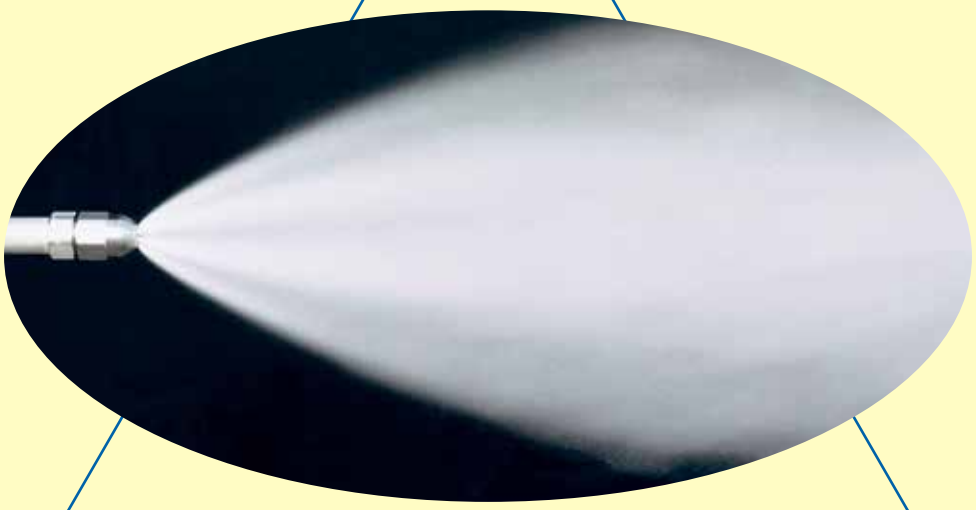
PA-3_200612E

IKEUCHI

Catalog on Pneumatic Spray Nozzles



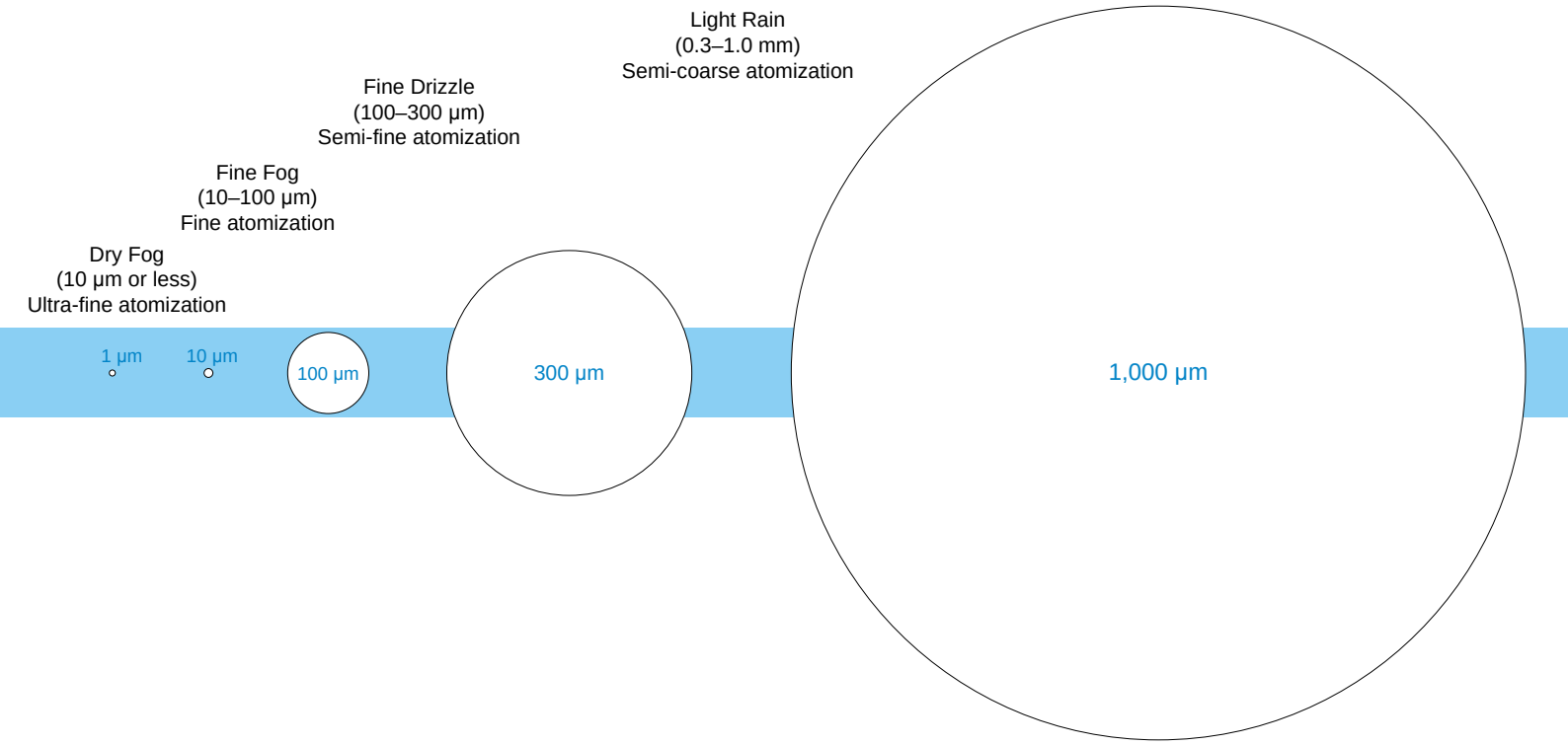
"The Fog Engineers"

H. IKEUCHI & CO., LTD.

20PA

Classification of Spray Droplet Size

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



The above classification is based on the spray droplet size (spray droplet diameter) measured by the immersion sampling method.
For comparison with other measuring methods, see the correlation of spray droplet diameter on page 7.

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

   Pneumatic spray nozzles are capable of producing fine atomization with a mean droplet diameter of 10 μm or less,*1 that are difficult with hydraulic spray nozzles.

2. Large turn-down ratio

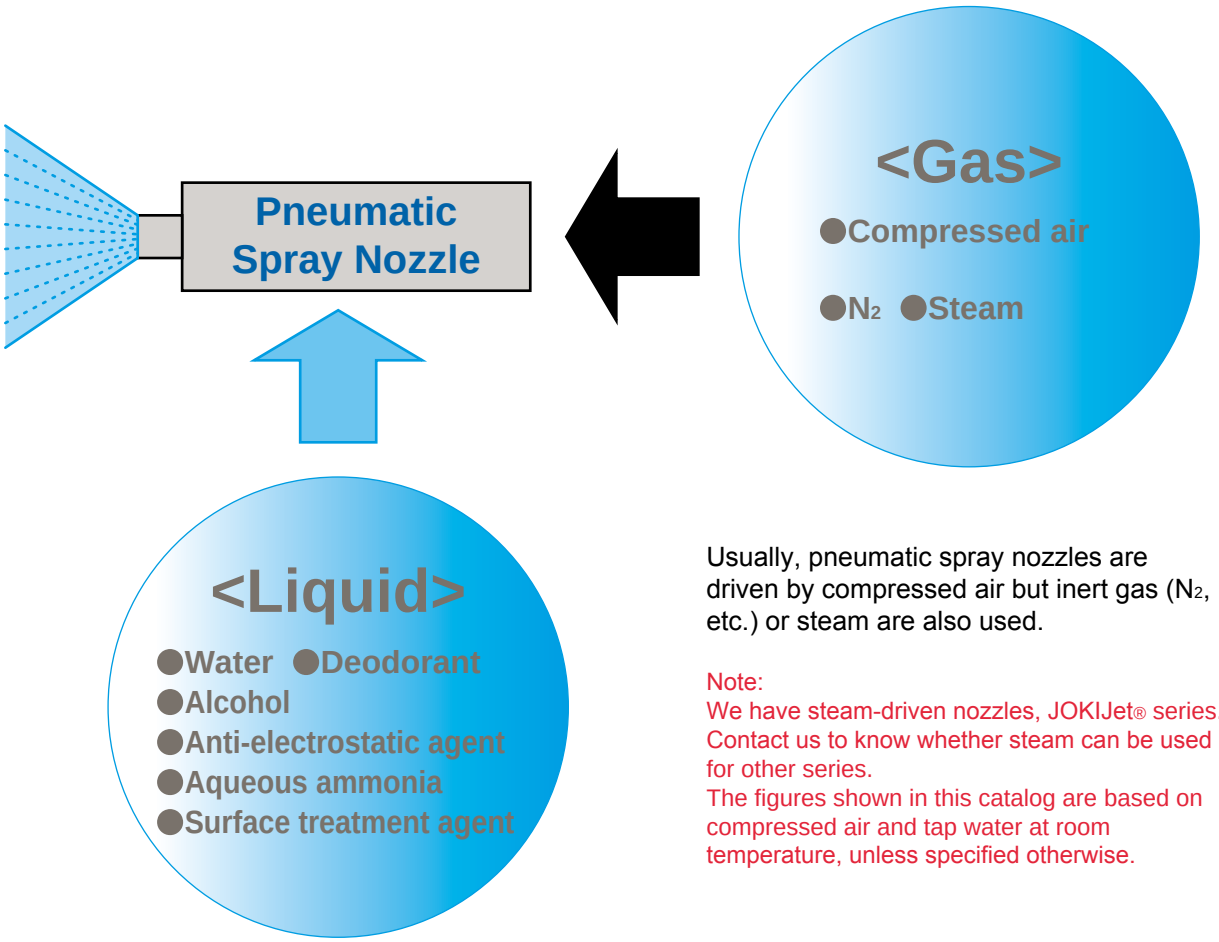
   Pneumatic spray nozzles have large turn-down ratios of spray flow-rate*2 with little variation in droplet size and spray distribution, which makes them ideal for spray flow adjustable nozzles.

3. Large free passage diameter

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

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

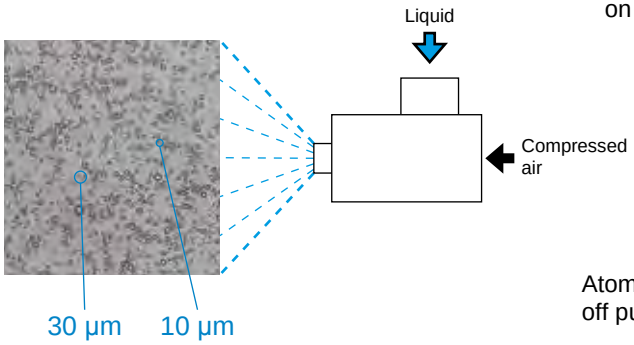
Various types of pneumatic spray nozzles are available.
Please read technical information on the following pages and select optimal spray nozzles that meet your specific purpose.



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

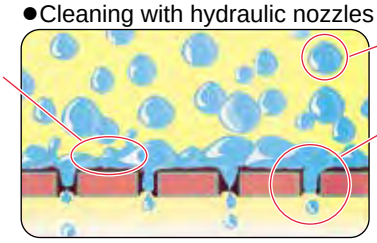
Note:
We have steam-driven nozzles, JOKIJet® series. Contact us to know whether steam can be used for other series.
The figures shown in this catalog are based on compressed air and tap water at room temperature, unless specified otherwise.

When fine atomization is required···

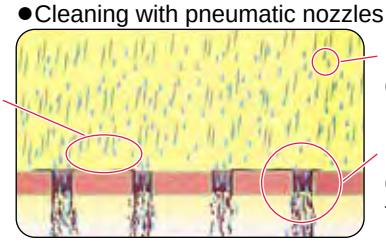


■ In cleaning process

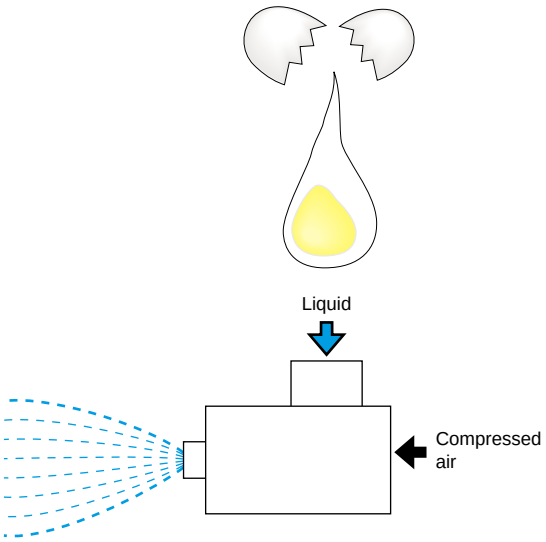
●Cleaning with hydraulic nozzles



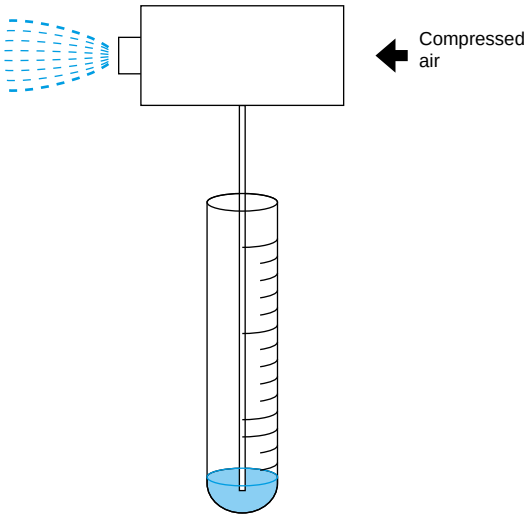
●Cleaning with pneumatic nozzles



When viscous liquid is sprayed···

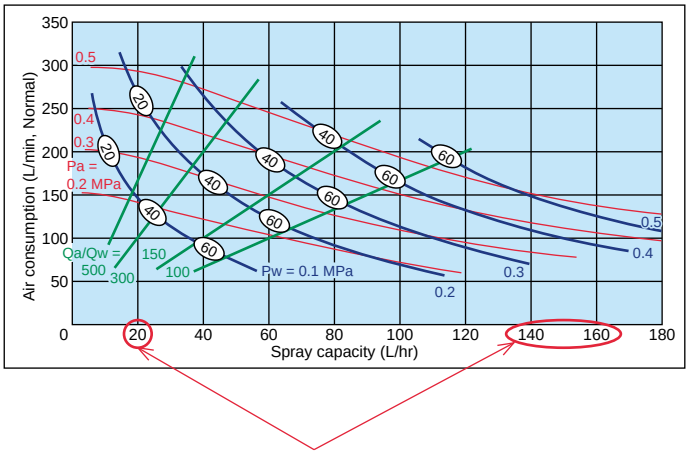


When extremely small spray capacity is required···



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

Example: BIMV11022



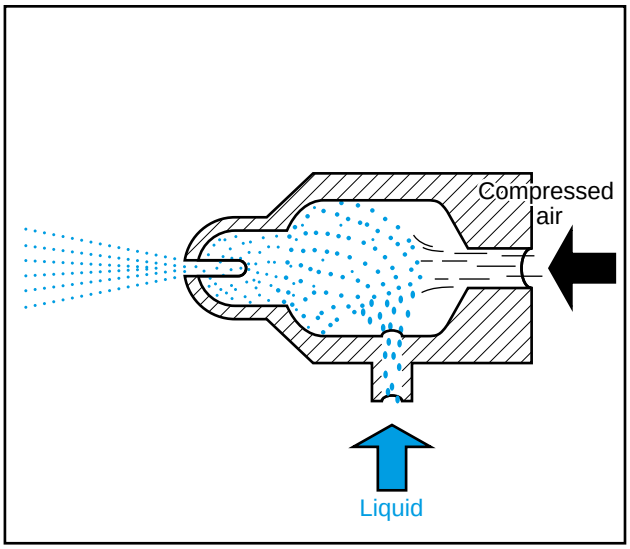
One spray nozzle can cover a wide range of spray capacity.

1. Air-liquid mixing systems

There are three air-liquid mixing systems 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

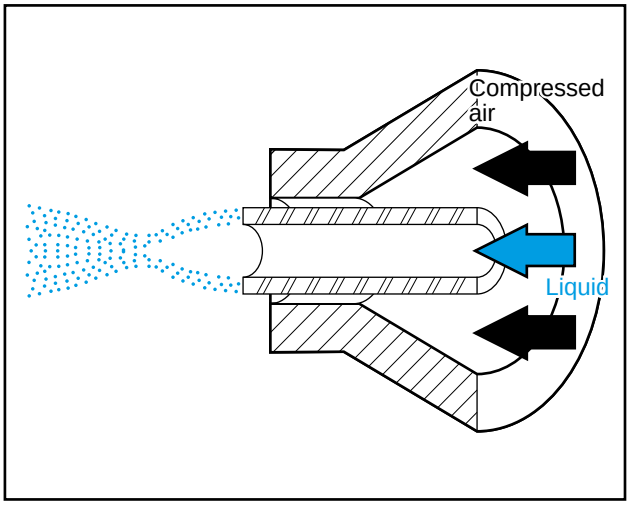
Liquid flows in the center of the nozzle, while compressed air flows along its circumference. This type of nozzle is selected for wide range of applications. Larger orifice size can be designed on demand while the spray droplets become a little coarser.

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.

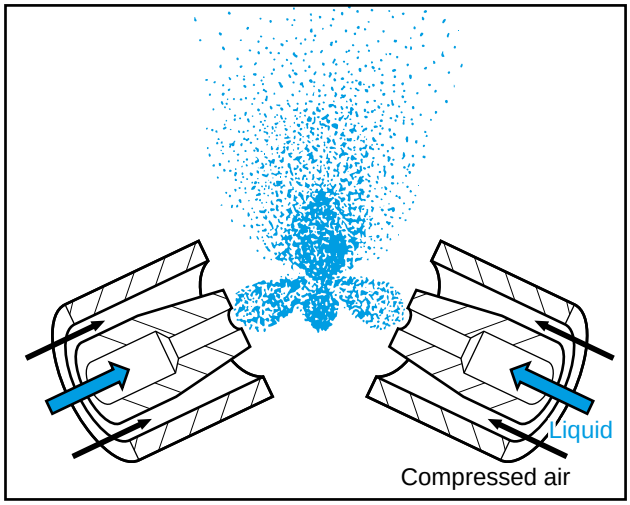
External mixing type

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

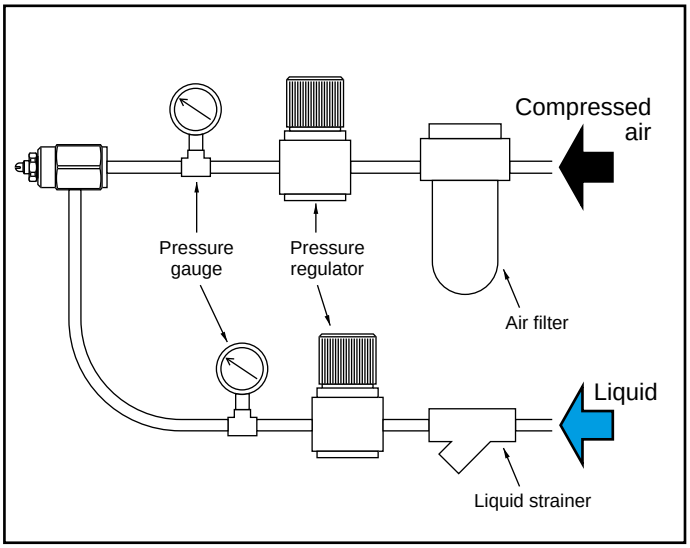
Air-stream entraining fine fog jets out from the nozzle and impinges against another air-stream of the same nature for shattering the fog into even finer, more-uniform droplets. This is an original method of IKEUCHI, "The Fog Engineers."



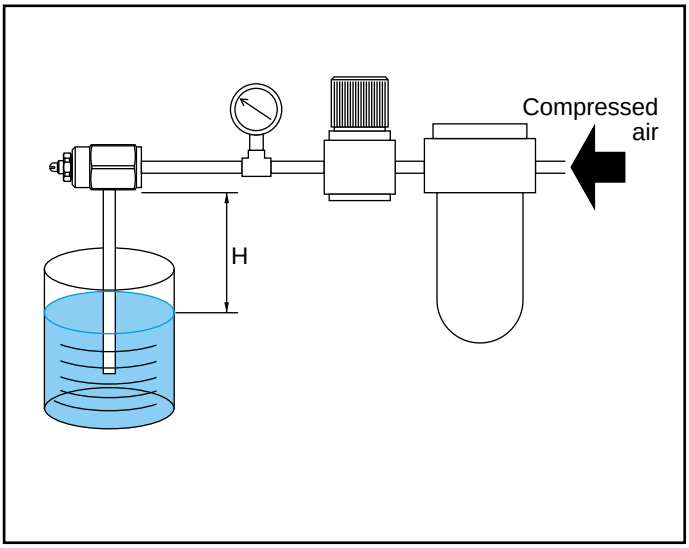
2. Liquid feeding system

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

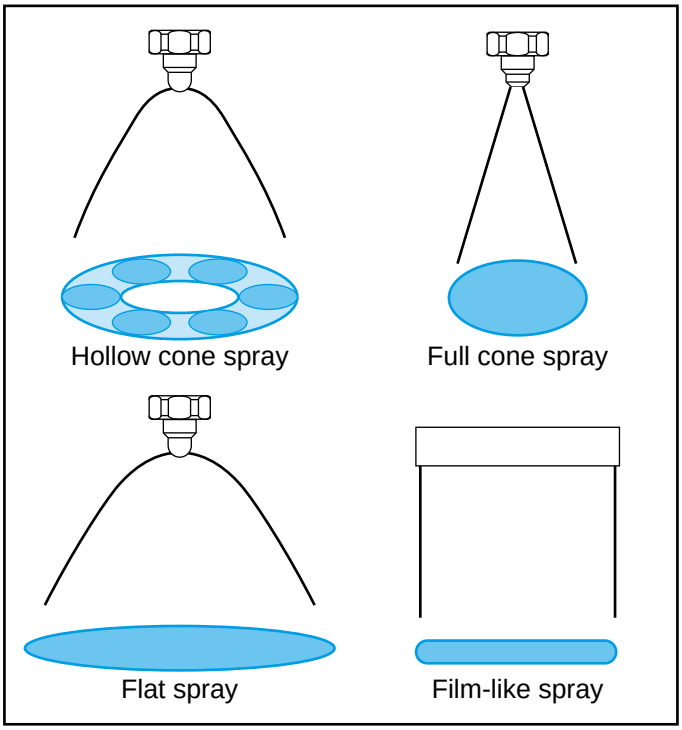


Liquid siphon system



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

3. Spray pattern

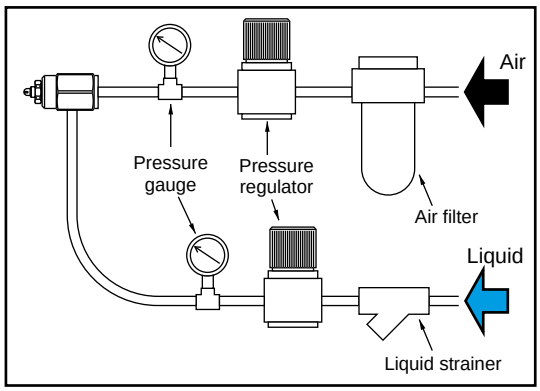


Spray pattern means the cross sectional shape of the spray.
As illustrated, spray patterns are available in cone spray (hollow cone spray and full cone spray), flat spray, and liquid film-like spray.
It is important to select a spray pattern suited for each application, thus, delivering the optimal nozzle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

Hollow cone spray and full cone spray patterns are suitable for applications such as humidification, cooling gases, chemical reactions, and moisture control, while flat spray pattern and film-like spray (laminar sheet of water) for cooling and coating.

