1/4		210
NDB UNDB	02, 04, 075	Rc1/8	Rc1/8		172
	15, 22				193
SPB USPB	02, 04, 075	Rc1/8	Rc1/8	Rc1/8	146
	15, 22				167
SNB USNB	02, 04, 075	Rc1/8	Rc1/8		151
	15, 22				172

Dimensions

Air consumption code	Dimensions (mm)									
	L1	L2	L3	L4	L5	L6	a	H1	H2	ϕD
02	25.3	16.3	40.8	24.8	87.3	66.8	32	17	21	23.5
04*2	26.8	17.8	42.3	26.3	88.8	68.3	32	17	21	23.5
BIMJ 2004	27.0	18.0	42.5	26.5	89.0	68.5	32	17	21	23.5
075	28.1	19.1	43.6	27.6	90.1	69.6	32	17	21	23.5
15	39.1	26.6	60.1	38.1	97.6	77.1	43	23	29	32.5
22	41.3	28.8	62.3	40.3	99.8	79.3	43	23	29	32.5

*2) Excludes BIMJ2004.

How to Use BIM Controlling Adaptors

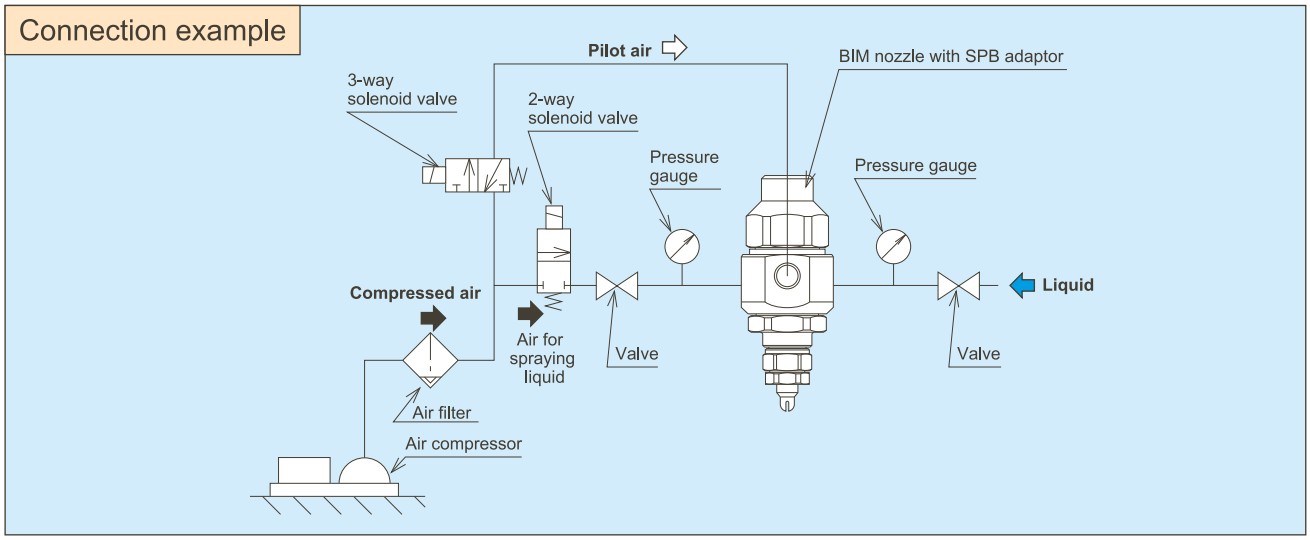
■ SPB adaptor

Spray ON/OFF can be regulated by switching the pilot air ON/OFF.
The pilot air actuates an internal piston to regulate the spray. (Pilot air pressure must be 0.2 MPa or higher.)
As even low pressure atomizing air can be used, production of a range of fine to coarse fog is possible.
Best-suited for when there is concern about scattering droplets.

Function chart

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

Connection example



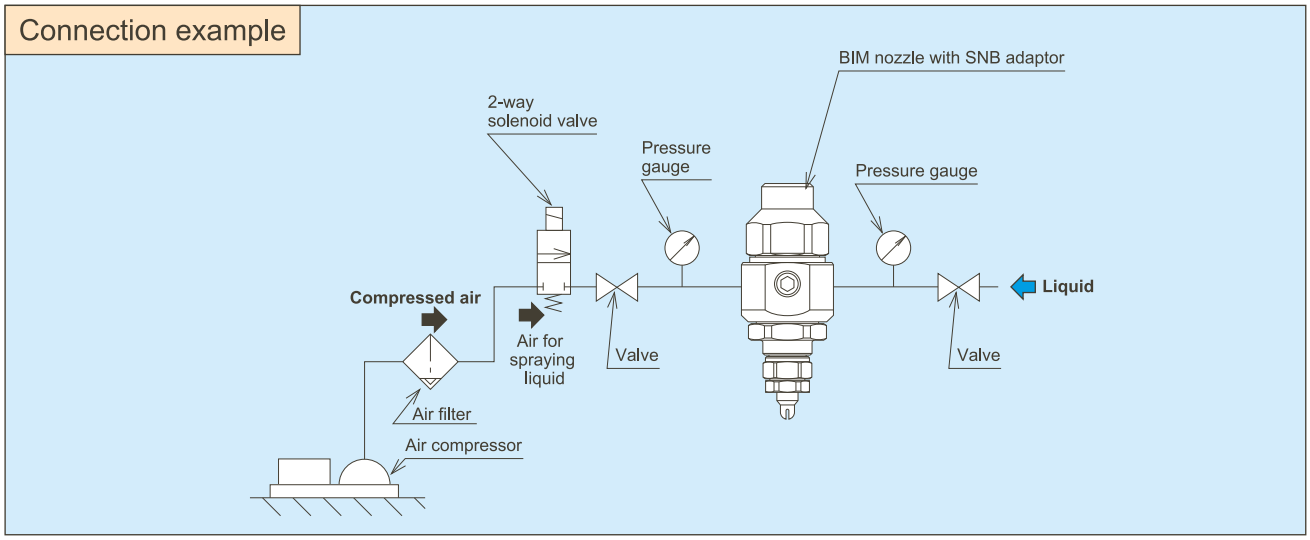
■ SNB adaptor

Spray ON/OFF can be regulated by turning compressed air ON/OFF.
Compressed air pressure must be 0.2 MPa or higher in order to start the spray.

Function chart

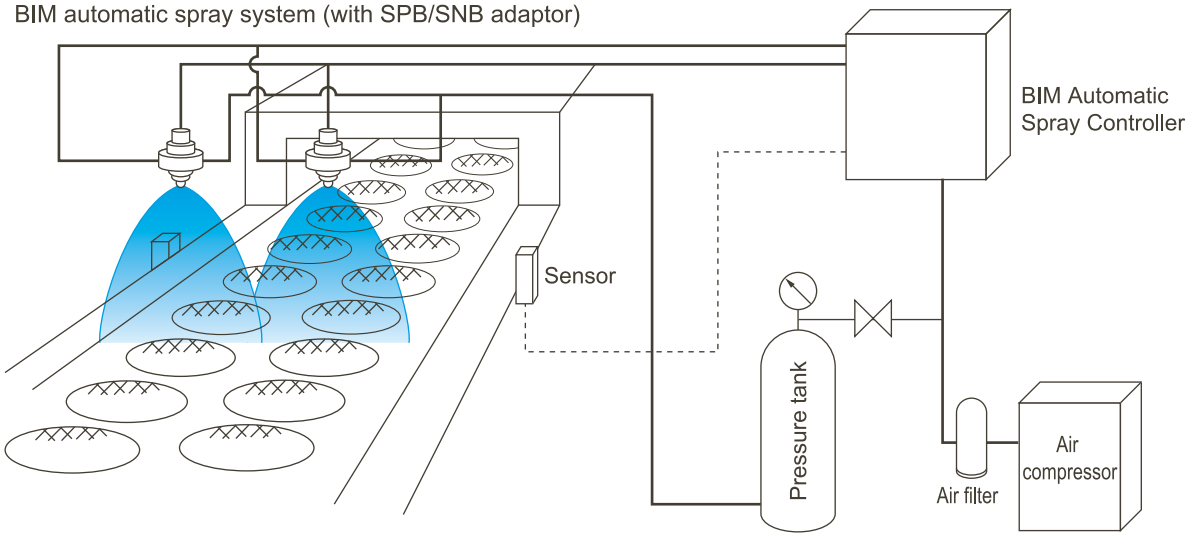
Compressed air	OFF	ON	OFF	ON	OFF	
Liquid	Stop	Spray	Stop	Spray	Stop	

Connection example



Installtion Example of BIM Automatic Spray System

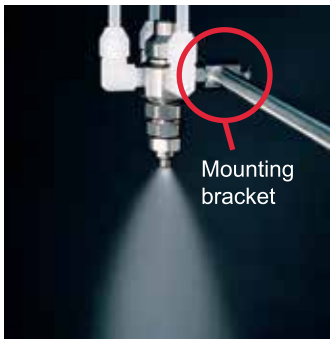
■ Example of applications controlled by
BIM automatic spray system (with SPB/SNB adaptor)



Optional/ Related Products

■ Mounting Bracket (product code: MBW)

Mounting bracket enables easy fixing of a nozzle on a pole (metal rod) with desired spray direction.
Available in two size for pipe diameters of 8 mm and 10 mm.
Available for the adaptor types T, NDB, UNDB, SPB, USPB, SNB, and USNB (not available for N-type adaptor).



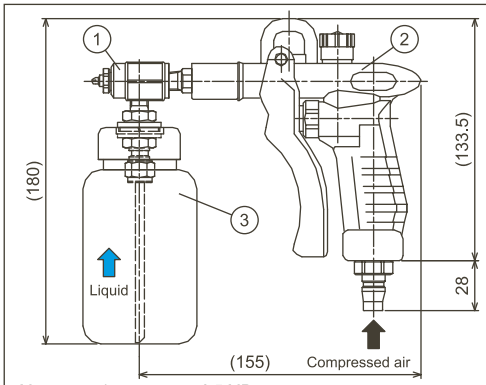
■ Spray Gun Unit with BIM nozzles: BIM-GUN

Liquid siphon type with 250 mℓ bottle.*
Air capacity adjustability (as standard equipment).
Suitable for chemical spraying, etc.

*500mℓ bottle is available as an option.

Pressure gauge kit including pressure reducing valve and two couplers.

Note: When using BIM**04S types, this item is necessary.



Max. operating pressure: 0.5 MPa
Structure: ①BIM nozzle ②Air duster gun ③Plastic bottle
Materials: S303, S304, PP, PE, etc.
Liquid contacting parts: PE (bottle) and Stainless steel 303 (nozzle)
Some kinds of chemical may not be suitable for use.

How to order

Please inquire or order for a specific BIM-GUN using these product codes.

(Flat spray) BIMV series
BIMV8004SS303+TS303 siphon spray unit (w/ 250 ml bottle)
BIMV80075SS303+TS303 siphon spray unit (w/ 250 ml bottle)

(Hollow cone spray) BIMK series
BIMK6004SS303+TS303 siphon spray unit (w/ 250 ml bottle)
BIMK60075SS303+TS303 siphon spray unit (w/ 250 ml bottle)

Approx. spray capacity (for your reference)
●BIMV8004S/BIMK6004S: 30 mℓ/min ●BIMV80075S/BIMK60075S: 60 mℓ/min

Small Capacity Fine Fog Nozzles Made of Polypropylene –Liquid Pressure Type–

BIM-PP

Features

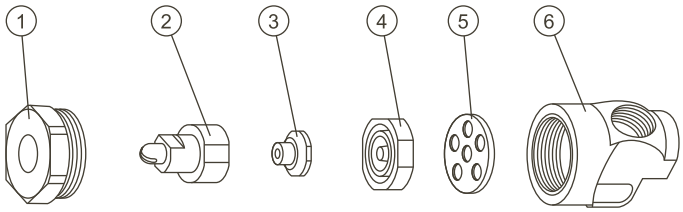
■Excellent chemical resistance with polypropylene construction.

■Two types, BIMV (flat spray pattern) and BIMJ (full cone spray pattern) are available.
Liquid pressure type with approx. 0.1 to 0.3 MPa.

Applications

■Spraying: Deodorant, germicide, disinfectant
■Moisture control: Paper, textile, printing
■Cleaning: Printed circuit boards, electrical components

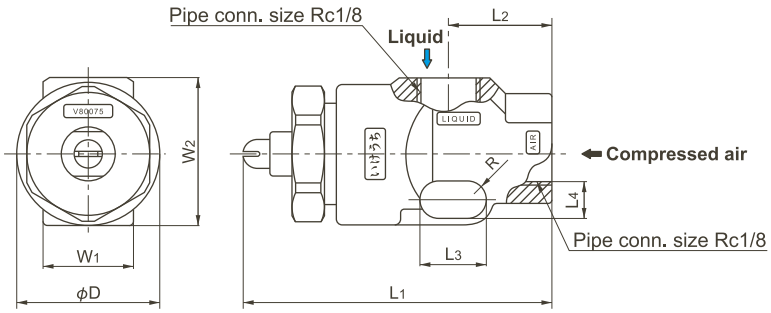
Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Cap	PP
②	Spray tip	PP
③	Core	PP
④	Orifice	PP
⑤	Packing	PTFE
⑥	Adaptor	PP

Dimensions & Pipe Conn. Sizes



■Dimensions

Spray pattern type	Nozzle code	Dimensions (mm)								Mass (g)
		L1	L2	L3	L4	W1	W2	φD	R	
Flat spray	BIMV80075	47.5	16	10	5	14	23	22	2.5	10
Full cone spray	BIMJ2004	46.7								

BIMV80075 (Flat spray): See pages 13 and 14 for spray performance details of BIMV80075.
BIMJ2004 (Full cone spray): See pages 21 and 22 for spray performance details of BIMJ2004.

How to order

Please inquire or order for a specific nozzle using these product codes.

Flat spray type
BIMV 80075 PP + TPP-IN

Full cone spray type
BIMJ 2004 PP + TPP-IN

Integrated Spray Header with BIM Fine Fog Nozzles

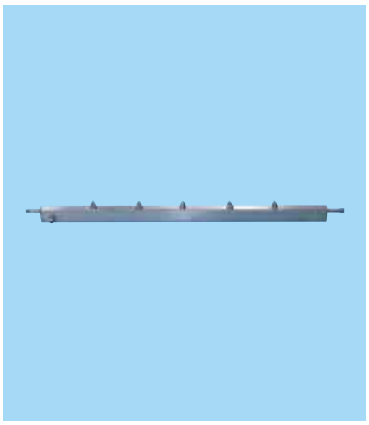
Features

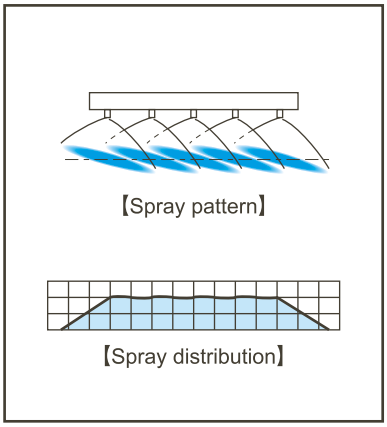
■Spray header equipped with BIMV series (liquid pressure type) producing fine atomization with mean droplet diameter of 100 μm or less.*1

■Combines two pipes for air and water into one rectangular spray header.
Compact and easy to install and maintain.

■Uniform spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method



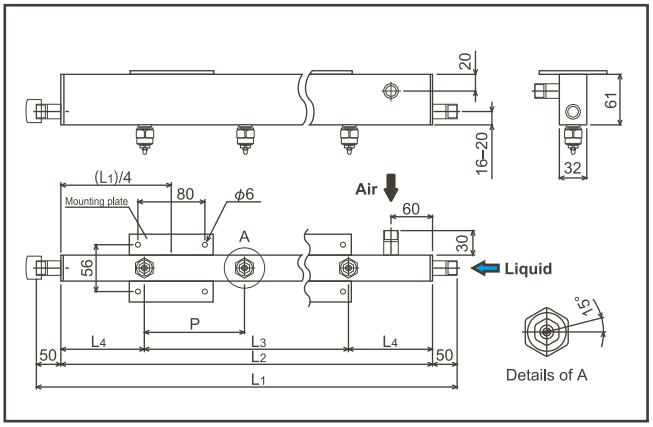


Applications

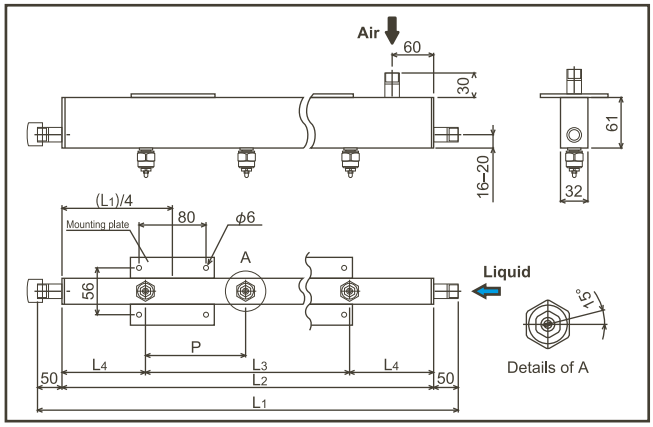
■Spraying: Oil, surface treatment agent
■Cooling: Moldings, steel plates, glass plates, plastic film
■Cleaning: Printed circuit boards

Structure, Materials, Dimensions & Pipe Connection Sizes

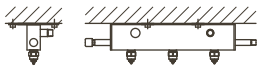
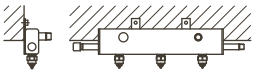
■ **Air/Liquid inlet position type [A]**



■ **Air/Liquid inlet position type [B]**



■ **Mounting plate type [None, F, or S]**

None	
F	
S	

F: To install facing perpendicular from a wall.
S: To install facing parallel along a wall edge.

■Dimensions

Header code		Nozzle spacing	Nozzle quantity	Spacing (mm)		Pipe connection size						Material	
						Nozzle code							
						BIMV11002		BIMV11004		BIMV110075			
Header length L2 (mm)	Total length L1 (mm)	P (mm)	(Number of BIM nozzles equipped)	L3	L4	Air	Liquid	Air	Liquid	Air	Liquid	Nozzle	Header
1,000	1,100	100	10	900	50	R3/8	R1/4	R3/8	R1/4	R1/2	R3/8	S303	S304
		200	5	800	100					R3/8	R1/4		
2,000	2,100	100	20	1,900	50	R1/2	R3/8	R1/2	R3/8	R3/4	R1/2		
		200	10	1,800	100	R3/8	R1/4	R3/8	R1/4	R1/2	R3/8		

Air Consumption & Spray Capacity

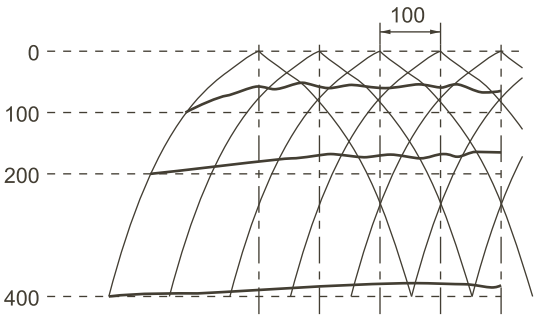
Nozzle code	Nozzle quantity	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) at liquid pressure of 0.1 MPa
BIMV11002	5	0.3	100	5.0
	10		200	10.0
	20		400	20.0
BIMV11004	5	0.3	180	10.0
	10		360	20.0
	20		720	40.0
BIMV110075	5	0.3	370	20.0
	10		740	40.0
	20		1,480	80.0

Note: Total air consumption and spray capacities shown in the above table are calculated from the number of nozzles used, based on each air consumption and spray capacity described on page 14.

Spray Distribution

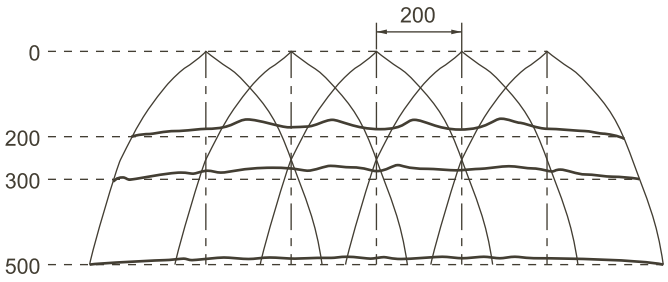
■BIMV11004S303

Nozzle spacing: 100 mm,
Compressed air pressure: 0.3 MPa,
Liquid pressure: 0.1 MPa,
Offset angle (nozzle tip angle to axis of header): 15°



■BIMV11004S303

Nozzle spacing: 200 mm,
Compressed air pressure: 0.3 MPa,
Liquid pressure: 0.1 MPa,
Offset angle (nozzle tip angle to axis of header): 15°



How to order

To determine specifications, please specify a nozzle code, nozzle quantity, nozzle spacing, and header length etc., using this coding system.

<Example> BIMV11002S303 + 10 (P100) A1000F (Pre-setting 15°, L=1100)

BIMV11002 S303+ 10 (P 100) A 1000 F (Pre-setting 15° , L= 1100)

Nozzle code	Nozzle quantity	Nozzle spacing	Inlet position type	Header length	Mounting plate type	Offset angle	Total length
■BIMV11002 ■BIMV11004 ■BIMV110075	■5 ■10 ■20	■100 ■200	■A ■B	■1000 ■2000	■F ■S ■None (Blank denotes "without plate".)	■0° (Blank denotes 0°.) ■15°	■1100 ■2100

Note: For details of BIMV nozzles, see page 14.
For details of BIM Header, please ask for our inquiry drawing.

Compact Design
Small Capacity Fine Fog Nozzles

CBIM

Features

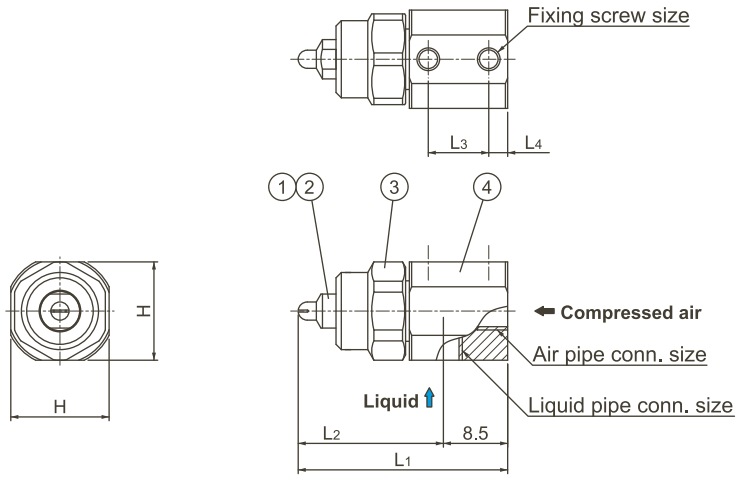
■Compact version of BIM series producing fine atomization. Space-saving design.

■Clog-resistant. Easy maintenance due to low number of parts.

■Available in liquid pressure or liquid siphon feed type*1, three spray pattern types (flat spray, hollow cone spray, full cone spray)—23 varieties in total. Wide selection.

*1) CBIMJ (full cone spray) series has no liquid siphon type.

Structure & Material



■Components and materials

No.	Components	Standard materials
①	Spray tip	S303
②	Core	S303
③	Cap	S303
④	Adaptor	S303

Dimensions & Pipe Connection Sizes

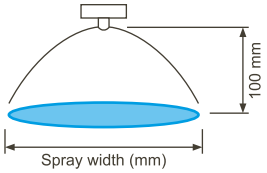
Air consumption code	Dimensions (mm)					Pipe connection size			Mass (g)
	L1	L2	L3	L4	H	Compressed air	Liquid	Fixing	
005	27.7	19.2	8	2.5	13	M5 depth 3	M5 depth 3	M3x2	22
01	27.7	19.2							
02	28.0	19.5							
04	31.3	22.8							
075	32.6	24.1							

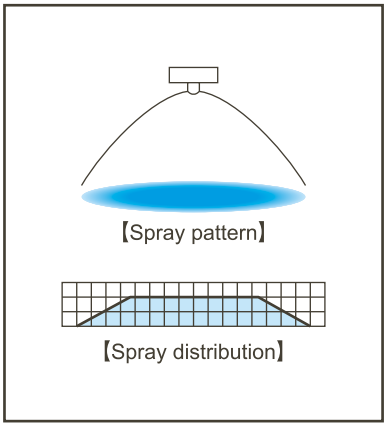
CBIMV (Flat Spray)

Features

- Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
- Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
- Spray angle of 110°, 80°, or 45°.
- Produces two different spray distributions: even spray distribution across the entire spray area (when spraying at a low air-water ratio), or a mountain-shaped distribution having gradually tapered edges (at a high air-water ratio).

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal)										Spray width*3 (mm)			Mean droplet diameter (µm)	Free passage diameter (mm)		
			Liquid pressure (MPa)																
			0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler method	Spray orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25			Liquid	Air
110	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	280	330	—	20–100	0.2	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	240	250	380				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	220	300				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	280	340	—	20–100	0.2	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	230	340				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	300	360	—	20–100	0.3	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	230	270	430				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	250	350				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	320	380	—	20–100	0.5	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	240	300	450				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	270	370				
80	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	230	260	—	20–100	0.1	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	170	200	280				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	160	250				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	220	250	—	20–100	0.2	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	140	200	250				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	140	220				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	200	260	—	20–100	0.3	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	170	210	300				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	200	250				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	200	260	—	20–100	0.4	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	170	210	310				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	200	260				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	200	270	—	20–100	0.6	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	170	210	310				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	200	260				
45	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	120	150	—	20–100	0.2	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	80	110	150				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	80	140				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	120	150	—	20–100	0.3	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	80	110	150				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	70	120				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	100	130	—	20–100	0.4	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	80	110	150				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	100	130				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	100	130	—	20–100	0.5	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	80	110	150				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	100	130				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	100	140	—	20–100	0.9	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	80	110	160				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	100	140				

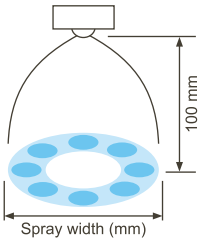
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.

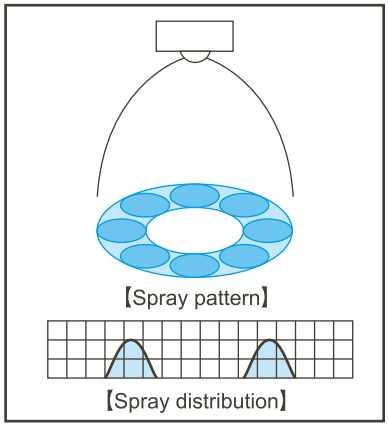
CBIMK (Hollow Cone Spray)

Features

- Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
- Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
- Spray angle of 60°.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
60	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	140	160	—	20–100	0.5	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	130	160	170				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	150	170				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	170	—	20–100	0.7	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	130	160	180				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	150	170				

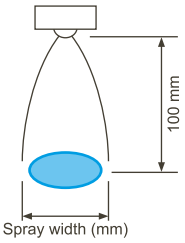
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa. *3) Measured at 100 mm from nozzle.

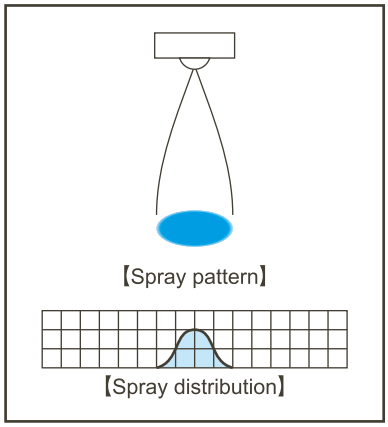
CBIMJ (Full Cone Spray)

Features

- Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
- Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
- Spray angle of 20°.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
20	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	25	20	—	20–100	0.7	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	30	30	25				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	30	30				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	25	30	—	20–100	0.8	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	30	30	25				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	30	30				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	25	20	—	20–100	1.1	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	30	30	25				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	30	30				
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	30	25	—	20–100	1.6	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	35	35	30				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	35	35				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	30	25	—	20–100	2.0	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	35	35	30				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	35	35				

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa. *3) Measured at 100 mm from nozzle.

Compact Design, Small Capacity Fine Fog Nozzles —Liquid Siphon Type—

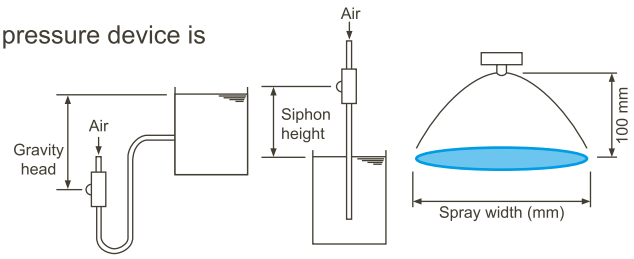
CBIMV-S CBIMK-S

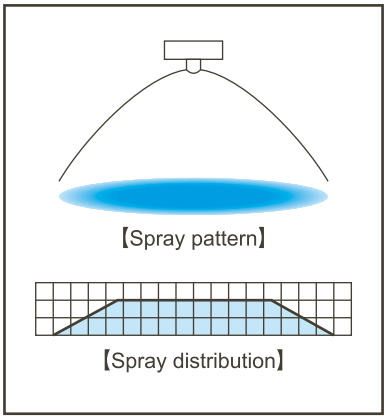
CBIMV-S (Flat Spray)

Features

■Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*1
■Liquid siphon feed type (liquid pressure device is not required).
■Spray angle of 80°.
■Even spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Gravity head (mm) +300	+100	Siphon height (mm) -100	-300	-500	Spray width*3 (mm)	Mean droplet diameter (μm) Laser Doppler method	Free passage dia. (mm) Spray orifice	Adaptor Liquid	Air
80	005S	0.2 0.3 0.4	3.75 5.0 6.25	0.4 0.29 0.16	0.38 0.27 0.15	0.36 0.25 0.13	0.34 0.23 0.11	0.32 0.21 0.1	160 165 170	20–30	0.2	0.4	0.3
	01S	0.2 0.3 0.4	7.5 10 12.5	0.74 0.55 0.38	0.68 0.52 0.34	0.65 0.5 0.3	0.61 0.47 0.27	0.57 0.43 0.25	160 165 170	20–30	0.2	0.6	0.5
	02S	0.2 0.3 0.4	15 20 25	1.4 1.1 0.7	1.3 1.0 0.7	1.2 1.0 0.6	1.2 0.9 0.6	1.1 0.9 0.5	160 165 170	20–30	0.3	0.6	0.7
	04S	0.2 0.3 0.4	27 36 46	2.8 2.4 1.9	2.5 2.1 1.7	2.3 2.0 1.6	2.2 1.9 1.5	2.0 1.8 1.4	165 170 175	20–30	0.5	0.9	0.9
	075S	0.2 0.3 0.4	56 74 92	5.5 4.7 3.5	5.1 4.3 3.2	4.7 4.0 2.9	4.3 3.7 2.7	3.9 3.3 2.5	170 180 190	20–30	0.7	1.2	1.4

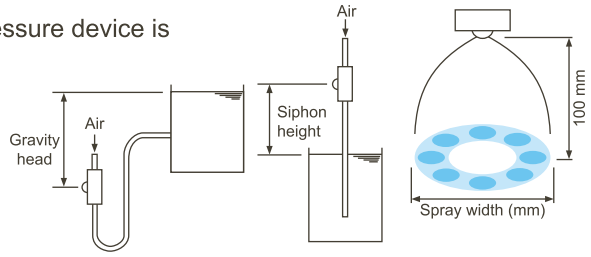
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm. *3) Measured at 100 mm from nozzle and liquid siphon height of 100 mm.