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

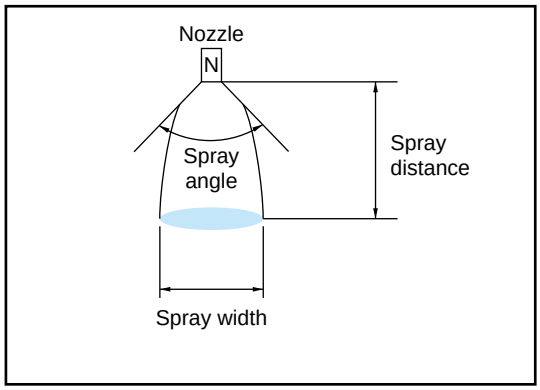
4. Spray pressure



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.

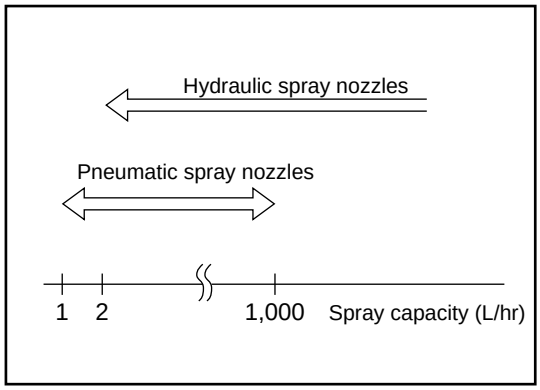
The figures in this catalog are based on compressed air and tap water at room temperature and the pressures are measured at the immediate upstream of each nozzle.

5. Spray angle



The spray angle is the angle of spray near the nozzle, measured at the top of the pattern made by straight lines from the spray edges.
Pneumatic spray nozzle's flow velocity is so fast that the specified spray angle is maintained only at the top of the spray.
For proper nozzle alignment, please refer to the spray width data in the performance table of each nozzle series.

6. Spray capacity

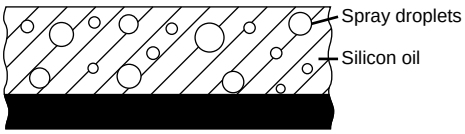
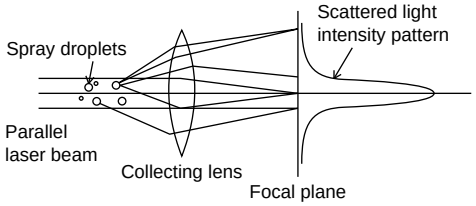
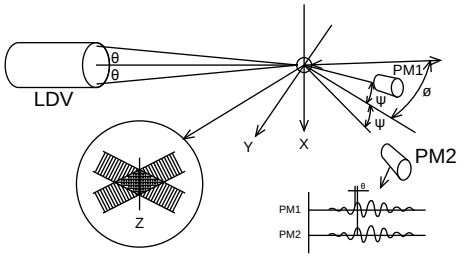
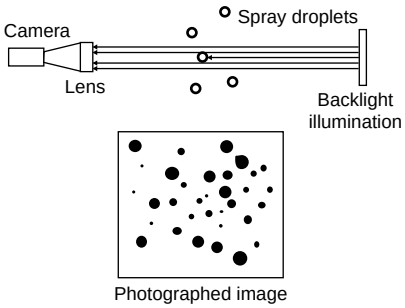


The spray capacity is the water volume flow rate sprayed from the nozzle. One of the features of pneumatic spray nozzles is that it is capable of producing a spray capacity as small as 0.1 L/hr (1.7 cc/min).
Spray capacities shown in this catalog are based on tap water at room temperature.
(The air consumption 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	
1. Fraunhofer diffraction method	1–1,000 μm
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. 	
2. Laser Doppler method	0.5–2,500 μm
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, measurement is made only at a single point in the spray.  (LDV: Laser Doppler Velocimeter PM: Phase monitor)	
Shadowgraph method	
Backlight illuminated shadows of droplets in various sizes are photographed and converted to circular shapes, from which the droplet diameters are calculated. This method enables the measurement of non-spherical coarse droplets that cannot be measured by the laser analyzer. On the other hand, it is not suitable for measuring fine droplets due to the low magnification of the camera. Also, when the droplets are dense, the overlapped multiple droplets could be measured as a single droplet, thus its droplet size may appear larger than the actual size. 	10–8,000 μm

2) Mean droplet diameter

■ Example of calculation of Sauter mean 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 Diameter ($\bar{d}_{32}$)·····$\Sigma nd^3/\Sigma nd^2$
- Volume Mean Diameter ($\bar{d}v$)·····$(\Sigma nd^3/\Sigma n)^{1/3}$
- Mass Median Diameter ($D_{v.5}$)·····$\int_0^{Dv.5} dv/v = \int_{Dv.5}^{\infty} dv/v = 50\%$

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 Diameter as the representative droplet size.
Sauter Mean Diameter is used in this catalog.

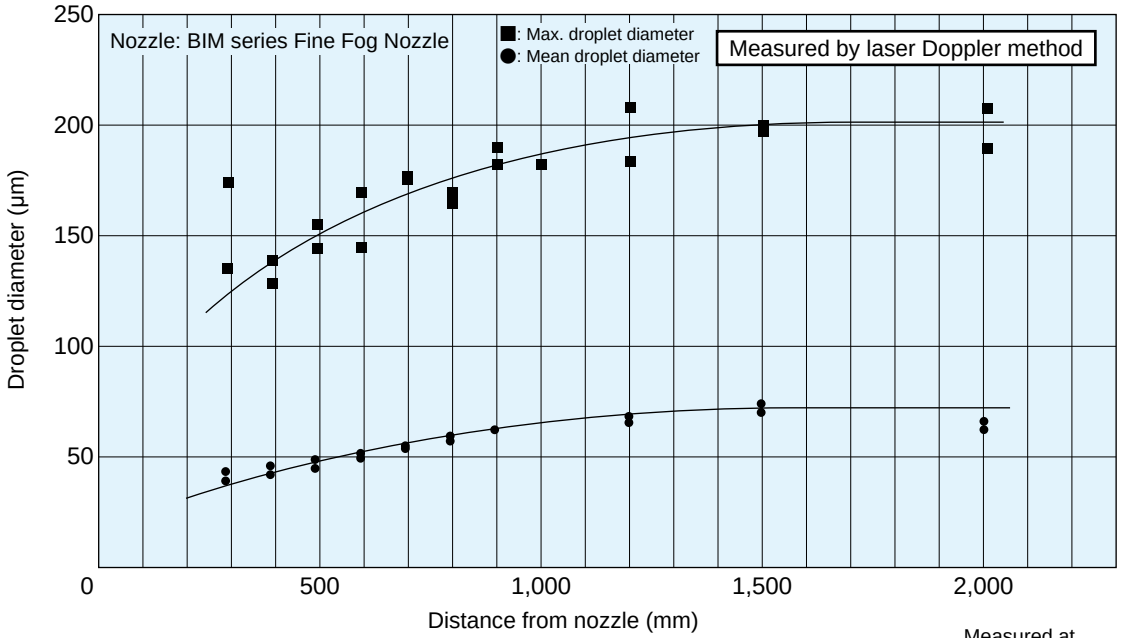
3) Correlation of spray droplet diameter

Measured results will differ depending on the measuring method used. Assuming the mean droplet diameter measured by the immersion sampling method is equal to 1 (as a relative coefficient number), the value will be different when measured with other measuring methods as shown on the right.

Measuring method / Nozzle type	Immersion sampling method	Fraunhofer diffraction method	Laser Doppler method	Shadowgraph method
Hydraulic spray nozzles	1	0.45	0.7–0.9	0.8–0.9
Pneumatic spray nozzles				

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.

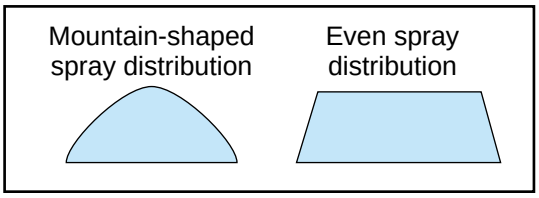


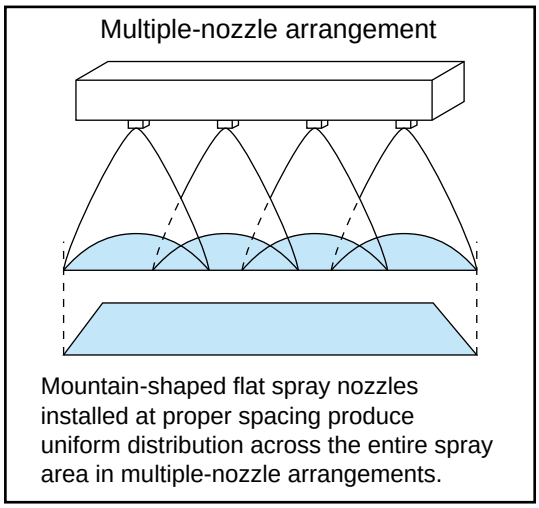
Droplet diameters at various distances from the nozzle

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 an even spray distribution is suitable for applications that require uniform spray distribution by one nozzle. The spray distribution varies depending on the spray height and spray pressure.

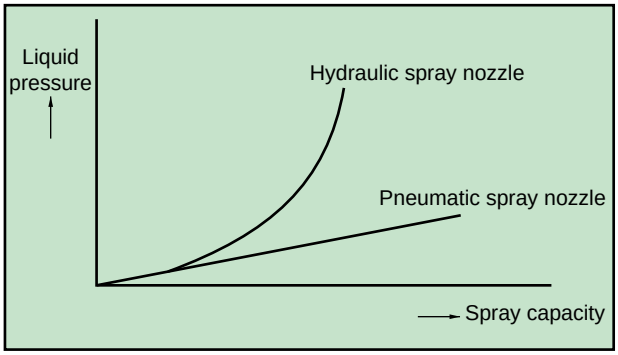




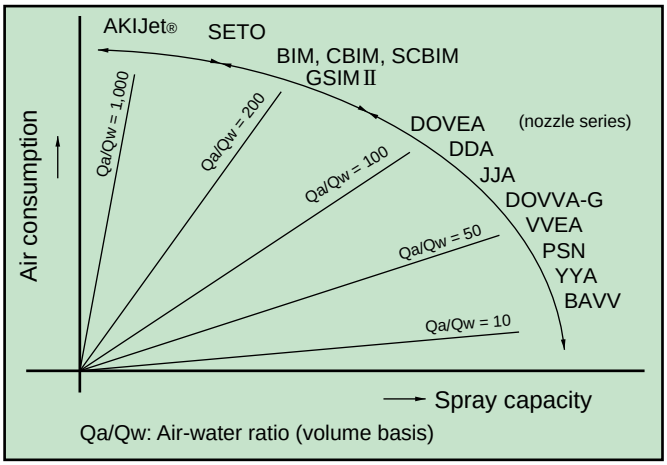
Mountain-shaped flat spray nozzles installed at proper spacing produce uniform distribution across the entire spray area in multiple-nozzle arrangements.

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
Compressed air	Low flow rate fine fog nozzles	Flat spray	Liquid pressure	BIMV, CBIMV, SCBIMV	Internal mixing inner air type
			Liquid siphon	BIMV-S, CBIMV-S, SCBIMV-S	
		Hollow cone spray	Liquid pressure	BIMK, CBIMK	
			Liquid siphon	BIMK-S, CBIMK-S	
		Full cone spray	Liquid pressure	BIMJ, CBIMJ, SCBIMJ	
	Clog-resistant fine fog nozzles	Flat spray	Liquid pressure	YYA	External mixing type
			Liquid pressure & Liquid siphon	SETOV	External mixing outer air type
				SETOV-C	
		Full cone spray		SETOJet	
				SETOJet-R	
				SETO-SP	
				SETO-SD	External mixing outer air type*4
	Medium capacity fine fog nozzles	Full cone spray	Liquid pressure	AKIJet	Internal mixing & Impinging type
	Large capacity fine fog nozzles	Full cone spray	Liquid pressure	GSIM Ⅱ	Internal mixing outer air type
	Semi-fine/ Semi-coarse fog nozzles	Flat spray	Liquid pressure	DOVEA	Internal mixing pre-mix type
				DDA	
				DOVVA-G	
				VVEA, INVVEA	
		Full cone spray		JJA	
	Slit laminar nozzles	Film-like spray		PSN	
Blower air	Ultra-low pressure nozzles	Flat spray	Liquid pressure	BAVV	Internal mixing inner air type
		Full cone spray		LSIM	Internal mixing outer air type
Steam	Steam driven nozzles	Full cone spray	Liquid pressure	JOKIJet	External mixing outer air type

Note: Check the respective product pages for the air and liquid pressures (measurement conditions of the above) and other details including adaptor type.
*1) Sauter mean diameter, measured by laser Doppler method unless otherwise specified. *2) Measured by the Immersion sampling method. *3) Measured by the Fraunhofer

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 here 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

Oil-free treatment is available at additional cost.
Contact us for details.

Plastics

[Material code	Material]
PP	Polypropylene
PPS	Polyphenylene sulfide
PVC	Polyvinyl chloride
HTPVC	Heat-treated polyvinyl chloride
PTFE	Polytetrafluoroethylene
PA	Polyamide
PE	Polyethylene

Rubbers

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

Mean droplet diameter*1 (μm)	Spray capacity	Unit	Spray angle (°)	Air consumption (L/min, Normal)	Adaptor type	Page
20–100	0.25–107	L/hr	110, 80, 45	2.6–245	N, T, NDB, UNDB, SNB, USNB, SPB, USPB	13, 31, 36
	0.1–4.7		80	3.75–92		15, 33, 37
	2.0–107		60	13–245		17, 32
	1.8–4.7		60	27–92		19, 32
	0.25–107		70, 20	2.6–245		21, 32, 36
15–30	2.2–10.0	L/hr	80	27–45	–	57
15–40	1.7–10.6		65, 55	27–75	T, SN, SP	48
–	1.2–25.9		–	33–151	SP	51
20–60	2.0–111		–	38–290	T	41
15–40	2.0–26.4		–	36–200	T	43
15–25	1.5–5.1		–	18–30	CSP	46
15–25	0.9–26.4		–	36–200	–	53
10–120*2	10–450	L/hr	–	340–2,150	T, H	85
40–80	15–2,000	L/hr	60, 20	150–4,000	T, flange connection	57
50–200*3	0.42–40	L/min	110, 95, 70, 55	30–630	T	63
15–200*3	0.14–57.3		125, 110, 100, 80, 75	17–610	T	68
80–120	1–25		70, 55	100–1,700	Flange connection	74
20–400	0.23–3.0		80, 60	14–128	T*5	78
150–650*2	1.1–24		–	70–720	Flange connection	71
–	8–28		–	520–1,700	–	82
30–100	9.0–123	L/hr	60	76–254	T	88
40–80	0–1,000		20	1,500–6,000	Flange connection	90
40–200*2	10–1,200	L/hr	–	–	Flange connection	94

diffraction method. *4) Nozzle code 07503R-I+SD is internal mixing outer air type. *5) Exclusive of INVVEA Header.

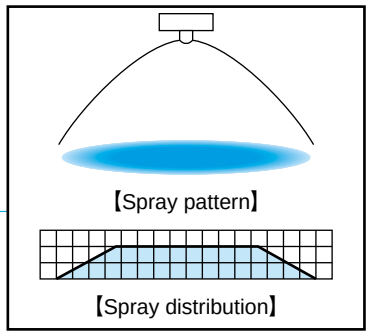
Items \ Materials		Metals				Plastics							Rubbers		
		S303	S304	S316 S316L	S321	PP	PPS	PVC	HTPVC	PTFE	PA	PE	NBR	FKM	FEPM
Chemical resistance	Hydrochloric acid	×	×	×	×	○	○	○	○	○	×	○	×	○	○
	Concentrated hydrochloric acid	×	×	×	×	△	○	○	○	○	×	○	×	○	○
	Sulfuric acid (35%)	×	×	×	×	○	○	○	○	○	×	○	×	○	○
	Concentrated 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	80	170	40	50	100	130	60	90	150	150
	Short-term use only (°C)	800	800	800	800	90	180	50	70	150	230	80	120	200	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 the Tables

●Spray nozzle specifications are shown in the respective tables.



●Spray pattern and spray distribution

Performance data table

●Spray angle code (110)

●Air consumption code (02)

L/min, Normal: L/min. at Normal Conditions (0°C, 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 *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) Tip orifice	Adaptor Liquid	Adaptor 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				
											—	—	340	400	—	20–100	0.8	1.8	1.9
													270	320	470				
														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 (with coarse droplets, wheezing, etc.)

●Range of Sauter mean diameters measured by laser Doppler method

Description of thread size and type

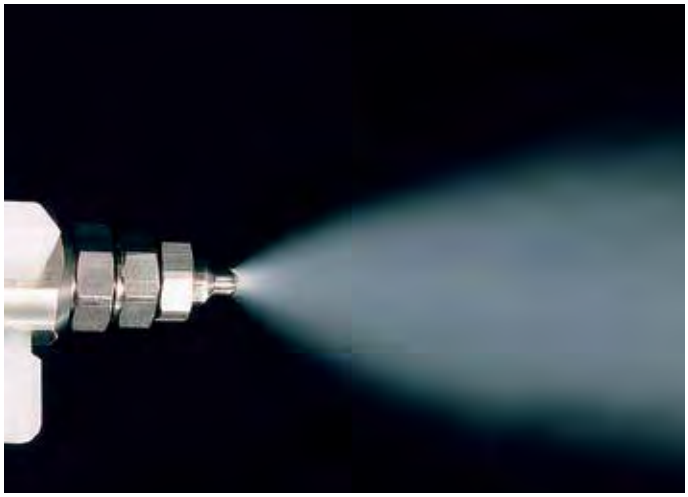
Thread type	ISO standard	Our thread code
Male tapered pipe threads	R1/4	1/4M
Female tapered pipe threads	Rc1/4	1/4F

Description of flange size

Pipe size		Flange description in this catalog
A (nominal diameter)	B (inch)	
10	3/8	3/8T10
15	1/2	1/2T10
20	3/4	3/4T10
25	1	1T10
32	1*1/4	1*1/4T10
40	1*1/2	1*1/2T10
50	2	2T10
65	2*1/2	2*1/2T10
80	3	3T10
90	3*1/2	3*1/2T10
100	4	4T10

Flanges shall be in accordance with JIS 5K and JIS 10K.
(JIS: Japanese Industrial Standards)
Flange JIS 5K is described as "T5" instead of "T10" in the above description.

Low Flow Rate Fine Fog 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 with reduced number of parts greatly minimizes clogging, allowing for easy 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.

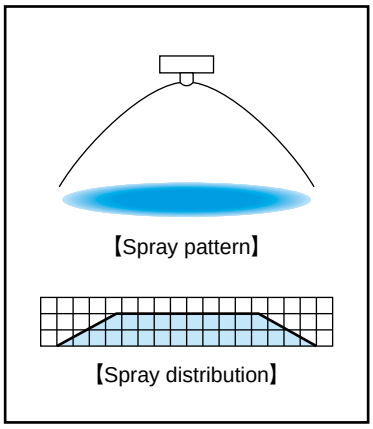
■Available with integrated spray header combining air and liquid conduits, ring-shaped header, and other compact headers to fit your site.

Contents

Low Flow Rate Fine Fog Nozzles
Flat Spray
—Liquid Pressure Type—

BIMV

BIMV with SNB-type adaptor



■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

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

■Comprising four parts: Nozzle tip, core, cap, and adaptor.
See pages 26 and 27 for details of adaptors.
■Materials: S303 (Optional material: S316L)
Adaptors other than T and N types include the parts made of FKM, NBR, and PTFE.