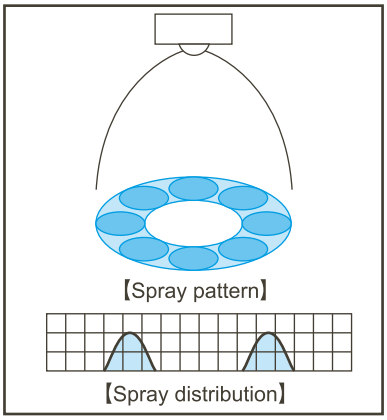
CBIMK-S (Hollow Cone Spray)

Features

■Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*1
■Liquid siphon feed type (liquid pressure device is not required).
■Spray angle of 60°.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Gravity head (mm) +300	+100	Siphon height (mm) -100	-300	-500	Spray width*3 (mm)	Mean droplet diameter (μm) Laser Doppler method	Free passage dia. (mm) Spray orifice	Adaptor Liquid	Air
60	04S	0.2 0.3 0.4	27 36 46	2.8 2.4 1.9	2.5 2.1 1.7	2.3 2.0 1.6	2.2 1.9 1.5	2.0 1.8 1.4	120 120 120	20–30	0.6	0.9	0.9
	075S	0.2 0.3 0.4	56 74 92	5.5 4.7 3.5	5.1 4.3 3.2	4.7 4.0 2.9	4.3 3.7 2.7	3.9 3.3 2.5	120 120 120	20–30	0.8	1.2	1.4

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm. *3) Measured at 100 mm from nozzle and liquid siphon height of 100 mm.

How to order

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

<Example> CBIMV 11002 S303 + T S303

CBIMV	110	02	S303 + T S303
Nozzle series	Spray angle code	Air consumption code	

■CBIMV, CBIMV-S
■CBIMK, CBIMK-S
■CBIMJ

See the respective tables on pages 31–33 for Spray angle code and Air consumption code.

Compact Design, Small Capacity Fine Fog Nozzles with Spray Control Adaptor

CBIM

Features

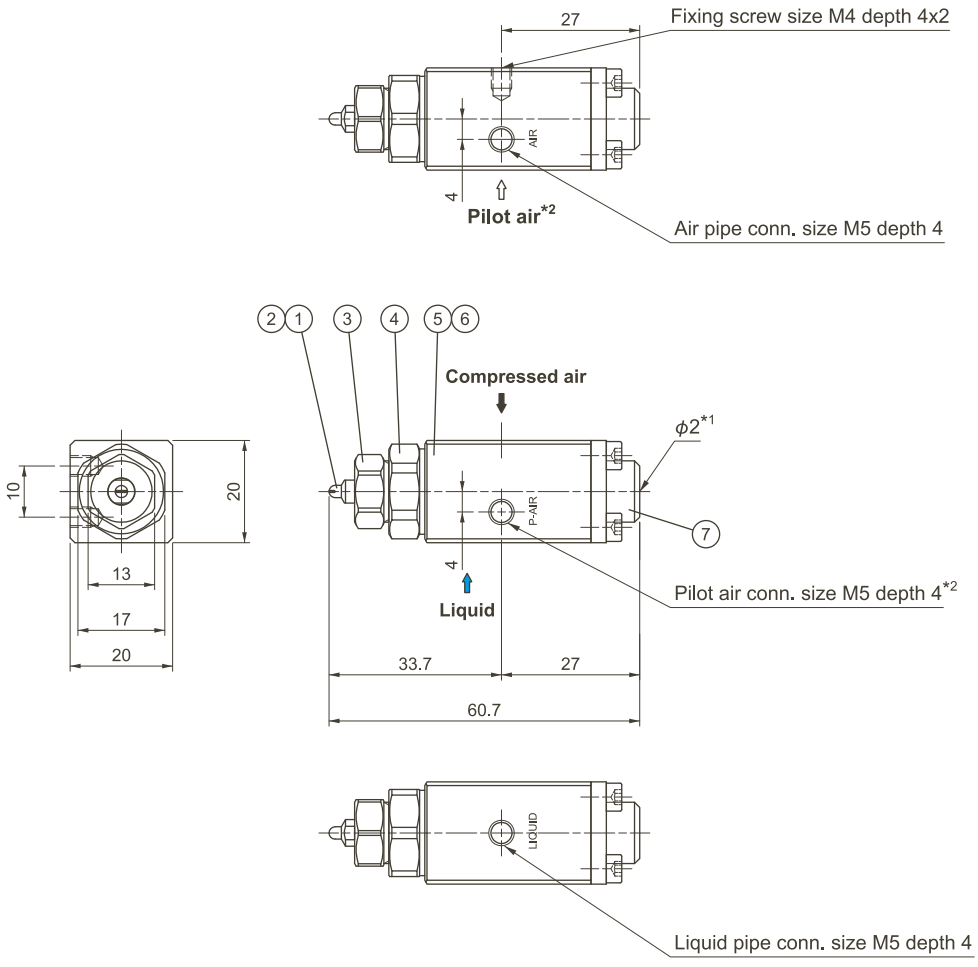
■Compact design, fine fog spray nozzles with spray-control adaptor, which can regulate spray ON/OFF with a built-in piston.

■Available in liquid pressure or liquid siphon feed type, two spray pattern types (flat spray or full cone spray)—14 varieties in total. Wide selection.

■Capable of spraying smallest flow rate among all of our pneumatic spray nozzles.

Structure & Material

■Mass: 125 g



*1) Hole φ2 is for air relief.
*2) No pilot air for CSN-type adaptor.

■Components and materials

No.	Components	Standard materials
①	Spray tip	S303
②	Core	S303
③	Cap	S303
④	Connector	S303
⑤	Adaptor	S303
⑥	Packing	FKM
⑦	Spring cap	S303

Compact Design, Small Capacity Fine Fog Nozzles with Spray Control Adaptor —Liquid Pressure Type—

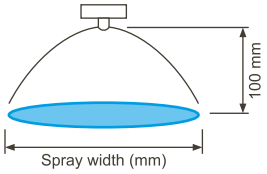
CBIMV
CBIMJ

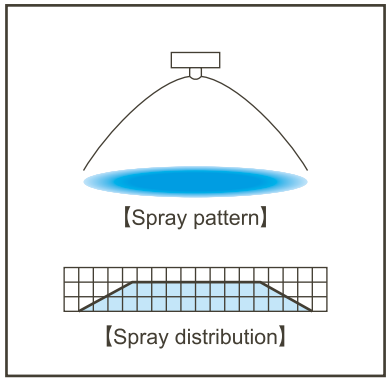
CBIMV (Flat Spray)

Features

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
■Flat spray pattern.
■Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
■Produces two different spray distributions: even spray distribution across the entire spray area (when spraying at a low air-water ratio), or a mountain-shaped distribution having gradually tapered edges (at a high air-water ratio).

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
110	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	280	330	—	20–100	0.2	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	240	250	380				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	220	300				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	280	340	—	20–100	0.2	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	230	340				
80	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	230	260	—	20–100	0.1	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	170	200	280				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	160	250				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	220	250	—	20–100	0.2	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	140	200	250				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	140	220				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	200	260	—	20–100	0.3	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	170	210	300				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	200	250				
45	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	120	150	—	20–100	0.2	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	80	110	150				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	80	140				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	120	150	—	20–100	0.3	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	80	110	150				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	80	140				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	100	130	—	20–100	0.4	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	80	110	150				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	100	130				

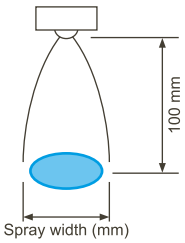
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa. *3) Measured at 100 mm from nozzle.

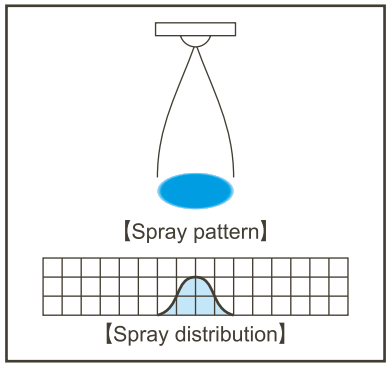
CBIMJ (Full Cone Spray)

Features

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
■Full cone spray pattern.
■Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
20	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	25	20	—	20–100	0.7	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	30	30	25				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	30	30				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	25	20	—	20–100	0.8	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	30	30	25				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	30	30				
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	25	20	—	20–100	1.1	0.9	0.7
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	30	30	25				
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	30	30				

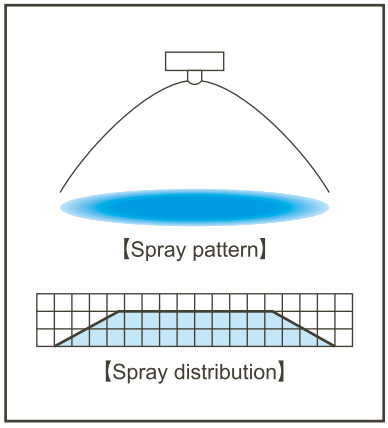
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa. *3) Measured at 100 mm from nozzle.

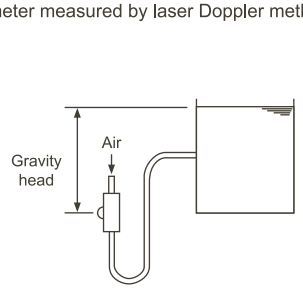
CBIMV-S (Flat Spray)

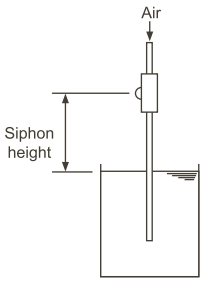
Features

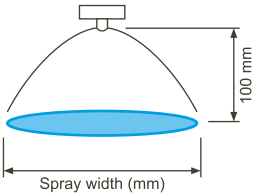
■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*1
■Flat spray pattern.
■Liquid siphon feed type (liquid pressure device is not required).
■Even spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method









Spray angle code *2	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Gravity head (mm) +300	Gravity head (mm) +100	Siphon height (mm) -100	Siphon height (mm) -300	Siphon height (mm) -500	Spray width*3 (mm)	Mean droplet diameter (μm) Laser Doppler method	Free passage dia. (mm) Spray orifice	Adaptor Liquid	Adaptor Air
80	005S	0.2	3.75	0.4	0.38	0.36	0.34	0.32	160	20–30	0.2	0.4	0.3
		0.3	5.0	0.29	0.27	0.25	0.23	0.21	165				
		0.4	6.25	0.16	0.15	0.13	0.11	0.1	170				
	01S	0.2	7.5	0.74	0.68	0.65	0.61	0.57	160	20–30	0.2	0.6	0.5
		0.3	10	0.55	0.52	0.5	0.47	0.43	165				
		0.4	12.5	0.38	0.34	0.3	0.27	0.25	170				
	02S	0.2	15	1.4	1.3	1.2	1.2	1.1	160	20–30	0.3	0.9	0.7
		0.3	20	1.1	1.0	1.0	0.9	0.9	165				
		0.4	25	0.7	0.7	0.6	0.6	0.5	170				

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*3) Measured at 100 mm from nozzle and liquid siphon height of 100 mm.

How to order

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

Liquid Pressure Type

<Example> CBIMV 80005 S303 + CSP S303

CBIMV (Nozzle series) 80 (Spray angle code) 005 (Air consumption code) S303 + CSP (Type of adaptor) S303

Nozzle series
■CBIMV
■CBIMJ

Spray angle code
■110
■80
■45
■20

Air consumption code
■005
■01
■02

Type of adaptor
■CSP
■CSN

Liquid Siphon Type

<Example> CBIMV 80005S S303 + CSP S303

CBIMV 80 005S (Air consumption code) S303 + CSP (Type of adaptor) S303

Air consumption code
■005S
■01S
■02S

Type of adaptor
■CSP
■CSN

Details of adaptors are shown on page 25.
Adaptor type CSP is used in the same way as SPB. Adaptor type CSN is used in the same way as SNB.

Ultra-Compact Design, Small Capacity Fine Fog Nozzles with Spray Control Adaptor

SCBIM

Features

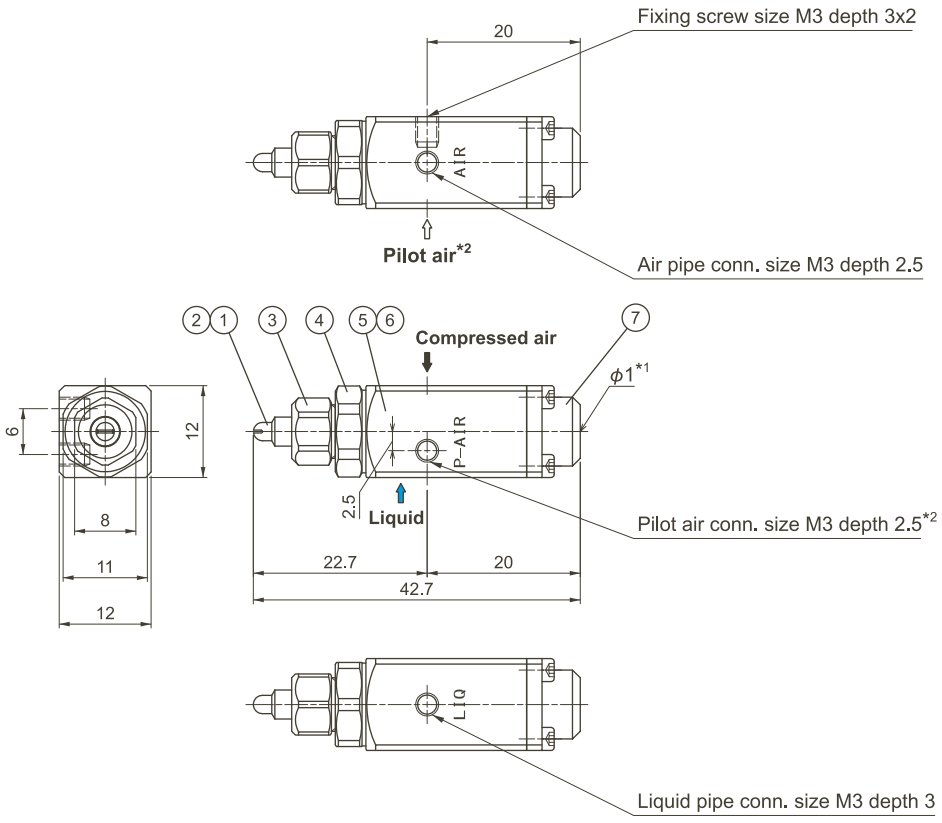
■Further miniaturized version of CBIM series producing fine atomization.

■Available in liquid pressure or liquid siphon feed type, two spray pattern types (flat spray or full cone spray)—9 varieties in total.

■Capable of spraying smallest flow rate among all of our pneumatic spray nozzles.

Structure & Material

■Mass: 30 g



*1) Hole ϕ1 is for air relief.
*2) No pilot air for SN-type adaptor.

■Components and materials

No.	Components	Standard materials
①	Spray tip	S303
②	Core	S303
③	Cap	S303
④	Connector	S303
⑤	Adaptor	S303
⑥	Packing	FKM
⑦	Spring cap	S303

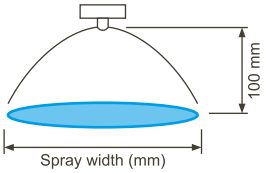
Ultra-Compact Design, Small Capacity Fine Fog Nozzles with Spray Control Adaptor —Liquid Pressure Type—

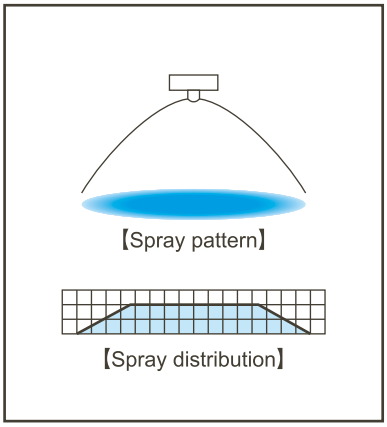
SCBIMV (Flat Spray)

Features

- Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
- Flat spray pattern.
- Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
- Produces two different spray distributions: even spray distribution across the entire spray area (when spraying at a low air-water ratio), or a mountain-shaped distribution having gradually tapered edges (at a high air-water ratio).

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
110	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	280	330	—	20–100	0.2	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	240	250	380				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	220	300				
80	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	230	260	—	20–100	0.1	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	170	200	280				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	160	250				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	220	250	—	20–100	0.2	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	140	200	250				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	140	220				
45	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	120	150	—	20–100	0.2	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	80	110	150				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	80	140				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	120	150	—	20–100	0.3	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	80	110	150				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	80	140				

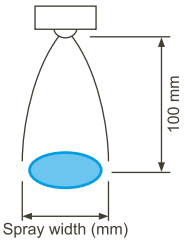
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.

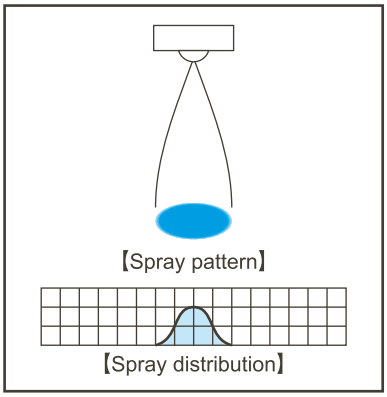
SCBIMJ (Full Cone Spray)

Features

- Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
- Full cone spray pattern.
- Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
20	005	0.2	0.7	3.4	1.5	2.6	—	—	—	—	—	—	25	20	—	20–100	0.7	0.4	0.3
		0.3	0.25	5.0	0.6	4.7	1.25	4.1	2.0	3.2	—	—	30	30	25				
		0.4	—	—	0.3	6.3	0.55	6.0	1.1	5.5	1.65	4.8	—	30	30				
	01	0.2	1.3	6.8	2.8	5.3	—	—	—	—	—	—	25	20	—	20–100	0.8	0.6	0.5
		0.3	0.5	10	1.1	9.5	2.3	8.4	4.0	6.5	—	—	30	30	25				
		0.4	—	—	0.6	12.4	1.1	12	2.2	11	3.3	9.6	—	30	30				

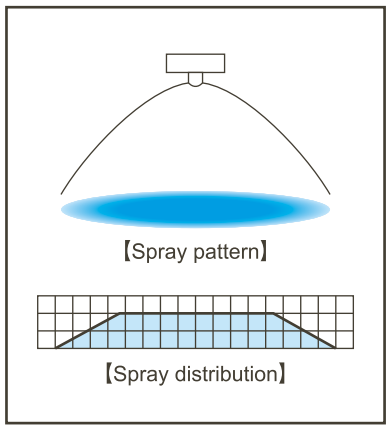
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.

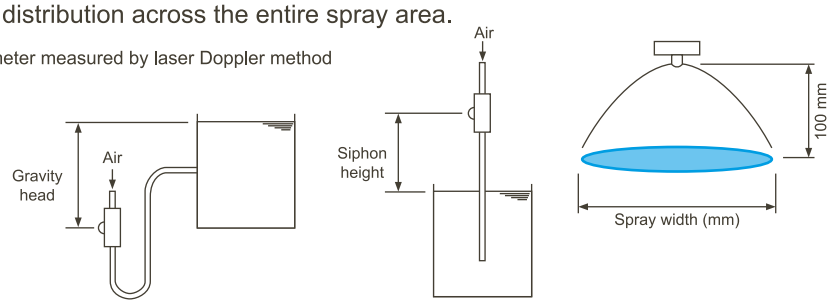
SCBIMV-S (Flat Spray)

Features

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*1
■Flat spray pattern.
■Liquid siphon feed type (liquid pressure device is not required).
■Even spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method





Spray angle code *2	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Gravity head (mm) +300	Gravity head (mm) +100	Siphon height (mm) -100	Siphon height (mm) -300	Siphon height (mm) -500	Spray width*3 (mm)	Mean droplet diameter (μm) Laser Doppler method	Free passage dia. (mm) Spray orifice	Adaptor Liquid	Adaptor Air
80	005S	0.2	3.75	0.4	0.38	0.36	0.34	0.32	160	20–30	0.2	0.4	0.3
		0.3	5.0	0.29	0.27	0.25	0.23	0.21	165				
		0.4	6.25	0.16	0.15	0.13	0.11	0.1	170				
	01S	0.2	7.5	0.74	0.68	0.65	0.61	0.57	160	20–30	0.2	0.6	0.5
		0.3	10	0.55	0.52	0.5	0.47	0.43	165				
		0.4	12.5	0.38	0.34	0.3	0.27	0.25	170				

*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*3) Measured at 100 mm from nozzle and liquid siphon height of 100mm.

How to order

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

Liquid Pressure Type

<Example> SCBIMV 80005 S303 + SP S303

SCBIMV (Nozzle series) ■SCBIMV ■SCBIMJ
80 (Spray angle code) ■110 ■80 ■45 ■20
005 (Air consumption code) ■005 ■01
S303 +
SP (Type of adaptor) ■SP ■SN
S303

Liquid Siphon Type

<Example> SCBIMV 80005S S303 + SP S303

SCBIMV 80 005S (Air consumption code) ■005S ■01S S303 + SP (Type of adaptor) ■SP ■SN S303

Details of adaptors are shown on page 25.
Adaptor type SP is used in the same way as SPB. Adaptor type SN is used in the same way as SNB.

List of Spray Tip Interchangeability

Spray tips with ◎ are interchangeable with each other to change spray angle and spray pattern. See page 41 for SCBIM series.

			Liquid pressure type																								Liquid siphon type				
			BIMV															BIMK				BIMJ									BIMV-S		BIMK-S	
			11002	11004	11007.5	11015	11022	8002	8004	80075	8015	8022	4502	4504	45075	4515	4522	6004	60075	6015	6022	7004	70075	7015	7022	2002	2004	20075	2015	2022	8002S	8004S	8007.5S	6004S	6007.5S
Liquid pressure type	BIMV	11002		×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×
		11004	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×
		11007.5	×	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×
		11015	×	×	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×
		11022	×	×	×	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×
		8002	◎	×	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×
		8004	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×
		80075	×	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×
		8015	×	×	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×
		8022	×	×	×	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×
		4502	◎	×	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×
		4504	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×
		45075	×	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×
		4515	×	×	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×
		4522	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	◎	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×
	BIMK	6004	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×		×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×
		60075	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×		×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×
		6015	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×		×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×
		6022	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×		×	×	×	◎	×	×	×	×	◎	×	×	×	×	×
	BIMJ	7004	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	×	×
		70075	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	×
		7015	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×		×	×	×	×	◎	×	×	×	×	×	×
		7022	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×		×	×	×	×	◎	×	×	×	×	×
		2002	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×
		2004	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	×	×
		20075	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	×
		2015	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×		×	×	×	×	×	×
		2022	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	◎	×	×	×	◎	×	×	×	×		×	×	×	×	×
Liquid siphon type	BIMV-S	8002S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×
		8004S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	◎	×
		80075S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	◎
	BIMK-S	6004S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	◎	×		×
		60075S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	◎	×	

			Liquid pressure type																			Liquid siphon type						
			CBIMV														CBIMK		CBIMJ				CBIMV-S					CBIMK-S	
			11001	11002	11004	11007.5	80005	8001	8002	8004	80075	45005	4501	4502	4504	45075	6004	60075	20005	2001	2002	2004	20075	80005S	8001S	8002S	8004S	80075S	6004S	6007.5S
Liquid pressure type	CBIMV	11001		×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
		11002	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×
		11004	×	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×
		11007.5	×	×	×		×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
		80005	×	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×	×
		8001	◎	×	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×
		8002	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×
		8004	×	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×
		80075	×	×	×	◎	×	×	×	×		×	×	×	×	◎	×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×
		45005	×	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×	×
		4501	◎	×	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×	×
		4502	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×	×
		4504	×	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×
		45075	×	×	×	◎	×	×	×	×	◎	×	×	×	×		×	×	×	×	×	×	◎	×	×	×	×	×	×	×	×	×
	CBIMK	6004	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×		×	×	×	×	◎	×	×	×	×	×	×	×	×	×	×
		60075	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×		×	×	×	×	◎	×	×	×	×	×	×	×	×	×
	CBIMJ	20005	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×	×	×
		2001	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×	×
		2002	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×
		2004	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×
		20075	×	×	×	◎	×	×	×	×	◎	×	×	×	×	◎	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×
Liquid siphon type	CBIMV-S	80005S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×
		8001S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×
		8002S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×
		8004S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×	×
		80075S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×	×
	CBIMK-S	6004S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×
		60075S	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×

SCBIM series Spray Tip Interchangeability

			Liquid pressure type							Liquid siphon type	
			SCBIMV					SCBIMJ		SCBIMV-S	
			11001	80005	8001	45005	4501	20005	2001	80005S	8001S
Liquid pressure type	SCBIMV	11001		×	◎	×	◎	×	◎	×	×
		80005	×		×	◎	×	◎	×	×	×
		8001	◎	×		×	◎	×	◎	×	×
		45005	×	◎	×		×	◎	×	×	×
		4501	◎	×	◎	×		×	◎	×	×
	SCBIMJ	20005	×	◎	×	◎	×		×	×	×
		2001	◎	×	◎	×	◎	×		×	×
Liquid siphon type	SCBIMV-S	80005S	×	×	×	×	×	×	×		×
		8001S	×	×	×	×	×	×	×	×	

Spray tips with ◎ are interchangeable with each other.

CBIM series Cap Interchangeability

Adaptor type		T*1					CSP/CSN*2		
		005	01	02	04	075	005	01	02
T*1	005		◎	◎	×	×	×	×	×
	01	◎		◎	×	×	×	×	×
	02	◎	◎		×	×	×	×	×
	04	×	×	×		◎	×	×	×
	075	×	×	×	◎		×	×	×
CSP/CSN*2	005	×	×	×	×	×		◎	◎
	01	×	×	×	×	×	◎		◎
	02	×	×	×	×	×	◎	◎	

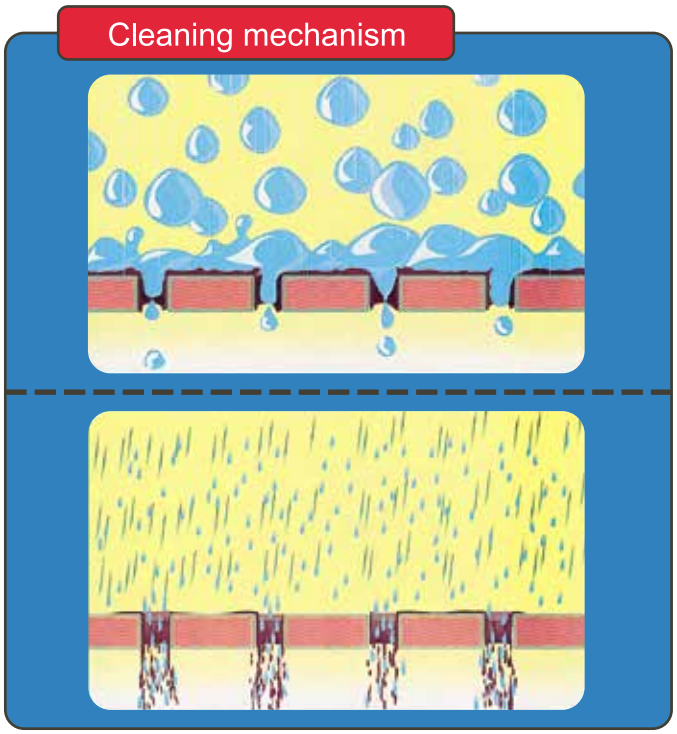
Caps with ◎ are interchangeable with each other.
*1) Air consumption codes available for T-type adaptor are 005, 01, 02, 04, and 075.
*2) Air consumption codes available for CSP- and CSN-type adaptors are 005, 01, and 02 only.

When changing an adaptor type of the existing CBIM nozzle between T, CSP, and CSN types, it is possible to continue to use the same spray tips and core, which are the common parts (the cap is not).

Common applications

■**Paper & Pulp:** Moisture control, spraying mold lubricant, preventing cardboard from curling
■**Plastics:** Spraying anti-electrostatic agent, coating
■**Iron & Steel:** Cooling metal sheets
■**Glass:** Coating and cooling glass sheets
■**Textile:** Moisture control of textile and fiber
■**Printing:** Moisture control of paper after dryer of web offset printing machine
■**Automotives:** Cooling carriages of automobile bodies on the painting lines after oven
■**Food:** Spraying egg yolk, oil, honey, and more

New cleaning method "Fog Cleaning"



■For precise cleaning in cleaning process of photo-processing products

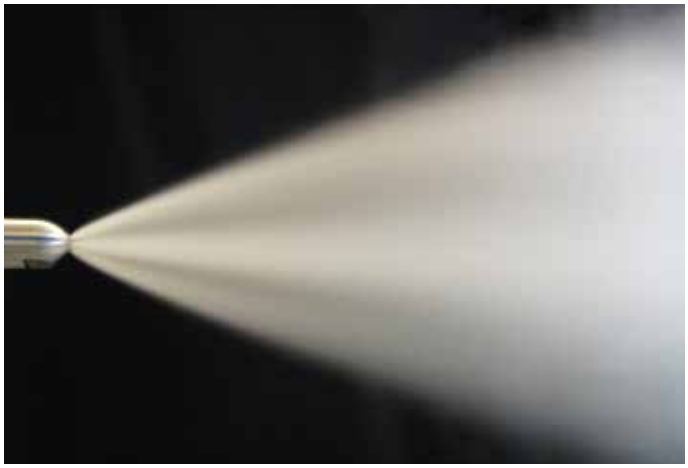
In conventional cleaning methods, large droplets created by hydraulic nozzles are used and cannot clean within fine interstices.
By using air, pneumatic spray nozzles produce very fine droplets for "fog cleaning".