DIMENSIONS

■See pages 26 and 27 for dimensions and pipe connection sizes of BIM series.

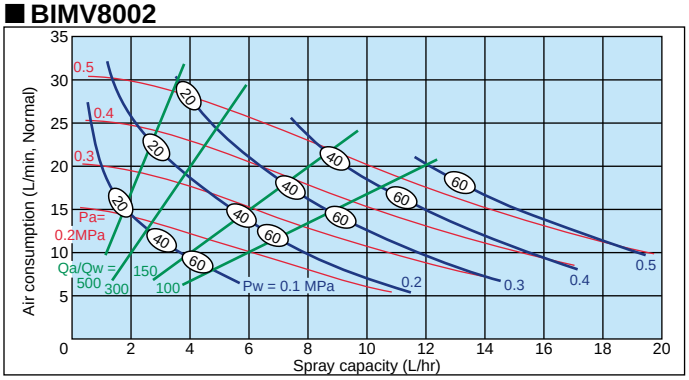
ACCESSORIES

■Mounting bracket is available as an option. See page 29.

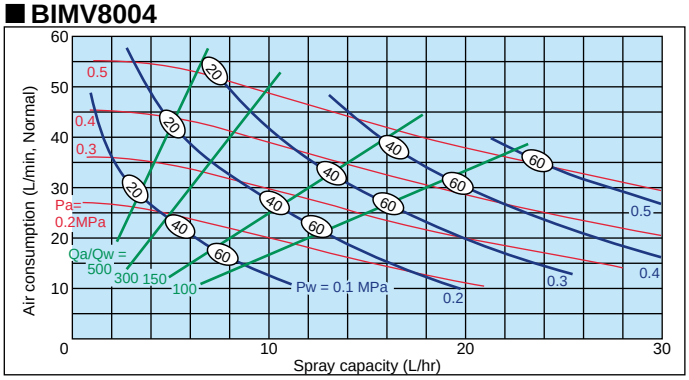
FLOW-RATE DIAGRAMS

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

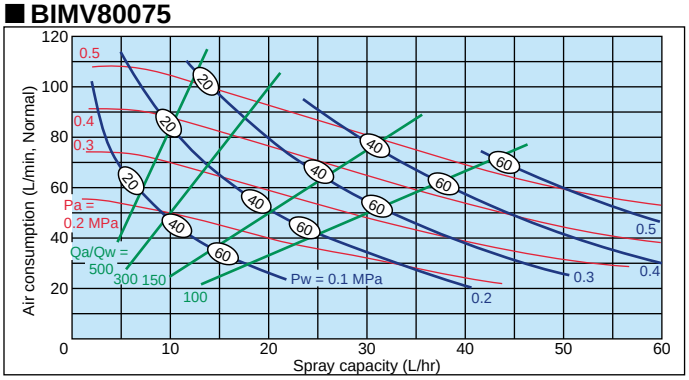
■ BIMV8002



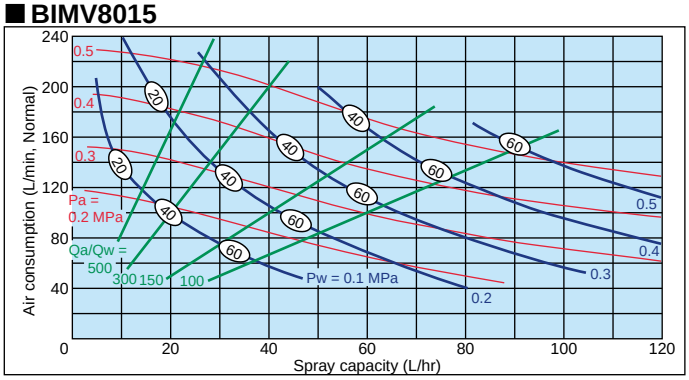
■ BIMV8004



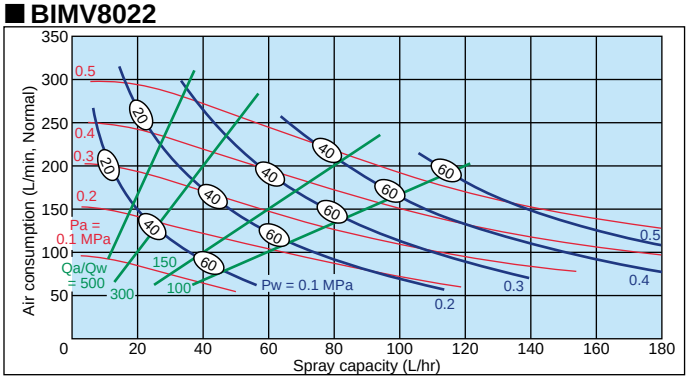
■ BIMV80075

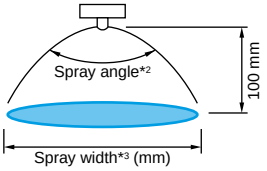


■ BIMV8015



■ BIMV8022





PERFORMANCE DATA

Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) — Liquid pressure (MPa)										Spray width*3 (mm) — Liquid press. (MPa)			Mean droplet dia. (μm)	Free passage diameter (mm)		
			0.1		0.15		0.2		0.25		0.3					Laser Doppler method	Tip 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]

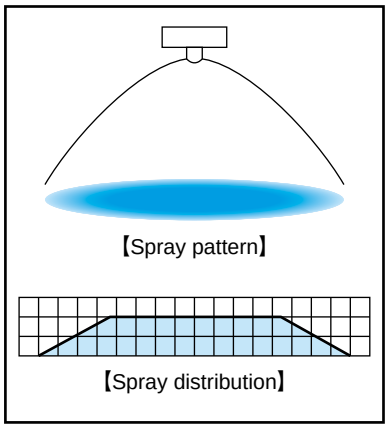
- 110 — Spray angle code: ■110 ■80 ■45
- 02 — Air consumption code: ■02 ■04 ■075 ■15 ■22
- S303 — Material of nozzle tip
- N — Type of adaptor: ■N ■T ■NDB ■UNDB ■SNB ■USNB ■SPB ■USPB
- S303 — Material of adaptor

See pages 26 and 27 for details of adaptors.

Low Flow Rate Fine Fog Nozzles
Flat Spray
—Liquid Siphon Type—

BIMV-S

BIMV-S with T-type adaptor



■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

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

■Comprising four parts: Nozzle tip, core, cap, and adaptor.
See pages 26 and 27 for details of adaptors.
■Materials: S303 (Optional material: S316L)
Adaptors other than T and N types include the parts made of FKM, NBR, and PTFE.

DIMENSIONS

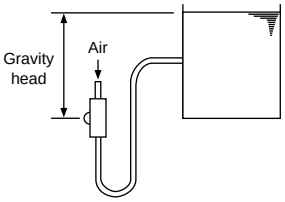
■See pages 26 and 27 for dimensions and pipe connection sizes of BIM series.

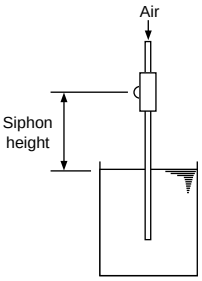
ACCESSORIES

■Mounting bracket is available as an option. See page 29.

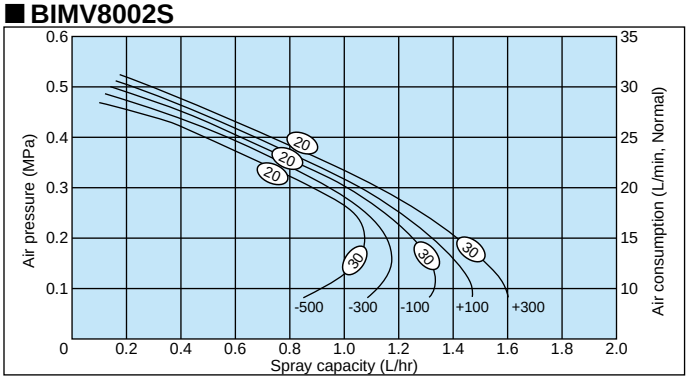
FLOW-RATE DIAGRAMS

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

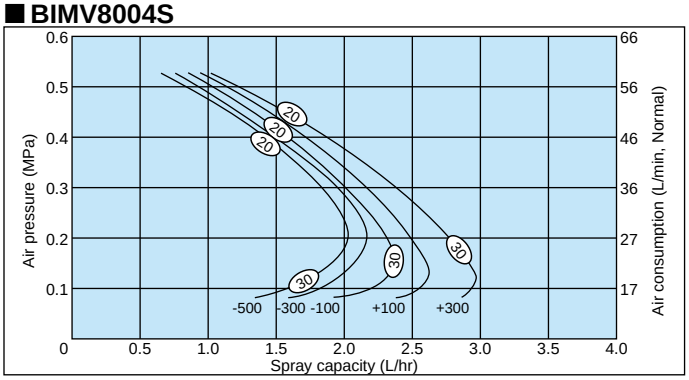




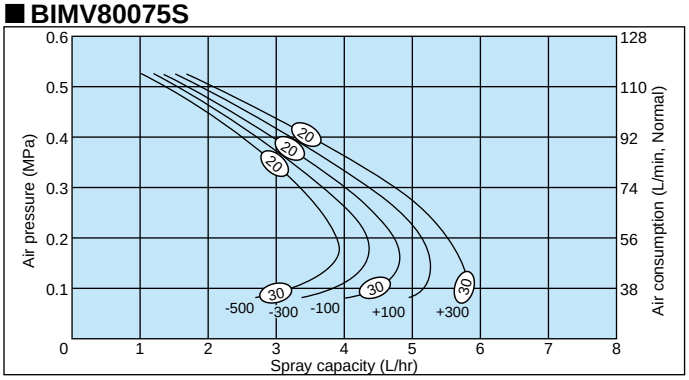
■ BIMV8002S

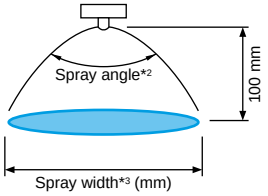


■ BIMV8004S



■ BIMV80075S





PERFORMANCE DATA

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	Tip orifice	Adaptor	
				+300	+100	-100	-300	-500				Liquid	Air
80	02	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				
	04	0.2	27	2.8	2.5	2.3	2.2	2.0	165	20–30	0.5	0.9	0.9
		0.3	36	2.4	2.1	2.0	1.9	1.8	170				
		0.4	46	1.9	1.7	1.6	1.5	1.4	175				
	075	0.2	56	5.5	5.1	4.7	4.3	3.9	170	20–30	0.7	1.2	1.4
		0.3	74	4.7	4.3	4.0	3.7	3.3	180				
		0.4	92	3.5	3.2	2.9	2.7	2.5	190				

*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.

BIMV-S

HOW TO ORDER

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

<Example> BIMV 8002S S303 + N S303

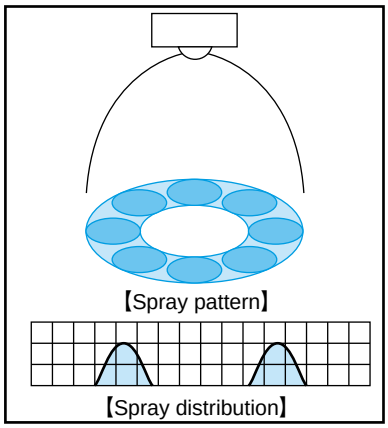
BIMV [80] [02] [S] [S303] + [N] [S303]

- 80 — Spray angle code
- 02 — Air consumption code: ■02 ■04 ■075
- S — Siphon type
- S303 — Material of nozzle tip
- N — Type of adaptor: ■N ■NDB ■SNB ■SPB ■T ■UNDB ■USNB ■USPB
- S303 — Material of adaptor

See pages 26 and 27 for details of adaptors.

Low Flow Rate Fine Fog Nozzles
Hollow Cone Spray —Liquid Pressure Type—

BIMK with T-type adaptor



■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

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

■Comprising four parts: Nozzle tip, core, cap, and adaptor.
See pages 26 and 27 for details of adaptors.
■Materials: S303 (Optional material: S316L)
Adaptors other than T and N types include the parts made of FKM, NBR, and PTFE.

DIMENSIONS

■See pages 26 and 27 for dimensions and pipe connection sizes of BIM series.

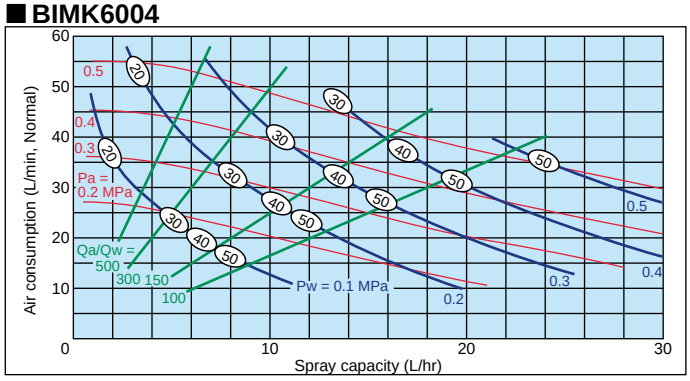
ACCESSORIES

■Mounting bracket is available as an option. See page 29.

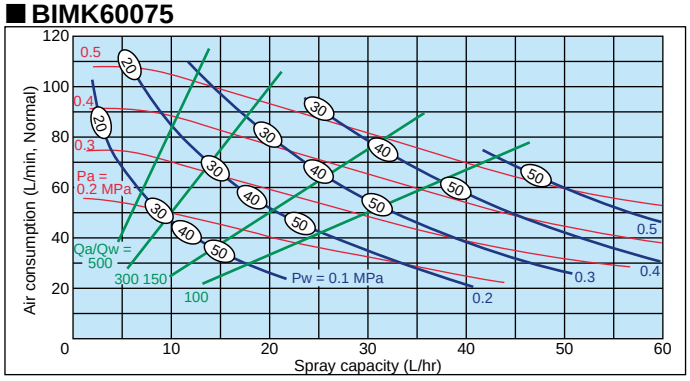
FLOW-RATE DIAGRAMS

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

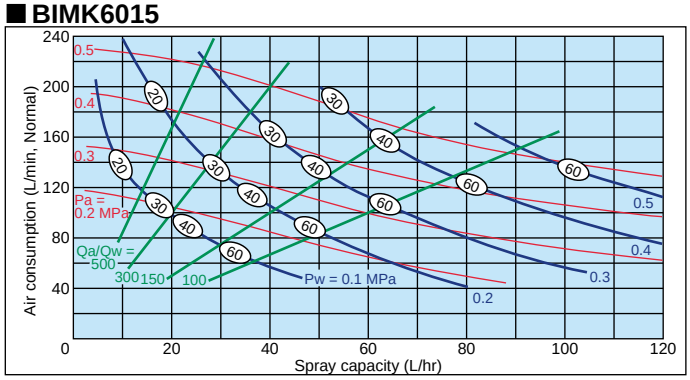
■ BIMK6004



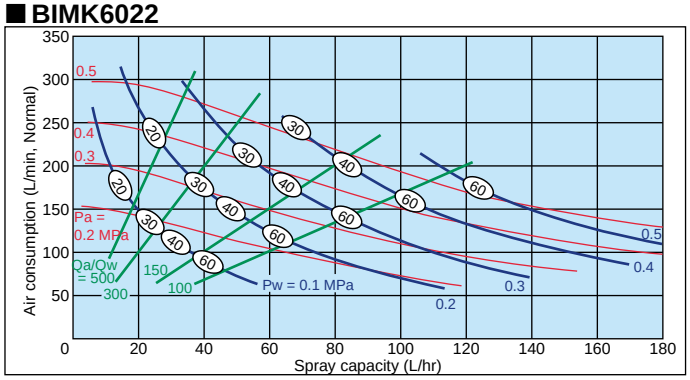
■ BIMK60075

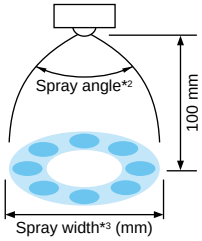


■ BIMK6015



■ BIMK6022





PERFORMANCE DATA

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	Tip 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**

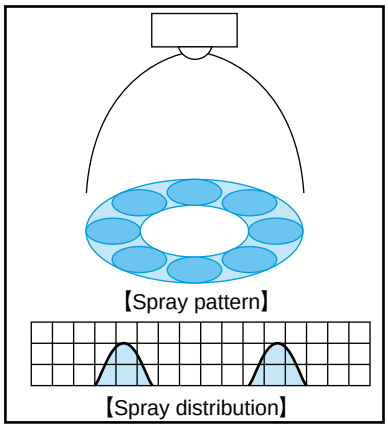
- **60** — Spray angle code
- **04** — Air consumption code
  - ■04
  - ■075
  - ■15
  - ■22
- **S303** — Material of nozzle tip
- **N** — Type of adaptor
  - ■N ■T
  - ■NDB ■UNDB
  - ■SNB ■USNB
  - ■SPB ■USPB
- **S303** — Material of adaptor

See pages 26 and 27 for details of adaptors.

Low Flow Rate Fine Fog Nozzles
Hollow Cone Spray —Liquid Siphon Type—

BIMK-S

BIMK-S with T-type adaptor



■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

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

■Comprising four parts: Nozzle tip, core, cap, and adaptor.
See pages 26 and 27 for details of adaptors.
■Materials: S303 (Optional material: S316L)
Adaptors other than T and N types include the parts made of FKM, NBR, and PTFE.

DIMENSIONS

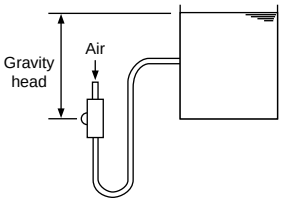
■See pages 26 and 27 for dimensions and pipe connection sizes of BIM series.

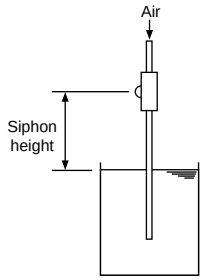
ACCESSORIES

■Mounting bracket is available as an option. See page 29.

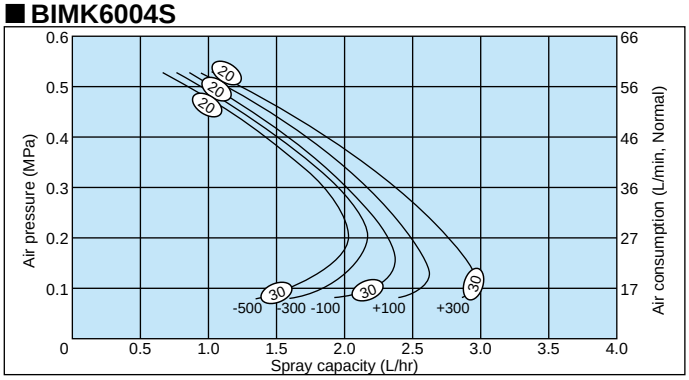
FLOW-RATE DIAGRAMS

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

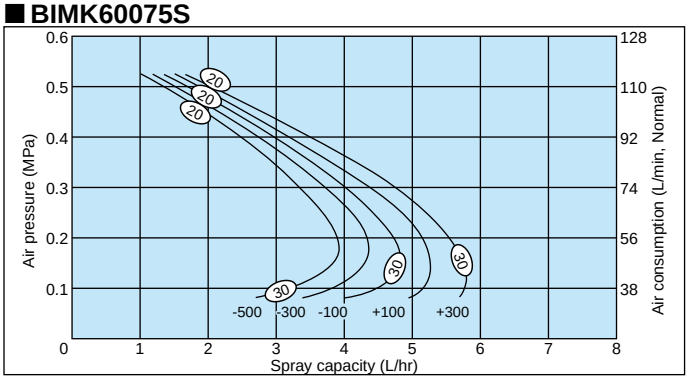


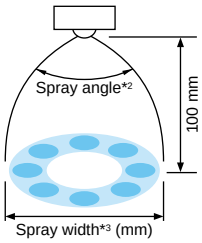


■ BIMK6004S



■ BIMK60075S





PERFORMANCE DATA

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	Tip orifice	Adaptor	
												Liquid	Air
60	04	0.2	27	2.8	2.5	2.3	2.2	2.0	120	20–30	0.6	0.9	0.9
		0.3	36	2.4	2.1	2.0	1.9	1.8	120				
		0.4	46	1.9	1.7	1.6	1.5	1.4	120				
	075	0.2	56	5.5	5.1	4.7	4.3	3.9	120	20–30	0.8	1.2	1.4
		0.3	74	4.7	4.3	4.0	3.7	3.3	120				
		0.4	92	3.5	3.2	2.9	2.7	2.5	120				

*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.

BIMK-S

HOW TO ORDER

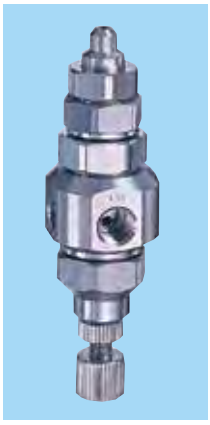
Please inquire or order for a specific nozzle using this coding system.