■Features of Fog Cleaning

①Very fine droplets get into interstices and wash out dirt.
②Velocity of cleaning water has been remarkably improved due to compressed air blow, that contributes to maximizing spray impact.
③Compressed air will blow off puddles on surfaces of objects, stopping chemical reactions, and thus, it will get better cleaning effects.

Medium/Large Capacity Fine Fog Nozzles

GSIMⅡ series Nozzles



■GSIMⅡ series fine fog nozzles, developed from a new nozzle engineering concept, have excellent atomization capabilities.

■GSIMⅡ series nozzles produce a large volume of fine atomization with a low consumption of compressed air, having very low air-water ratios.

■Simple structure, easy maintenance.

Contents

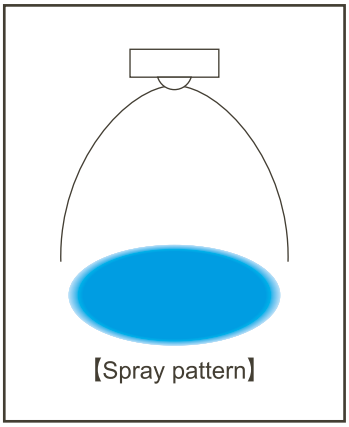
Medium/Large Capacity Fine Fog Nozzles

GSIMⅡ

Features

■Pneumatic spray nozzle producing large amount of "fine fog", spray capacity 30–1,000 ℓ/hr.
■Energy-saving design—mean droplet diameter of 50 μm and a maximum droplet diameter of 150 μm*1 at an air-water ratio of 130.
■Available in spray angles of 60° and 20°, in 6 spray capacity types—12 varieties in total. Wide selection.
■Easy maintenance with simple structure and compact body.

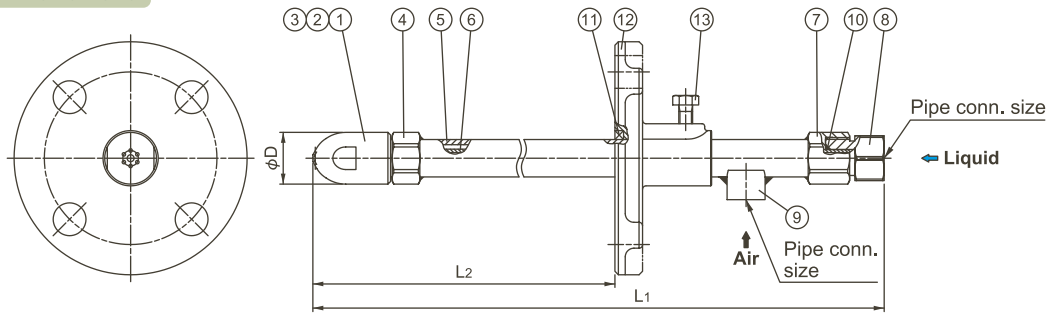
*1) Droplet diameter measured by laser Doppler method



Applications

■Cooling: Gas, moldings, refractories
■Moisture control: Flue gas, concrete
■Combustion: Oil, waste fluid
■Dust suppression: Recycling facilities, material facilities, moldings

Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Nozzle tip	S316L
②	Nozzle core	S316L
③	Whirler	S316L equivalent
④	Nozzle adaptor	S316L
⑤	Outer pipe (for air)	S316L
⑥	Inner pipe (for liquid)	S304

No.	Components	Standard materials
⑦	Joint	S304
⑧	Liquid socket	S304
⑨	Air socket	S304
⑩	O-ring	FKM
⑪	Packing	Metal wire reinforced AES wool
⑫	Flange	SCS13 (S304)
⑬	Bolt	S304

Dimensions & Pipe Connection Sizes

■Dimensions

Spray angle code	Air consumption code	Pipe connection size		Outer diameter ϕD (mm)	Free passage diameter (mm)	
		Air	Liquid		Air	Liquid*2
60 20	37	Rc3/8	Rc3/8	30	1.6	1.8 (2.2)
	55				2.0	2.2 (2.2)
	75	Rc1/2	Rc1/2	38	2.3	2.6 (3.2)
	110				2.9	3.2 (3.2)
	150	Rc3/4		50	3.3	3.7 (4.0)
	220				4.0	4.0 (4.0)

*2) Free passage diameter in ( ) shows that of GSIMⅡ with spray angle code of 20.

■Type of length

Type	Total length L1*3 (mm)	Length L2 (mm)
A	560	300–400
B	760	400–600
C	960	600–800
D	1,160	800–1,000

*3) L1: Standard length

■Mass

Air consumption code	Type of length	Mass*4 (g)
37, 55	A	1,300
	B	1,600
	C	2,000
	D	2,400
75, 110	A	1,800
	B	2,300
	C	2,800
	D	3,300
150, 220	A	2,500
	B	3,100
	C	3,700
	D	4,300

*4) The mass shown is when the total length is the standard length L1 and excludes a mass of flange. For longer lengths, add the corresponding mass for each 100 mm of L1 length as below.
(Air consumption code: Mass per 100 mm)
37/55: 180 g, 75/110: 260 g, 150/220: 300 g

Flow-rate Diagrams (Spray angle 60° type)

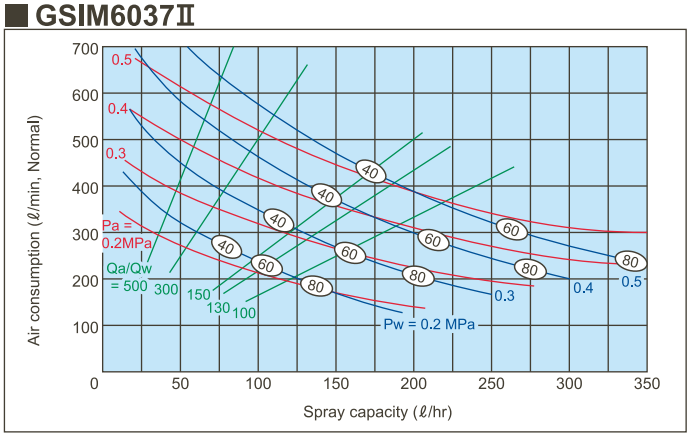
■How to read the chart

①The spray capacity shown is for one nozzle.

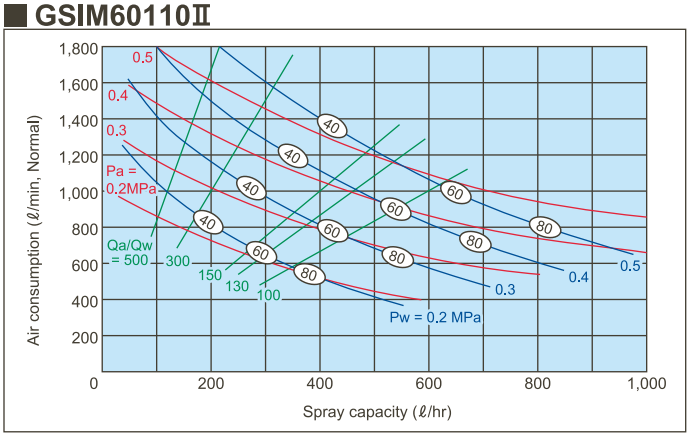
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.

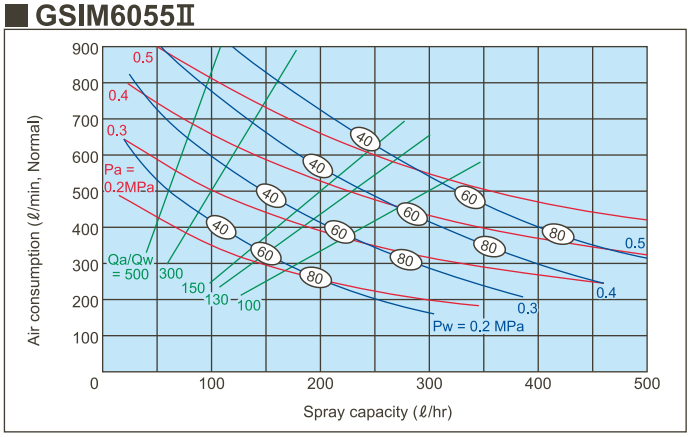
■ GSIM6037Ⅱ



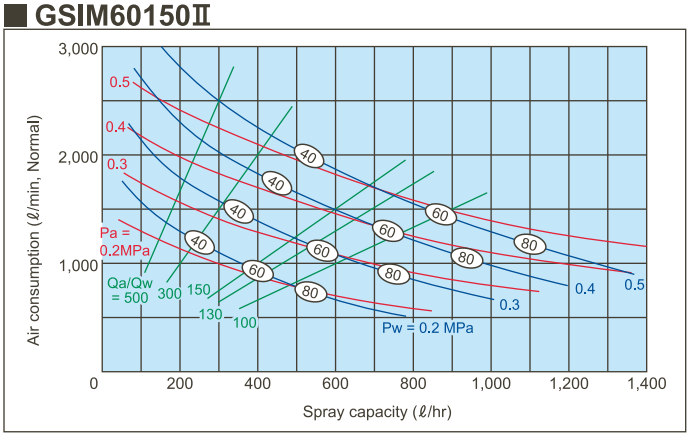
■ GSIM60110Ⅱ



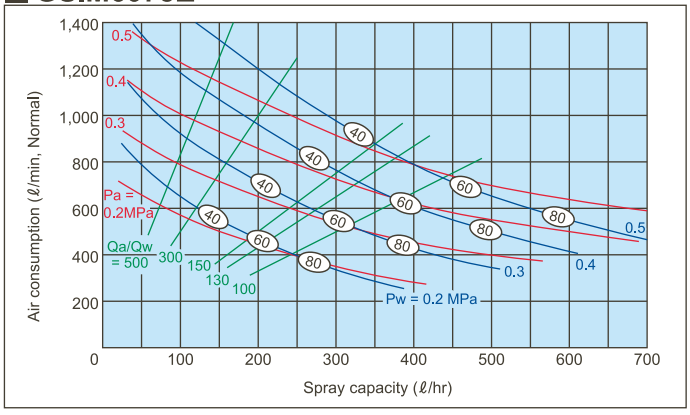
■ GSIM6055Ⅱ



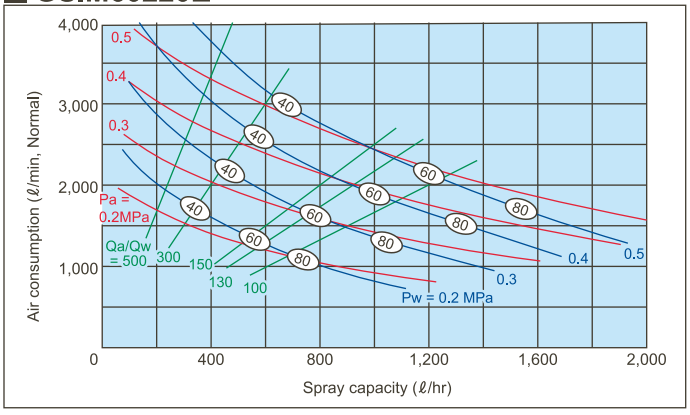
■ GSIM60150Ⅱ



■ GSIM6075Ⅱ



■ GSIM60220Ⅱ



Flow-rate Diagrams (Spray angle 20° type)

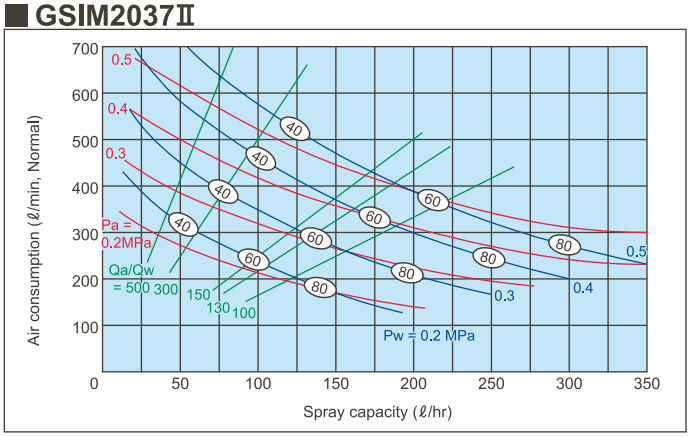
■How to read the chart

①The spray capacity shown is for one nozzle.

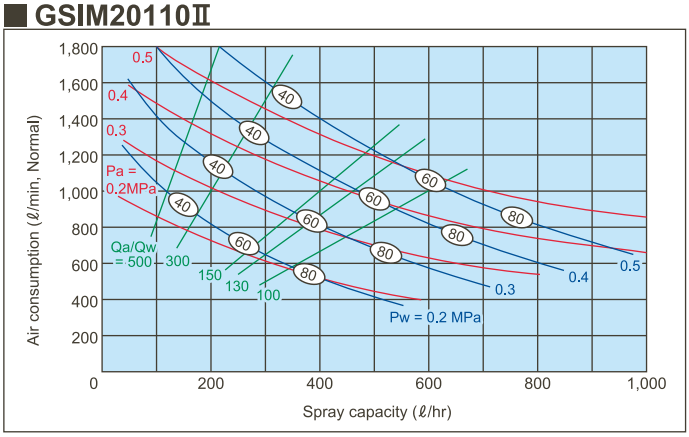
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.

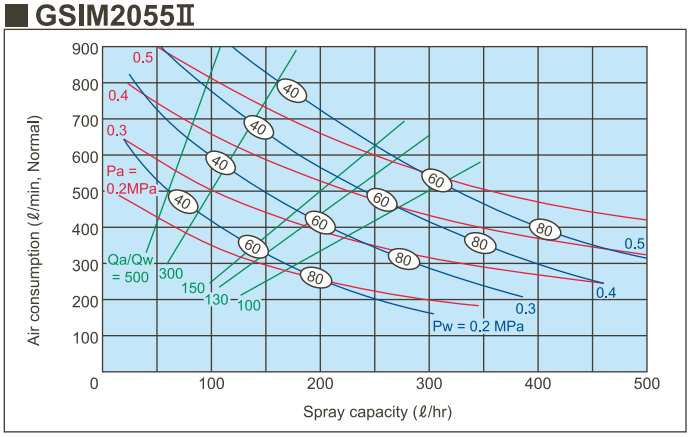
■ GSIM2037Ⅱ



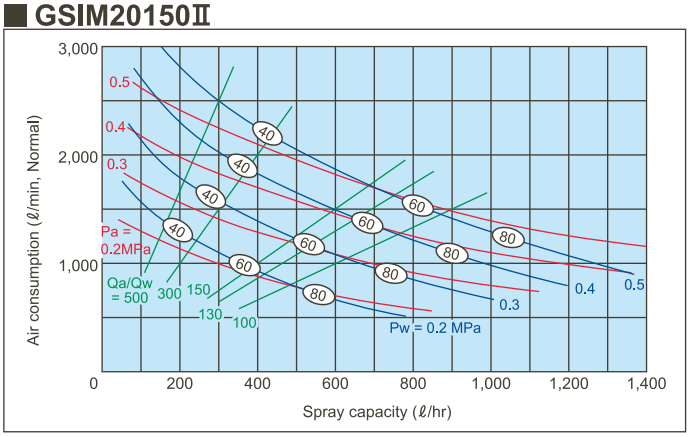
■ GSIM20110Ⅱ



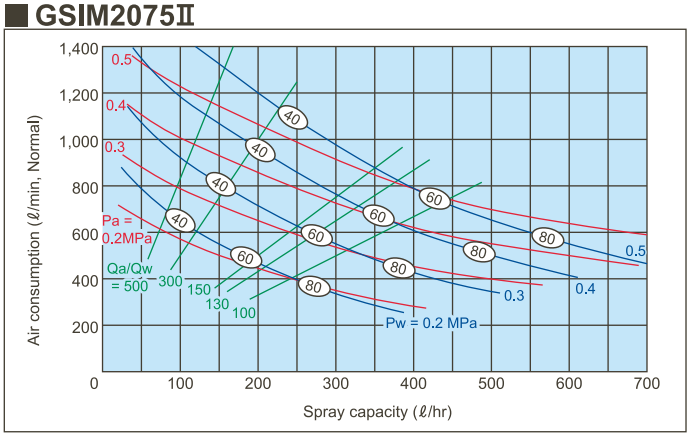
■ GSIM2055Ⅱ



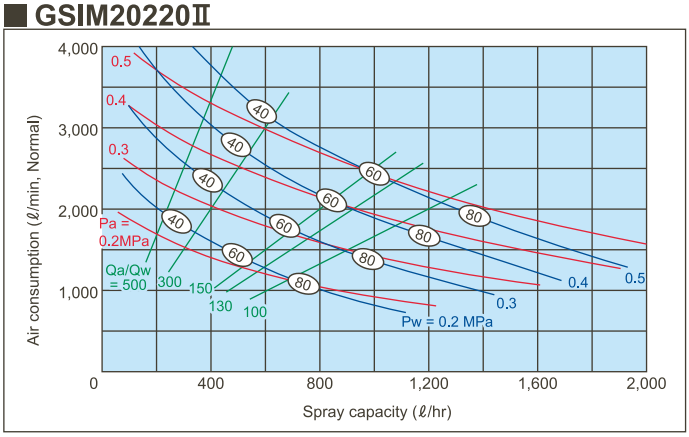
■ GSIM20150Ⅱ



■ GSIM2075Ⅱ

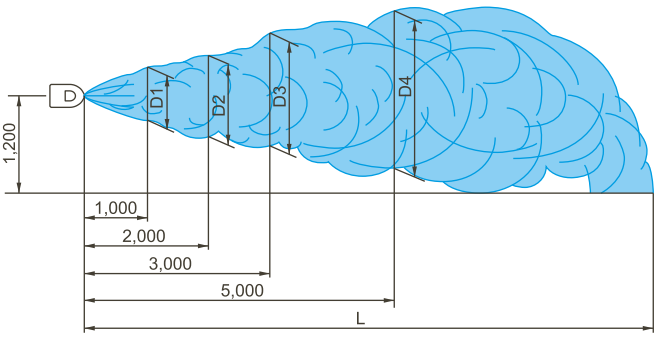


■ GSIM20220Ⅱ



Spray Dimensions

Spray angle code	Air consumption code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)				
				D1	D2	D3	D4	L
60	37	0.3	0.25–0.30	600	950	1,200	1,700	8,000
			0.30–0.35	700	1,050	1,350	1,700	8,000
		0.4	0.35–0.40	550	850	1,100	1,700	8,000
			0.40–0.45	650	950	1,250	1,700	8,000
		0.5	0.45–0.50	500	800	1,000	1,700	8,000
			0.50–0.55	600	900	1,150	1,700	8,000
	55	0.3	0.25–0.30	650	1,000	1,250	1,800	9,000
			0.30–0.35	750	1,100	1,400	1,800	9,000
		0.4	0.35–0.40	600	900	1,150	1,800	9,000
			0.40–0.45	650	1,000	1,300	1,800	9,000
		0.5	0.45–0.50	500	850	1,050	1,800	9,000
			0.50–0.55	600	950	1,200	1,800	9,000
	75	0.3	0.25–0.30	700	1,050	1,300	1,900	10,000
			0.30–0.35	800	1,150	1,450	1,900	10,000
		0.4	0.35–0.40	650	950	1,200	1,900	10,000
			0.40–0.45	700	1,050	1,350	1,900	10,000
		0.5	0.45–0.50	550	900	1,100	1,900	10,000
			0.50–0.55	600	1,000	1,250	1,900	10,000
	110	0.3	0.25–0.30	750	1,100	1,400	1,900	10,000
			0.30–0.35	850	1,200	1,500	1,900	10,000
		0.4	0.35–0.40	700	1,050	1,300	1,900	11,000
			0.40–0.45	750	1,150	1,450	1,900	11,000
		0.5	0.45–0.50	600	1,000	1,200	1,900	11,000
			0.50–0.55	650	1,100	1,350	1,900	11,000
	150	0.3	0.25–0.30	800	1,150	1,500	2,000	11,000
			0.30–0.35	900	1,250	1,600	2,000	11,000
		0.4	0.35–0.40	750	1,100	1,400	2,000	12,000
			0.40–0.45	800	1,200	1,500	2,000	12,000
		0.5	0.45–0.50	650	1,050	1,300	2,000	12,000
			0.50–0.55	700	1,150	1,400	2,000	12,000
	220	0.3	0.25–0.30	900	1,200	1,600	2,100	11,000
			0.30–0.35	950	1,300	1,700	2,100	11,000
		0.4	0.35–0.40	800	1,150	1,500	2,100	12,000
			0.40–0.45	850	1,250	1,600	2,100	12,000
		0.5	0.45–0.50	700	1,100	1,400	2,100	12,000
			0.50–0.55	750	1,200	1,500	2,100	12,000



Spray angle code	Air consumption code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)				
				D1	D2	D3	D4	L
20	37	0.3	0.25–0.35	200	450	750	1,100	9,000
		0.4	0.35–0.45	250	500	850	1,200	10,000
		0.5	0.45–0.55	300	550	900	1,300	10,000
	55	0.3	0.25–0.35	250	500	800	1,200	10,000
		0.4	0.35–0.45	300	550	900	1,300	11,000
		0.5	0.45–0.55	350	600	1,000	1,400	11,000
	75	0.3	0.25–0.35	300	550	900	1,300	12,000
		0.4	0.35–0.45	350	650	1,000	1,400	13,000
		0.5	0.45–0.55	400	750	1,100	1,500	13,000
	110	0.3	0.25–0.35	350	600	1,000	1,400	12,000
		0.4	0.35–0.45	400	700	1,100	1,500	13,000
		0.5	0.45–0.55	450	800	1,200	1,600	13,000
	150	0.3	0.25–0.35	400	750	1,100	1,500	13,000
		0.4	0.35–0.45	450	800	1,200	1,600	14,000
		0.5	0.45–0.55	500	850	1,300	1,700	14,000
	220	0.3	0.25–0.35	450	800	1,200	1,500	13,000
		0.4	0.35–0.45	500	850	1,250	1,600	14,000
		0.5	0.45–0.55	550	900	1,300	1,700	14,000

Note: The above data were measured with tap water in a laboratory, in windless conditions.

How to order

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

<Example> GSIM6037Ⅱ B S316L+1*1/4T10 SCS13 (L_2)

GSIM [60] [37] Ⅱ [B] S316L + [1*1/4T10] SCS13 [(L_2)]

Spray angle code
- ■60
- ■20

Air consumption code
- ■37
- ■55
- ■75
- ■110
- ■150
- ■220

Type of length (Total length)
- ■A
- ■B
- ■C
- ■D

Flange size
- ■1*1/4T10
- ■1*1/2T10
- ■2T10

Length between the nozzle head and flange

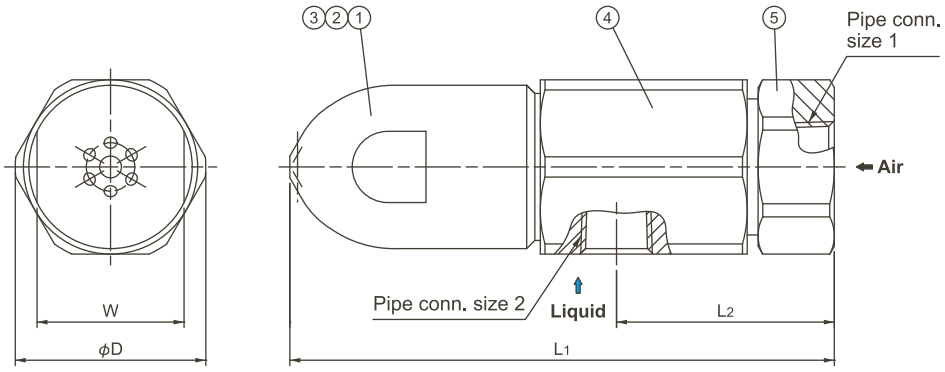
The minimum flange sizes
(Air consumption code: Flange size)
37Ⅱ, 55Ⅱ: 1*1/4T10
75Ⅱ, 110Ⅱ: 1*1/2T10
150Ⅱ, 220Ⅱ: 2T10

Please send us an inquiry for the different flange sizes.

See the drawing and table on page 43 for length type and L_2.
For details please ask for our inquiry drawing.

GSIMⅡ Nozzle with T-type Adaptor

Structure & Materials



Note: The above drawing is for GSIM6037ⅡS316L+TS303.
Configurations of nozzle tip slightly differ depending on air consumption codes.

■Dimension and materials

No.	Components	Standard materials
①	Nozzle tip	S316L
②	Nozzle core	S316L
③	Whirler	S316L equivalent
④	Adaptor	S303
⑤	Air socket	S303

Dimensions & Pipe Connection Sizes

Spray angle code	Air consumption code	Pipe connection size		Outer dimensions (mm)				Free passage diameter* (mm)		Mass (g)
		1 (Air)	2 (Liquid)	L1	L2	W	ϕD	Air	Liquid	
60 20	37	Rc3/8	Rc1/4	100	40	27	35	1.6	1.8 (2.2)	500
	55							2.0	2.2 (2.2)	
	75	Rc1/2	Rc3/8	120	42	32	45	2.3	2.6 (3.2)	900
	110							2.9	3.2 (3.2)	
	150	Rc3/4	Rc1/2	140	44	46	50	3.3	3.7 (4.0)	1,200
	220							4.0	4.0 (4.0)	

*Free passage diameter in ( ) shows that of GSIMⅡ with spray angle code of 20.

How to order

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

<Example> GSIM6037Ⅱ S316L + T S303

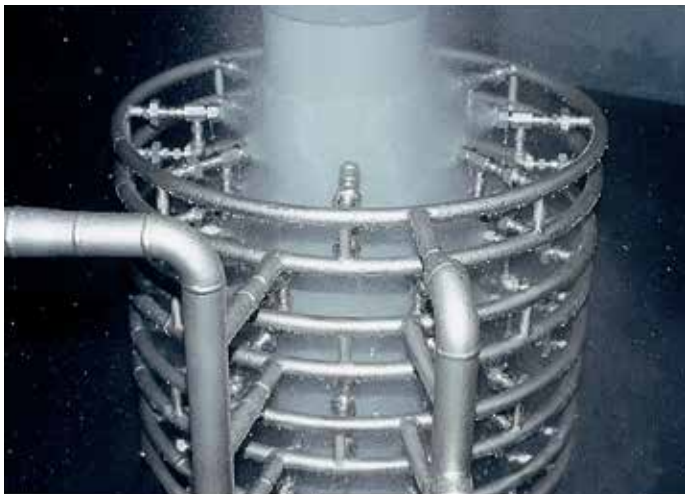
GSIM [60] [37] Ⅱ S316L + T S303

Spray angle code
■60
■20

Air consumption code
■37
■55
■75
■110
■150
■220

Semi-Fine Fog, Semi-Coarse Fog Nozzles

DOVEA/DDA/JJA DOVVA-G/VVEA/PSN series Nozzles



■DOVEA, DDA, JJA, and DOVVA-G series, developed to satisfy the crucial requirements for spray nozzles in the continuous casting process of steel making, feature stable spray angles and distributions with large turndown ratios, having fine and uniform spray droplet size distributions across the entire spray area.
Also, free passage diameters are twice as large as those of hydraulic nozzles to minimize clogging.

With these features, DOVEA, DDA, JJA, and DOVVA-G series are highly effective nozzles for steel/gas cooling.

■VVEA and PSN series are innovative pneumatic spray nozzles developed for new cleaning method requiring high-velocity and concentrated spraying of fine atomization, which can wash out fine dirt particles that conventional cleaning could not clean.

Contents

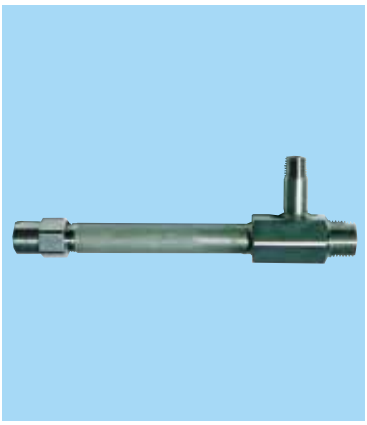
Flat Spray
Semi-Fine, Semi-Coarse Fog Nozzles

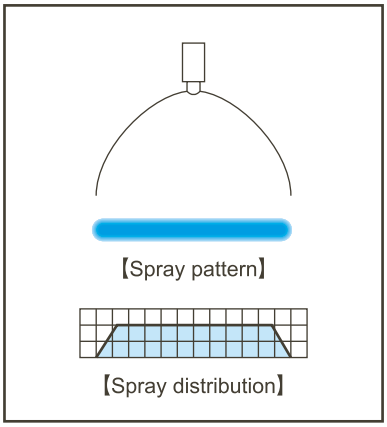
DOVEA

Features

■Flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 µm or more.*1
■Large turn-down ratio with minimal variation in spray angle.
■Uniform spray droplet size distribution across the entire spray area.
■Uniform distribution suitable for multiple-nozzle arrangements.
■Large free passage diameter minimizes clogging.

*1) Droplet diameter measured by the Fraunhofer diffraction method. Please see pages 6–7 for comparison with laser Doppler method.

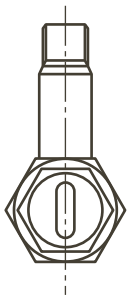


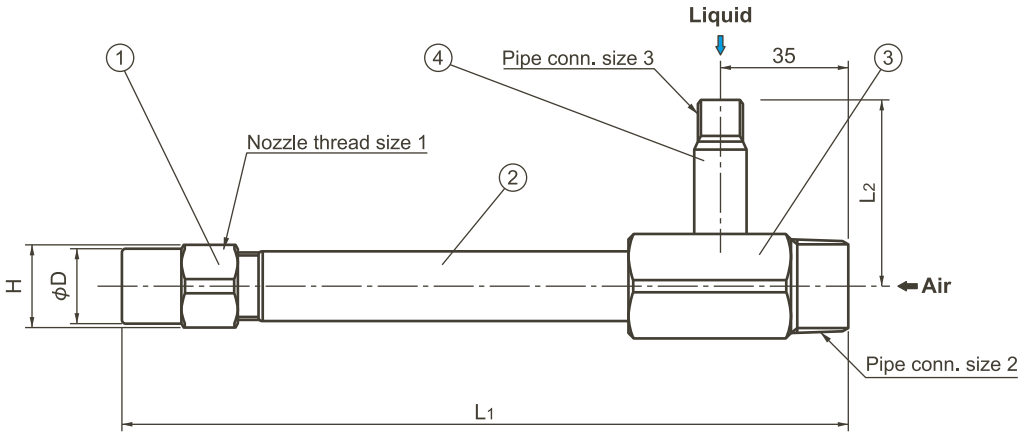


Applications

■Cooling: Gas, steel plates, steel pieces, moldings

Structure & Materials





■Components and materials

No.	Components	Standard materials
①	Nozzle body	S303
②	Pipe	S304
③	Mixing adaptor	S304
④	Liquid nipple	S304

Dimensions & Pipe Connection Sizes

Spray capacity code	Nozzle thread size	Pipe connection size		Outer dimensions (mm)				Mass*3 (g)
	1	2 (Air)	3 (Liquid)	L1*2	L2	H	ϕD	
82 110	Rc1/4	R1/2	R1/4	500	47.5	19	18	550
180 230	Rc3/8			500	47.5	21	19	650
400	Rc1/2			500	47.5	26	25	850

*2) L_1 = 200–1,500 mm
*3) The mass shown is when L_1 is 500 mm of straight pipe.
For the mass of DOVEA with a longer/shorter pipe, add or subtract the corresponding mass (listed below) for each 100 mm of L_1 length, according to the Nozzle thread size 1.