<Example> BIMK 60075S S303 + N S303

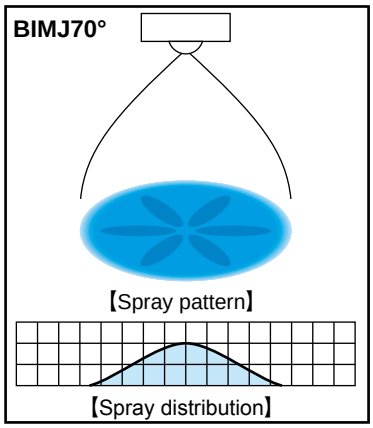
BIMK	60	075	S	S303	+	N	S303
	Spray angle code	Air consumption code ■04 ■075	Siphon type	Material of nozzle tip		Type of adaptor ■N ■T ■NDB ■UNDB ■SNB ■USNB ■SPB ■USPB	Material of adaptor

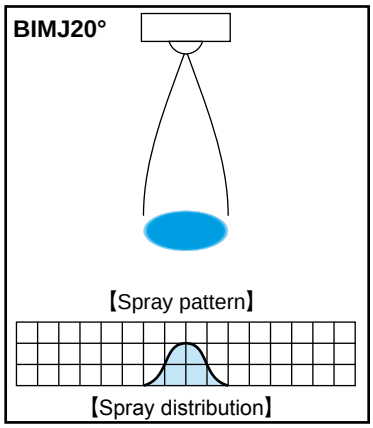
See pages 26 and 27 for details of adaptors.

Low Flow Rate Fine Fog Nozzles
Full Cone Spray —Liquid Pressure Type—



BIMJ w/ NDB-type adaptor





■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

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

■Comprising four parts: Nozzle tip, core, cap, and adaptor. See pages 26 and 27 for details of adaptors.
■Materials: S303 (Optional material: S316L)
Adaptors other than T and N types include the parts made of FKM, NBR, and PTFE.

DIMENSIONS

■See pages 26 and 27 for dimensions and pipe connection sizes of BIM series.

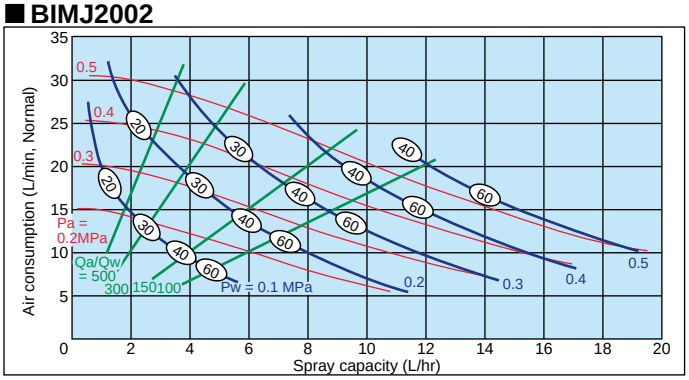
ACCESSORIES

■Mounting bracket is available as an option. See page 29.

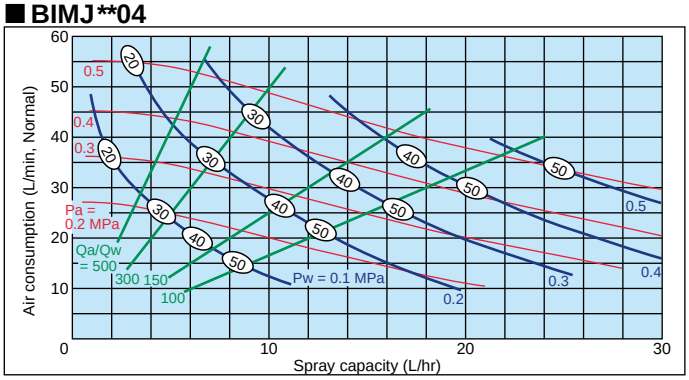
FLOW-RATE DIAGRAMS

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

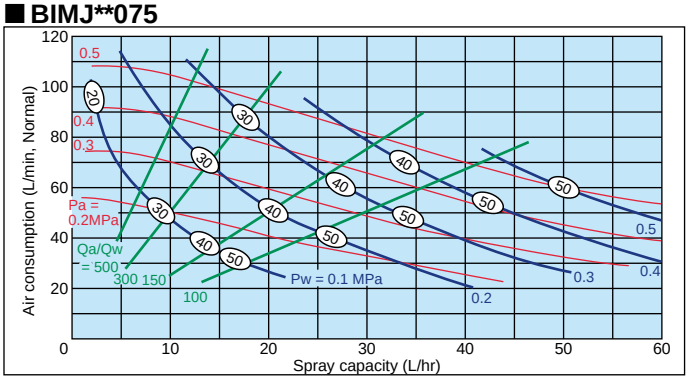
■ BIMJ2002



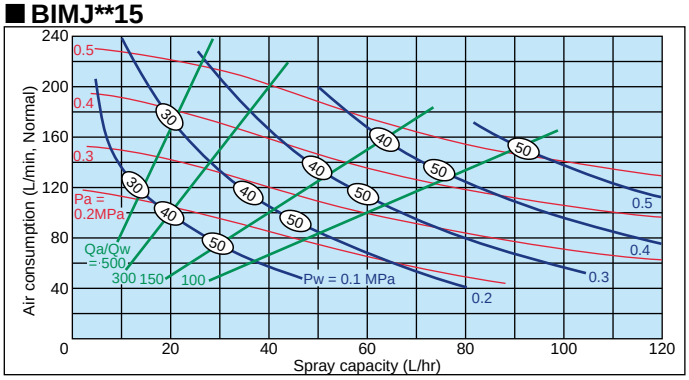
■ BIMJ**04



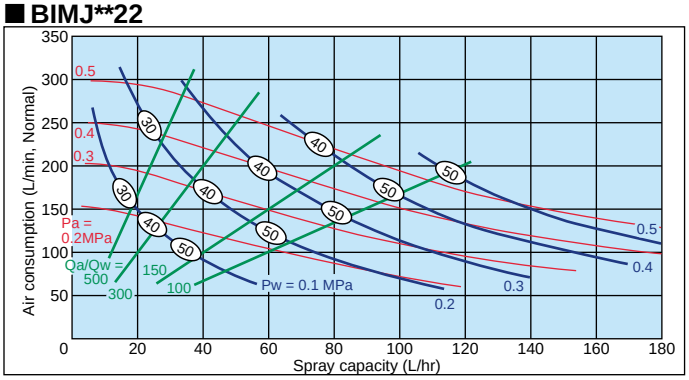
■ BIMJ**075

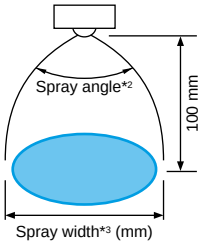


■ BIMJ**15



■ BIMJ**22





PERFORMANCE DATA

Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) — Liquid pressure (MPa)										Spray width*3 (mm) — Liquid press. (MPa)			Mean droplet diameter (μm)	Free passage diameter (mm)		
			0.1		0.15		0.2		0.25		0.3					Laser Doppler method	Tip 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

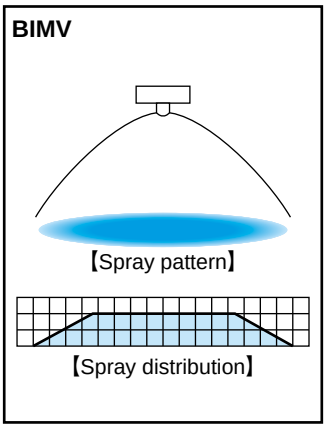
BIMJ [20] [04] [S303] + [N] [S303]

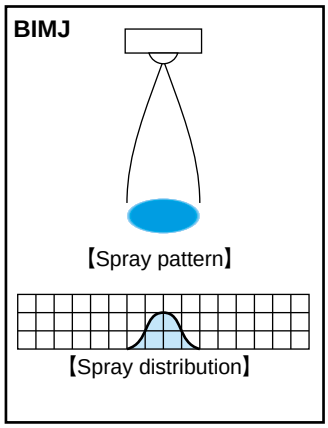
- **20** — Spray angle code: ■70 ■20
- **04** — Air consumption code: ■02 (for 20° only) ■04 ■075 ■15 ■22
- **S303** — Material of nozzle tip
- **N** — Type of adaptor: ■N ■NDB ■SNB ■SPB ■T ■UNDB ■USNB ■USPB
- **S303** — Material of adaptor

See pages 26 and 27 for details of adaptors.

Low Flow Rate Fine Fog Nozzles Made of Polypropylene —Liquid Pressure Type—

BIM-PP



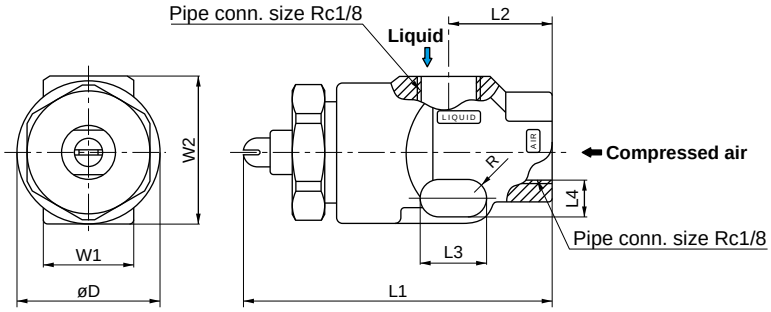


■Excellent chemical resistance with polypropylene construction.
■Two types, BIMV (flat spray pattern) and BIMJ (full cone spray pattern) are available.
Liquid pressure type with approx. 0.1 to 0.3 MPa.

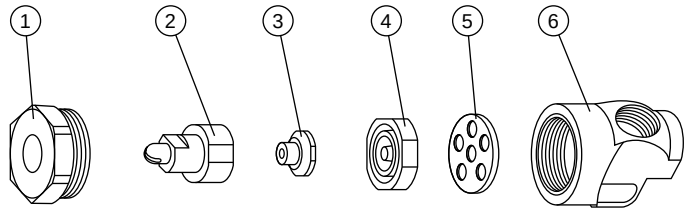
APPLICATIONS

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

DRAWING



STRUCTURE



■COMPONENTS AND MATERIALS

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

DIMENSIONS

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

PERFORMANCE DATA

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.

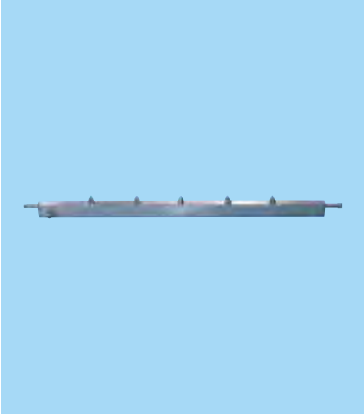
HOW TO ORDER

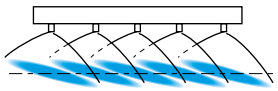
Please inquire or order for a specific nozzle using these product codes.

Flat spray type
BIMV 80075 PP + TPP-IN

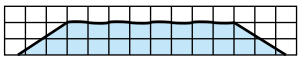
Full cone spray type
BIMJ 2004 PP + TPP-IN

Integrated Spray Header with BIM Fine Fog Nozzles





【Spray pattern】



【Spray distribution】

■Spray header equipped with BIMV series nozzles (liquid pressure type) producing fine atomization with a 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.
■Provides a uniform spray distribution across the entire spray area.

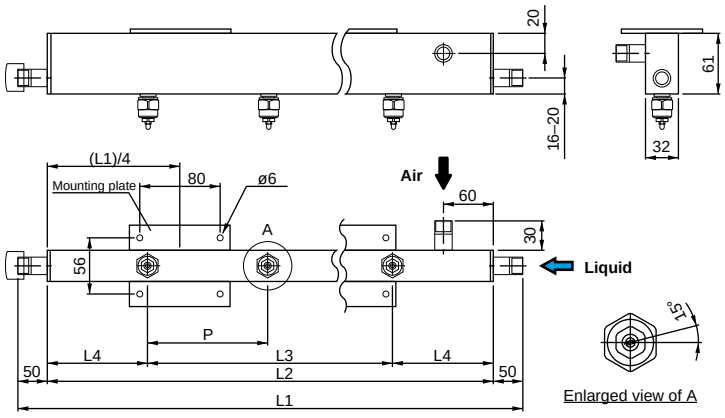
*1) Droplet diameter measured by laser Doppler method

APPLICATIONS

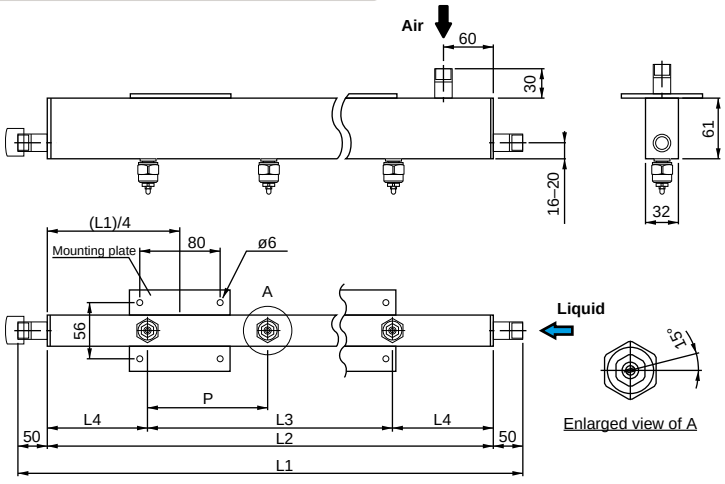
■Spraying: Oil, surface treatment agent
■Cooling: Moldings, steel plates, glass plates, plastic film
■Cleaning: Printed circuit boards

DRAWING

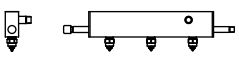
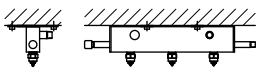
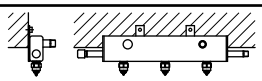
Air/Liquid inlet position type [A]



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		

PERFORMANCE DATA

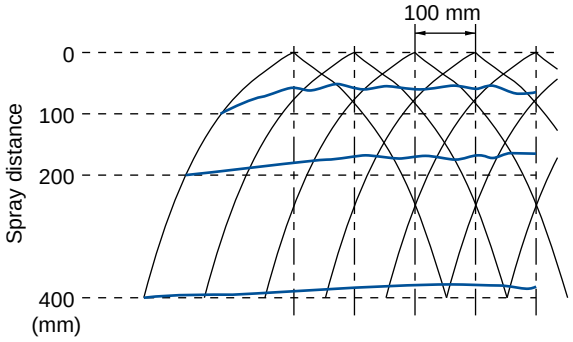
Nozzle code	Nozzle quantity	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) at liquid pressure of 0.1 MPa
BIMV11002	5	0.3	100	5.0
	10		200	10.0
	20		400	20.0
BIMV11004	5	0.3	180	10.0
	10		360	20.0
	20		720	40.0
BIMV110075	5	0.3	370	20.0
	10		740	40.0
	20		1,480	80.0

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

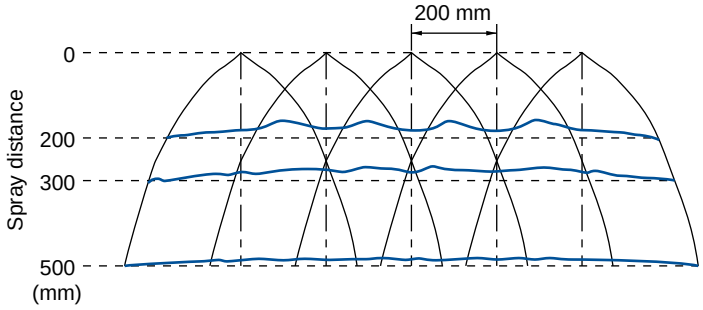
■ BIMV11004S303

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 the 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**	■**5**	■**100**	■**A**	■**1000**	■**F**	■**0°** (Blank denotes 0°.)	■**1100**
■**BIMV11004**	■**10**	■**200**	■**B**	■**2000**	■**S**	■**15°**	■**2100**
■**BIMV110075**	■**20**				■**None** (Blank denotes "without plate".)		

Note: For details of BIMV nozzles, see pages 13 and 14.
For details of BIM Header, please ask for our inquiry drawing.

Adaptors for BIM series Fine Fog Nozzles

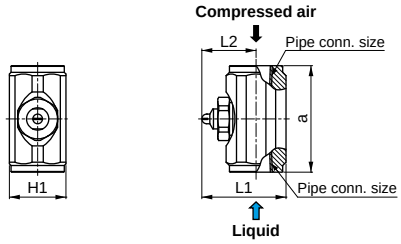
The following eight types of adaptors are available for BIM series Low Flow Rate Fine Fog Nozzles: BIMV, BIMV-S, BIMK, BIMK-S, and BIMJ, which are introduced on pages 13 to 22.
See page 27 for dimensions and pipe connection sizes of each adaptor.
Drawings with parts list (each description and material) are available upon request.

TYPES OF ADAPTORS

Type N

Liquid and air enter into adaptor from both sides.

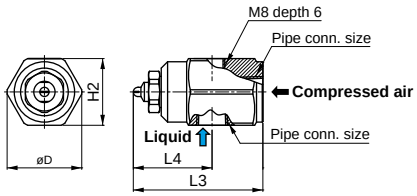
■Material: S303



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.

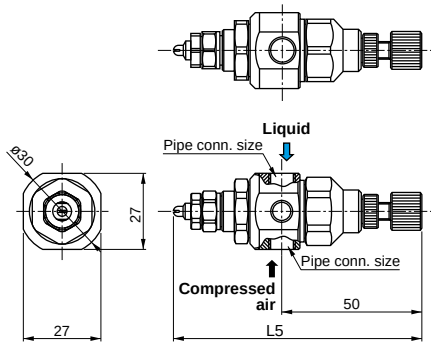
■Material: S303



Type NDB

Spray capacity is adjustable with needle valve.

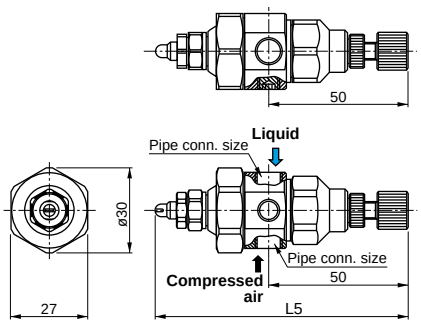
■Material: S303, FKM, PTFE, and NBR



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.

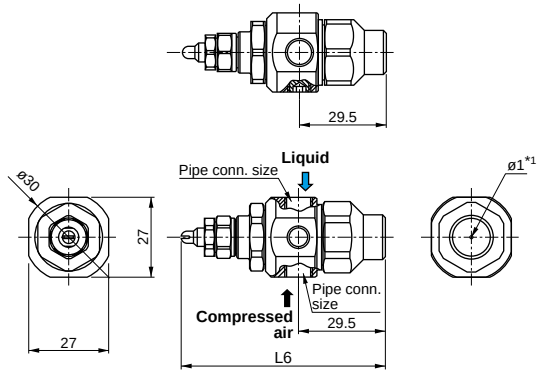
■Material: S303, FKM, PTFE, and NBR



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.

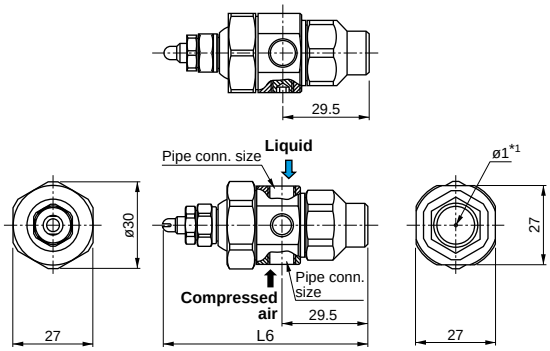
■Material: S303, FKM, PTFE, and NBR



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.

■Material: S303, FKM, PTFE, and NBR



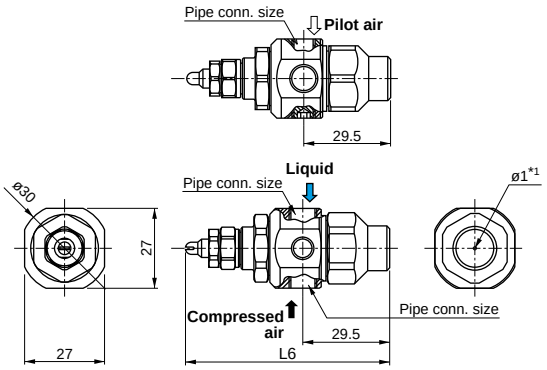
*1) Hole ø1 is for air relief.

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.

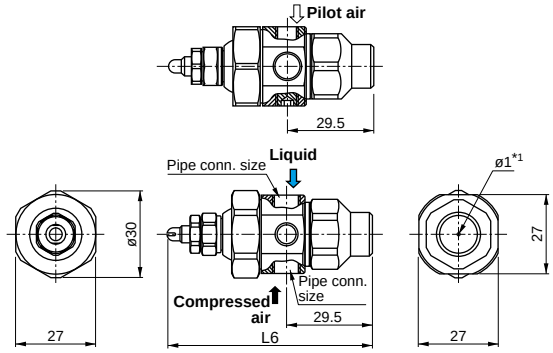
■Material: S303, FKM, PTFE, and NBR



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.

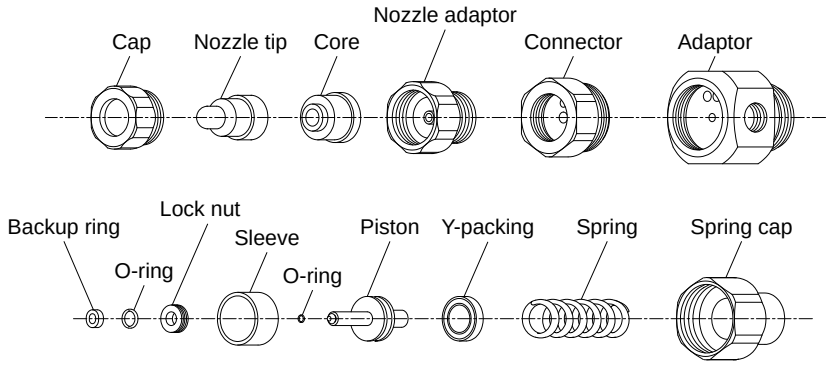
■Material: S303, FKM, PTFE, and NBR



*1) Hole ø1 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, SNB, USNB, SPB, and USPB adaptors

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

First assemble Core, Nozzle 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
SNB USNB	02, 04, 075	Rc1/8	Rc1/8		151
	15, 22				172
SPB USPB	02, 04, 075	Rc1/8	Rc1/8	Rc1/8	146
	15, 22				167

DIMENSIONS

Air consumption code	Dimensions (mm)									
	L1	L2	L3	L4	L5	L6	a	H1	H2	øD
02	25.3	16.3	40.8	24.8	87.3	66.8	32	17	21	23.5
04	26.8	17.8	42.3	26.3	88.8	68.3	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

How to Use Spray ON/OFF Control Adaptors

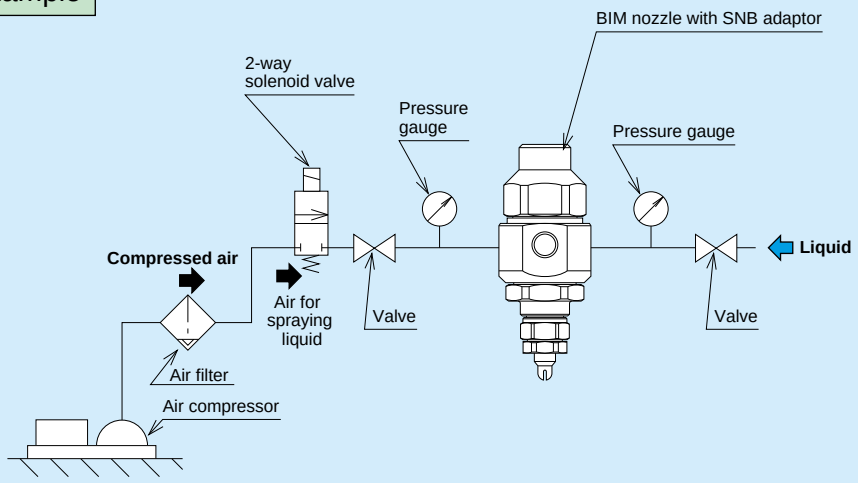
■**SNB adaptor** (CSN, SN adaptors)

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.
Adaptor types **CSN** (see page 30) and **SN** (page 35) are used in the same way.

Function chart

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

Connection example



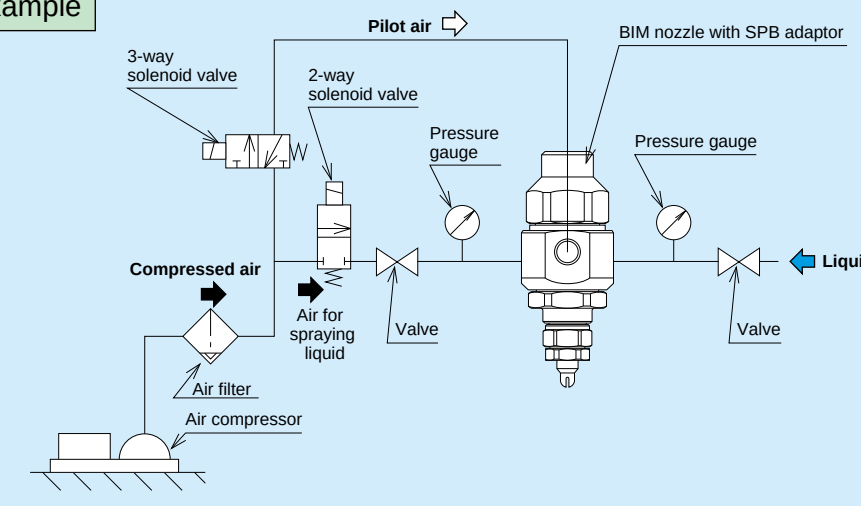
■**SPB adaptor** (CSP, SP adaptors)

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.
Adaptor types **CSP** (see page 30) and **SP** (page 35) are used in the same way.

Function chart

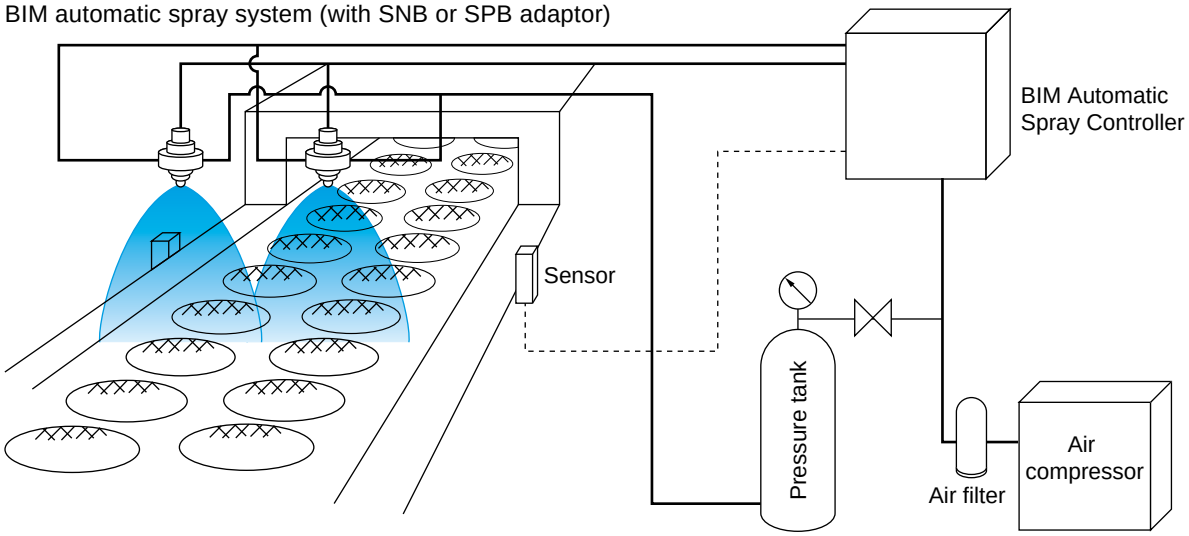
Compressed air		ON			
Pilot air	OFF	ON	OFF	ON	OFF
Liquid	Stop	Spray	Stop	Spray	Stop

Connection example



Installation Example of BIM Automatic Spray System

■Example of applications controlled by
BIM automatic spray system (with SNB or SPB 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 or 10 mm.
Available for the adaptor types T, NDB, UNDB, SNB, USNB, SPB, and USPB (not available for N-type adaptor).

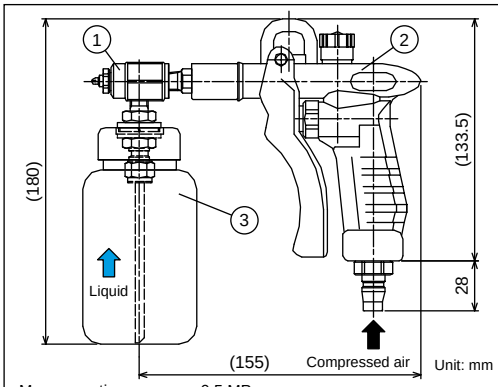
■Spray Gun Unit with BIM nozzles: BIM-GUN

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

*500 ml 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: 1) BIM nozzle, 2) Air duster gun, 3) Plastic 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

Compact Design
Low Flow Rate Fine Fog Nozzles

CBIM

CBIM with T-type adaptor

CBIM with spray control adaptor

■Compact version of BIM series producing fine atomization. Space-saving design.
■Able to provide the lowest spray flow rate among all of our pneumatic spray nozzles.
■Clog-resistant design with a low parts count.
■Some CBIM models are available with a spray control adaptor (type CSP or CSN), which can regulates spray ON/OFF with a built-in piston.

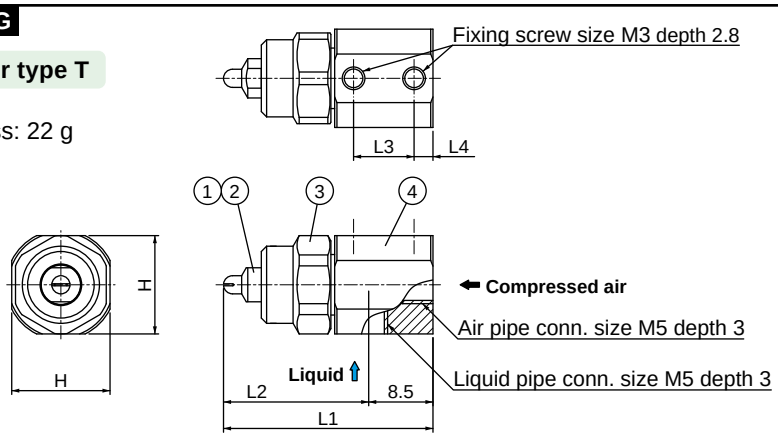
APPLICATIONS

■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: PC boards, glass tubes (for CBIMV and CBIMV-S only)

DRAWING

Adaptor type T

■Mass: 22 g

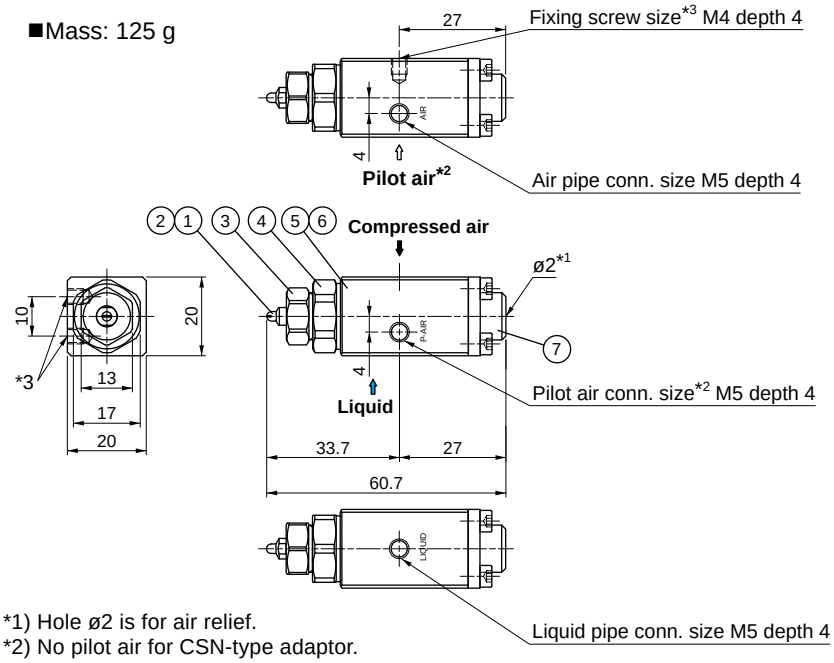


■COMPONENTS AND MATERIALS

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

Adaptor type CSN/CSP (Spray control adaptor)

■Mass: 125 g



■COMPONENTS AND MATERIALS

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

*1) Hole ø2 is for air relief.
*2) No pilot air for CSN-type adaptor.
*3) Adaptor has two fixing screw holes of the same size.

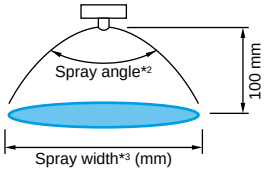
DIMENSIONS

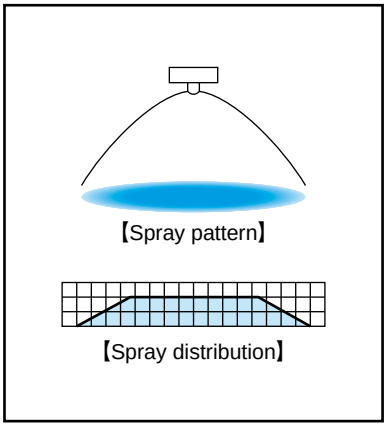
Air consumption code	Dimensions (mm)				
	L1	L2	L3	L4	H
005	27.7	19.2	8	2.5	13
01	27.7	19.2			
02	28.0	19.5			
04	31.3	22.8			
075	32.6	24.1			

CBIMV (Flat Spray)

■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





PERFORMANCE DATA

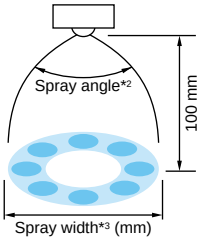
Adaptor type*4		Spray angle code *2	Air con-sump-tion code	Air press. (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa)										Spray width*3 (mm)			Mean droplet diameter (µm)	Free passage diameter (mm)		
					0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler method	Tip orifice	Adaptor	
T	CSN CSP				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				

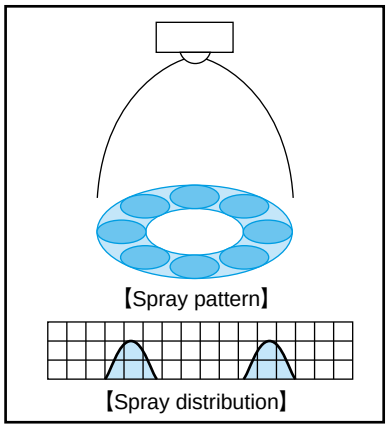
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at 100 mm from nozzle.
*4) ○ shows the availability of adaptor for each model number.

CBIMK (Hollow Cone Spray)

■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





PERFORMANCE DATA

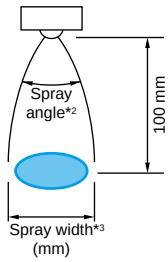
Adaptor type*4		Spray angle code *2	Air consumption code	Air press. (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa)										Spray width*3 (mm) Liquid press. (MPa)			Mean droplet dia. (μm)	Free passage diameter (mm)		
					0.1		0.15		0.2		0.25		0.3					Laser Doppler method	Tip orifice	Adaptor	
T	CSN CSP				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				

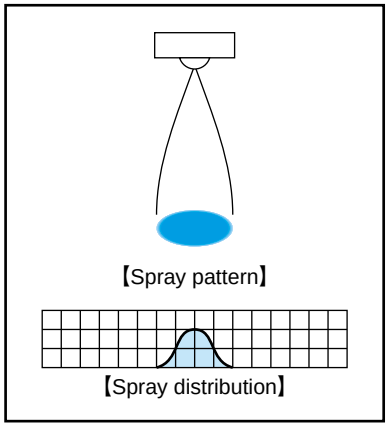
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa. *3) Measured at 100 mm from nozzle.
*4) ○ shows the availability of adaptor for each model number.

CBIMJ (Full Cone Spray)

■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





PERFORMANCE DATA

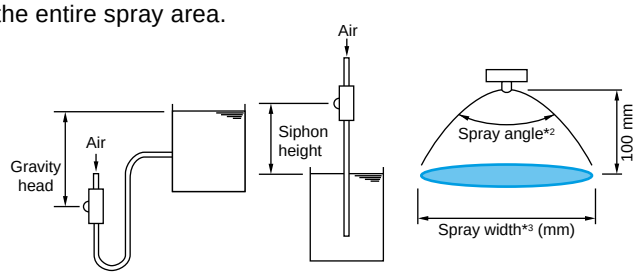
Adaptor type*4		Spray angle code *2	Air consumption code	Air press. (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa)										Spray width*3 (mm) Liquid press. (MPa)			Mean droplet dia. (μm)	Free passage diameter (mm)		
					0.1		0.15		0.2		0.25		0.3					Laser Doppler method	Tip orifice	Adaptor	
T	CSN CSP				Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25			Liquid	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				

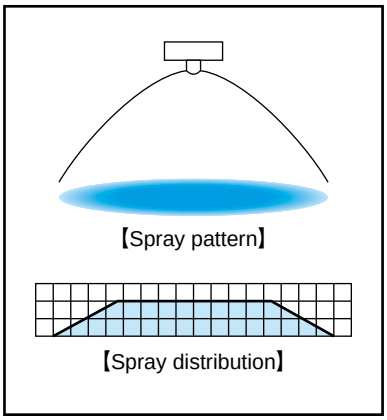
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa. *3) Measured at 100 mm from nozzle.
*4) ○ shows the availability of adaptor for each model number.

CBIMV-S (Flat Spray)

■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





PERFORMANCE DATA

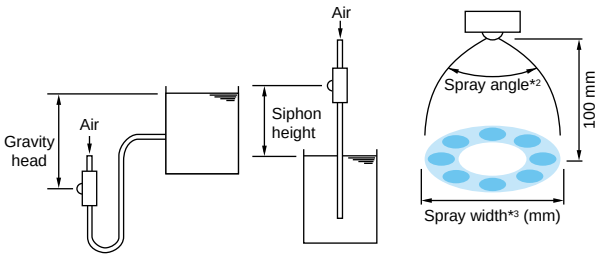
Adaptor type*4 T	Adaptor type*4 CSN CSP	Spray angle code *2	Air consumption code	Air press. (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Gravity head (mm) +300	Gravity head (mm) +100	Siphon height (mm) -100	Siphon height (mm) -300	Siphon height (mm) -500	Spray width*3 (mm)	Mean droplet diameter (μm) Laser Doppler method	Free passage dia. (mm) Tip orifice	Free passage dia. (mm) Adaptor Liquid	Free passage dia. (mm) 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	0.6	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				
○	—		04S	0.2	27	2.8	2.5	2.3	2.2	2.0	165	20–30	0.5	0.9	0.9
				0.3	36	2.4	2.1	2.0	1.9	1.8	170				
				0.4	46	1.9	1.7	1.6	1.5	1.4	175				
○	—		075S	0.2	56	5.5	5.1	4.7	4.3	3.9	170	20–30	0.7	1.2	1.4
				0.3	74	4.7	4.3	4.0	3.7	3.3	180				
				0.4	92	3.5	3.2	2.9	2.7	2.5	190				

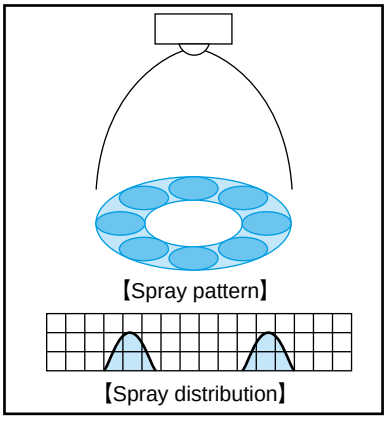
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*3) Measured at 100 mm from nozzle and liquid siphon height of 100 mm.
*4) ○ shows the availability of adaptor for each model number.

CBIMK-S (Hollow Cone Spray)

■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





PERFORMANCE DATA

Adaptor type*4 T	Adaptor type*4 CSN CSP	Spray angle code *2	Air consumption code	Air press. (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) Tip orifice	Free passage dia. (mm) Adaptor Liquid	Free passage dia. (mm) Adaptor Air
○	—	60	04S	0.2	27	2.8	2.5	2.3	2.2	2.0	120	20–30	0.6	0.9	0.9
				0.3	36	2.4	2.1	2.0	1.9	1.8	120				
				0.4	46	1.9	1.7	1.6	1.5	1.4	120				
○	—		075S	0.2	56	5.5	5.1	4.7	4.3	3.9	120	20–30	0.8	1.2	1.4
				0.3	74	4.7	4.3	4.0	3.7	3.3	120				
				0.4	92	3.5	3.2	2.9	2.7	2.5	120				

*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.
*4) ○ shows the availability of adaptor for each model number.

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	80	005	S303	+	CSP	S303
Nozzle series	Spray angle code	Air consumption code	Material of nozzle tip		Type of adaptor	Material of adaptor
■**CBIMV**	■**110**	■**005**			■**T**	
■**CBIMK**	■**80**	■**01**			■**CSN**	
■**CBIMJ**	■**60**	■**02**			■**CSP**	
	■**45**	■**04**				
	■**20**	■**075**				

Liquid Siphon Type

<Example> CBIMV 80005S S303 + CSP S303

CBIMV	80	005S	S303	+	CSP	S303
Nozzle series	Spray angle code	Air consumption code	Material of nozzle tip		Type of adaptor	Material of adaptor
■**CBIMV**	■**80**	■**005S**			■**T**	
■**CBIMK**	■**60**	■**01S**			■**CSN**	
		■**02S**			■**CSP**	
		■**04S**				
		■**075S**				

CSN and CSP adaptors are available for the limited models as shown on pages 31–33.
Adaptor type CSN is used in the same way as SNB. Adaptor type CSP is used in the same way as SPB. See page 28 for details.

Ultra-Compact Design, Low Flow Rate Fine Fog Nozzles with Spray Control Adaptor

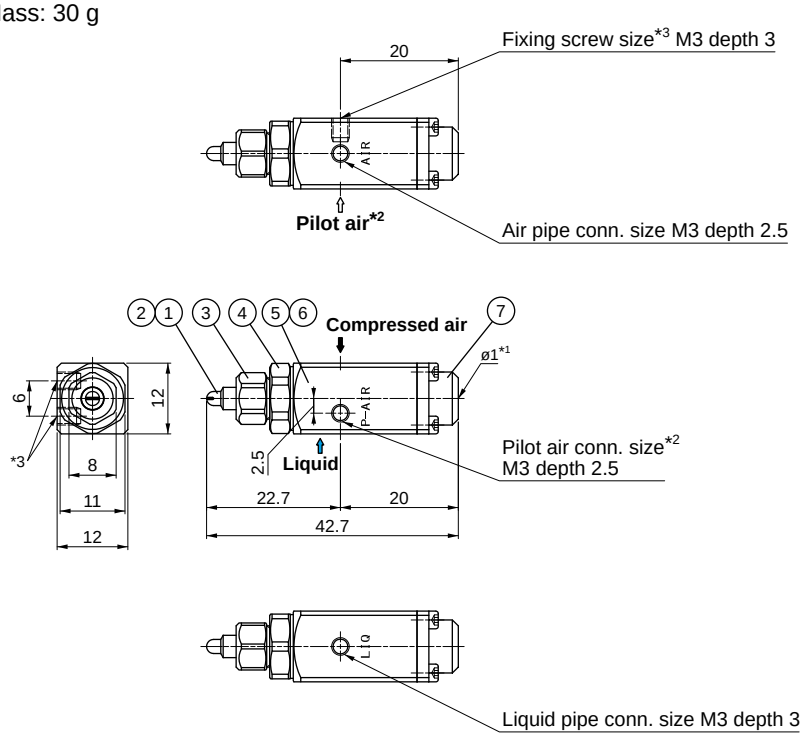
■Further miniaturized version of CBIM series producing fine atomization.
All SCBIM models come with a spray ON/OFF control adaptor.
■Available in liquid pressure or liquid siphon feed type, two spray pattern types (flat spray or full cone spray)—nine varieties in total.
■Able to provide the lowest flow rate among all of our pneumatic spray nozzles.