Nozzle thread size 1	Mass per 100 mm
Rc1/4	63 g
Rc3/8	85 g
Rc1/2	130 g

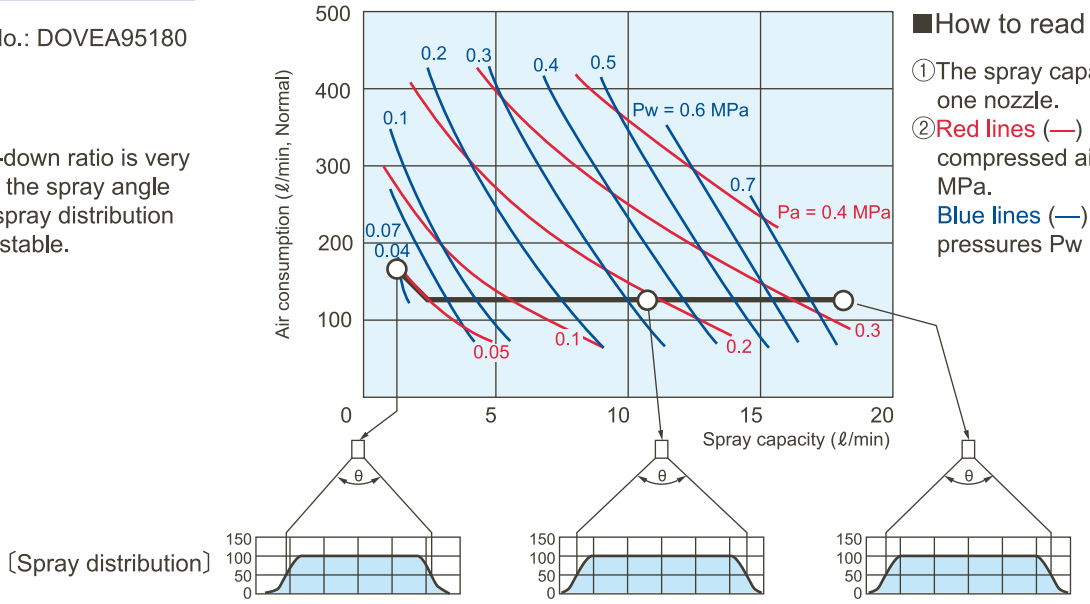
Spray angle code*4	Spray capacity code	Air pressure (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa)										Mean droplet diameter (μm)		Free passage diameter (mm)		
			0.07		0.1		0.2		0.4		0.7		Immersion sampling method	Fraunhofer diffraction method	Spray orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air				Liquid	Air
110	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100–350	50–175	2.7	3.6	5.1
		0.2	—	—	—	—	4.34	280	12.9	100	—	—					
		0.3	—	—	—	—	—	—	9.49	250	18.0	100					
		0.4	—	—	—	—	—	—	—	—	15.9	200					
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	3.1	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100–400	50–200	4.1	5.2	7.7
		0.2	—	—	—	—	9.65	630	28.6	220	—	—					
		0.3	—	—	—	—	—	—	21.1	560	40.0	225					
		0.4	—	—	—	—	—	—	—	—	35.4	450					
95	82	0.1	0.42	125	1.45	85	4.19	30	—	—	—	—	100–300	50–150	2.0	2.5	3.5
		0.2	—	—	—	—	1.98	125	5.86	45	—	—					
		0.3	—	—	—	—	—	—	4.32	110	8.2	45					
		0.4	—	—	—	—	—	—	—	—	7.26	90					
	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100–350	50–175	3.0	3.6	5.1
		0.2	—	—	—	—	4.34	280	12.9	100	—	—					
		0.3	—	—	—	—	—	—	9.49	250	18.0	100					
		0.4	—	—	—	—	—	—	—	—	15.9	200					
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	3.3	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100–400	50–200	4.5	5.2	7.7
		0.2	—	—	—	—	9.65	630	28.6	220	—	—					
		0.3	—	—	—	—	—	—	21.1	560	40.0	225					
		0.4	—	—	—	—	—	—	—	—	35.4	450					
70	110	0.1	0.56	180	1.94	120	5.63	40	—	—	—	—	100–300	50–150	2.8	2.8	4.1
		0.2	—	—	—	—	2.65	180	7.87	65	—	—					
		0.3	—	—	—	—	—	—	5.8	160	11.0	65					
		0.4	—	—	—	—	—	—	—	—	9.74	130					
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	4.1	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
55	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	4.5	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100–400	50–200	5.6	5.2	7.7
		0.2	—	—	—	—	9.65	630	28.6	220	—	—					
		0.3	—	—	—	—	—	—	21.1	560	40.0	225					
		0.4	—	—	—	—	—	—	—	—	35.4	450					

*4) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.7 MPa.

Flow-rate Diagram

Nozzle No.: DOVEA95180

The turn-down ratio is very large but the spray angle and the spray distribution are very stable.



■How to read the chart

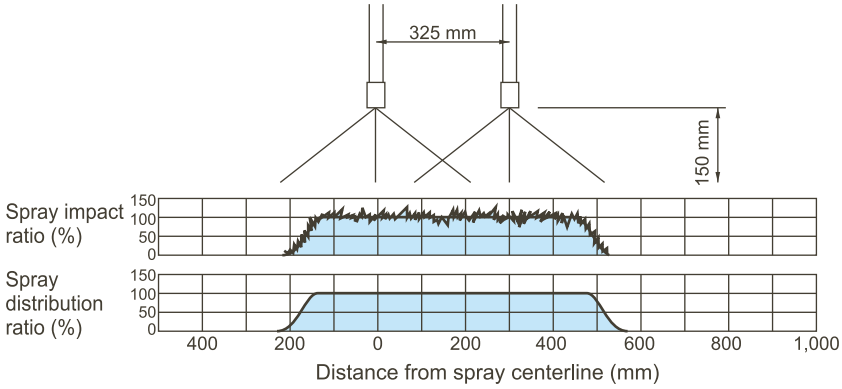
①The spray capacity shown is for one nozzle.
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.

Spray Flow distribution & Spray Impact Distribution

Nozzle No.: DOVEA95180

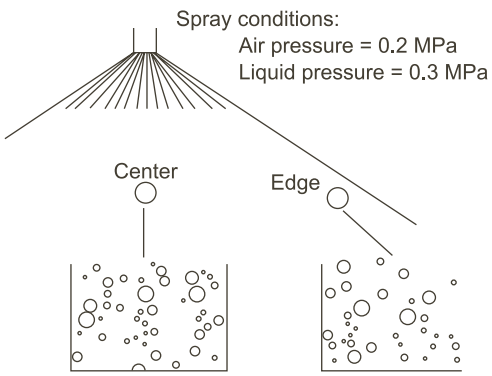
Spray conditions:
Air pressure = 0.2 MPa
Liquid pressure = 0.3 MPa

DOVEA nozzles produce a flat spray pattern with tapered spray pattern edges, which provide uniform spray distribution and spray impact in multiple-nozzle arrangements.



Spray Droplet Diameter

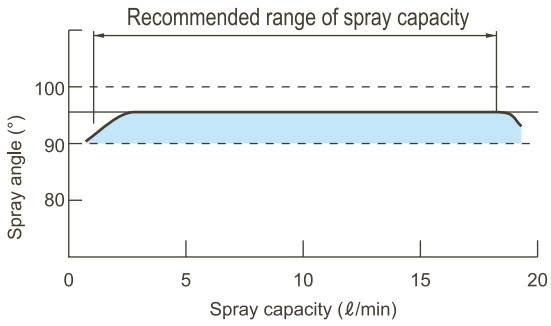
Nozzle No.: DOVEA95180



The spray droplet sizes are fine and uniform across the entire spray area.

Variation in Spray Angle

Nozzle No.: DOVEA95180

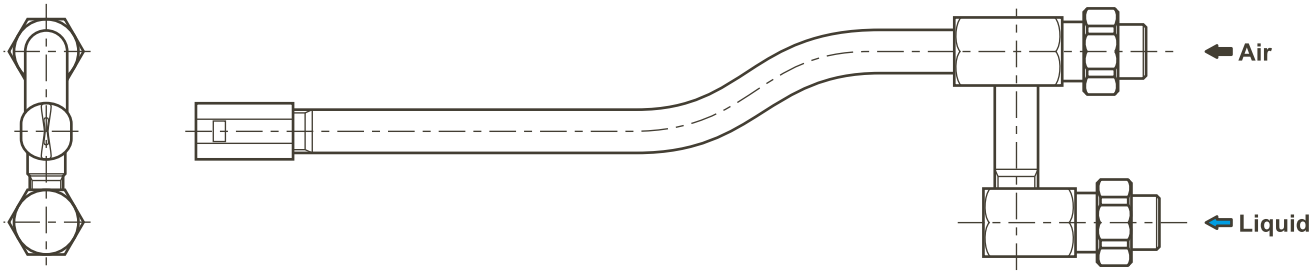


The variation in spray angle is minimized despite the large modulation of spray capacities.

Note:
Spray angle means the angle between two lines from the nozzle orifice to both sides of spray distribution where the spray distribution ratio is 50%, taking the spray distribution ratio at the center as 100%.

Special Pipe

– Bent Pipe –



Note: For details of bent pipes or other special pipes, please contact our sales office.

How to order

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

<Example> 1/4 DOVEA 9582-M × 500 S303-n

1/4	DOVEA	95	82	- M ×	500	S303 -	n
Nozzle thread size 1		Spray angle code	Spray capacity code		Total length L_1		Code of bent pipe*
■1/4 ■3/8 ■1/2		■110 ■95 ■70 ■55	■82 I ■400		■Min . 200 ■Standard 500 ■Max. 1500		

(*This code will be determined upon receipt of an inquiry.)

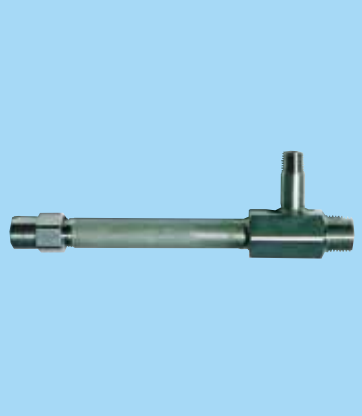
Sister product

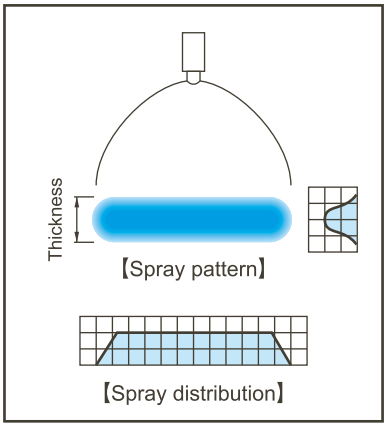
Thick Flat Spray Semi-Fine, Semi-Coarse Fog Nozzles

DOVEA-W

Features

■Flat spray pneumatic nozzle with a larger spray thickness compared to DOVEA series.
■Features uniform distribution of flow-rate and sprays droplets across the entire spray area, large turn-down ratio with minimal variation in spray angle as with DOVEA series.
■DOVEA-W series nozzles have a high cooling effect for cooling metal sheets.





Applications

■Cooling: Steel plates, steel pieces, gas

Double-wide spray thickness makes a difference in cooling applications (Comparison with DOVEA)

DOVEA-W series

Conventional nozzles (DOVEA series)

The increased thickness of the flat spray from this nozzle allows for more effective cooling in the space between rolls.

For further information, please contact our sales office.

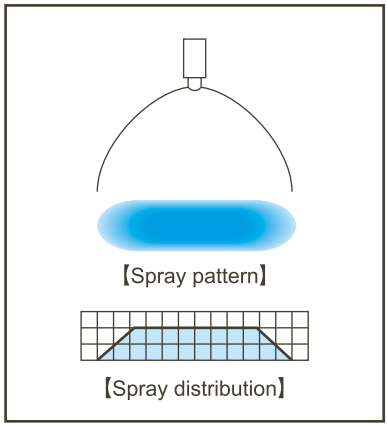
Ultra-Thick Flat Spray Semi-Fine, Semi-Coarse Fog Nozzles

DDA

Features

■Thick flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 μm or more.*1
■Thicker flat spray pattern covers wider area.
■Large turn-down ratio with minimal variation in spray angle.
■Uniform spray droplet size distribution across the entire spray area.
■Uniform distribution suitable for multiple-nozzle arrangements.
■Large free passage diameter minimizes clogging.

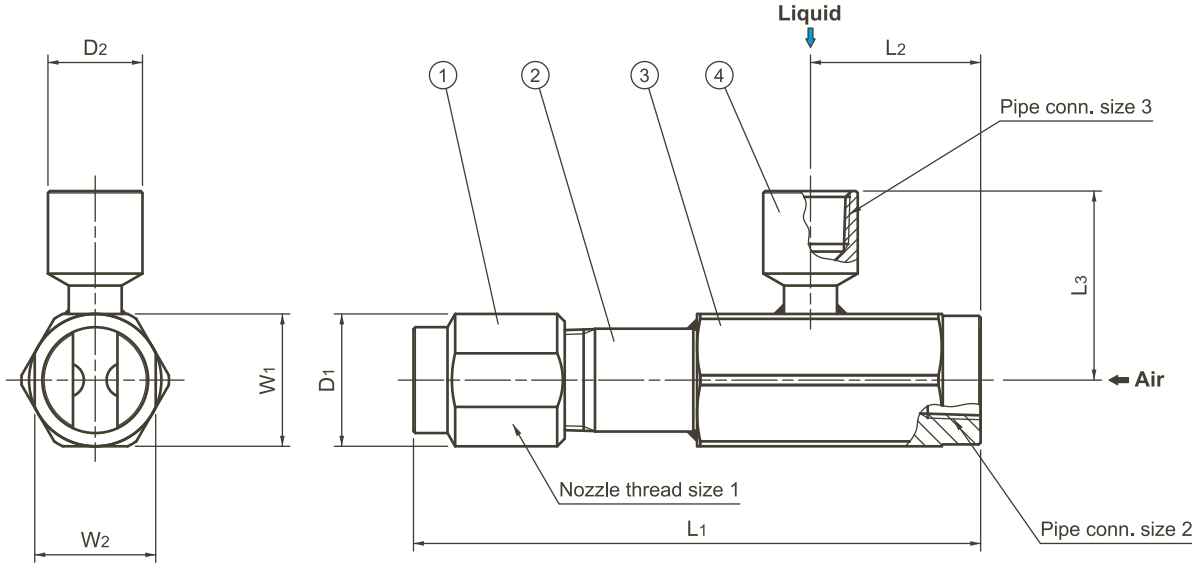
*1) Droplet diameter measured by the Fraunhofer diffraction method. Please see pages 6–7 for comparison with laser Doppler method.



Applications

■Cooling: Steel plates, steel pieces, steel pipes, moldings

Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Nozzle body	S303
②	Pipe	S304
③	Mixing adaptor	S304
④	Liquid socket	S304

(Some DDA nozzles have no Pipe②, depending on the nozzle codes.)

Dimensions & Pipe Connection Sizes

Nozzle thread size 1	Pipe connection sizes 2 & 3*2	L1*3 (mm)	L2 (mm)	L3 (mm)	W1 (mm)	W2 (mm)	ϕD1 (mm)	ϕD2 (mm)	Mass*4 (g)
Rc1/8	Rc1/4	70	32.5	40	24	16	18	16	170
Rc1/4		70	32.5	40	24	16	18	16	180
Rc1/2	Rc1/2	130	40	50	27	25	28	25	450
Rc3/4		150	45	50	35	32	35	25	650

*2) Pipe connection sizes for air and liquid are the same.
*3) L1 shows the standard length, which is the shortest, and the longest length is 1,500 mm.

*4) Each mass shows DDA with standard length (L1). For longer lengths, add the corresponding mass (listed below) for each 100 mm of length.

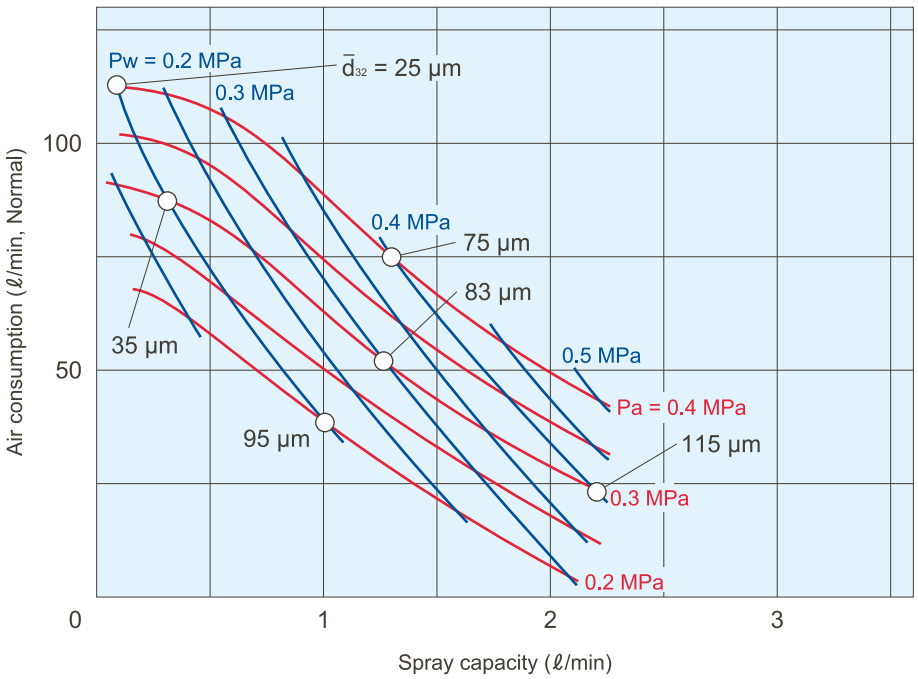
Nozzle thread size 1	Mass per 100 mm
Rc1/8	50 g
Rc1/4	80 g
Rc1/2	160 g
Rc3/4	220 g

Spray angle code		Spray capacity code	Nozzle thread size 1	Pipe conn. size 2,3	Air press. (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal)										Mean droplet diameter (μm)		Free passage diameter (mm)		
						Liquid pressure (MPa)														
						0.07		0.1		0.2		0.4		0.7						
Width	Thick-ness					Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Immersion sampling method	Fraunhofer diffraction method	Spray orifice	Adaptor	
																			Liquid	Air
125	20	70	Rc 1/4	Rc 1/4	0.1	1.51	29	2.22	24	—	—	—	—	—	—	200–300	100–150	2.4	2.2	1.5
					0.2	1.39	47	2.02	47	3.18	45	5.13	33	7.07	18					
					0.3	1.29	63	1.84	63	2.92	63	4.77	55	6.66	41					
					0.4	1.19	79	1.70	79	2.70	79	4.42	77	6.29	64					
110	25	36	Rc 1/4	Rc 1/4	0.1	0.87	34	1.20	34	1.87	31	—	—	—	—	200–300	100–150	2.0	1.7	1.5
					0.2	0.75	50	1.10	50	1.76	49	2.80	44	3.70	36					
					0.3	0.63	66	1.00	66	1.66	66	2.64	64	3.64	57					
					0.4	0.50	82	0.90	82	1.55	82	2.50	82	3.60	76					
	20	50	Rc 1/4	Rc 1/4	0.1	1.20	46	1.62	46	2.72	41	—	—	—	—	200–300	100–150	2.4	2.0	1.8
					0.2	1.00	69	1.47	69	2.45	65	3.86	55	5.13	43					
					0.3	0.80	92	1.28	92	2.17	91	2.56	85	5.04	72					
					0.4	0.60	114	1.10	114	1.93	114	3.30	111	4.86	99					
100	45	470	Rc 3/4	Rc 1/2	0.1	8.79	220	15.6	170	—	—	—	—	—	—	120–350	60–175	6.0	5.8	4.1
					0.2	5.86	370	12.2	330	20.2	280	—	—	—	—					
					0.3	3.45	490	9.66	480	15.5	443	32.1	285	—	—					
					0.4	1.21	610	7.07	610	12.9	587	20.7	491	46.3	240					
	45	580	Rc 3/4	Rc 1/2	0.1	12.6	278	18.8	213	—	—	—	—	—	—	140–400	70–200	7.0	6.5	4.7
					0.2	6.87	500	12.2	462	24.2	336	—	—	—	—					
					0.3	—	—	—	—	17.9	550	38.9	325	—	—					
					0.4	—	—	—	—	—	—	32.5	535	57.3	190					
	15	25	Rc 1/8	Rc 1/4	0.1	—	—	—	—	—	—	—	—	—	—	30–200	15–100	2.0	1.9	1.8
					0.2	—	—	—	—	1.05	37	—	—	—	—					
					0.3	—	—	—	—	0.34	87	2.20	24	—	—					
					0.4	—	—	—	—	—	—	1.30	75	—	—					
80	20	14	Rc 1/4	Rc 1/4	0.1	0.36	19	0.50	19	0.71	19	1.11	18	1.40	17	70–150	35–75	2.0	1.1	1.2
					0.2	0.29	29	0.46	29	0.68	29	1.10	28	1.41	27					
					0.3	0.22	39	0.41	39	0.65	39	1.08	39	1.42	37					
					0.4	0.14	49	0.37	49	0.62	49	1.06	49	1.43	48					
	20	37	Rc 1/4	Rc 1/4	0.1	0.93	33	1.35	32	2.02	30	3.01	24	3.74	17	200–300	100–150	2.8	1.7	1.5
					0.2	0.80	51	1.23	51	1.92	50	2.90	47	3.74	41					
					0.3	0.68	68	1.12	68	1.83	68	2.80	65	3.74	61					
					0.4	0.57	84	1.00	84	1.74	84	2.72	83	3.74	80					
	20	50	Rc 1/4	Rc 1/4	0.1	1.06	44	1.70	41	2.78	32	—	—	—	—	200–300	100–150	2.8	2.0	1.8
					0.2	0.86	71	1.40	70	2.37	65	3.79	48	4.95	35					
					0.3	0.67	96	1.18	95	2.05	92	3.40	82	4.84	62					
					0.4	0.50	121	0.92	121	1.68	119	3.06	111	4.70	89					
75	25	230	Rc 1/2	Rc 1/2	0.1	4.48	133	7.03	116	—	—	—	—	—	—	120–300	60–150	4.0	4.1	2.9
					0.2	3.50	207	5.76	199	10.4	168	16.2	104	—	—					
					0.3	2.54	271	4.58	268	9.27	249	15.1	200	22.3	110					
					0.4	1.61	330	3.47	330	8.33	320	14.1	278	21.7	191					

Note: Criteria for spray angle measurement differs depending on nozzle codes.

Flow-rate Diagram

Nozzle No.: DDA1001525



■How to read the chart

①The spray capacity shown is for one nozzle.

②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.

③Droplet diameter $\bar{d}_{32}$ is Sauter mean droplet diameter measured by the immersion sampling method.

How to order

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

<Example> 1/4 DDA 1252070 × (70) S303-n

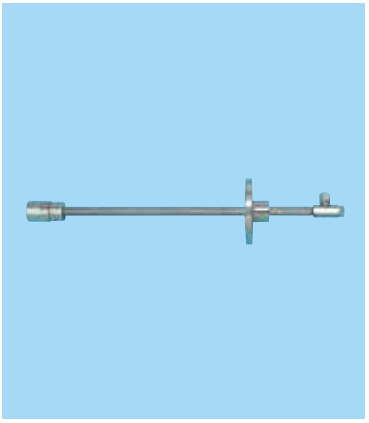
1/4	DDA	125	20	70	× (	70	) S303 -	n
Nozzle thread size 1		Spray angle code (Width)	Spray angle code (Thickness)	Spray capacity code		Total length L_1		Code of bent pipe*2
■1/8 ■1/4 ■1/2 ■3/4		■125 ■110 ■100 ■80 ■75	■45 I ■15	■14 I ■580		■Standard (70–150)*1 ■Max. 1500		(*2This code will be determined upon receipt of an inquiry.)

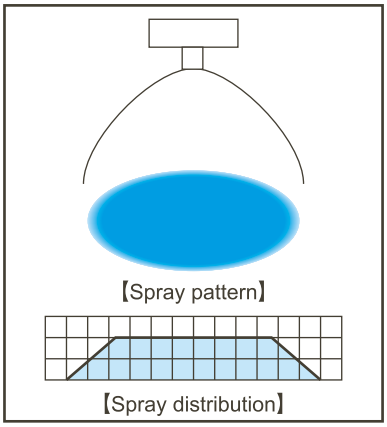
*1Standard total length L_1 differs with nozzle code. See page 54.

Full Cone Spray
Semi-Fine, Semi-Coarse Fog Nozzles

JJA

Features





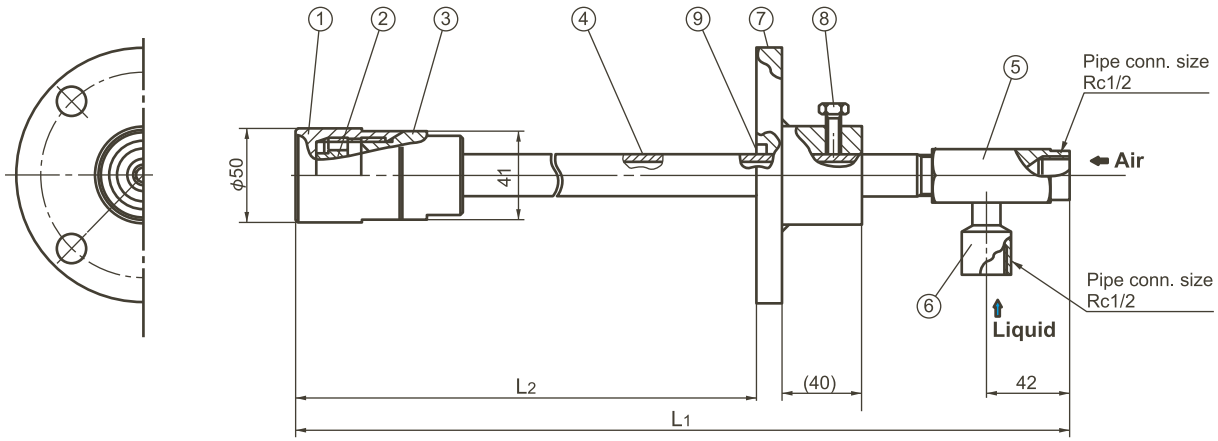
■Full cone spray pneumatic nozzle producing a large volume of semi-fine to semi-coarse atomization with a mean droplet diameter of 130 µm or more.*1
■Large turn-down ratio.
■Uniform spray droplet size distribution across the entire spray area.
■Large free passage diameter minimizes clogging. Ideal for spraying liquid containing foreign particles and for combustion of waste liquid at waste incinerators.

*1) Droplet diameter measured by the immersion sampling method. Please see pages 6–7 for comparison with laser Doppler method.

Applications

■Cooling: Gas, moldings
■Combustion: Waste water

Structure, Materials, Dimensions & Pipe Connection Sizes



■Components and materials

No.	Components	Standard materials
①	Nozzle body	S316L
②	Mixing core	S316L
③	Nozzle adaptor	S316L
④	Pipe	S316LTP
⑤	Mixing adaptor	S304
⑥	Liquid socket	S304
⑦	Flange	S304
⑧	Bolt	S304
⑨	Packing	Metal wire reinforced AES wool

■Type of length

Type	Total length L_1 (mm)	Length L_2 (mm)	Mass*2 (kg)
A	440	200–300	1.8
B	540	300–400	2.0
C	740	400–600	2.3
D	940	600–800	2.6
E	1,140	800–1,000	2.9

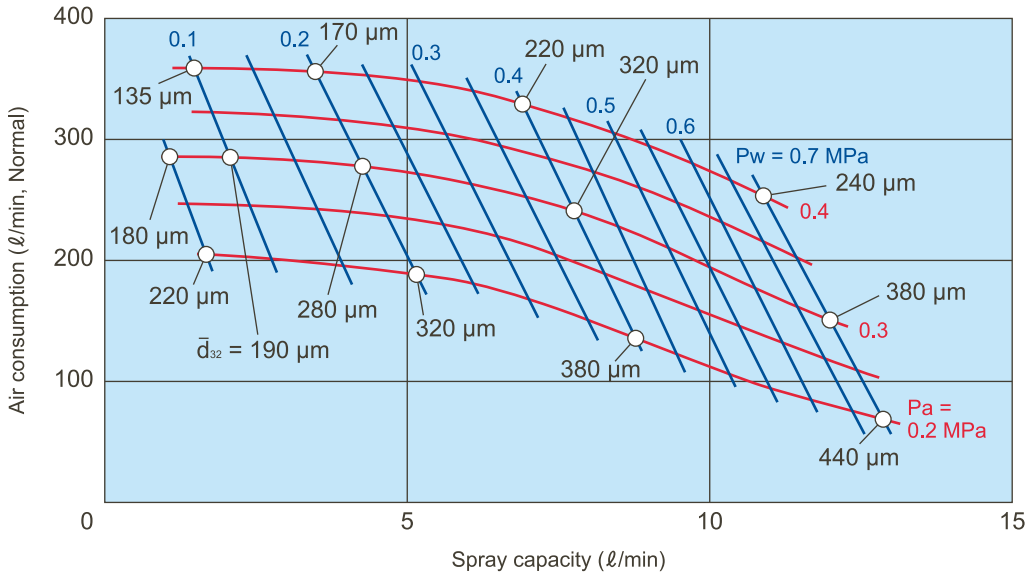
*2) Mass of flange is not included.