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 (for SCBIMV and SCBIMV-S only)

DRAWING

■Mass: 30 g



■COMPONENTS AND MATERIALS

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

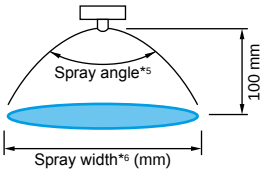
*1) Hole ø1 is for air relief.
*2) No pilot air for SN-type adaptor.
*3) Adaptor has two fixing screw holes of the same size.

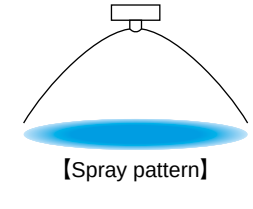
Unit: mm

SCBIMV (Flat Spray)

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*4
■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).

*4) Droplet diameter measured by laser Doppler method




【Spray pattern】


【Spray distribution】

PERFORMANCE DATA

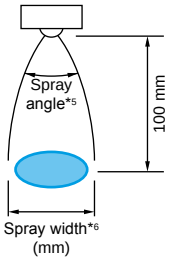
Spray angle code *5	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*6 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Tip 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	—	70	120				

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

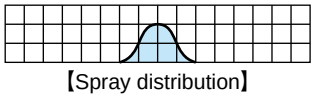
SCBIMJ (Full Cone Spray)

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*4
■Full cone spray pattern.
■Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.

*4) Droplet diameter measured by laser Doppler method




【Spray pattern】


【Spray distribution】

PERFORMANCE DATA

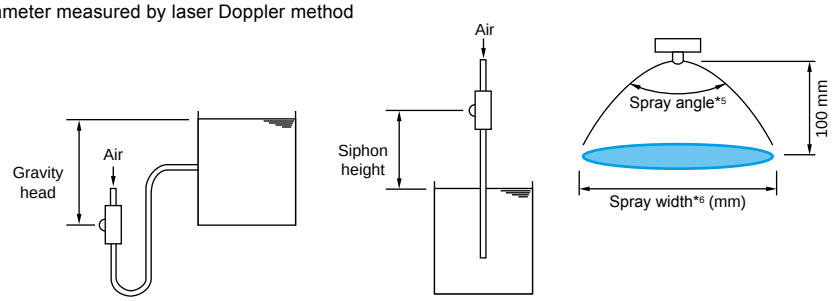
Spray angle code *5	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*6 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Tip 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				

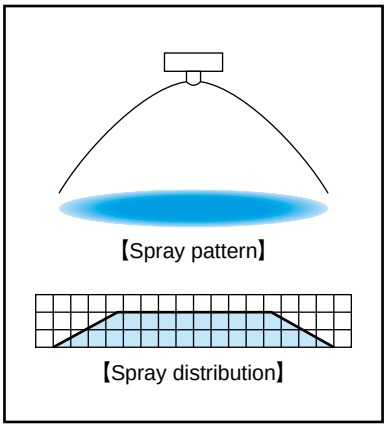
*5) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*6) Measured at 100 mm from nozzle.

SCBIMV-S (Flat Spray)

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 30 μm or less.*4
■Flat spray pattern.
■Liquid siphon feed type (liquid pressure device is not required).
■Even spray distribution across the entire spray area.

*4) Droplet diameter measured by laser Doppler method





PERFORMANCE DATA

Spray angle code *5	Air consumption code	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr)					Spray width*6 (mm)	Mean droplet diameter (μm)	Free passage dia. (mm)		
				Gravity head (mm)		Siphon height (mm)				Laser Doppler method	Tip orifice	Adaptor	
				+300	+100	-100	-300	-500				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

*5) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*6) 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	80	005	S303	+	SP	S303
Nozzle series ■**SCBIMV** ■**SCBIMJ**	Spray angle code ■**110** ■**80** ■**45** ■**20**	Air consumption code ■**005** ■**01**	Material of nozzle tip		Type of adaptor ■**SN** ■**SP**	Material of adaptor

Liquid Siphon Type

<Example> SCBIMV 80005S S303 + SP S303

SCBIMV	80	005S	S303	+	SP	S303
Nozzle series	Spray angle code	Air consumption code ■**005S** ■**01S**	Material of nozzle tip		Type of adaptor ■**SN** ■**SP**	Material of adaptor

Adaptor type SN is used in the same way as SNB. Adaptor type SP is used in the same way as SPB. See page 28 for details.

BIM series Nozzle Tip Interchangeability

List of Nozzle Tip Interchangeability

Nozzle tips with ○ are interchangeable with each other to change spray angle and spray pattern.

BIM series

			Liquid pressure type																									Liquid siphon type				
			BIMV														BIMK				BIMJ									BIMV-S			BIMK-S	
			11002	11004	11075	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	80075S	6004S	60075S
Liquid pressure type	BIMV	11002		—	—	—	—	○	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—
		11004	—		—	—	—	—	○	—	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	—	○	—	—	—	—	—	—	—	—
		11075	—	—		—	—	—	—	○	—	—	—	—	○	—	—	—	○	—	—	—	○	—	—	—	—	○	—	—	—	—	—	—	—
		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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○	—		—

BIM series Nozzle Tip Interchangeability

List of Nozzle Tip Interchangeability

Nozzle tips with ○ are interchangeable with each other to change spray angle and spray pattern.

CBIM series

			Liquid pressure type																				Liquid siphon type						
			CBIMV													CBIMK		CBIMJ					CBIMV-S					CBIMK-S	
			11001	11002	11004	110075	80005	8001	8002	8004	80075	45005	4501	4502	4504	45075	6004	60075	20005	2001	2002	2004	20075	80005S	8001S	8002S	8004S	80075S	6004S	60075S
Liquid pressure type	CBIMV	11001		—	—	—	—	○	—	—	—	—	○	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—
		11002	—		—	—	—	—	○	—	—	—	—	○	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—
		11004	—	—		—	—	—	—	○	—	—	—	—	○	—	○	—	—	—	—	○	—	—	—	—	—	—	—	—
		110075	—	—	—		—	—	—	—	○	—	—	—	—	○	—	○	—	—	—	—	○	—	—	—	—	—	—	—	—
		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

			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	—	—	—	—	—	—	—	—	

CBIM series Cap Interchangeability

Caps with ○ are interchangeable with each other.

Adaptor type		T					CSN/CSP		
		005	01	02	04	075	005	01	02
T	005		○	○	—	—	—	—	—
	01	○		○	—	—	—	—	—
	02	○	○		—	—	—	—	—
	04	—	—	—		○	—	—	—
	075	—	—	—	○		—	—	—
CSN/CSP	005	—	—	—	—	—		○	○
	01	—	—	—	—	—	○		○
	02	—	—	—	—	—	○	○	

Note:
1) Air consumption codes available for T-type adaptor are 005, 01, 02, 04, and 075.
2) Air consumption codes available for CSN- and CSP-type adaptors are 005, 01, and 02 only.

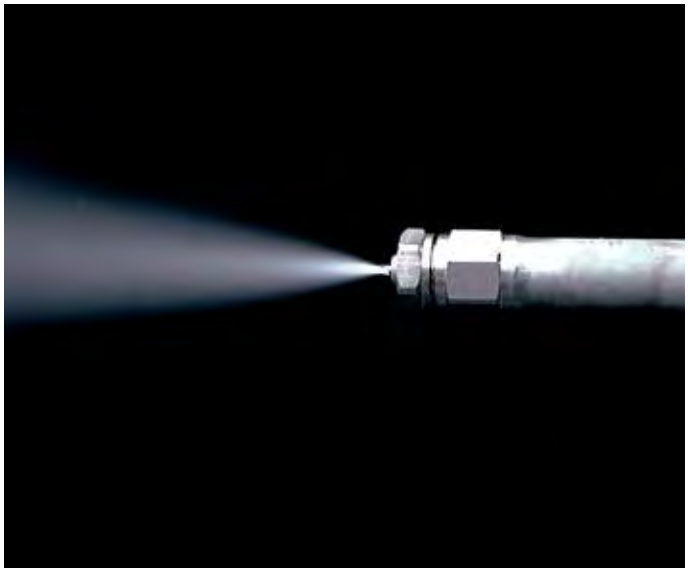
When changing an adaptor type of the existing CBIM nozzle between T, CSN, and CSP types, it is possible to continue to use the same nozzle tips and core, which are the common parts (the cap is not).

Clog-resistant Fine Fog Nozzles

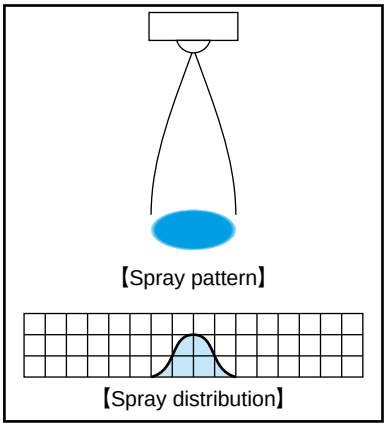
■SETOJet, SETOV, SETO-SD, and YYA series are the clog-resistant pneumatic nozzles specially designed for spraying viscous liquid.

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

Contents



Clog-resistant Fine Fog Nozzles
Full Cone Spray



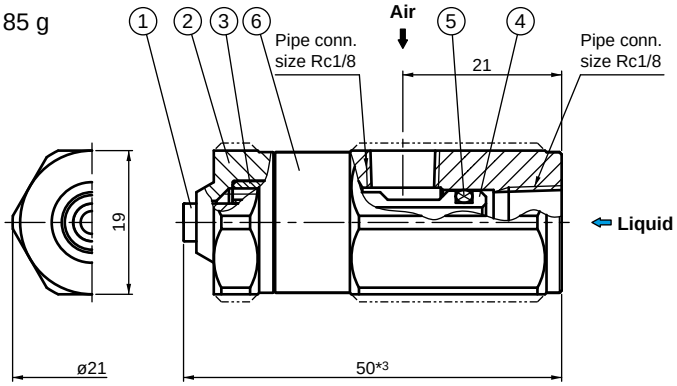
■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 60 μm or less.*1
■Clog-resistant design. Optimal for spraying viscous liquids.
■External mixing type (designed to mix air and liquid outside the nozzle for atomization).
*1) Droplet diameter measured by laser Doppler method

APPLICATIONS

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

DRAWING

■Mass: 85 g



■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

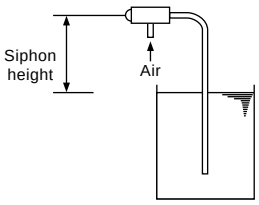
Unit: mm

*3) As for the models SETO0405, 0407, 0410, 07507 and 07510, the total length is 49.5 mm.

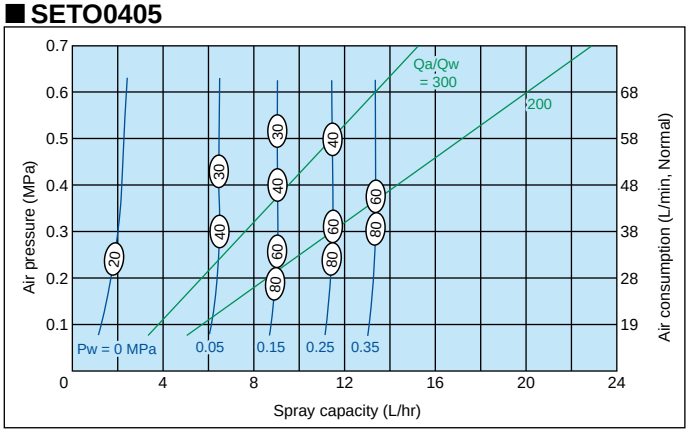
FLOW-RATE DIAGRAMS

■How to read the chart

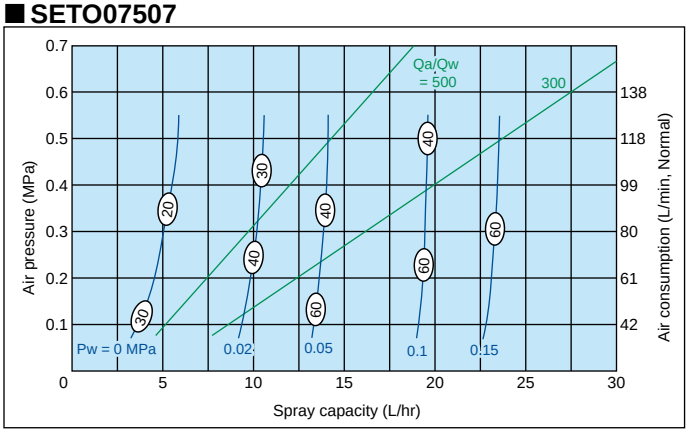
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa. Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at liquid siphon height of 100 mm when Pw is 0 MPa.
4. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).



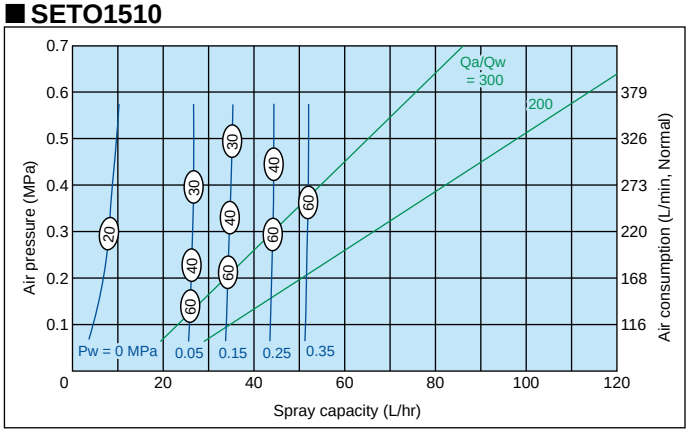
■ SETO0405



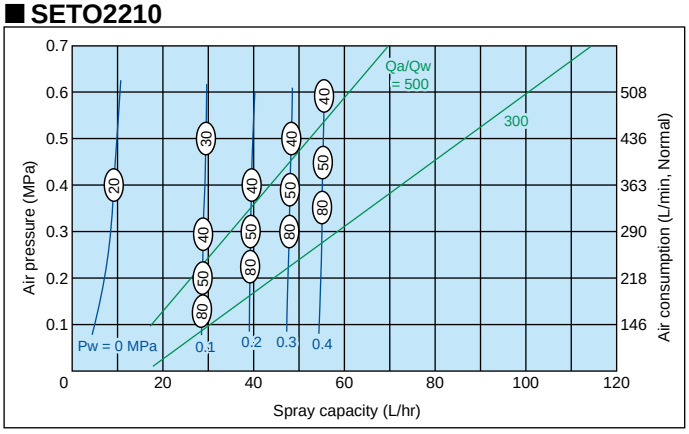
■ SETO07507

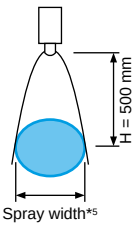


■ SETO1510



■ SETO2210





PERFORMANCE DATA

Air consumption code	Spray capacity code	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Liquid pressure (MPa) 0 (Siphon)*4	Spray capacity (L/hr) Liquid pressure (MPa) 0.05	Spray width*5 (mm) H = 500 mm	Mean droplet diameter*5 (μm) Laser Doppler method	Free passage diameter (mm) Liquid	Free passage diameter (mm) 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

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

HOW TO ORDER

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

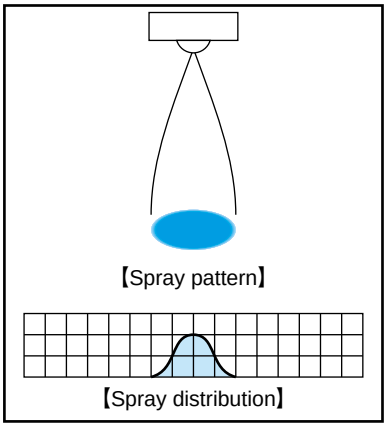
<Example> SETO 0405 S303 + T S303

SETO	04	05	S303	+	T	S303
	Air consumption code	Spray capacity code	Material of nozzle tip		Type of adaptor	Material of adaptor
	■04 ■075 ■15 ■22	■05 ■07 ■10 ■20				

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

Clog-resistant Fine Fog Nozzles
Full Cone Spray

SETOJet-R



■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 40 μm or less.*1
■Eddies from air makes further fine atomization.
■Optimal for spraying viscous liquids.
■External mixing type (designed to mix air and liquid outside the nozzle for atomization).

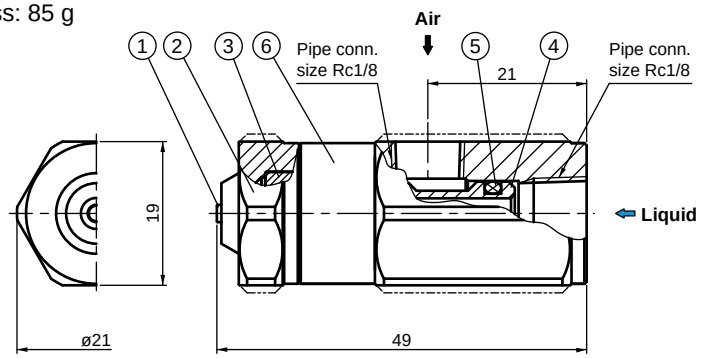
*1) Droplet diameter measured by laser Doppler method

APPLICATIONS

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

DRAWING

■Mass: 85 g



■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

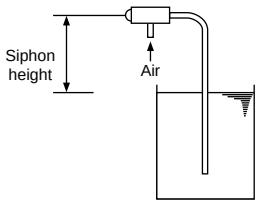
Note: Components No. 1 and 3 are combined for SETO04**R and SETO075**R.
*2) Optional material: S316L

Unit: mm

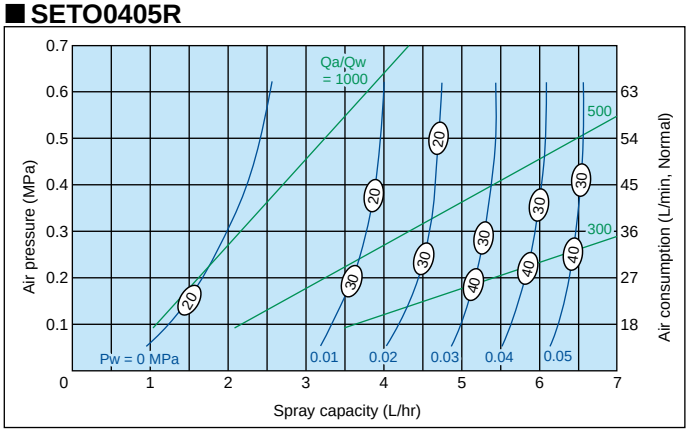
FLOW-RATE DIAGRAMS

■How to read the chart

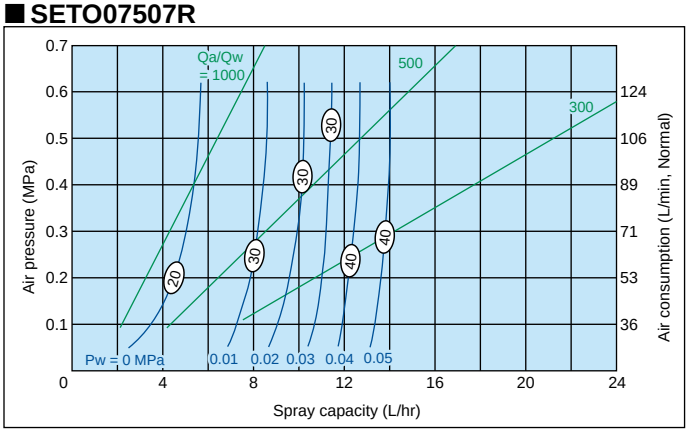
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa. Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at liquid siphon height of 100 mm when Pw is 0 MPa.
4. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).



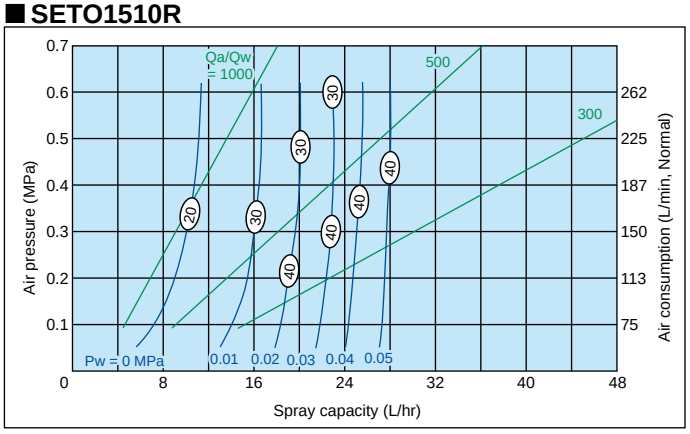
■ SETO0405R



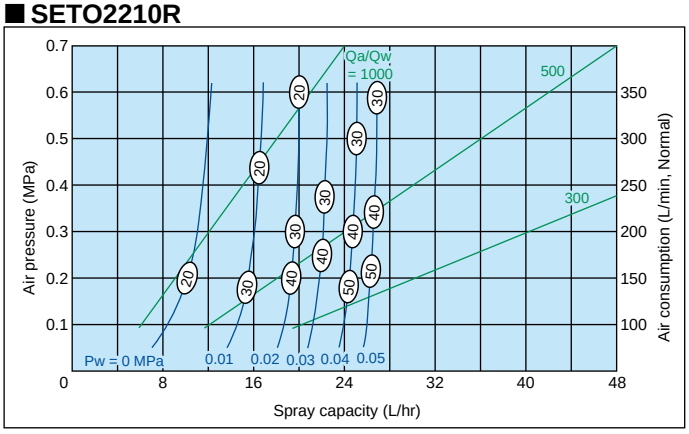
■ SETO07507R

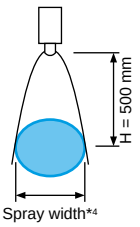


■ SETO1510R



■ SETO2210R





PERFORMANCE DATA

Air consumption code	Spray capacity code	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Liquid pressure (MPa) 0 (Siphon)*3	Spray capacity (L/hr) Liquid pressure (MPa) 0.05	Spray width*4 (mm) H = 500 mm	Mean droplet diameter*4 (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

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

HOW TO ORDER

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

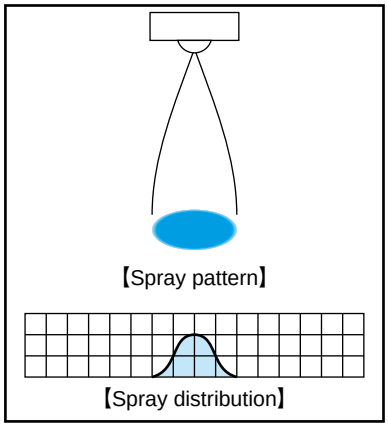
<Example> SETO 0405R S303 + T S303

SETO	04	05R	S303	+	T	S303
	Air consumption code	Spray capacity code	Material of nozzle tip		Type of adaptor	Material of adaptor
	■04 ■075 ■15 ■22	■05R ■07R ■10R				

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

Clog-resistant Fine Fog Nozzles for Wafer Cleaning

SETOJet-PTFE

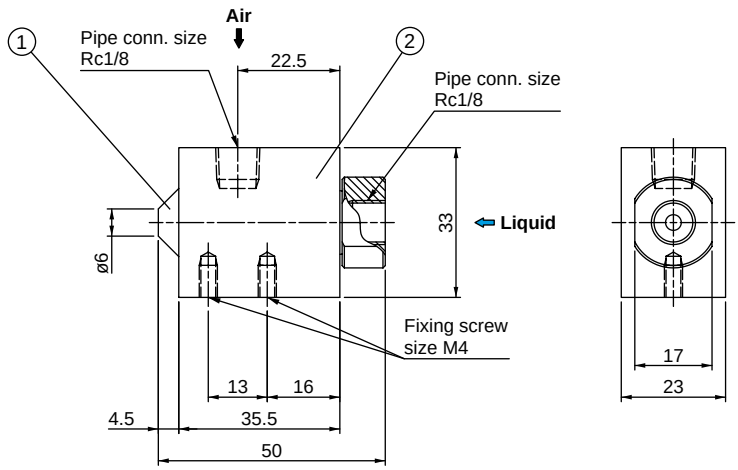


■Pneumatic spray nozzle made of PTFE.
Capable of spraying chemical solutions.
■External mixing type preventing contamination.

APPLICATIONS

■Cleaning: Precise cleaning for semiconductor wafers

DRAWING



■COMPONENTS AND MATERIALS

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

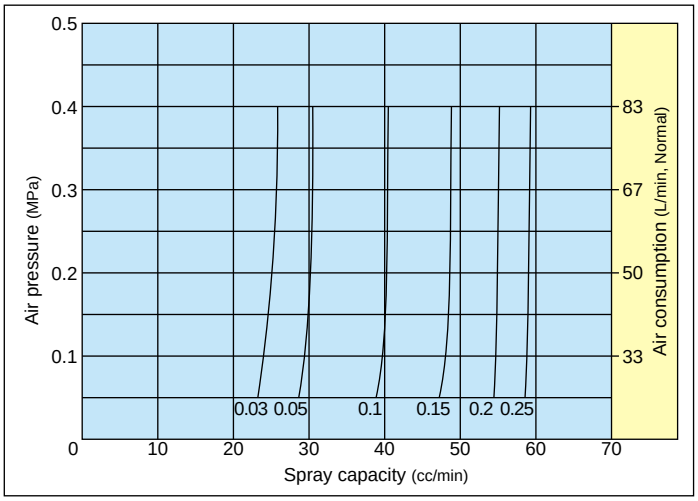
Unit: mm

FLOW-RATE DIAGRAMS

■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Figures at the foot of each curve indicate liquid pressures in MPa.

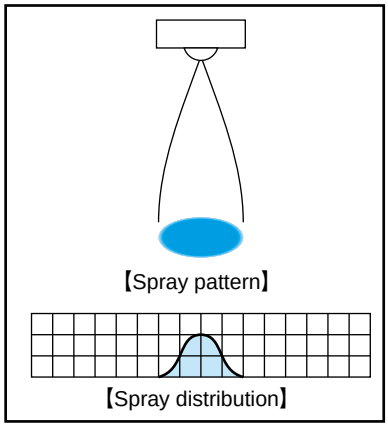
Note:
This charts is a single example.
We can design an optimal nozzle according to your application and purpose.



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

Clog-resistant Fine Fog Nozzles with Spray Control Adaptor

SETO-SP



- ■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 50 μm or less.*1
- ■Clog-resistant design. Optimal for spraying viscous liquids.
- ■External mixing type (designed to mix air and liquid outside the nozzle for atomization).
- ■Built-in piston activated by pilot air prevents liquid dripping from the nozzle and provides fast response to spray ON/OFF control.
- ■Compact, 46 mm-long design to fit in tight spaces.
- ■Capable of controlled intermittent liquid dispensing by using as a hydraulic spray nozzle without atomizing air supply.

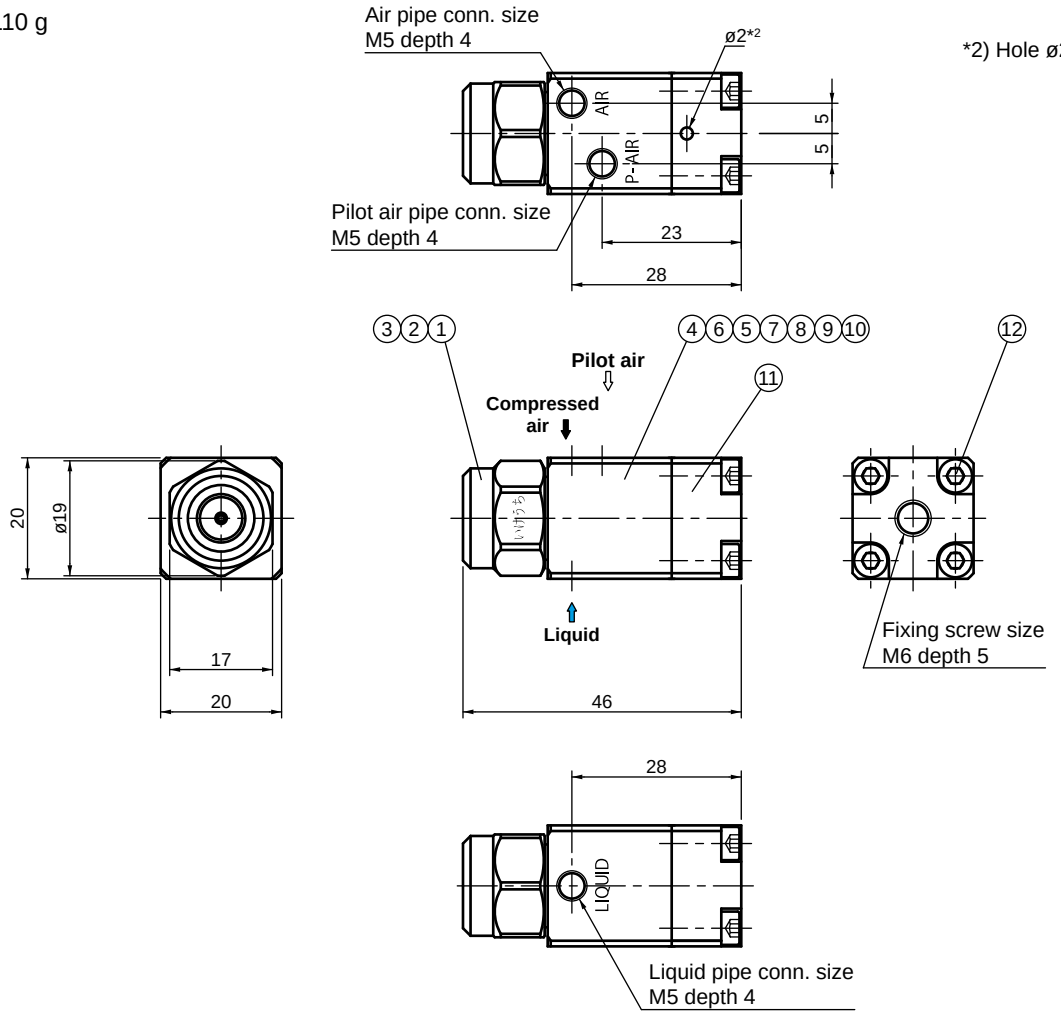
*1) Droplet diameter measured by laser Doppler method

APPLICATIONS

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

DRAWING

■Mass: 110 g



*2) Hole ø2 is for air relief.

■COMPONENTS AND MATERIALS

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

No.	Components	Standard materials
7	O-ring	FKM
8	Piston	S303
9	Y-packing	NBR
10	Spring	S304
11	Spring cap	S303
12	Hex socket screw (M3x14mm)	S304

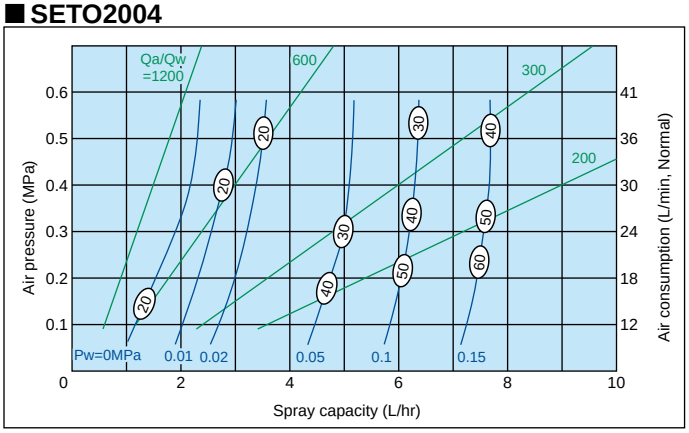
Unit: mm

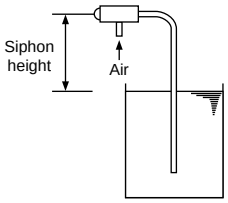
FLOW-RATE DIAGRAMS

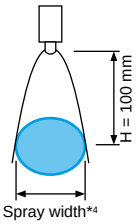
■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at liquid siphon height of 100 mm when Pw is 0 MPa.
4. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).

■ **SETO2004**







PERFORMANCE DATA

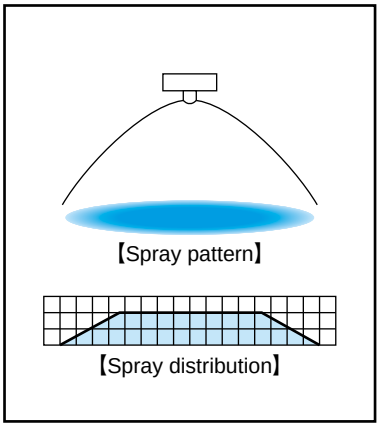
Air consumption code	Spray capacity code	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Liquid pressure (MPa) 0 (Siphon)*3	Spray capacity (L/hr) Liquid pressure (MPa) 0.05	Spray width*4 (mm) H = 100 mm	Mean droplet diameter*4 (μm) Laser Doppler method	Free passage diameter (mm) Liquid	Free passage diameter (mm) Air
02	04	0.2	18	1.5	4.7	40–50	10–50	0.4	0.1
		0.3	24	1.9	5.0				
		0.4	30	2.2	5.1				

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

HOW TO ORDER Please inquire or order using this product code.

SETO 0204 S303 + CSP S303

Clog-resistant Fine Fog Nozzles
Flat Spray



■Flat spray pneumatic nozzle producing fine atomization. External mixing type.
■Liquid siphon feed type (liquid pressure device is not required). Use with a liquid pressure device is also possible.
■Spray capacity increases or decreases in proportion to the air pressure.
■No dripping from the nozzles when the spray shuts off.
■Spray ON/OFF controllable adaptor (type SP or SN) is available.

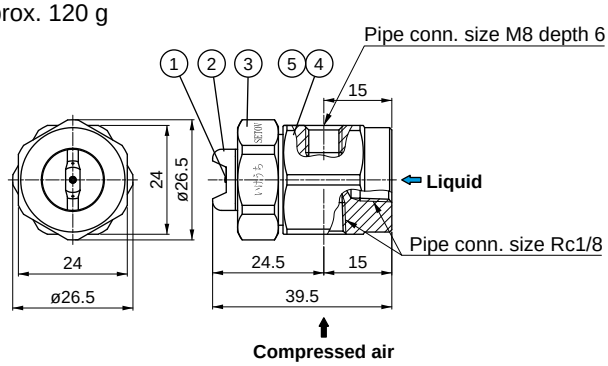
APPLICATIONS

■Humidification in small spaces
■Disinfection in tight spaces
■Coating: flavoring

DRAWING

Adaptor type T

■Mass: approx. 120 g

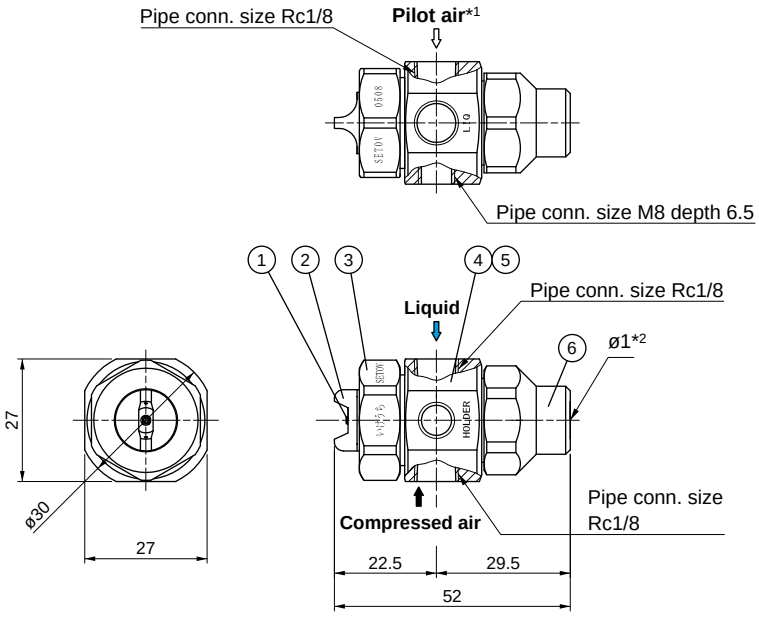


■COMPONENTS AND MATERIALS

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

Adaptor type SP/SN (Spray control 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 ø1 is for air relief.

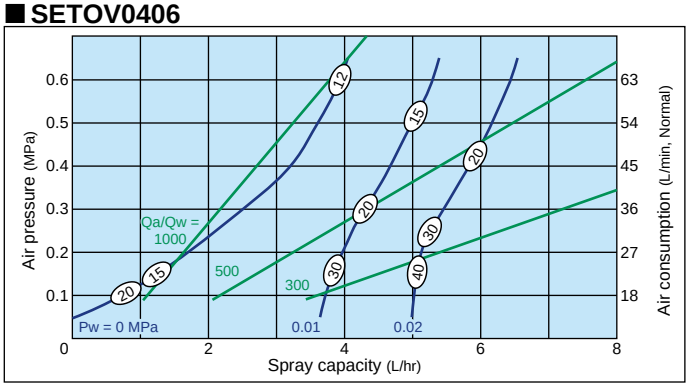
Unit: mm

FLOW-RATE DIAGRAMS

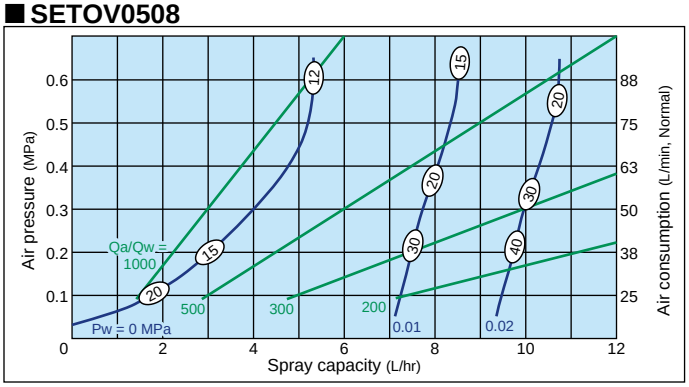
■How to read the chart

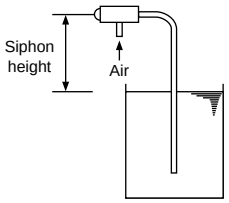
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at liquid siphon height of 100 mm when Pw is 0 MPa.
4. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).
5. These flow-rate diagrams are applicable only when using a T-type adaptor.

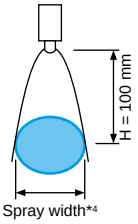
■ SETOV0406



■ SETOV0508







PERFORMANCE DATA

Spray angle *4	Air consumption code	Spray capacity code	Pipe conn. size Air	Pipe conn. size Liquid	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Liquid pressure (MPa) 0 (Siphon)*3	Spray capacity (L/hr) Liquid pressure (MPa) 0.02	Spray width*4 (mm) H = 100 mm	Mean droplet diameter*4 (μm) Laser Doppler method	Free passage diameter (mm) Liquid	Free passage diameter (mm) 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			

*3) Siphon height: 100 mm.
*4) Spray angle, spray width, and mean droplet diameter measured at liquid pressure of 0 MPa (siphon height of 100 mm).

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

- [04 06]: Air consumption code & Spray capacity code
  - ■0406
  - ■0508
- S303: Material of nozzle tip
- [T]: Type of adaptor
  - ■T
  - ■SP
  - ■SN
- S303: Material of adaptor

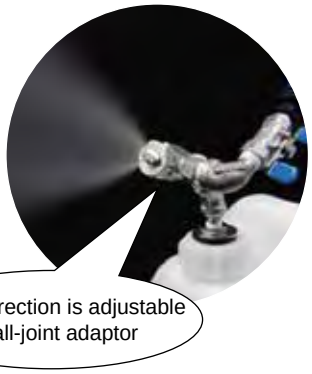
Adaptor type SP is used in the same way as SPB. Adaptor type SN is used in the same way as SNB.
See page 28 for details.

Portable Spray Unit with SETOV Nozzle Assembly

■Spray unit including a SETOV series nozzle and large-capacity 20 liter tank. Spray unit without a tank is also available.
■Immediate use with an air compressor. Recommended air pressure is 0.3 MPa (use pressure range: 0.2–0.5 MPa).
■Available in two spray capacity types (nozzle SETOV0406 or SETOV0508).
■Nozzle is clog-resistant for easy maintenance.

APPLICATIONS

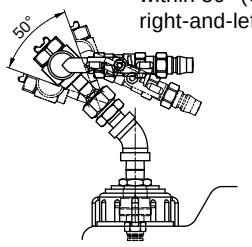
■Disinfection at a facility entrance
■Disinfecting interior surfaces
(Note: After spraying chemicals, spray water for about 5 minutes to mitigate corrosion and rust of the metal parts.)



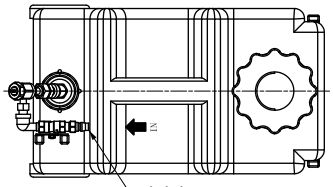
Spray direction is adjustable with a ball-joint adaptor

DRAWING

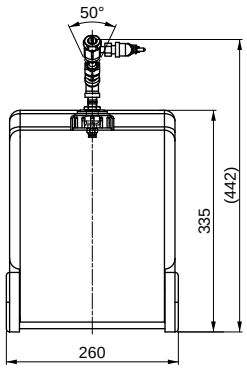
Spray direction adjustable within 50° (Up-and-down, right-and-left)

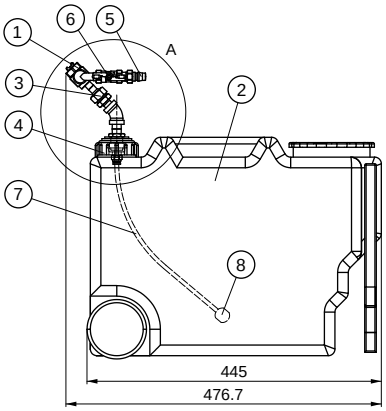


Details of A



Spray flow rate by nozzle type
SETOV0406: Approx. 1.8–2.2 L/hr (at air pressure of 0.3 MPa)
SETOV0508: Approx. 2.8–3.3 L/hr (at air pressure of 0.3 MPa)
Note: Spray flow rate varies depending on the liquid level in a tank.