Spray capacity code	Air pressure (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal)										Mean droplet diameter (μm)	Free passage diameter (mm)		
		Liquid pressure (MPa)													
		0.05		0.1		0.3		0.5		0.7					
		Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Immersion sampling method	Spray orifice	Mixing adaptor	
														Liquid	Air
12	0.2	1.7	205	2.8	200	7.0	170	10.3	110	12.9	70	150–450	3.7	2.9	3.0
	0.3	1.1	285	2.1	285	6.1	265	9.3	215	12.0	150				
	0.4	—	—	1.5	360	5.2	350	8.4	305	10.9	255				

Spray capacity code	Air pressure (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal)										Mean droplet diameter (μm)	Free passage diameter (mm)		
		Liquid pressure (MPa)													
		0.05		0.1		0.2		0.3		0.35					
		Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Immersion sampling method	Spray orifice	Mixing adaptor	
														Liquid	Air
24 (ϕ6)	0.2	3.8	395	7.1	390	16.3	235	23.8	170	—	—	200–650	5.2	6.0	4.2
	0.3	2.5	560	5.0	550	11.4	480	19.0	350	24.0	240				
	0.4	1.5	720	3.5	715	8.1	690	14.5	590	18.0	515				

Flow-rate Diagram

Nozzle No.: JJA12



■How to read the chart

①The spray capacity shown is for one nozzle.

②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.

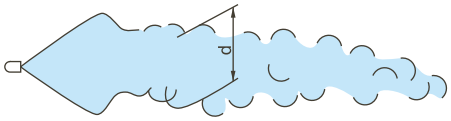
③Droplet diameter $\bar{d}_{32}$ is Sauter mean droplet diameter measured by the immersion sampling method.

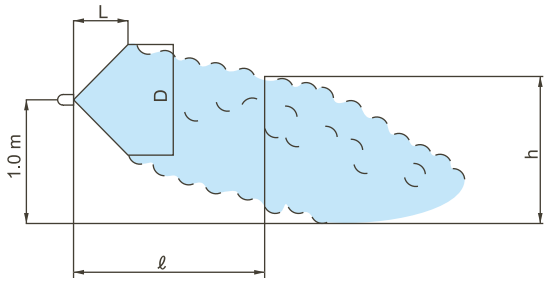
Spray Dimensions

Spray capacity code	Pressure (MPa)		Spray dimensions (m)					
			L	D	h/d			
	Air	Liquid			ℓ = 2.0	ℓ = 3.0	ℓ = 4.0	ℓ = 5.0
12	0.2	0.05	0.6	0.6	0.6/1.1	—	—	—
		0.1	1.4	1.1	0.9/1.2	—	—	—
		0.2	1.5	1.2	1.2/1.5	0.7/1.2	—	—
		0.4	1.8	1.5	1.5/1.8	0.7/1.3	—	—
		0.7	1.9	1.7	1.5/1.8	1.0/1.6	0.6/1.1	—
	0.3	0.05	1.1	0.8	0.9/1.0	0.5/1.4	—	—
		0.1	1.4	1.0	1.0/1.2	0.6/1.4	—	—
		0.2	1.5	1.3	1.2/1.3	0.9/1.5	0.5/1.0	—
		0.4	2.0	1.5	1.5/1.4	1.2/1.5	0.6/1.1	—
		0.7	2.1	1.8	1.7/1.6	1.5/1.7	1.0/1.3	0.7/1.0
	0.4	0.1	1.9	1.1	1.1/1.1	0.9/1.5	0.5/1.0	—
		0.2	2.0	1.5	1.5/1.4	1.3/1.4	1.0/1.5	0.5/1.5
		0.4	2.1	1.5	1.5/1.4	1.4/1.5	1.3/1.5	0.6/1.5
		0.7	2.3	1.8	1.7/1.9	1.8/2.0	1.8/1.9	1.0/2.0

Spray capacity code	Pressure (MPa)		Spray dimensions (m)					
			L	D	h/d			
	Air	Liquid			ℓ = 2.0	ℓ = 3.0	ℓ = 4.0	ℓ = 5.0
24 (φ6)	0.15	0.05	0.6	0.8	0.7/0.8	—	—	—
		0.1	1.1	1.7	1.2/1.3	0.7/1.2	—	—
		0.2	1.3	1.8	1.5/2.8	1.3/3.0	0.7/2.0	—
	0.2	0.05	0.7	0.8	0.8/0.9	—	—	—
		0.1	1.3	1.4	1.3/0.9	0.8/0.7	—	—
		0.2	1.6	1.7	1.5/2.2	1.2/1.9	0.8/1.1	—
		0.25	1.8	1.8	1.8/2.8	1.3/2.0	0.9/1.4	—
	0.3	0.05	1.2	1.0	1.0/1.2	0.8/1.0	—	—
		0.1	1.5	1.3	1.2/1.5	0.8/1.8	0.6/1.0	—
		0.2	1.5	1.4	1.3/1.5	1.1/2.0	0.7/1.3	—
		0.3	1.9	1.5	1.5/2.0	1.3/2.1	0.9/1.7	0.6/1.2
		0.35	2.1	2.0	2.0/2.3	1.5/2.3	1.2/1.8	0.9/1.4
	0.4	0.05	1.4	1.1	1.0/1.2	0.8/1.0	0.4/0.9	—
		0.1	1.9	1.2	1.1/1.0	0.9/1.5	0.7/1.3	—
		0.2	2.0	1.4	1.4/1.1	1.1/1.5	0.8/1.4	0.5/0.9
		0.3	2.1	1.5	1.5/1.6	1.2/2.4	1.0/1.6	0.5/1.6
		0.35	2.2	1.6	1.5/2.5	1.3/2.9	1.2/2.4	0.9/1.8

Note: The above data were measured with tap water in a laboratory, in windless conditions.





How to order

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

<Example> 1/2F JJA 12 B S316L + 2T10 S304

1/2F	JJA	12	B	S316L	+	2T10	S304
Pipe conn. size (Rc1/2)		Spray capacity code ■12 ■24 (φ6)	Type of length ■A ■B ■C ■D ■E (See p.57)			Flange size	

Please send us an inquiry for the different flange sizes.
For details please ask for our inquiry drawing.

Flat Spray
Semi-Fine, Semi-Coarse Fog Nozzles

DOVVA-G

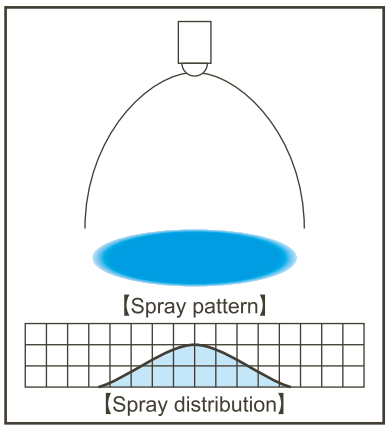
Features

■Flat spray pneumatic nozzle producing semi-fine atomization with a mean droplet diameter of 80 μm or more.*1

■Clog-resistant design due to large free passage diameter is suitable for spraying factory effluents and waste water.

■Simple structure, easy maintenance.

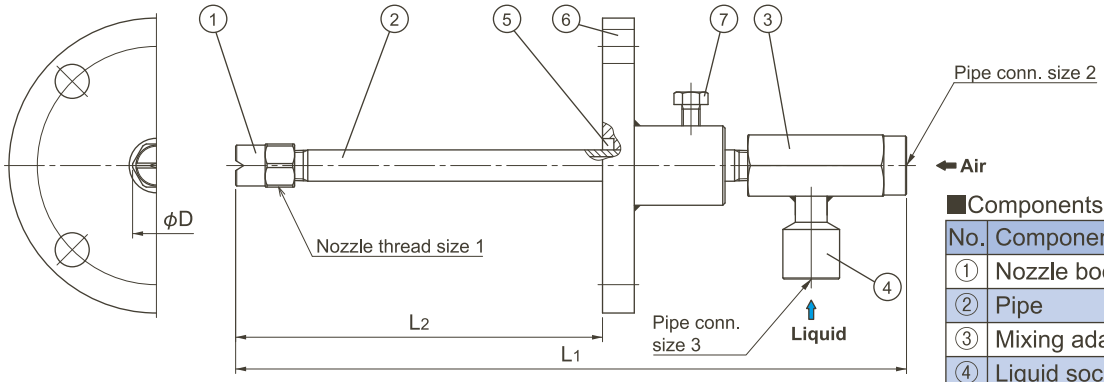
*1) Droplet diameter measured by laser Doppler method



Applications

■Denitration: Gas cooling
■Moisture control: Flue gas
■Combustion: Waste water

Structure, Materials, Dimensions & Pipe Connection Sizes



■Components and materials

No.	Components	Standard materials
①	Nozzle body	S316L
②	Pipe	S316LTP
③	Mixing adaptor	S304
④	Liquid socket	S304
⑤	Packing	Metal wire reinforced AES wool
⑥	Flange	S304
⑦	Bolt	S304

■Dimensions

Spray angle code	Spray capacity code	Nozzle thread size 1	Pipe connection sizes 2 & 3		Outer dimensions ϕD (mm)	Free passage diameter (mm)			
						Spray orifice		Adaptor	
						Spray angle code			
			Air	Liquid		70	55	Air	Liquid
70 55	82	Rc1/4	Rc1/2		21	2.5	2.8	3.4	2.4
	110					2.9	3.3	3.9	2.7
	180	Rc3/8			23	3.6	4.1	4.9	3.4
	230					4.1	4.9	5.7	3.8
	300	Rc1/2			29	5.2	5.6	6.5	4.4
	400					5.9	6.3	7.4	5.0
	500	Rc3/4	Rc3/4		35	6.1	7.4	8.3	5.9
	600					7.5	8.3	9.1	6.2

■Type of length

Type	Total length L1*2 (mm)	Length L2 (mm)
A	560	300–400
B	760	400–600
C	960	600–800
D	1,160	800–1,000

*2) L1: Standard length

*3) The mass shown is when the total length is the standard length L1 and excludes a mass of flange. For longer lengths, add the corresponding mass (listed below) for each 100 mm of L1 length, according to the Nozzle thread size 1.

Nozzle thread size 1	Mass per 100 mm
Rc1/4	80 g
Rc3/8	110 g
Rc1/2	170 g
Rc3/4	220 g

■Mass

Nozzle thread size 1	Type of length	Mass*3 (g)
Rc1/4	A	750
	B	900
	C	1,100
	D	1,250
Rc3/8	A	900
	B	1,100
	C	1,350
	D	1,550
Rc1/2	A	1,350
	B	1,700
	C	2,000
	D	2,350
Rc3/4	A	2,050
	B	2,500
	C	2,950
	D	3,400

Flow-rate Diagrams

■How to read the chart

①The spray capacity shown is for one nozzle.

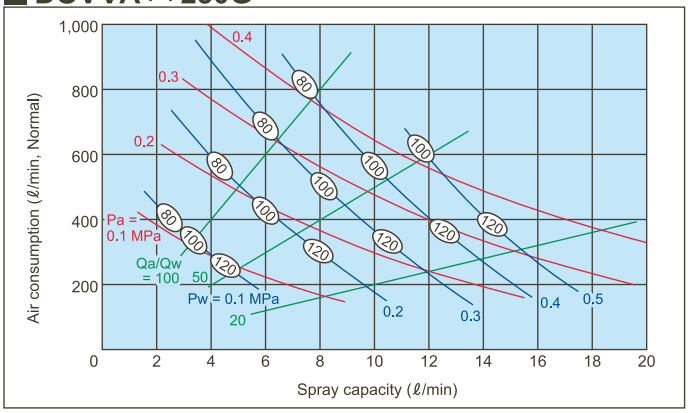
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.

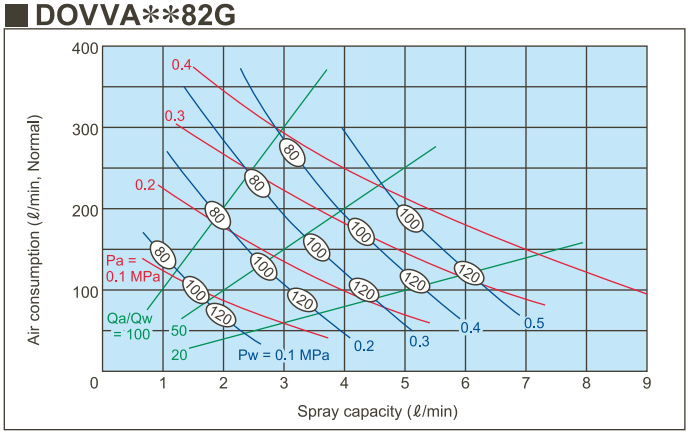
④** to be filled by spray angle code of 70 or 55.

Note:
The flow-rate diagrams below are those of DOVVA-G with total length of 560 mm (length type: A).
For nozzles with a longer total length (type B–D), the original air and liquid pressures need to be increased by about 0.03 MPa in order to obtain numerical values in the diagram (due to pressure loss).

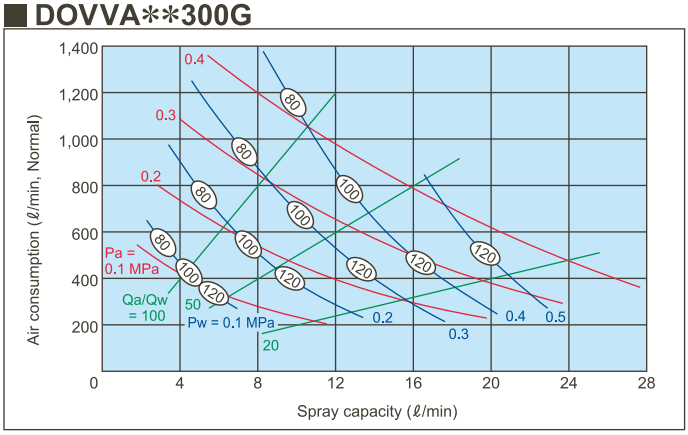
■DOVVA**230G



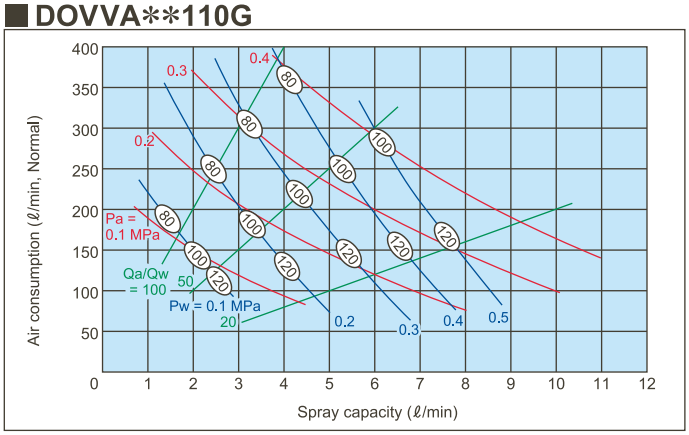
■DOVVA**82G



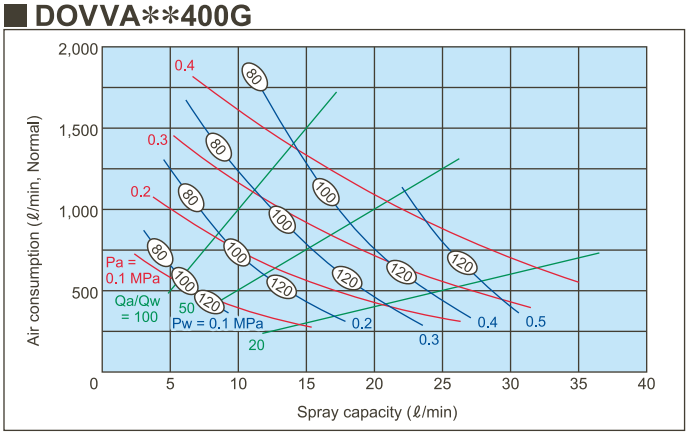
■DOVVA**300G



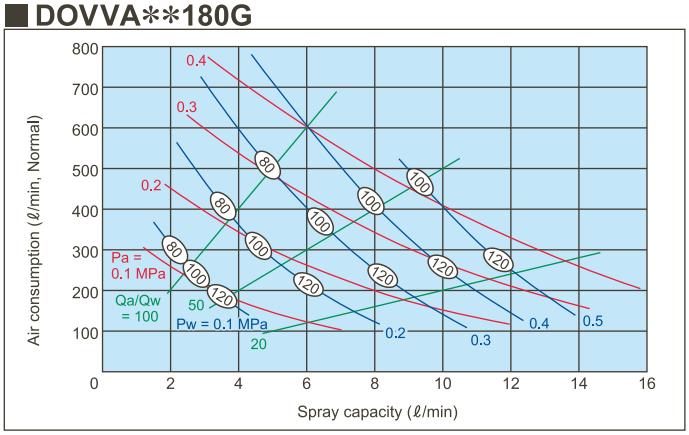
■DOVVA**110G



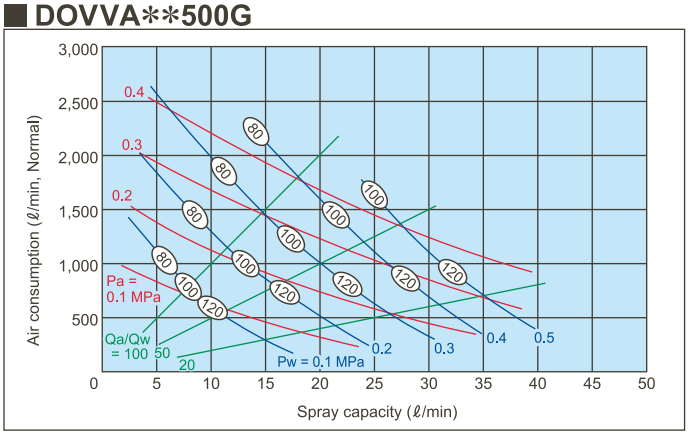
■DOVVA**400G



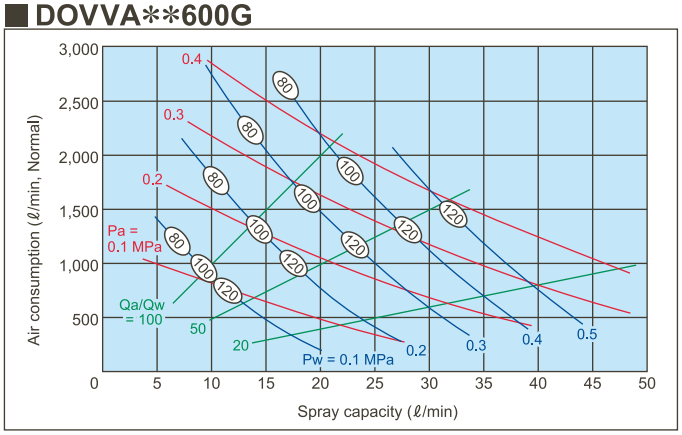
■DOVVA**180G

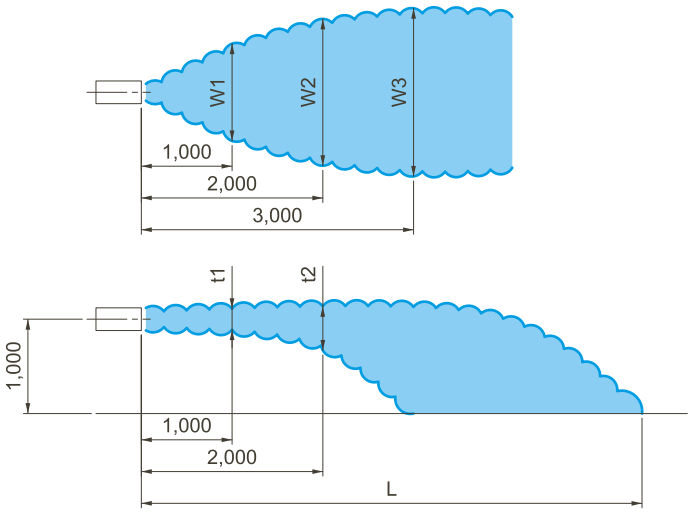


■DOVVA**500G



■ DOVVA**600G





Spray Dimensions

Spray angle code	Spray capacity code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm) W1	W2	W3	t1	t2	L
70	82	0.2	0.2	500	700	900	400	600	4,000
		0.3	0.3	600	800	1,000	400	700	5,000
			0.4	700	1,000	1,200	400	700	5,000
		0.4	0.4	600	900	1,100	400	800	6,000
			0.5	700	1,000	1,300	400	800	6,000
	110	0.2	0.2	500	700	900	400	600	5,000
		0.3	0.3	600	800	1,000	400	700	6,000
			0.4	700	1,000	1,200	400	700	6,000
		0.4	0.4	600	900	1,100	400	800	7,000
			0.5	700	1,000	1,300	400	800	7,000
	180	0.2	0.2	600	850	1,050	400	600	6,000
		0.3	0.3	650	900	1,150	400	700	7,000
			0.4	800	1,150	1,450	400	700	7,000
		0.4	0.4	700	1,050	1,350	400	800	8,000
			0.5	800	1,200	1,600	400	800	8,000
	230	0.2	0.2	700	1,000	1,200	400	600	7,000
		0.3	0.3	700	1,000	1,300	400	700	8,000
			0.4	900	1,300	1,700	400	700	8,000
		0.4	0.4	800	1,200	1,600	400	800	9,000
			0.5	900	1,400	1,900	400	800	9,000
55	82	0.2	0.2	400	550	700	450	700	5,000
		0.3	0.3	500	650	800	450	800	6,000
			0.4	600	900	1,100	450	800	6,000
		0.4	0.4	500	750	900	450	900	7,000
			0.5	600	900	1,100	450	900	7,000
	110	0.2	0.2	400	600	800	450	700	6,000
		0.3	0.3	500	700	900	450	800	7,000
			0.4	600	900	1,100	450	800	7,000
		0.4	0.4	500	800	1,000	450	900	8,000
			0.5	600	900	1,100	450	900	8,000
	180	0.2	0.2	500	700	900	450	700	7,000
		0.3	0.3	550	800	1,000	450	800	8,000
			0.4	700	1,000	1,250	450	800	8,000
		0.4	0.4	600	900	1,150	450	900	9,000
			0.5	700	1,050	1,350	450	900	9,000
	230	0.2	0.2	550	800	1,000	450	700	8,000
		0.3	0.3	600	900	1,100	450	800	9,000
			0.4	750	1,100	1,400	450	800	9,000
		0.4	0.4	650	1,000	1,300	450	900	10,000
			0.5	750	1,200	1,600	450	900	10,000

Note:
The above data were measured with tap water in a laboratory, in windless conditions.
Please contact us for spray dimensions of DOVVA-G with other spray capacity codes.

How to order

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

<Example> 1/4 DOVVA 5582G D S316L + 1T10S304 (L2)

1/4	DOVVA	55	82	G	D	S316L	+	1T10	S304	(L2)
Nozzle thread size 1		Spray angle code	Spray capacity code		Type of length (Total length)			Flange size		Length between the nozzle head and flange

■1/4
■3/8
■1/2
■3/4

■70
■55

■82 ■300
■110 ■400
■180 ■500
■230 ■600

■A
■B
■C
■D

■1T10
■1*1/4T10
■1*1/2T10

The minimum flange sizes
(Spray capacity code: Flange size)
82G–230G: 1T10
300G, 400G: 1*1/4T10
500G, 600G: 1*1/2T10

See the drawing and table on page 60 for length type and L2.
Please send us an inquiry for the different flange sizes.
For details please ask for our inquiry drawing.

High Impact Flat Spray Semi-Fine, Semi-Coarse Fog Nozzles

VVEA

Features

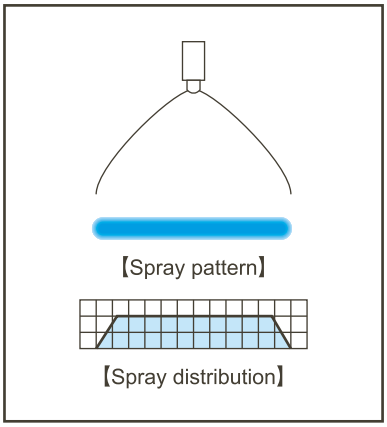
■Flat spray pneumatic nozzle producing semi-fine (and semi-coarse) atomization with a mean droplet diameter of 50 µm or more.*1

■High spray impact with thin flat spray pattern and uniform distribution.

■Large turn-down ratio with stable spray angle.

■Compact design.

*1) Droplet diameter measured by laser Doppler method

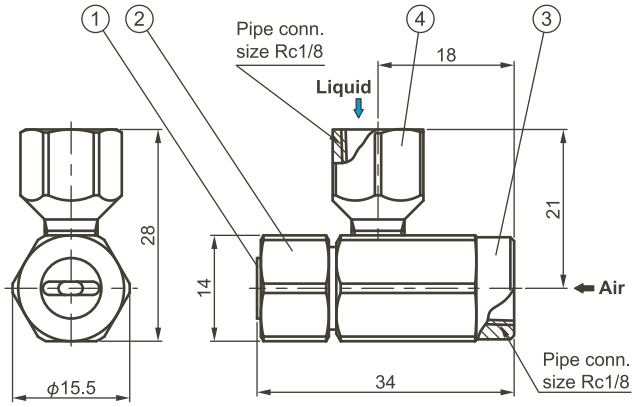


Applications

■Cleaning: Printed circuit boards, liquid crystal, steel plates

Structure & Materials

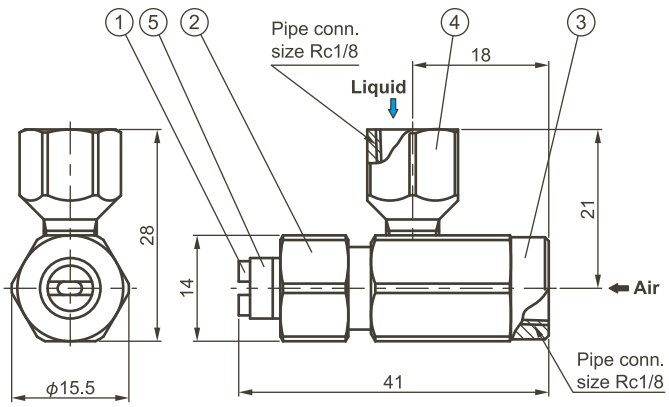
■**Spray angle 60° type**
Mass: 50 g



■Components and materials

No.	Components	Standard materials
①	Nozzle tip	S303
②	Cap	S303
③	Mixing adaptor	S303
④	Liquid socket	S303

■**Spray angle 80° type**
Mass: 50 g



■Components and materials

No.	Components	Standard materials
①	Nozzle tip	S303
②	Cap	S303
③	Mixing adaptor	S303
④	Liquid socket	S303
⑤	Sleeve	S303

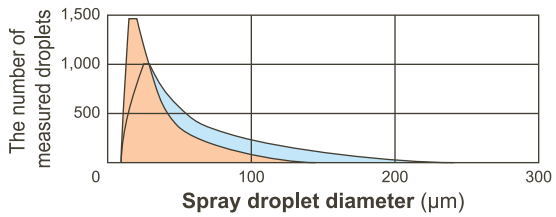
Note: No Sleeve⑤ for VVEA8005.

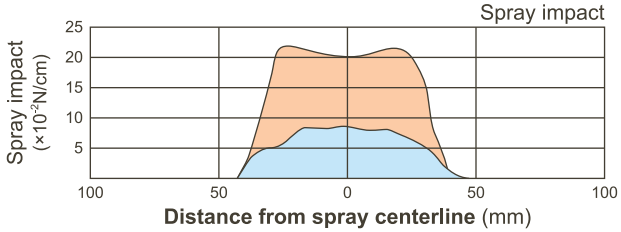
Spray Impact

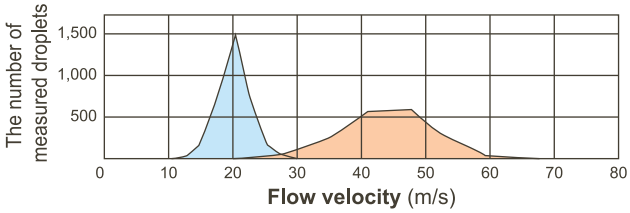
In comparison to a hydraulic spray nozzle with equal spray capacity at the same pressure, VVEA series nozzles achieve a more powerful spray impact (2.5 times higher) with fine droplets (at twice the speed).

■Air pressure: 0.3 MPa ■Air consumption: 59 ℓ/min, Normal
■Liquid pressure: 0.3 MPa ■Spray capacity: 1.1 ℓ/min
(Air pressure, air consumption are only for VVEA)

○ = VVEA6020 (pneumatic) ○ = VVP6510 (hydraulic)







Spray angle code*2	Spray capacity code	Air pressure (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.2 Liquid	0.2 Air	0.3 Liquid	0.3 Air	0.5 Liquid	0.5 Air	Mean droplet diameter (μm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air
80	05	0.2	0.31	17	0.45	14	—	—	20–250	0.8	0.7	0.9
		0.3	0.23	24	0.36	22	0.58	18				
		0.4	—	—	0.29	29	0.50	25				
		0.5	—	—	—	—	0.43	33				
	10	0.2	0.54	36	0.90	24	—	—	20–250	1.0	1.1	1.3
		0.3	0.30	58	0.60	49	1.28	25				
		0.4	—	—	0.39	74	1.00	50				
		0.5	—	—	—	—	0.81	69				
	20	0.2	0.96	44	1.98	18	—	—	30–300	1.1	1.6	1.6
		0.3	0.53	81	1.10	59	2.63	19				
		0.4	—	—	0.53	104	2.00	50				
		0.5	—	—	—	—	1.30	89				
	30	0.2	1.34	50	—	—	—	—	40–400	1.3	1.9	1.9
		0.3	0.63	100	1.60	64	—	—				
		0.4	—	—	0.88	128	3.00	50				
		0.5	—	—	—	—	2.25	85				
60	05	0.2	0.31	17	0.45	14	—	—	20–250	1.0	0.8	0.9
		0.3	0.23	24	0.36	22	0.58	18				
		0.4	—	—	0.29	29	0.50	25				
		0.5	—	—	—	—	0.43	33				
	10	0.2	0.54	36	0.90	24	—	—	20–250	1.4	1.1	1.3
		0.3	0.30	58	0.60	49	1.28	25				
		0.4	—	—	0.39	74	1.00	50				
		0.5	—	—	—	—	0.81	69				
	20	0.2	0.96	44	1.98	18	—	—	30–300	1.5	1.6	1.6
		0.3	0.53	81	1.10	59	2.63	19				
		0.4	—	—	0.53	104	2.00	50				
		0.5	—	—	—	—	1.30	89				
	30	0.2	1.34	50	—	—	—	—	40–400	1.6	1.9	1.9
		0.3	0.63	100	1.60	64	—	—				
		0.4	—	—	0.88	128	3.00	50				
		0.5	—	—	—	—	2.25	85				

*2) Spray angle measured at compressed air pressure of 0.4 MPa and liquid pressure of 0.5 MPa.

How to order

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

<Example> 1/8 VVEA 6010 S303

1/8 VVEA [60] [10] S303

Spray angle code
- ■80
- ■60

Spray capacity code
- ■05
- ■10
- ■20
- ■30

Integrated Spray Header with VVEA series nozzles — VVEA Header

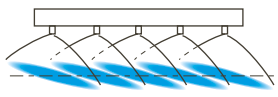
Features

■Spray header equipped with VVEA series nozzles producing semi-fine (and semi-coarse) atomization with a mean droplet diameter of 50 μm or more.*1

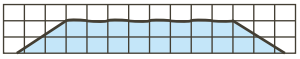
■Combines two pipes for air and liquid into one rectangular spray header. Compact and easy to install and maintain.

■Uniform spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method



【Spray pattern】



【Spray distribution】

Applications

■Cleaning: Liquid crystal glass substrate, printed circuit boards, steel plates

Integrated Spray Header with Quick-Detachable nozzles

INVVEA

Features

■Integrated spray header equipped with VVEA series nozzles producing semi-fine (and semi-coarse) atomization with a mean droplet diameter of 50 µm or more.*1

■Quick-detachable design helps to greatly reduce maintenance time.

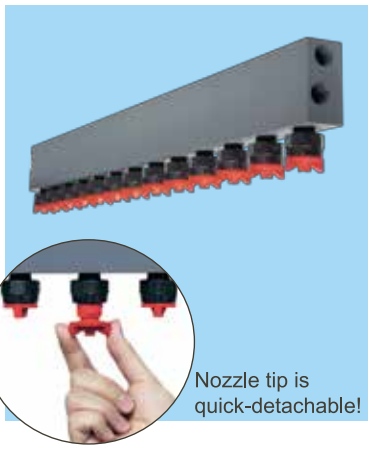
■Made of highly chemical-resistant plastic.

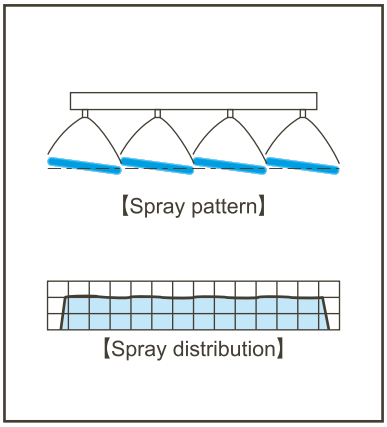
■High spray impact with thin flat spray pattern and uniform distribution.

■Ideal for washing away particles with fine fog spray.

■Nozzle tips are color-coded by spray capacity for easy identification.

*1) Droplet diameter measured by laser Doppler method





Applications

■Cleaning: Liquid crystal glass substrate, printed circuit boards
■Etching

Materials

■Nozzle tip: PP, Nozzle adaptor: PPS, Header: HTPVC

Spray angle code *2	Spray capacity code	Air pressure (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0.2 Liquid	0.2 Air	0.3 Liquid	0.3 Air	0.5 Liquid	0.5 Air	Mean droplet diameter (µm) Laser Doppler method	Free passage diameter (mm) Spray orifice	Adaptor Liquid	Adaptor Air	Color of nozzle tip
60	10	0.2	0.54	36	0.90	24	—	—	20–250	1.4	1.1	1.3	
		0.3	0.30	58	0.60	49	1.28	25					
		0.4	—	—	0.39	74	1.00	50					
		0.5	—	—	—	—	0.81	69					
	20	0.2	0.96	44	1.98	18	—	—	30–300	1.5	1.6	1.6	
		0.3	0.53	81	1.10	59	2.63	19					
		0.4	—	—	0.53	104	2.00	50					
		0.5	—	—	—	—	1.30	89					
	30	0.2	1.34	50	—	—	—	—	40–400	1.6	1.9	1.9	
		0.3	0.63	100	1.60	64	—	—					
		0.4	—	—	0.88	128	3.00	50					
		0.5	—	—	—	—	2.25	85					

*2) Spray angle measured at compressed air pressure 0.4 MPa and liquid pressure of 0.5 MPa.

How to order

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

<Example> INVVEA 6010 PP + PPS + 11 (P50) 600 (10°) HTPVC

INVVEA 60 [10] PP + PPS + 11 (P50) 600 (10°) HTPVC

Spray capacity code

■10
■20
■30

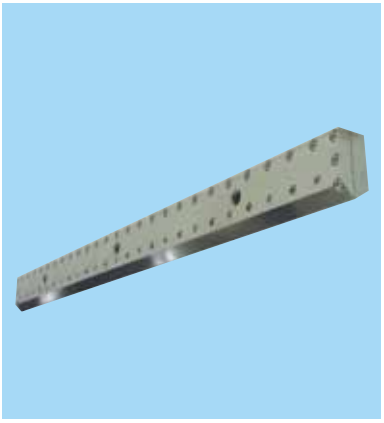
Pneumatic Slit Nozzles

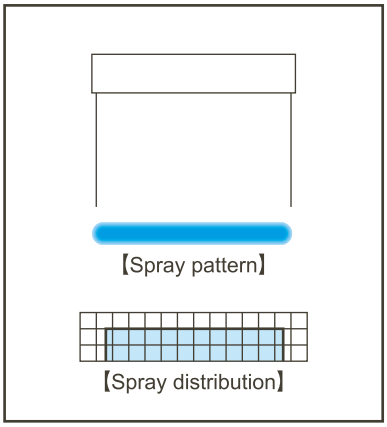
PSN

Features

■New pneumatic slit-laminar nozzle provides uniform spray distribution with high impact, which ensures perfect and complete cleaning, leaving no spot unwashed.

■PSN series can be used at a short spray distance.

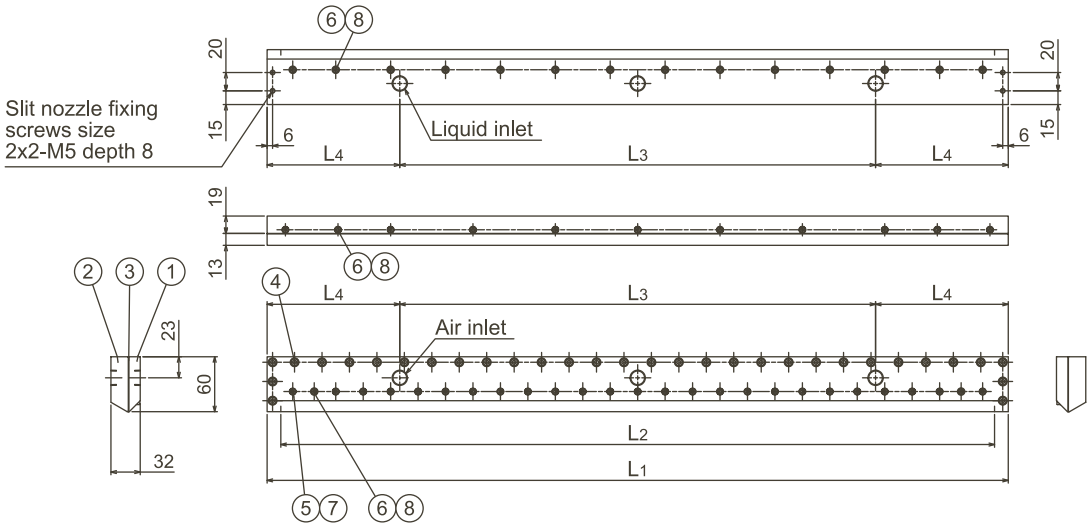




Applications

■Cleaning: Glass substrate, liquid crystal
■Cooling: Steel plates, moldings
■Moisture control: Paper, cardboard

Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Body (Air inlet side)	S304
②	Body (Liquid inlet side)	S304
③	Packing	PE
④	Bolt (M5x12)	S304
⑤	Bolt (M4x8)	S304
⑥	Bolt (M4x10)	S304
⑦	O-ring (P-4)	FKM
⑧	O-ring	FKM

Dimensions & Pipe Connection Sizes

Nozzle code		Number of inlet - Inlet thread size		L_1* (mm)	L_2 (mm)	L_3 (mm)	L_4 (mm)	Mass (kg)
Slit length L_2 (mm)	Slit opening (mm)	Air	Liquid					
460	0.05	2 - Rc3/8	2 - Rc3/8	490	460	230	130	5.6
600		3 - Rc3/8	3 - Rc3/8	630	600	400	115	7.2
700	0.1	3 - Rc3/8	3 - Rc3/8	730	700	460	135	8.4
780	0.15	3 - Rc3/8	3 - Rc3/8	810	780	520	145	9.3
1200		5 - Rc3/8	5 - Rc3/8	1,230	1,200	960	135	14.0

*Total length L_1 available from 250 to 3,950 mm.

Flow-rate Diagrams

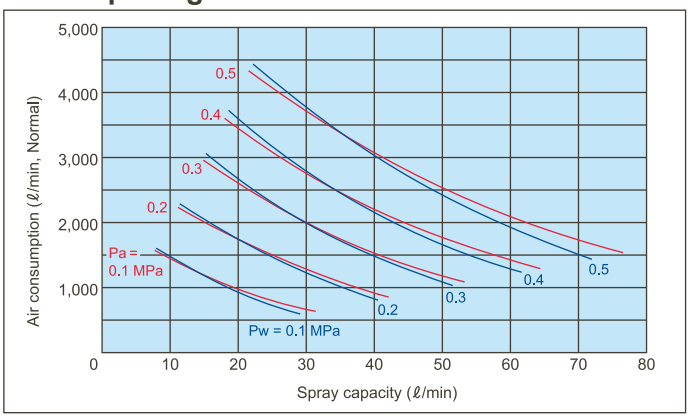
■How to read the chart

①The air consumption and spray capacity shown are for one nozzle per 1,000 mm of slit length.

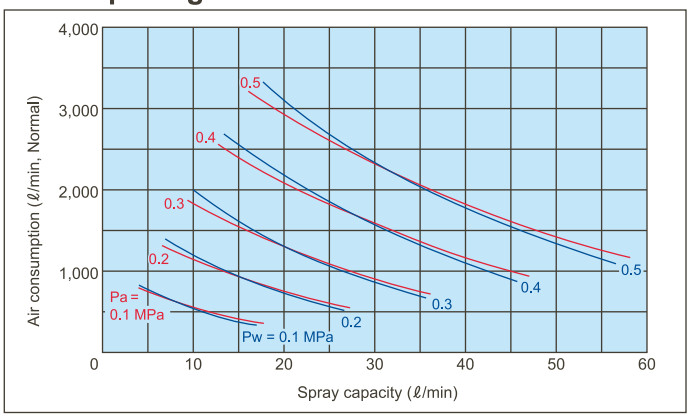
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.

Air consumption and spray capacity are proportionate to slit length.
To calculate the air consumption and spray capacity for slit length longer/shorter than 1,000 mm, multiply in proportion to this length.
(Example: when the slit length is 700 mm, multiply the amount for 1,000 mm x 0.7)

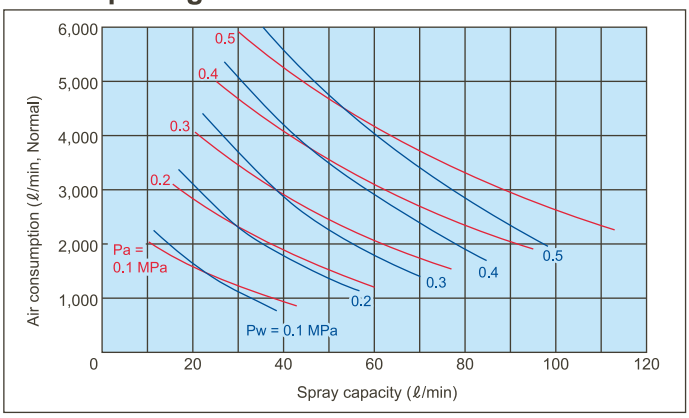
■ Slit opening: 0.1 mm



■ Slit opening: 0.05 mm



■ Slit opening: 0.15 mm



How to order

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

<Example> 2 x 3-3/8F PSN 700 x 0.05 S304

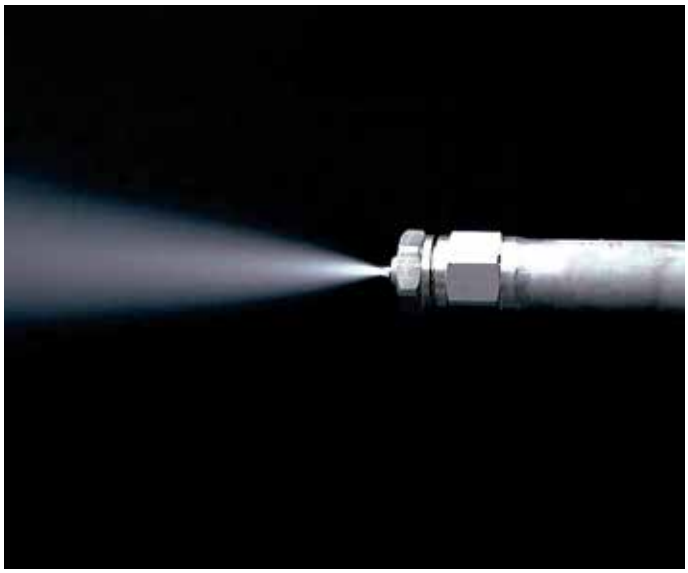
2 x [3] − 3/8F PSN [700] x [0.05] S304

Number of inlets	Slit length	Slit opening
■2	■460	■0.05
■3	■600	■0.1
■5	■700	■0.15
	■780	
	■1200	

Please feel free to send us an inquiry if you need a different slit length.

Clog-resistant Fine Fog Nozzles

SETOJet/SETOV/SETO-SD/YYA series Nozzles



■SETOJet, SETOV, SETO-SD, and YYA series are the clog-resistant pneumatic nozzles specially designed for spraying viscous liquid.

■Designed to mix air and liquid outside the nozzle for atomizing, these nozzles are clog resistant.

Contents

Clog-resistant Full Cone Spray Fine Fog Nozzles

SETOJet

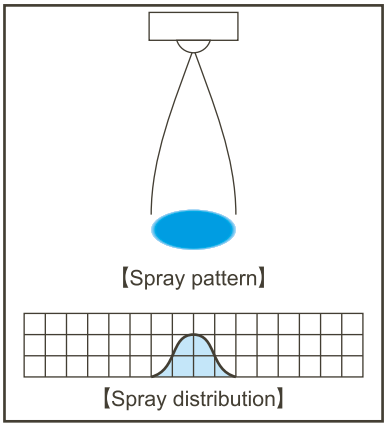
Features

■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 60 μm or less.*1

■Clog-resistant design: Liquid passage is straight without curve, and circular in cross-section.

■External mixing type (designed to mix air and liquid outside the nozzle).

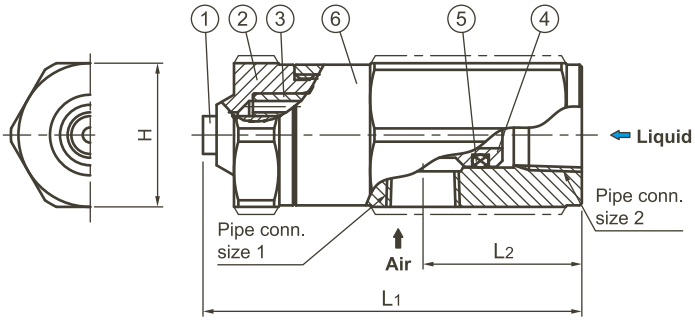
*1) Droplet diameter measured by laser Doppler method



Applications

■Spraying: Oil, lubricant, mold release agent, honey, aqueous urea, rust preventive, glaze, viscous liquid, slurry

Structure & Materials



■Components and materials

No.	Components	Standard materials*2
①	Nozzle tip	S303
②	Nozzle body	S303
③	Air balancer	S303
④	Stem	S303
⑤	O-ring	FKM
⑥	Adaptor	S303

Note: Components ① and ③ are combined for SETO04—— and SETO075——.

*2) Optional material: S316L

Dimensions & Pipe Connection Sizes

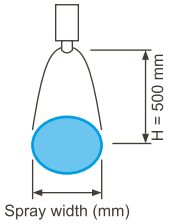
■Dimensions

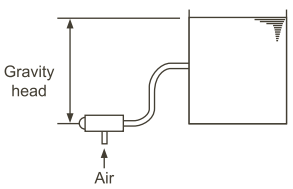
Air consumption code	Spray capacity code	Pipe connection size		L1 (mm)	L2 (mm)	H (mm)	Mass (g)
		1 (Air)	2 (Liquid)				
04	05	Rc1/8	Rc1/8	49.5	21	19	85
	07			49.5			
	10			49.5			
075	07			49.5			
	10			49.5			
15	10			50.0			
	20			50.0			
22	10			50.0			
	20			50.0			

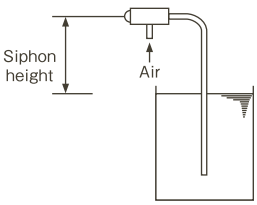
Air consumption code	Spray capacity code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Liquid pressure (MPa)		Spray width*4 (mm)	Mean droplet diameter*4 (μm)	Free passage diameter (mm)	
				0 (Siphon)*3	0.05	H = 500 mm	Laser Doppler method	Liquid	Air
04	05	0.3	38	2.0	6.5	130	20–60	0.5	0.1
	07		38	4.0	12.3	130		0.7	0.1
	10		38	7.0	27.7	130		1.0	0.1
075	07		80	5.0	13.9	160		0.7	0.2
	10		80	8.0	27.9	160		1.0	0.2
15	10		220	8.0	27.7	170		1.0	0.3
	20		220	25.0	111.0	170		2.0	0.3
22	10		290	8.0	26.4	180		1.0	0.5
	20		290	26.0	111.0	180		2.0	0.5

*3) Siphon height: 100 mm.

*4) Measured at compressed air pressure of 0.3 MPa and liquid pressure of 0 MPa (liquid siphon feed).







Sister product

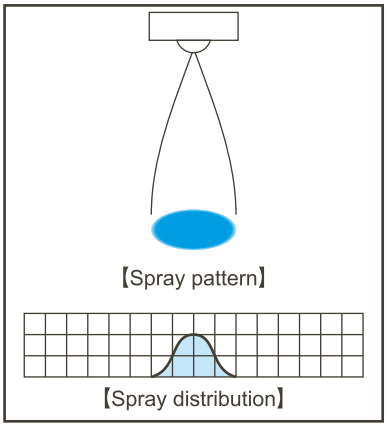
Clog-resistant Full Cone Spray Fine Fog Nozzles

SETOJet-R

Features

■Clog-resistant full cone spray pneumatic nozzles producing fine atomization.
Eddies from air makes further fine atomization.

■Optimal for spraying viscous liquids.



Dimensions & Pipe Connection Sizes

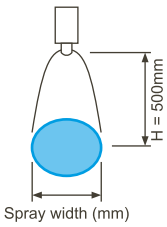
■Dimensions

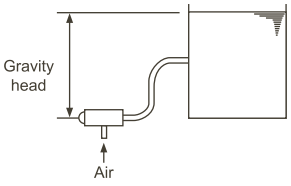
Air consumption code	Pipe connection size		L1 (mm)	L2 (mm)	H (mm)	Mass (g)
	1 (Air)	2 (Liquid)				
04	Rc1/8	Rc1/8	49	21	19	85
075						
15						
22						

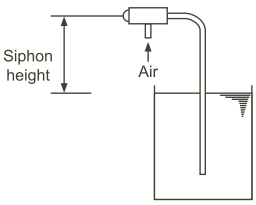
Please see page 69 for structure and materials.

Air consumption code	Spray capacity code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Liquid pressure (MPa) 0 (Siphon)*1	Spray capacity (ℓ/hr) Liquid pressure (MPa) 0.05	Spray width*2 (mm) H = 500 mm	Mean droplet diameter*2 (μm) Laser Doppler method	Free passage diameter (mm) Liquid	Free passage diameter (mm) Air
04	05R	0.3	36	2.0	6.5	130	15–40	0.5	0.1
	07R		36	4.0	12.3	130		0.7	0.1
	10R		36	8.0	27.7	130		1.0	0.1
075	07R		71	5.0	13.9	160		0.7	0.2
	10R		71	9.0	27.9	160		1.0	0.2
15	10R		150	10.0	27.7	170		1.0	0.3
22	10R		200	11.0	26.4	180		1.0	0.5

*1) Siphon height: 100 mm.
*2) Measured at compressed air pressure of 0.3 MPa and liquid pressure of 0 MPa (liquid siphon feed).







How to order

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

<Example> SETO 0405 S303 + T S303

SETO [04] [05] S303 + T S303

[04] Air consumption code
■04 ■075 ■15 ■22

[05] Spray capacity code
■05 ■05R ■07 ■07R ■10 ■10R ■20

Note: Configuration and dimensions may be changed when nozzle tip material is different.

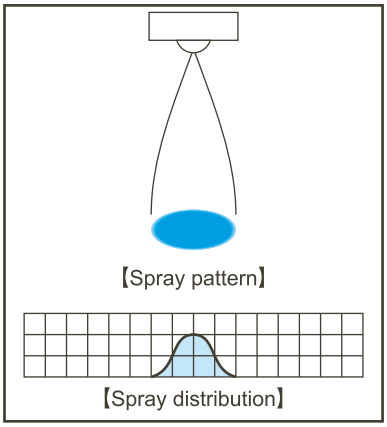
Full Cone Spray Fine Fog Nozzles for Wafer Cleaning

SETOJet-PTFE

Features

■Pneumatic spray nozzle made of PTFE.
Capable of spraying chemical solutions.

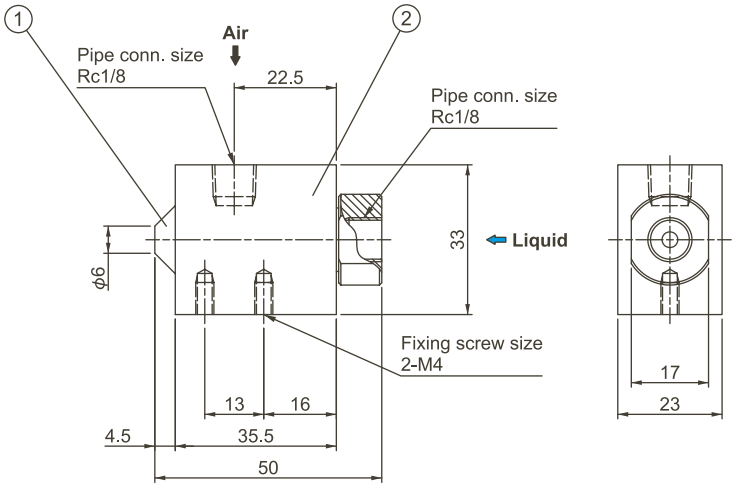
■External mixing type preventing contamination.



Applications

■Cleaning: Precise cleaning for semiconductor wafers

Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Nozzle tip	PTFE
②	Nozzle body	PTFE

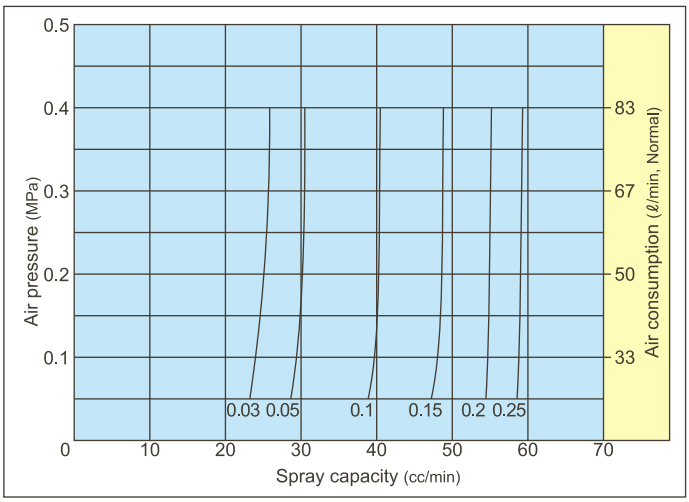
Flow-rate Diagram

■How to read the chart

①The spray capacity shown is for one nozzle.

②Figures at the foot of each curve indicate liquid pressures in MPa.

Note:
This charts is a single example.
We can design an optimal nozzle according to your application and purpose.



[Made-to-order product]
Please contact our sales office for details and other specifications.

Clog-resistant
Flat Spray Fine Fog Nozzles

SETOV

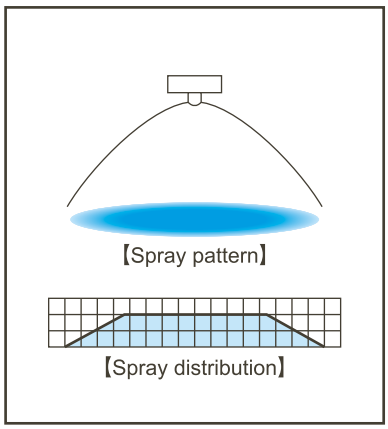
Features

■Flat spray pattern with fine droplet diameter. External mixing type.

■Liquid siphon feed type (liquid pressure device is not required).

■Spray capacity increases or decreases in proportion to the air pressure.

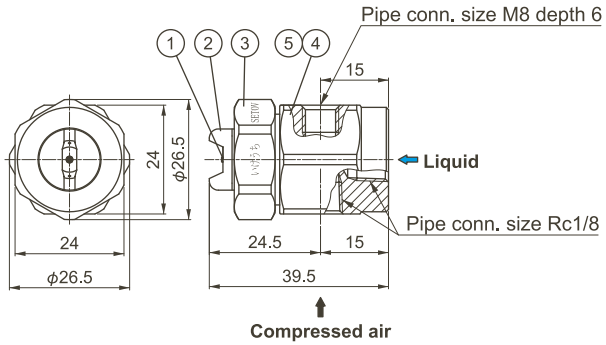
■No dripping from the nozzles at spray shut off.



Structure & Materials

■SETOV series with T-type Adaptor

Mass: approx. 120 g

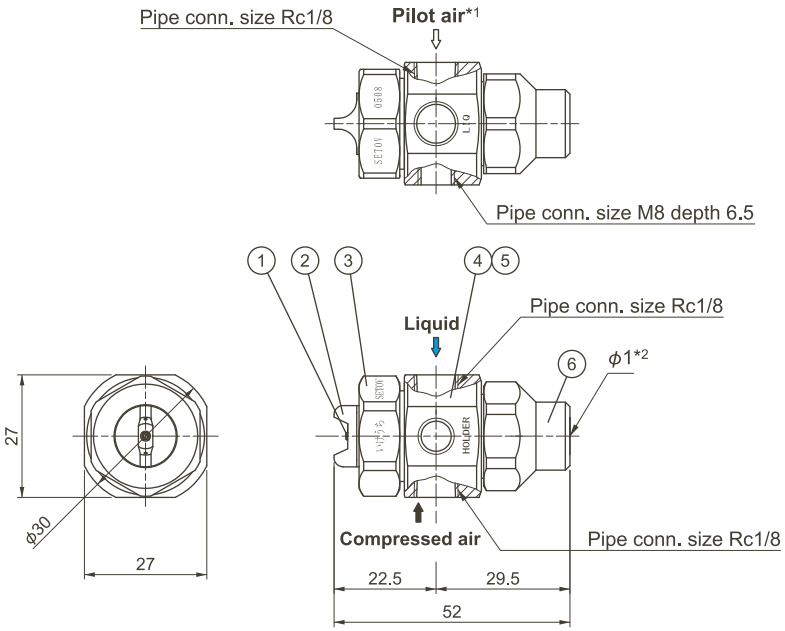


■Components and materials

No.	Components	Standard materials
①	Nozzle tip	S303
②	Nozzle body	S303
③	Cap	S303
④	Adaptor	S303
⑤	O-ring	FKM

■SETOV series with SP- or SN-type Adaptor

Mass: approx. 140 g



■Components and materials

No.	Components	Standard materials
①	Nozzle tip	S303
②	Nozzle body	S303
③	Cap	S303
④	Adaptor	S303
⑤	Packing	NBR, FKM, PTFE
⑥	Spring cap	S303

*1) No pilot air for SN-type adaptor.
*2) Hole φ1 is for air relief.

Flow-rate Diagrams

■How to read the chart

①The spray capacity shown is for one nozzle.

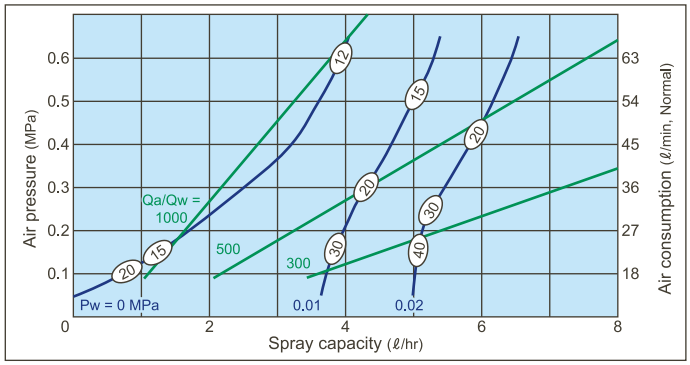
②Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Measured at liquid siphon height of 100 mm when Pw is 0 MPa.

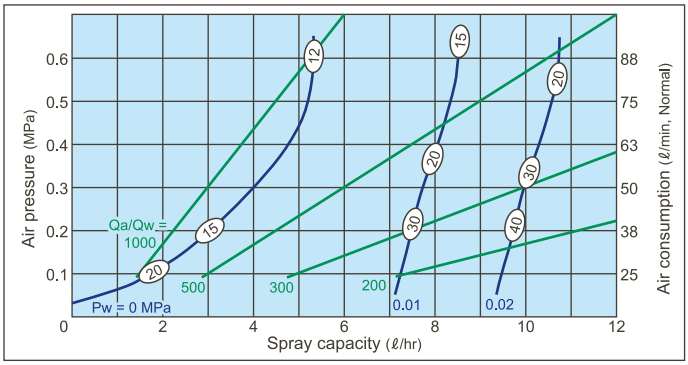
④Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).

⑤These flow-rate diagrams are applicable only when using a T-type adaptor.

■ SETOV0406



■ SETOV0508



Spray angle *1	Air consumption code	Spray capacity code	Pipe conn. size		Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr)		Spray width *1 *3 (mm)	Mean droplet diameter*1 (μm)	Free passage diameter (mm)	
			Air	Liquid			Liquid pressure (MPa)					
							0 (Siphon)*2	0.05		Laser Doppler method	Liquid	Air
65	04	06	Rc1/8		0.2	27	1.7	5.1	130	15–40	0.6	0.1
					0.3	36	2.5	5.5	130			
					0.4	45	3.2	5.8	120			
					0.5	54	3.6	6.2	115			
55	05	08			0.2	38	3.1	9.7	110		0.8	0.2
					0.3	50	4.0	10.0	100			
					0.4	63	4.8	10.3	95			
					0.5	75	5.2	10.6	95			

*1) Spray angle, spray width, and mean droplet diameter measured at liquid pressure of 0 MPa (Liquid siphon feed).
*2) Siphon height: 100 mm.
*3) Spray width measured at 100 mm from nozzle.

How to order

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

<Example> SETOV 0406 S303 + TS303

SETOV [04 06] S303 + [T] S303

Air consumption code & Spray capacity code
■0406
■0508

Type of adaptor
■T
■SP
■SN

Please see pages 23–25 for details of adaptors.
Adaptor type SP is used in the same way as SPB. Adaptor type SN is used in the same way as SNB.

Solenoid-activated Spray Nozzles SETO-SD

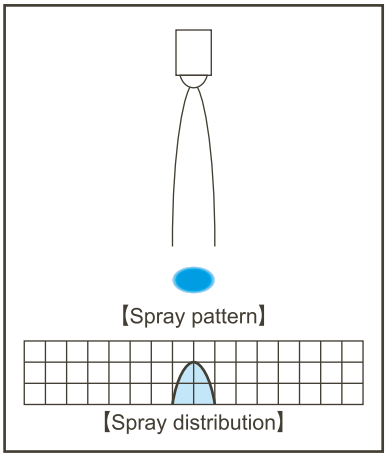
Features

■Fast response performance by solenoid activation: Intermittent pulse spray at 0.02 sec/shot with a minimum of 0.006 cc/shot is possible.

■Ideal for coating in small amounts, i.e. protective agent coating, etc.

■IP65, IP67 (dust-proof and water-proof) structure.

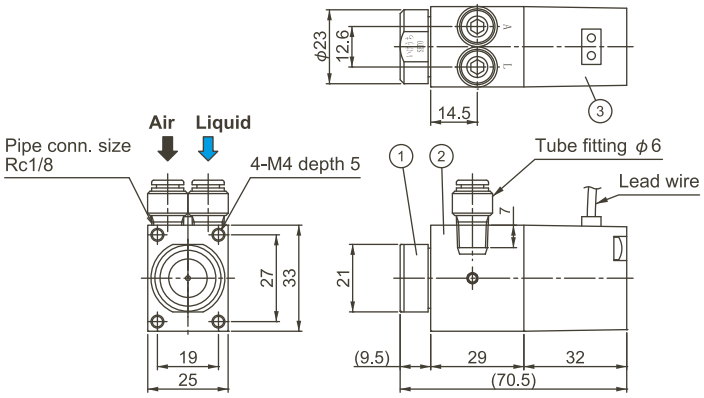
■SETO07503R-I+SD is internal mixing outer air type (the other SETO models are external mixing type).



Applications

■Spraying release agent for metal molds
■Coating ■Mold cooling
■Seasoning (food)
■Uniform coating without dripping

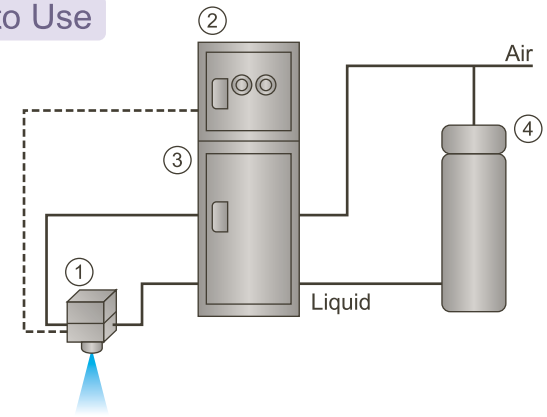
Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Nozzle body	Main materials: S304 or Aluminum
②	Adaptor	
③	Solenoid	

How to Use



No.	Description
①	Solenoid-activated pneumatic spray nozzle
②	Solenoid control panel
③	Pressurized flow control unit
④	Liquid pressurization tank (required only if oil-based release agent is used)

Nozzle code	Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa) 0 *1 Liquid	0 *1 Air	0.05 Liquid	0.05 Air	0.13 Liquid	0.13 Air	0.2 Liquid	0.2 Air	0.3 Liquid	0.3 Air	Spray width*2 (mm)	Mean droplet diameter*3 (μm) Laser Doppler method	Free passage diameter (mm) Adaptor Liquid	Adaptor Air	Mass (g) Aluminum	Mass (g) S304
07503R-I	0.2	—	—	—	—	1.0	50	3.2	48	—	—	40–50	15–25	0.3	0.4	180	270
	0.3	—	—	—	—	—	—	0.9	66	4.0	64						
	0.4	—	—	—	—	—	—	—	—	1.9	80						
0405R	0.3	2.0	36	6.5	36	—	—	—	—	—	—			0.5	0.1		
07507R	0.3	5.0	71	13.9	71	—	—	—	—	—	—			0.7	0.2		
2210R	0.3	10.0	200	26.4	200	—	—	—	—	—	—			1.0	0.5		

*1) Spray capacity and air consumption at liquid pressure of 0 MPa (liquid siphon feed) are measured at 100 mm siphon height.
*2) Spray width measured at 100 mm from nozzle.
*3) 07503R-I: Sauter mean droplet diameters measured at compressed air pressure of 0.2 MPa and liquid pressure of 0.13 MPa.
0405R, 07507R, 2210R: Sauter mean droplet diameters measured at compressed air pressure of 0.3 MPa and liquid pressure of 0 MPa (liquid siphon feed).

Valve function	Min. operating frequency (sec)	Max. operating pressure (MPa)	Electric current (A)	Electric voltage (DC-V)	Max. allowable temperature
Single solenoid, normally closed	ON: 0.02 OFF: 0.02	0.5 for both air/liquid	0.26	24	50°C (120°F)

Flow-rate Diagrams

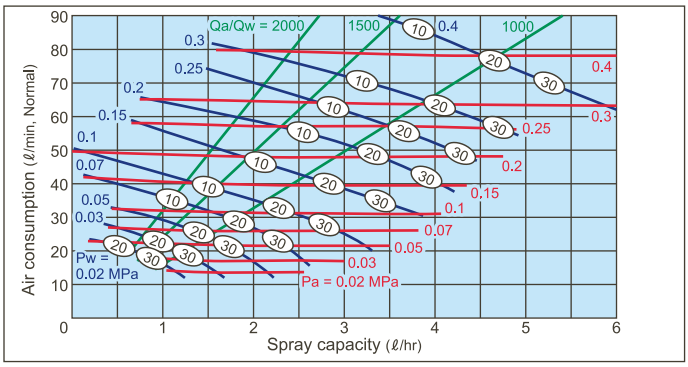
■How to read the chart

①The spray capacity shown is for one nozzle.

②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).

■ SETO07503R-I+SD



■How to read the chart

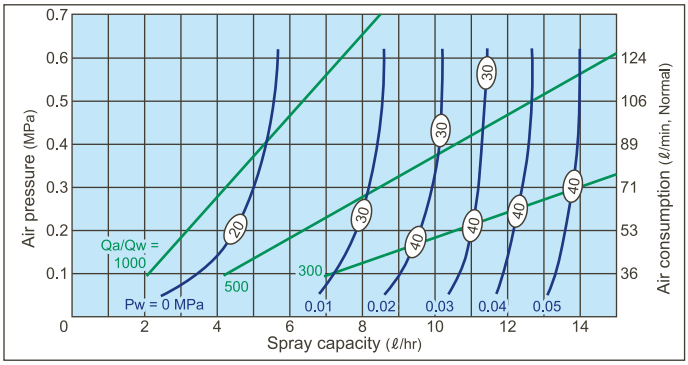
①The spray capacity shown is for one nozzle.

②Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

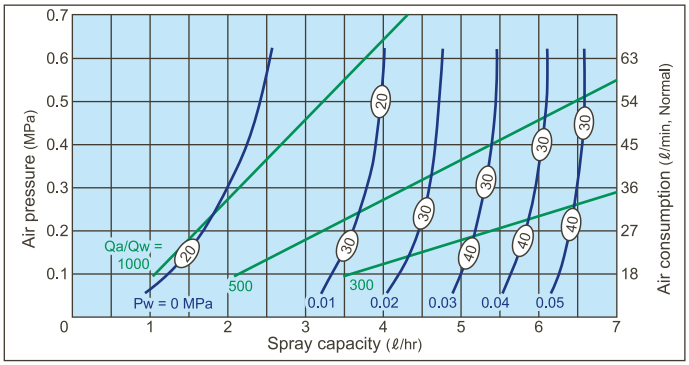
③Measured at liquid siphon height of 100 mm when Pw is 0 MPa.

④Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).

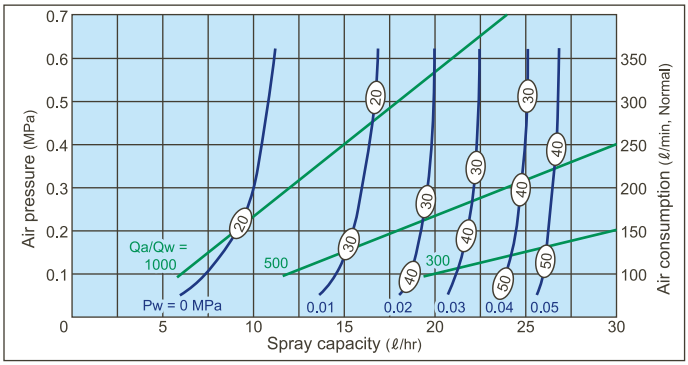
■ SETO07507R+SD



■ SETO0405R+SD



■ SETO2210R+SD



How to order

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

<Example> SETO 07503R-I +SD AL

SETO	07503R-I	+ SD	AL
	Nozzle code		Material
	■07503R-I		■AL (Aluminum)
	■0405R		■S304
	■07507R		
	■2210R		

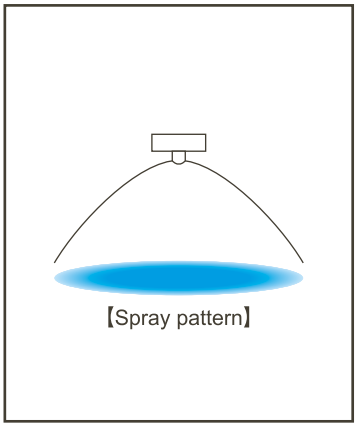
Clog-resistant Wide-angle Flat Spray Fine Fog Nozzles

YYA

Features

■Wide-angle flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 15–30 μm.*1
■External mixing type (designed to mix air and liquid outside the nozzle).
■Unique 2-step atomization mechanism enables a wide spray angle of 80°. Combines “clog-resistant” and “wide spray angle” features.
■Compact, 22 mm-long design.
■Capable of spraying viscous liquid up to approx. 300 cP.*2

*1) Droplet diameter measured by laser Doppler method
*2) Spray capacity and spray angle are reduced when viscous liquid is sprayed.
Raising the liquid pressure to 0.2–0.3 MPa is recommended when spray capacity is small, otherwise the spray pattern becomes irregular.

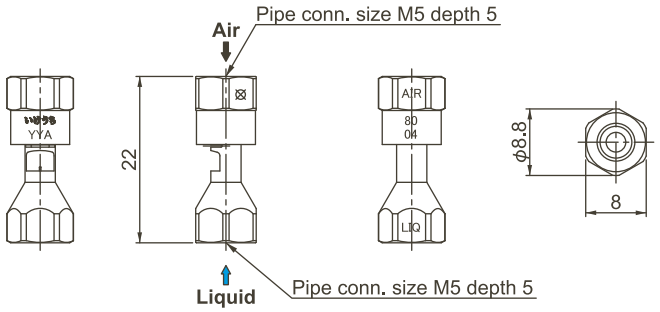


Applications

■Spraying viscous liquid such as oil and honey

Structure, Materials, Dimensions & Pipe Connection Sizes

■Material: S303



Spray angle code *3	Air consumption code	Air pressure (MPa)	Air consumption (ℓ/min, Normal)	Spray capacity (ℓ/hr) Liquid pressure (MPa) 0.01	0.05	0.1	0.2	Spray width*4 (mm) Liquid pressure (MPa) 0.01	0.05	0.1	0.2	Mean droplet diameter (μm) Laser Doppler method	Free passage diameter (mm) Liquid	Air	Mass (g)
80	04	0.2	27	2.2	5.0	7.1	10.0	160	170	170	—	15–30	0.4	0.2	5
		0.3	36					170	170	180	190				
		0.4	45					170	180	190	200				
		0.5	54					180	180	200	210				

*3) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.05 MPa.
*4) Spray width meaured at 100 mm from nozzle.

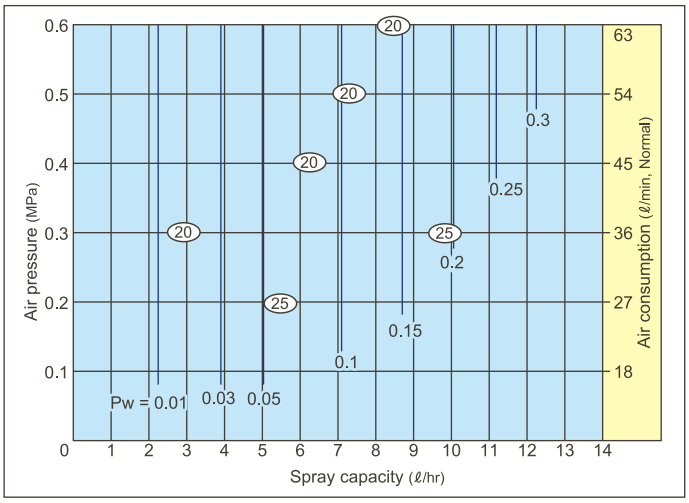
Flow-rate Diagram

■How to read the chart

①The spray capacity shown is for one nozzle.

②Figures at the foot of each line indicate liquid pressures Pw in MPa.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.



How to order

Please inquire or order using this product code.

M5F YYA 8004 S303

Medium/Large Capacity Impinging-type Fine Fog Nozzles

AKIJet®/AKIJet®-S series Nozzles

■AKIJet® series are the impinging-atomization type pneumatic spray nozzles.
Atomized droplets are impinged against each other at optimum condition, which results in uniform distribution of droplet size.

■Medium spray capacity AKIJet® series nozzle is an internal mixing type and large spray capacity AKIJet®-S series nozzle is an external mixing type.

Contents

Medium Capacity Impinging-type Fine Fog Nozzles

AKIJet®

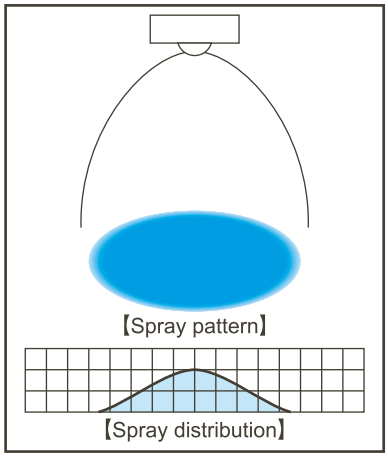
Features

■Impinging-type fine fog nozzle developed from a new engineering concept for generating fine fog.

■Atomized droplets are impinged against each other creating ultrasonic waves, which results in creation of a uniform distribution of even finer droplet sizes.

■Using a special mixing adaptor, AKIJet® can mix two different liquids outside of the orifices while spraying.

AKIJet® with T-type adaptor

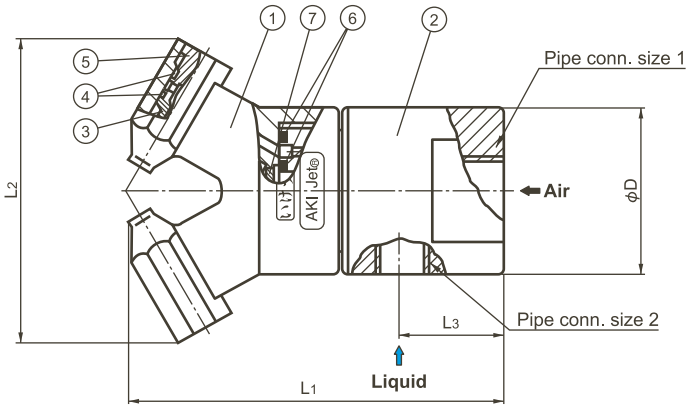


Applications

■Cooling: Gas, steel plates, refractories, moldings, glass
■Moisture control: Flue gas, concrete
■Combustion: Oil, waste water
■Others: Mixing two liquids, spray drying

Structure & Materials

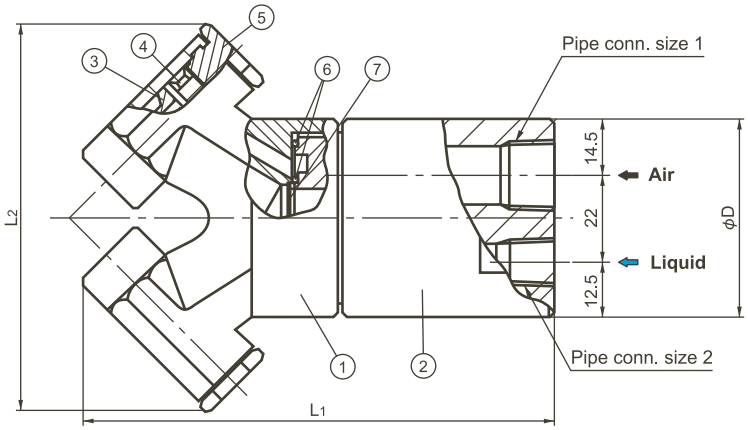
■AKI37 S303 + TS303
■AKI75 S303 + TS303



■Components and materials

No.	Components	Standard materials
①	Nozzle body	S303 equivalent
②	Adaptor	S303
③	Spray tip	S303
④	O-ring	FKM
⑤	Plug	S303
⑥	Packing	PTFE
⑦	Strainer	S304

■AKI150 S316 + HS316 (metal-to-metal seal)



■Components and materials

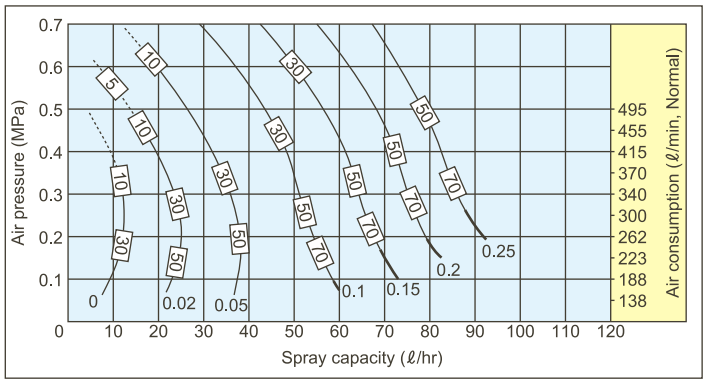
No.	Components	Standard materials
①	Nozzle body	SCS14
②	Adaptor	S316
③	Spray tip	S316
④	Liner	S316
⑤	Plug	S316
⑥	O-ring	S321
⑦	Strainer	S316

Dimensions & Pipe Connection Sizes

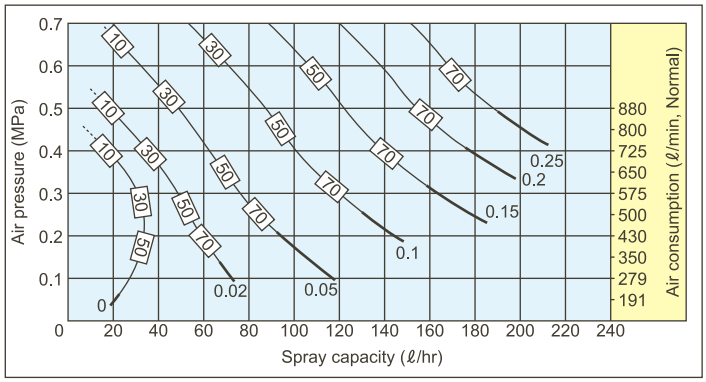
Nozzle code	L1 (mm)	L2 (mm)	L3 (mm)	ϕD (mm)	Pipe connection size		Free passage diameter (mm)		Mass (g)
					1 (Air)	2 (Liquid)	Air	Liquid	
AKI37	72.5	62	19	33	Rc1/4	Rc1/8	0.4	0.6	300
AKI75	100	87	30	49	Rc3/8	Rc1/4	0.4	0.8	880
AKI150	105	94	—	49	Rc3/8	Rc1/4	0.9	1.1	970

Flow-rate Diagrams

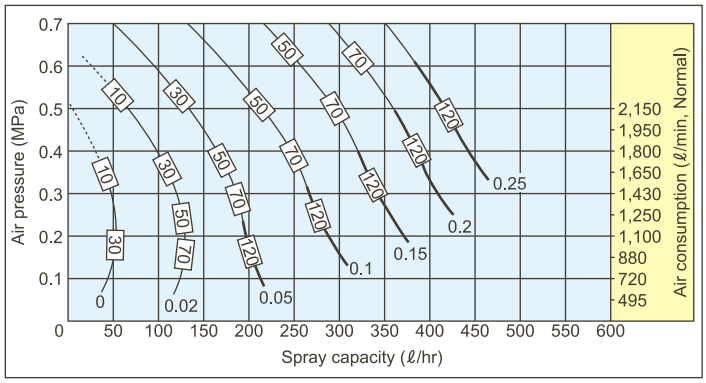
■ AKI37



■ AKI75



■ AKI150



■ How to read the chart

①The spray capacity shown is for one nozzle.
②Thin solid lines (—) represent fine atomization zone.
Bold lines (—) represent semi-fine atomization zone.
③Figures at the foot of each curve indicate liquid pressures in MPa.
④Figures in squares ☐ on each curve indicate Sauter mean droplet diameters (μm) measured by the immersion sampling method.

Spray Dimensions

■ AKI37

Air pressure (MPa)	Liquid pressure (MPa)	Spray width (mm)				Spray thickness (mm)			
		250 mm	500 mm	750 mm	1,000 mm	250 mm	500 mm	750 mm	1,000 mm
0.2	0	230	350	430	500	160	260	340	400
	0.02	260	390	470	530	150	250	330	400
	0.05	250	370	450	510	140	240	320	390
	0.10	210	310	380	410	160	260	340	400
0.3	0	220	350	440	500	140	240	320	400
	0.02	250	380	470	540	150	260	340	420
	0.05	270	400	490	560	140	240	330	410
	0.10	260	390	480	550	150	260	340	420
0.4	0.02	230	350	440	520	140	270	360	410
	0.05	260	390	490	560	160	290	380	450
	0.10	280	420	520	590	150	280	370	430
	0.15	270	400	510	580	150	280	370	440
0.5	0.05	220	360	460	530	140	250	350	430
	0.10	270	410	500	570	160	280	380	460
	0.15	290	430	520	590	150	270	370	450
	0.20	250	390	480	550	160	280	390	470

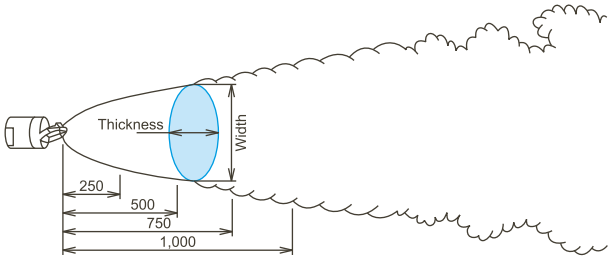
■ AKI75

Air pressure (MPa)	Liquid pressure (MPa)	Spray width (mm)				Spray thickness (mm)			
		250 mm	500 mm	750 mm	1,000 mm	250 mm	500 mm	750 mm	1,000 mm
0.2	0	340	460	540	590	160	270	360	430
	0.02	180	300	390	460	220	330	430	510
	0.05	150	250	340	410	270	400	500	590
	0.10	160	260	350	420	330	470	580	670
0.3	0	280	400	480	540	150	260	350	420
	0.02	360	490	570	630	170	280	380	460
	0.05	190	320	410	490	230	360	450	520
	0.10	180	290	390	460	290	420	510	580
0.4	0.02	300	420	510	570	170	280	380	460
	0.05	350	490	580	660	180	300	400	480
	0.10	190	300	390	460	240	360	460	530
	0.15	170	280	370	450	260	390	480	550
0.5	0.05	330	480	580	660	170	290	400	480
	0.10	280	420	500	560	190	320	420	500
	0.15	220	320	410	480	230	360	450	540
	0.20	190	300	390	460	250	370	470	550

■ AKI150

Air pressure (MPa)	Liquid pressure (MPa)	Spray width (mm)				Spray thickness (mm)			
		250 mm	500 mm	750 mm	1,000 mm	250 mm	500 mm	750 mm	1,000 mm
0.2	0	260	360	460	520	150	260	370	460
	0.02	250	350	450	500	200	320	420	510
	0.05	270	370	480	550	180	300	400	490
	0.10	290	400	510	590	190	310	410	500
0.3	0	250	380	480	540	150	250	370	460
	0.02	310	440	550	640	190	290	410	510
	0.05	300	430	530	610	170	280	400	500
	0.10	290	420	520	600	180	300	420	520
0.4	0.02	270	400	520	590	160	280	400	500
	0.05	300	440	550	630	180	300	420	520
	0.10	320	470	590	670	160	280	400	500
	0.15	330	480	610	700	170	290	410	510
0.5	0.05	270	420	530	640	160	260	360	460
	0.10	320	490	610	730	180	280	390	490
	0.15	330	500	630	750	170	270	370	470
	0.20	350	530	660	780	170	270	390	490

Note: The above data were measured with tap water in a laboratory, in windless conditions.



Large Capacity Impinging-type Fine Fog Nozzles

AKIJet®-S

Features

■Large capacity impinging-type AKIJet® nozzle.

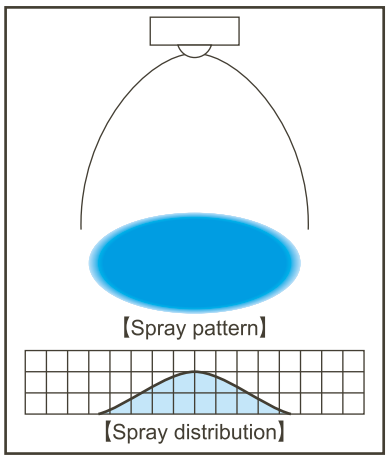
■Atomized droplets are impinged against each other creating ultrasonic waves, which results in creation of a uniform distribution of even finer droplet sizes.

■Produces a large volume of fine atomization up to 1,000 ℓ/hr with a mean droplet diameter of 100 μm or less.*1

■Minimal clogging due to the liquid orifices being set at the end of the spray tips.

*1) Droplet diameter measured by Fraunhofer diffraction method.
Please see pages 6–7 for comparison with laser Doppler method.

L: AKI150SS316+HS316
R: AKI370SS316+HS316

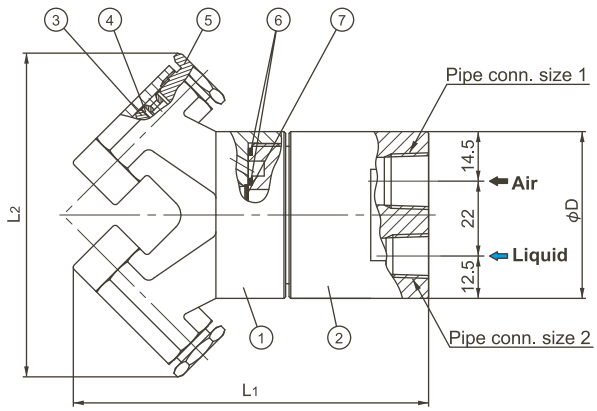


Applications

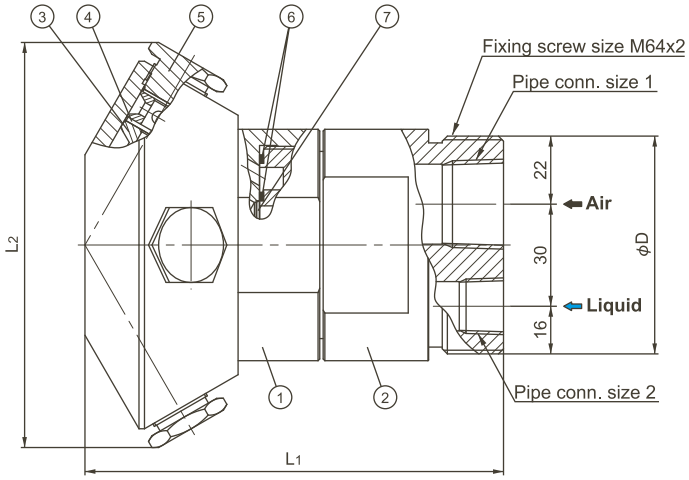
■Cooling: Gas, refractories, moldings, glass
■Moisture control: Flue gas, concrete
■Combustion: Oil, waste water
■Others: Mixing two liquids, spray drying

Structure & Materials

■AKI150S S316 + HS316 (metal-to-metal seal)



■AKI370S S316 + HS316 (metal-to-metal seal)



■Components and materials

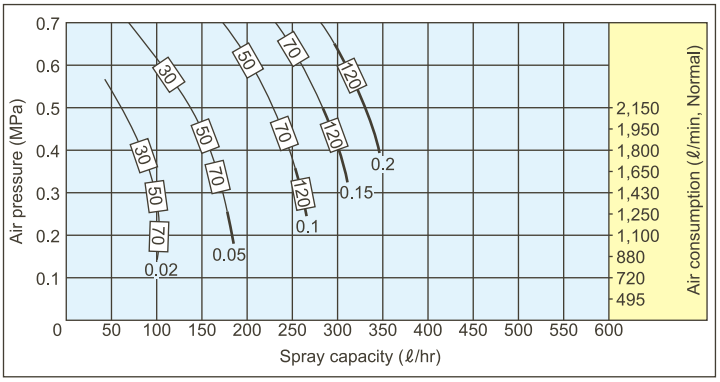
No.	Components	Standard materials
①	Nozzle body	S316 equivalent
②	Adaptor	S316
③	Spray tip	S316
④	Liner	S316
⑤	Plug	S316
⑥	O-ring	S321
⑦	Strainer	S316

Dimensions & Pipe Connection Sizes

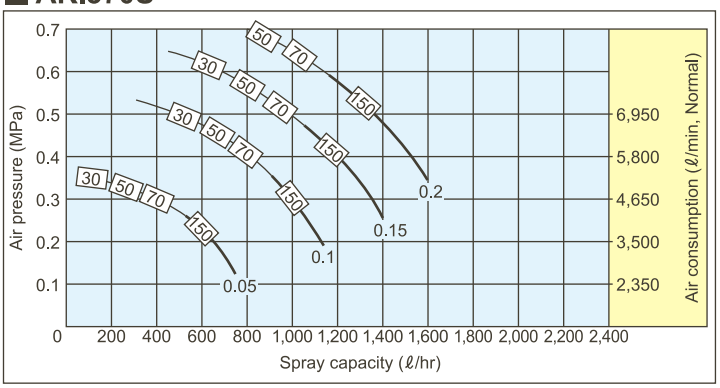
Nozzle code	L1 (mm)	L2 (mm)	ϕD (mm)	Pipe connection size		Free passage diameters (mm)		Mass (g)
				1 (Air)	2 (Liquid)	Air	Liquid	
AKI150S	111	94	49	Rc3/8	Rc1/4	0.9	2.0	980
AKI370S	123	(117)	68	Rc3/4	Rc3/8	1.3	4.3	3,700

Flow-rate Diagrams

■ AKI150S



■ AKI370S



■ How to read the chart

①The spray capacity shown is for one nozzle.
②Thin solid lines (—) represent fine atomization zone.
Bold lines (—) represent semi-fine atomization zone.
③Figures at the foot of each curve indicate liquid pressures in MPa.
④Figures in squares ☐ on each curve indicate Sauter mean droplet diameters (μm) measured by the immersion sampling method.

Spray Dimensions

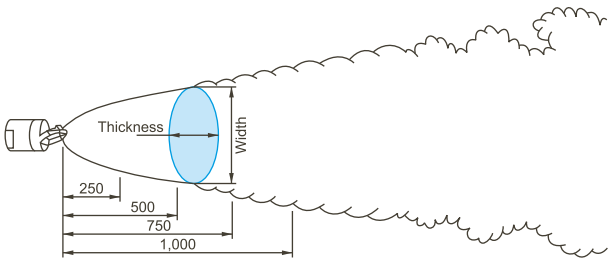
■ AKI150S

Air pressure (MPa)	Liquid pressure (MPa)	Spray width (mm)				Spray thickness (mm)			
		250 mm	500 mm	750 mm	1,000 mm	250 mm	500 mm	750 mm	1,000 mm
0.2	0.02	280	450	650	840	80	120	170	210
	0.05	360	520	750	950	120	160	210	250
	0.10	440	660	880	1,120	150	190	240	270
	0.15	490	720	940	1,190	160	210	260	300
0.3	0.02	240	400	590	780	110	150	210	260
	0.05	340	500	720	930	140	190	240	290
	0.10	400	650	840	1,080	170	230	280	320
	0.15	500	720	940	1,200	170	230	290	330
0.4	0.02	190	340	530	720	110	160	210	270
	0.05	310	470	680	890	130	180	240	290
	0.10	420	620	850	1,080	160	220	280	320
	0.15	490	710	940	1,200	170	240	300	340
0.5	0.05	260	410	620	850	110	170	220	280
	0.10	390	580	820	1,060	130	190	260	300
	0.15	490	700	930	1,190	150	220	280	330
	0.20	600	830	1,060	1,280	200	240	320	380

■ AKI370S

Air pressure (MPa)	Liquid pressure (MPa)	Spray width (mm)			
		250 mm	500 mm	750 mm	1,000 mm
0.2	0.05	320	430	550	670
	0.10	360	490	620	750
	0.15	380	530	670	820
	0.20	400	550	700	860
0.3	0.05	220	300	390	480
	0.10	320	430	530	640
	0.15	390	510	630	750
	0.20	420	550	680	800
0.4	0.10	260	340	430	510
	0.15	340	430	520	610
	0.20	380	480	580	680
0.5	0.10	210	290	370	450
	0.15	290	380	460	540
	0.20	330	420	510	600

Note: The above data were measured with tap water in a laboratory, in windless conditions.



How to order **AKIJet®** series nozzles

Please inquire or order for a specific nozzle as follows.

AKI37 S303 + TS303

AKI75 S303 + TS303

AKI150 S316 + HS316 (metal-to-metal seal)

How to order **AKIJet®-S** series nozzles

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

<Example> AKI150S S316+HS316 (metal-to-metal seal)

AKI 150S S316 + H S316 (metal-to-metal seal)

Nozzle code
■150S
■370S

Blower-Air Driven Ultra-Low Pressure Nozzles

BAVV/LSIM series Nozzles

■BAVV and LSIM series nozzles produce fine/semi-fine atomization by applying very low pressure air from conventional blowers.

■Save on installation and operational costs due to utilization of conventional blowers.

■Simple construction and compact design make maintenance and handling easy.

Contents

Ultra-Low Pressure Flat Spray Fine Fog Nozzles

BAVV

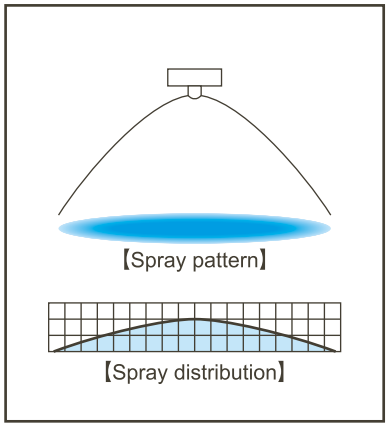
Features

■Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 40 μm or more.*1

■Energy-saving for blower-use. Low running cost.

■Large free passage diameter.

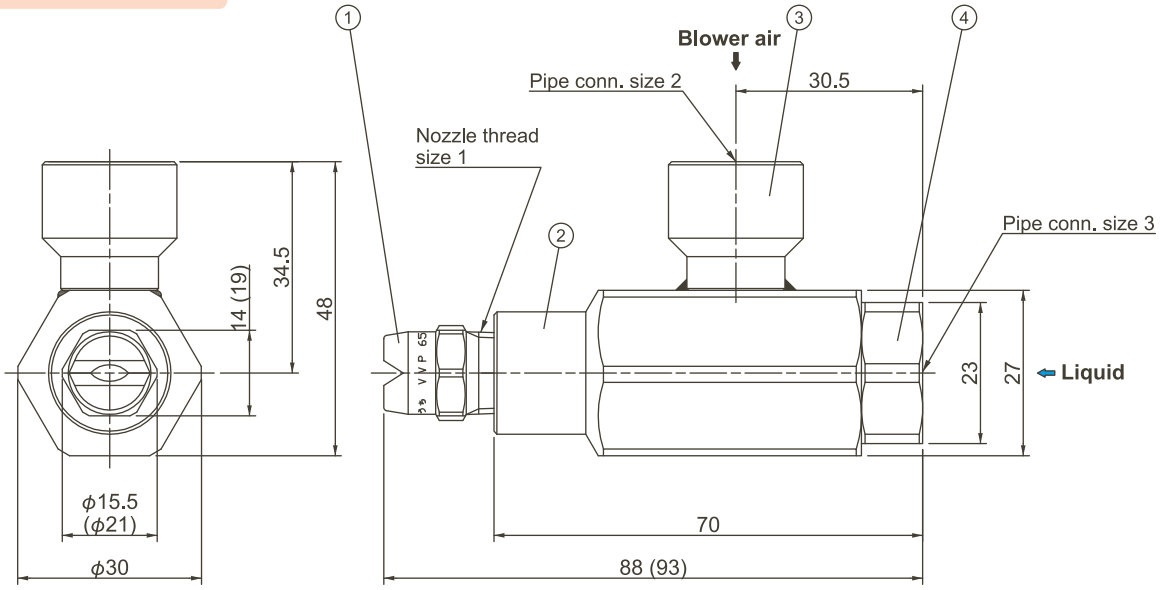
*1) Droplet diameter measured by laser Doppler method



Applications

■Cleaning: Liquid crystal, glass substrate, printed circuit boards
■Cooling: Steel plates
■Dust suppression: Raw material conveyor line
■Moisture control: Paper making

Structure & Materials



Note:
■Dimensions in ( ) shows those for the model BAVV6060S303.
■Appearance and dimensions may differ depending on nozzle codes and materials.

■Components and materials

No.	Components	Standard materials
①	Nozzle	S303
②	Mixing adaptor	S304
③	Air Socket	S304
④	Liquid socket	S303

Dimensions & Pipe Connection Sizes

Spray angle code*2	Spray capacity code	Nozzle thread size 1	Pipe connection sizes 2 & 3		Air pressure (MPa)	Spray capacity (ℓ/hr) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa)						Free passage diameter (mm)			Mass (g)
						0.02		0.03		0.04		Spray orifice	Adaptor		
			Air	Liquid		Liquid	Air	Liquid	Air	Liquid	Air		Liquid	Air	
60	10	R1/4	Rc3/8	Rc1/4	0.02	9.0	92	21.0	78	31.2	76	2.5	1.4	3.0	270
	30	R1/4				27.6	168	48.0	150	64.8	136	3.6	2.0		270
	60	R3/8				57.6	254	94.2	220	123	190	4.7	2.6		280

*2) Spray angle measured at both air and liquid pressure of 0.02 MPa

Flow-rate Diagrams

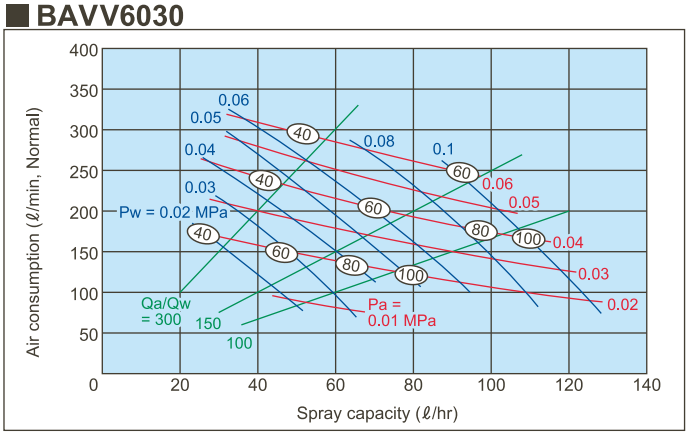
■How to read the chart

①The spray capacity shown is for one nozzle.

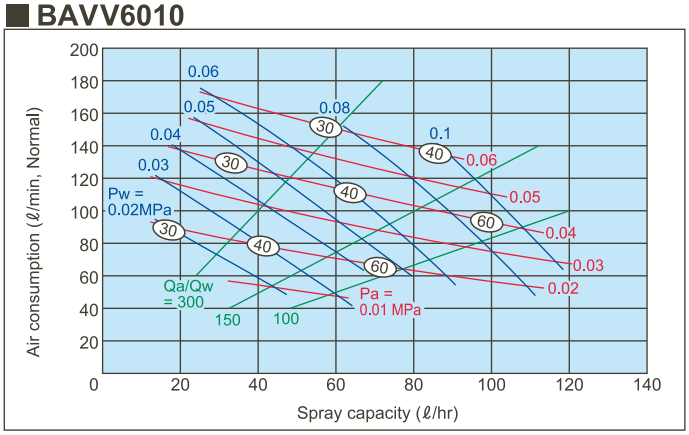
②Red lines (—) represent (blower) air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.

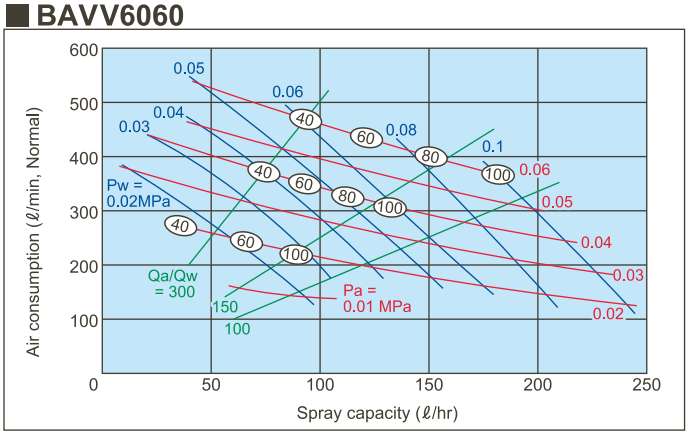
■ BAVV6030



■ BAVV6010



■ BAVV6060



How to order

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

<Example> BAVV 6010 S303

BAVV	60	10	S303
		Spray capacity code	

■10
■30
■60

Ultra-Low Pressure Semi-Fine Fog Nozzles

LSIM

Features

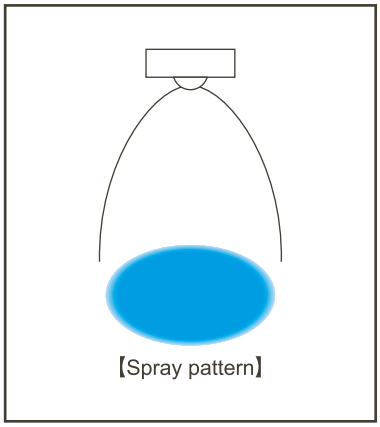
■1/3 to 1/2 of installation cost and running cost is saved due to utilizing blower air for atomizing, compared with nozzles requiring compressed air.

■Produces semi-fine atomization having no large droplets. When the mean droplet diameter is 80 μm, the maximum droplet diameter is 180 μm.*1

■Compact and lightweight design.

■Spray angle of 20°.

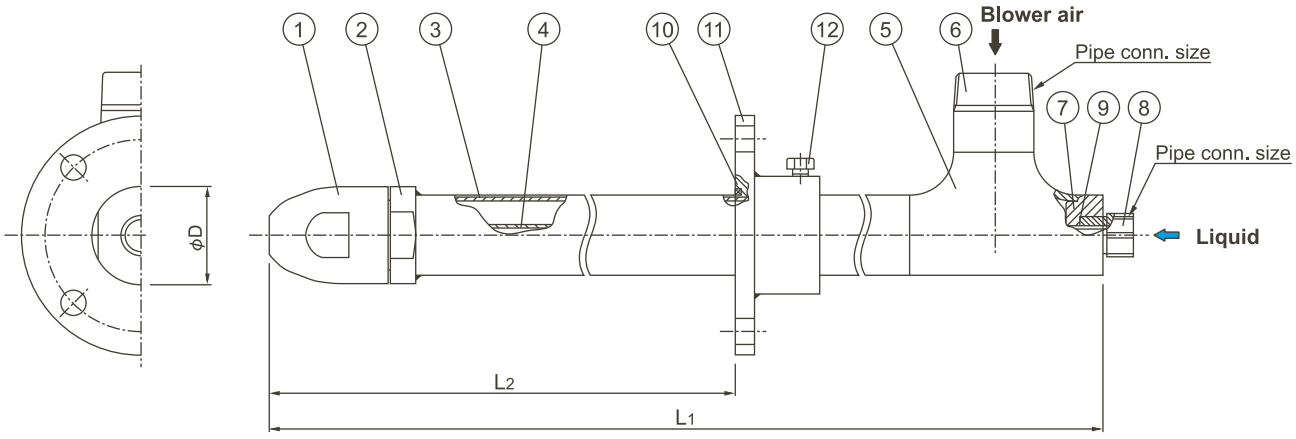
*1) Measured by laser Doppler method under air-water ratio of 250



Applications

■Cooling: Gas, refractories

Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Nozzle tip A,B & whirler	S316L
②	Nozzle adaptor	S316L
③	Outer pipe	S316LTP
④	Inner pipe	S304TP
⑤	T-connection	S304
⑥	Air nipple	S304

No.	Components	Standard materials
⑦	Joint	S304
⑧	Liquid socket	S304
⑨	O-ring	FKM
⑩	Packing	Metal wire reinforced AES wool
⑪	Flange	S304
⑫	Bolt	S304

Dimensions & Pipe Connection Sizes

■Dimensions

Nozzle code	Pipe connection size		Outer diameter ϕD (mm)	Free passage diameter (mm)	
	Air (Blower)	Liquid		Air	Liquid
20500	R1*1/2	Rc1/2	60	4.0	1.5
201000	R2	Rc1/2	74	5.9	2.0

■Type of length

Type	Total length L1 (mm)	Length L2 (mm)	Mass*2 (kg)	
			20500	201000
A	650	300–400	3.8	5.5
B	850	400–600	4.6	6.5
C	1,050	600–800	5.4	7.5
D	1,250	800–1,000	6.2	8.6

*2) Mass of flange is not included.

Mass of flange (reference only)

Flanges for Nozzle code 20500
JIS5K 2*1/2B: 2.6 kg

Flanges for Nozzle code 201000
JIS5K 3B: 3.7 kg

Flow-rate Diagrams

■How to read the chart

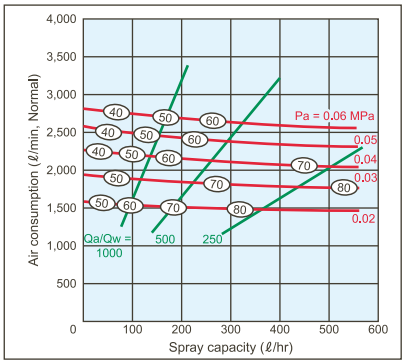
①The spray capacity shown is for one nozzle.

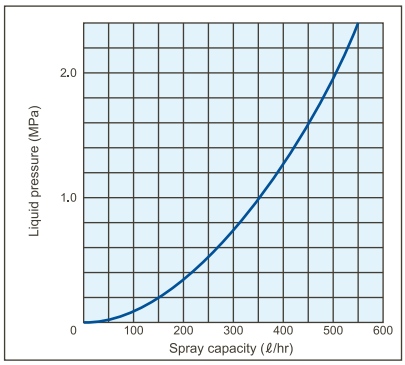
②Red lines (—) represent (blower) air pressures Pa in MPa.
Green lines (—) represent air-water ratio Qa/Qw.

③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by laser Doppler method.

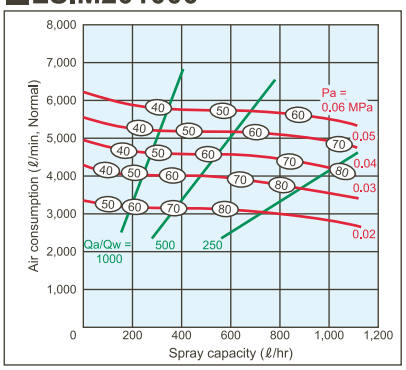
④Relation between liquid pressure and spray capacity of each nozzle is shown (as blue line) in the graphs to the right of flow-rate diagrams.

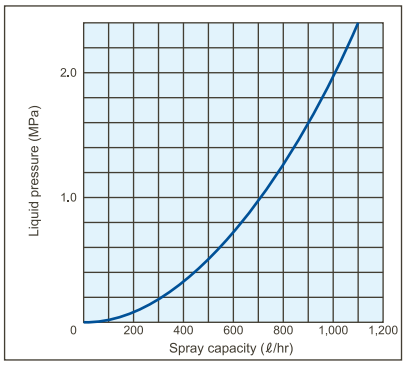
■LSIM20500



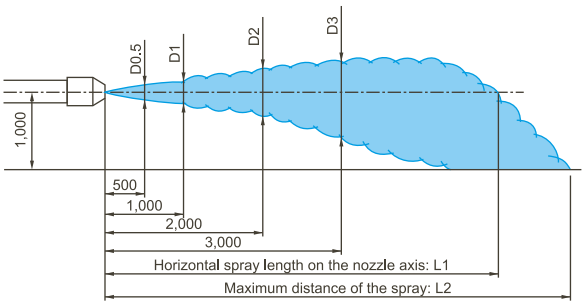


■LSIM201000





Spray Dimensions



Note: The above data were measured with tap water in a laboratory, in windless conditions.

Nozzle code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)					
			D0.5	D1	D2	D3	L1	L2
LSIM 20500	0.03	0–0.2	180	350	600	800	4,000	7,000
		0.2–1.0	180	300	550	800	4,000	7,000
		1.0–2.0	180	350	600	800	4,000	7,000
	0.04	0–0.2	180	300	550	800	4,000	7,000
		0.2–1.0	180	300	550	800	5,000	8,000
		1.0–2.0	180	300	550	800	5,000	8,000
	0.05	0–0.2	200	350	550	800	5,000	8,000
		0.2–1.0	200	350	600	850	5,000	8,000
		1.0–2.0	200	350	600	850	5,000	8,000
LSIM 201000	0.03	0–0.2	200	350	600	800	5,000	8,000
		0.2–1.0	180	300	600	800	5,000	8,000
		1.0–2.0	200	350	600	800	6,000	9,000
	0.04	0–0.2	200	400	800	1,000	5,000	8,000
		0.2–1.0	180	300	600	900	6,000	9,000
		1.0–2.0	180	350	600	900	6,000	9,000
	0.05	0–0.2	200	400	700	900	6,000	9,000
		0.2–1.0	160	280	600	850	6,000	9,000
		1.0–2.0	160	300	700	850	6,000	9,000

How to order

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

<Example> LSIM20500 C S316L + 2*1/2T5 S304 (L_2)

LSIM [20500] [C] S316L + [2*1/2T5] S304 [(L_2)]

[20500] Nozzle code
■20500
■201000

[C] Type of length (Total length)
■A
■B
■C
■D

[2*1/2T5] Flange size
■2*1/2T5
■3T5

The minimum flange size
2*1/2T5 for nozzle code 20500
3T5 for nozzle code 201000

[(L_2)] Length between the nozzle head and flange

See the drawing and table on page 86 for length type and L_2.
Please send us an inquiry for the different flange sizes.
For details please ask for our inquiry drawing.

Steam-Driven Nozzles

JOKIJet® series Nozzles

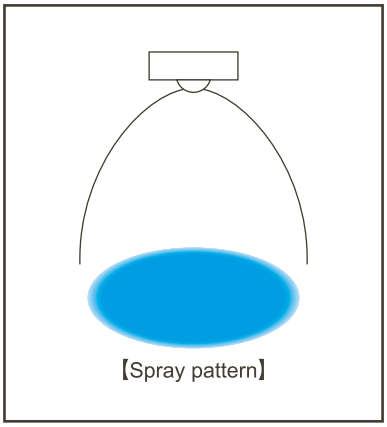
■JOKIJet® series nozzles use steam instead of compressed air to atomize liquid.
The world's first steam-driven pneumatic spray nozzle.

■Great savings on running costs realized by utilizing steam from an existing boiler facility.

Contents

Features

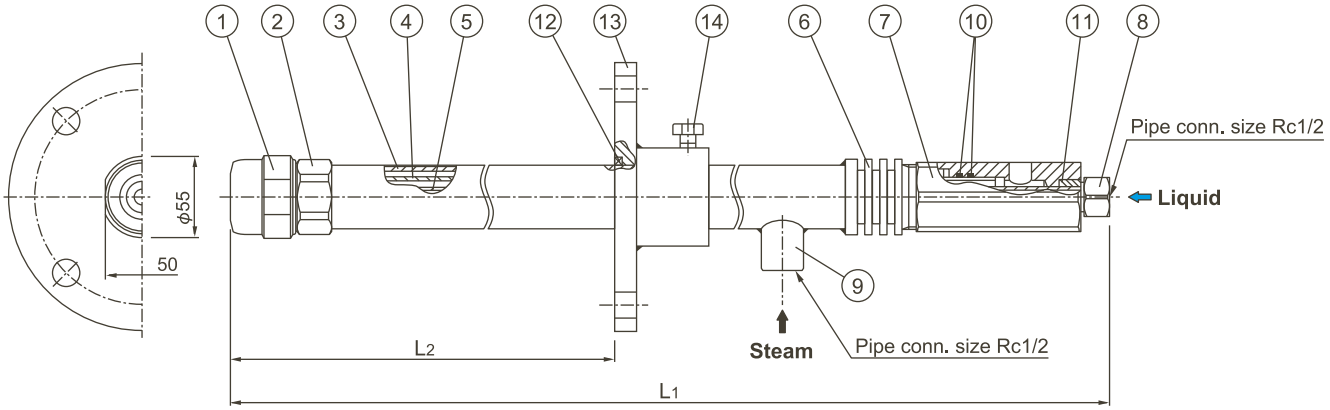
■Innovative pneumatic nozzles using steam instead of compressed air to produce fine (semi-fine) atomization.



Applications

■Cooling: Gas
■Moisture control: Flue gas, paper, cardboard
■Chemical reaction: Denitration

Structure & Materials



■Components and materials

No.	Components	Standard materials
①	Nozzle body	S316L
②	Nozzle adaptor	S316L
③	Outer pipe	S316LTP
④	Inner pipe	S304TP
⑤	Inner pipe	S304TP
⑥	Fin	S304
⑦	Joint	S304
⑧	Liquid socket	S304

No.	Components	Standard materials
⑨	Steam socket	S304
⑩	O-ring (P-26)	FKM
⑪	O-ring (P-12.5)	FKM
⑫	Packing	Metal wire reinforced AES wool
⑬	Flange	S304
⑭	Bolt (M12)	S304

Dimensions & Mass

■Dimensions

Spray capacity code	Free passage diameter (mm)	
	Steam	Liquid
15	1.1	1.1
37	1.7	1.6
75	2.6	3.1
150	4.1	4.2

■Type of length

Type	Total length L_1 (mm)	Length L_2 (mm)	Mass* (kg)
A	720	300–400	6.0
B	920	400–600	7.2
C	1,120	600–800	8.3
D	1,320	800–1,000	9.4

*Mass of flange is not included.

Flow-rate Diagrams

■How to read the chart

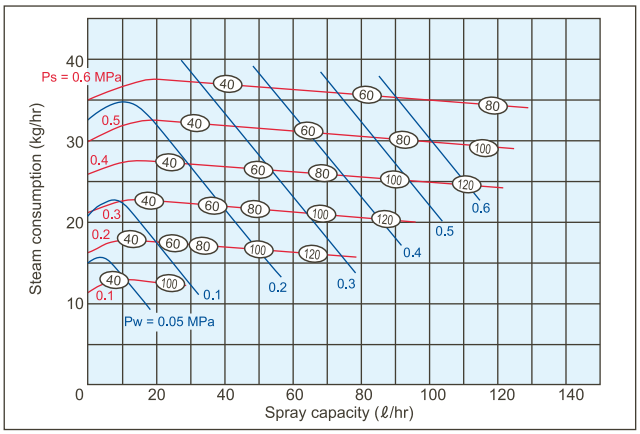
①The spray capacity shown is for one nozzle.
②Red lines (—) represent steam pressures Ps in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.
③Figures in ovals ⬭ indicate Sauter mean droplet diameters (μm) measured by the immersion sampling method.

Note: Data shown in the diagrams are based on saturated steam and estimated values.

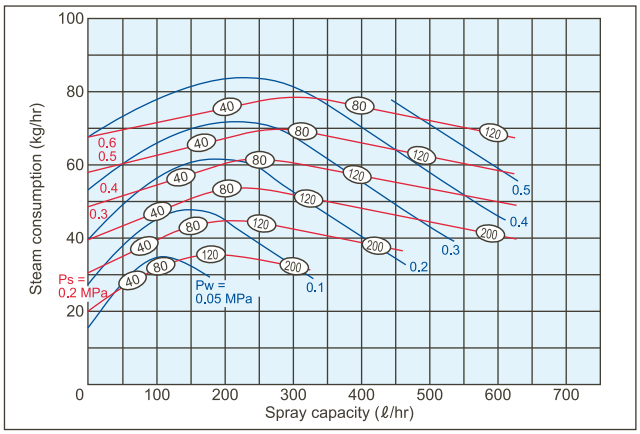
Note for spray control

To control the spray out of the JOKIJet® nozzles, control by steam pressure and spray capacity is recommended. Attempts to control the spray by controlling the steam pressure and liquid pressure may not allow stable spray control.
For more details on JOKIJet® spray control, please contact a sales representative.

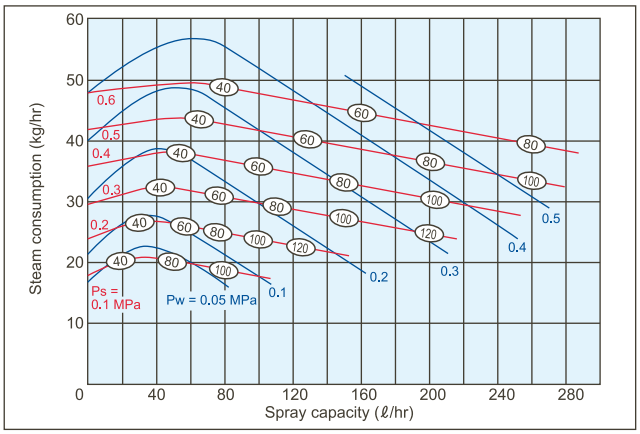
■JOKI15



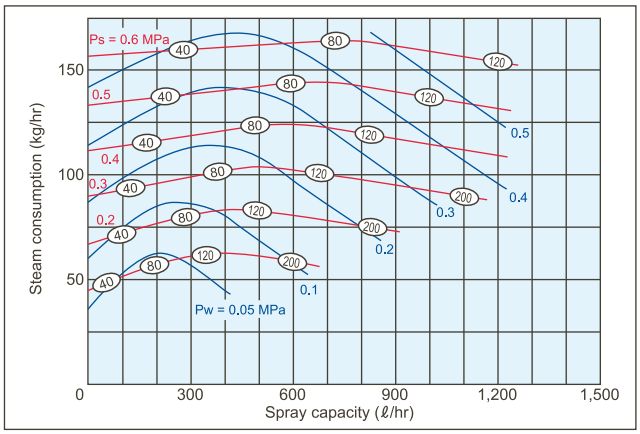
■JOKI75



■JOKI37



■JOKI150



How to order

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

<Example> JOKI15 A S316L + 2*1/2T10 S304 (L_2)

JOKI	15	A	S316L	+	2*1/2T10	S304	(L_2)
	Spray capacity code	Type of length (Total length)			Flange size		Length between the nozzle head and flange
	■15 ■37 ■75 ■150	■A ■B ■C ■D					

(See p.89)

Please send us an inquiry for the different flange sizes.
For details please ask for our inquiry drawing.

Reference Data

Conversion of units

	μm	mm	cm	m	in	ft
Length	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

	cm^2	m^2	in^2	ft^2
Area	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

	cm^3	ℓ	m^2 (kℓ)	ft^3	Imperial gal	U.S. gal
Volume	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	35.3	220	264
	2.83×10^{4}	28.3	2.83×10^{-2}	1	6.23	7.49
	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

	MPa	bar	kg/cm^2	psi (lb/in^2)	atm	mmHg	mmH_2O (mmAq)
Pressure	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

	ℓ/min	m^3/min	m^3/hr	in^3/hr	ft^3/hr	Imperial gal/min	U.S. gal/min
Flow rate	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	1P = 100 cP 1St = 100 cSt
Mass	1 kg ≈ 2.21 lb 1 lb ≈ 0.45 4kg
Temperature	[°F] ≈ ([°C] × 9/5) + 32 [°C] ≈ 5/9 × ([°F] − 32)

Water flow and proper pipe size

Pipe size		Steel pipe		Spray flow (ℓ/min) when pressure loss is 0.01–0.03 MPa per pipe length of 10 m
A	B	Inside dia.	Outside dia.	
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

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