■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle body	S303
2	20L plastic tank	PE
3	UT Ball joint	S303, FKM
4	Cap	PE
5	Plastic joint	PA
6	Valve	S316
7	700 mm water hose	PVC
8	Strainer (air stone)	—

This unit does not include a compressor or disinfectant.

Unit: mm

HOW TO ORDER Please inquire or order for a specific product using these product codes.

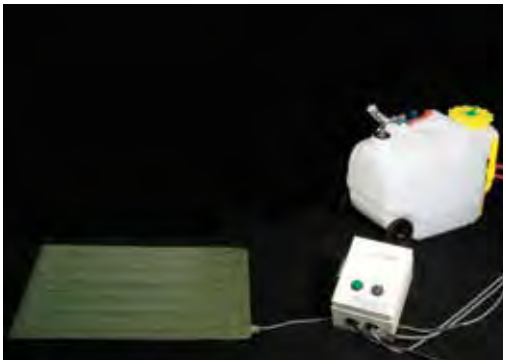
Spray Unit SETOV0406 S303+TS303+UT (with 20L Tank)

Spray Unit SETOV0508 S303+TS303+UT (with 20L Tank)

Optional Product

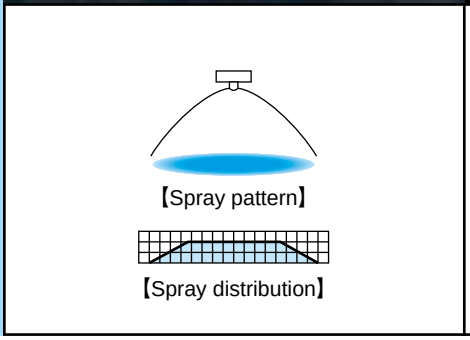
SETOV Smart Kit

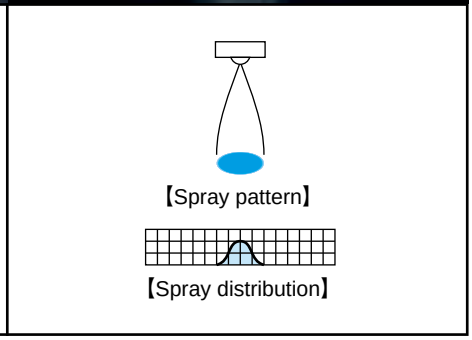
■An application example combining the spray unit with a 100 VAC timer controller and a mat switch for a short-time auto-spray.
Stepping on a mat switch automatically activates spraying for a preset time.



Spray Pattern Adjustable Nozzles for Coating Applications

SETOV-C





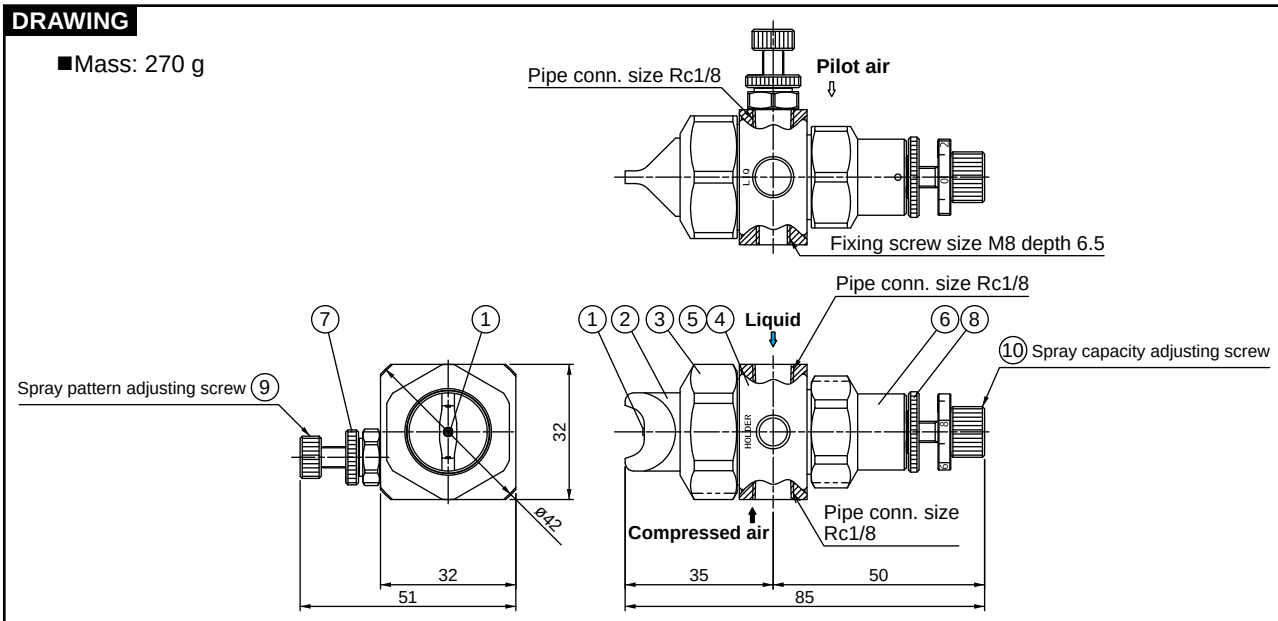
■Pneumatic spray nozzle with adjustable spray width and spray pattern.
When the spray pattern adjusting screw is fully open, it provides a flat spray pattern with the widest spray width. When the spray pattern adjusting screw is fully closed, it provides a full cone spray pattern with the narrowest spray width.
■Spray capacity can be fine-tuned without changing the present pressures. Spray ON-OFF is controllable.
■Capable of applying the coating only where needed with minimal splatter.
■External mixing type (designed to mix air and liquid outside the nozzle for atomization).

APPLICATIONS

■Coating (possible to spray high-viscosity liquid of up to 1,000 centipoise, e.g. egg yolk.)

DRAWING

■Mass: 270 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

No.	Components	Standard materials
6	Spring cap	S303
7	Pattern adjusting screw locknut	S303
8	Capacity adjusting screw locknut	S303
9	Pattern adjusting screw	S303
10	Capacity adjusting screw	S303

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

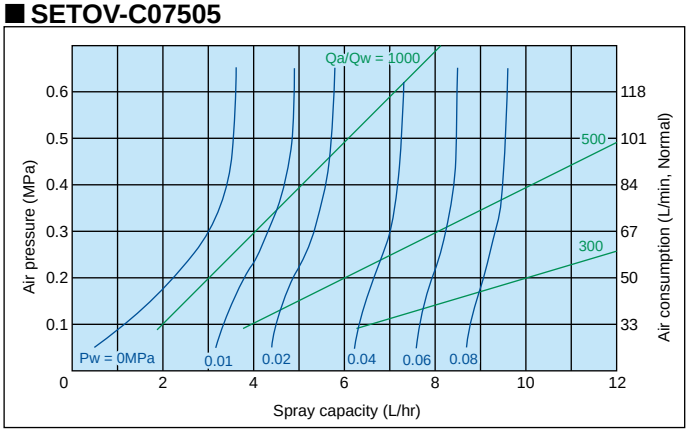
Unit: mm

FLOW-RATE DIAGRAMS

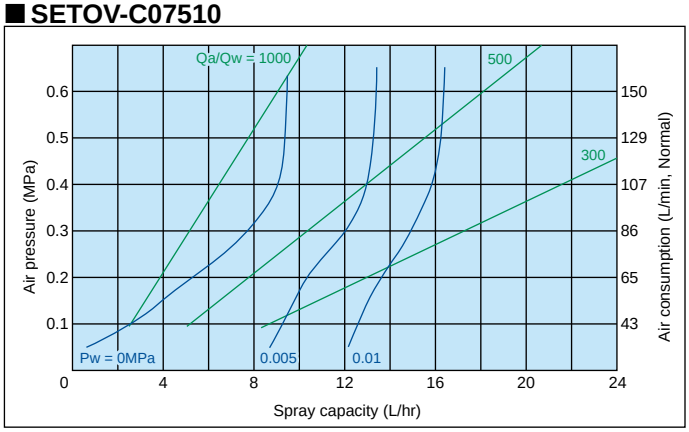
■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa. Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at liquid siphon height of 100 mm when Pw is 0 MPa.
4. Spray capacity and air consumption shown are values when the pattern adjusting screw and the capacity adjusting screw are fully open.

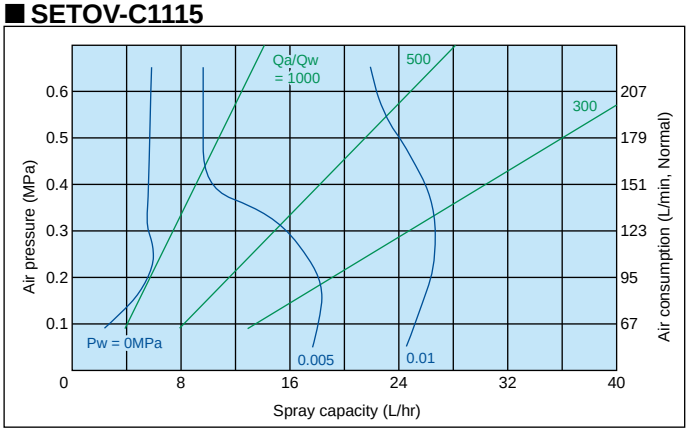
■ SETOV-C07505

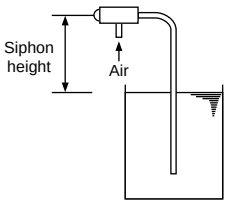


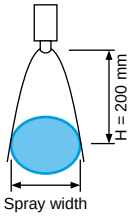
■ SETOV-C07510



■ SETOV-C1115







PERFORMANCE DATA

Air consumption code	Spray capacity code	Air pressure (MPa)	Air consumption*1 (L/min, Normal)	Spray capacity*1 (L/hr) Liquid pressure (MPa) 0 (Siphon)*2	Spray capacity*1 (L/hr) Liquid pressure (MPa) 0.05	Widest spray width*1 (mm) H = 200 mm	Free passage diameter (mm) Liquid	Free passage diameter (mm) Air
075	05	0.1	33	1.2	3.4	360	0.5	0.2
		0.2	50	2.2	3.8			
		0.3	67	3.0	4.3			
		0.4	84	3.4	4.7			
075	10	0.1	43	2.7	12.6	360	0.6	0.2
		0.2	65	5.3	13.6			
		0.3	86	7.7	14.9			
		0.4	107	9.0	15.9			
11	15	0.1	67	2.7	24.5	360	0.6	0.3
		0.2	95	5.5	26.4			
		0.3	123	5.5	26.6			
		0.4	151	5.6	25.9			

*1) Values when pattern adjusting screw and capacity adjusting screw are fully open.
*2) Spray capacity and compressed air consumption at liquid pressure of 0 MPa are measured at siphon height of 100 mm.

HOW TO ORDER

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

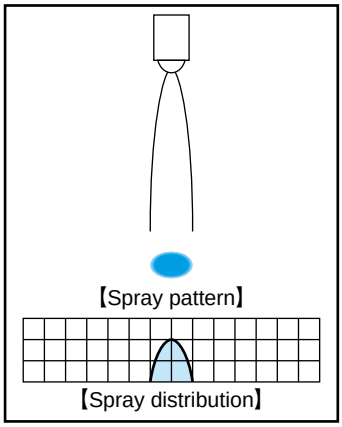
<Example> SETOV-C 07510 S303 + SP S303

SETOV-C [075 10] S303 + SP S303

- [075 10]: Air consumption code & Spray capacity code
- S303: Material of nozzle tip
- SP: Type of adaptor
- S303: Material of nozzle tip

■07505
■07510
■1115

Solenoid-activated Spray Nozzles SETO-SD

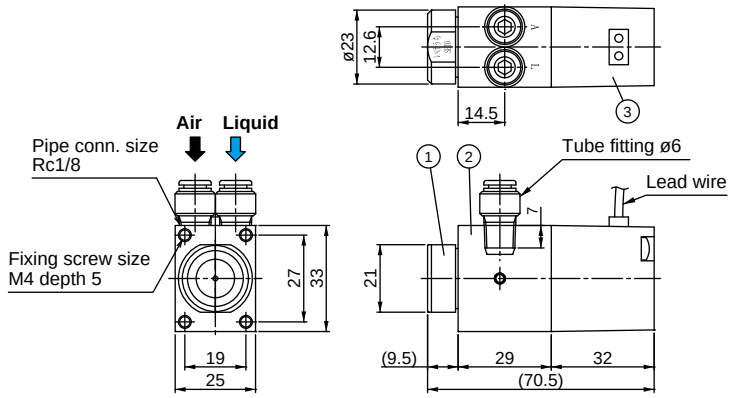


■Fast response performance by solenoid activation: Intermittent pulse spray at 0.02 sec/shot with a minimum of 0.006 cc/shot is possible.
■Ideal for coating in small amounts, i.e. protective agent coating, etc.
■IP65, IP67 (dust-proof and water-proof) structure.
■SETO07503R-I+SD is an internal mixing outer air type (the other SETO models are external mixing type).

APPLICATIONS

■Spraying release agent for metal molds
■Coating
■Mold cooling
■Uniform coating without dripping

DRAWING

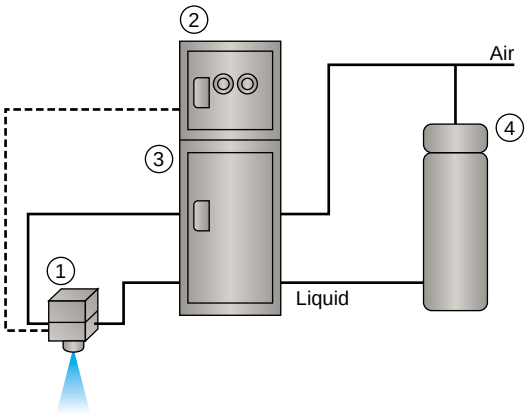


■COMPONENTS AND MATERIALS

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

Unit: mm

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)

PERFORMANCE DATA

Nozzle code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal)										Spray width*2 (mm)	Mean droplet diameter*3 (μm)	Free passage diameter (mm)		Mass (g)
		Liquid pressure (MPa)											Laser Doppler method	Adaptor		Aluminum
		0 *1		0.05		0.13		0.2		0.3				Liquid	Air	
		Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air					
07503R-I	0.2	—	—	—	—	1.0	50	3.2	48	—	—	40–50	15–25	0.3	0.4	180
	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 diameters measured at compressed air pressure of 0.2 MPa and liquid pressure of 0.13 MPa.
0405R, 07507R, 2210R: Sauter mean diameters measured at compressed air pressure of 0.3 MPa and liquid pressure of 0 MPa (siphon height of 100 mm).

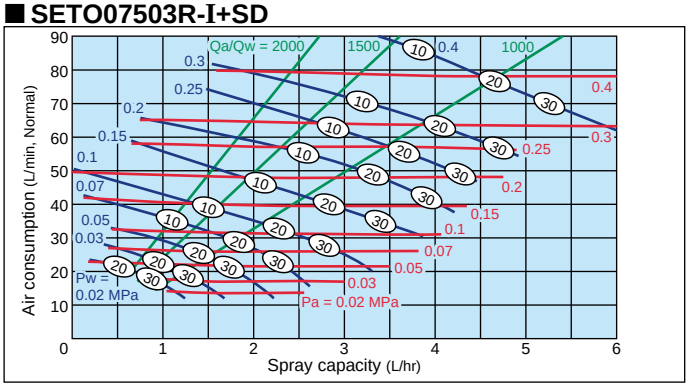
Valve function	Min. operating time (sec)	Max. operating pressure (MPa)	Electric current (A)	Electric voltage (DC-V)	Max. allowable temperature
Single solenoid, normally closed	ON: 0.02 OFF: 0.02	0.5 for both air/liquid	0.26	24	50°C (120°F)

FLOW-RATE DIAGRAMS

■How to read the chart

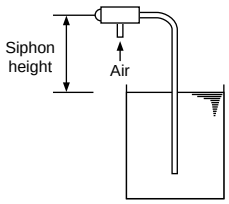
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).

■ SETO07503R-I+SD

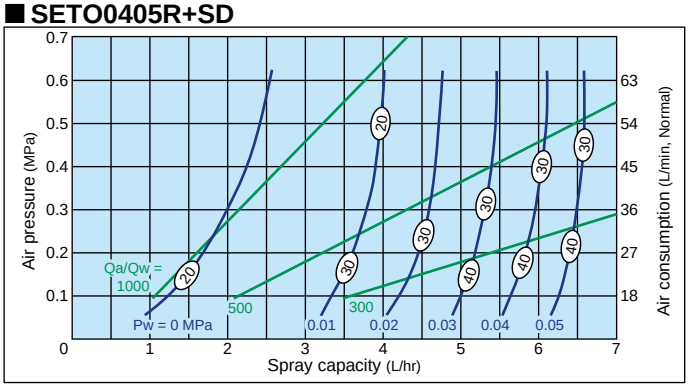


■How to read the chart

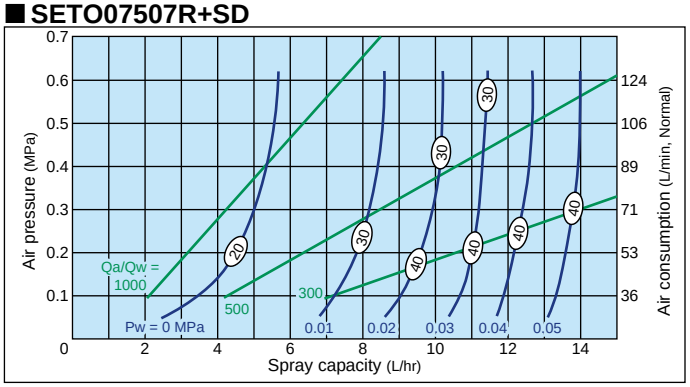
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at liquid siphon height of 100 mm when Pw is 0 MPa.
4. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).



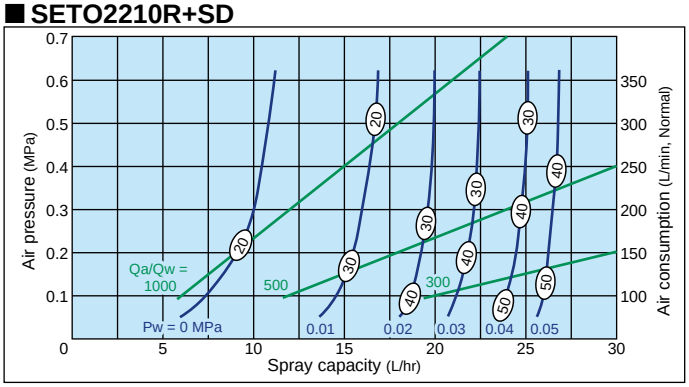
■ SETO0405R+SD



■ SETO07507R+SD



■ SETO2210R+SD



HOW TO ORDER

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

<Example> SETO 07503R-I +SD AL

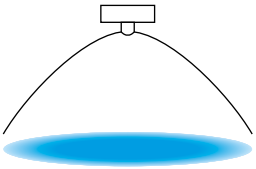
SETO [07503R-I] + SD [AL]

Nozzle code
- **■07503R-I**
- **■0405R**
- **■07507R**
- **■2210R**

Material
- **■AL (Aluminum)**

Clog-resistant Fine Fog Nozzles
Wide-angle Flat Spray

YYA



【Spray pattern】

■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 for atomization).
■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

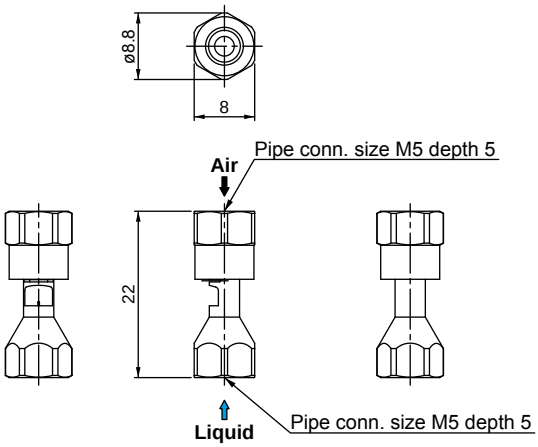
*1) Droplet diameter measured by laser Doppler method
*2) Spray capacity and spray angle are reduced when viscous liquid is sprayed. Raising the liquid pressure to 0.2–0.3 MPa is recommended when spray capacity is small, otherwise the spray pattern becomes irregular.

APPLICATIONS

■Spraying viscous liquid such as oil and honey

DRAWING

■Material: S303



PERFORMANCE DATA

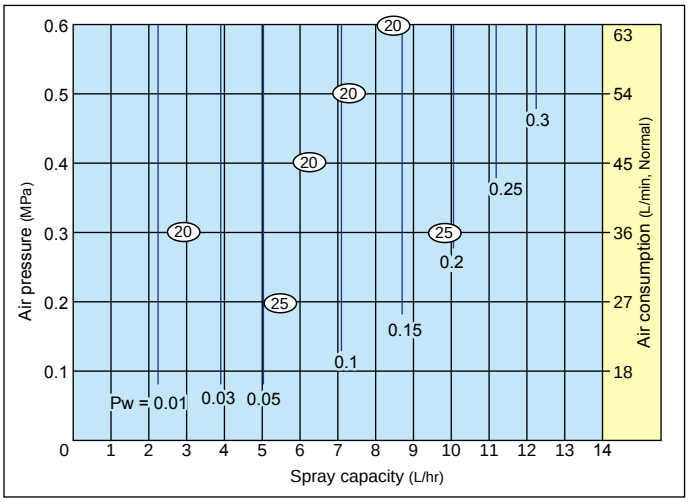
Spray angle code*3	Air consumption code	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Liquid pressure (MPa)				Spray width*4 (mm) Liquid pressure (MPa)				Mean droplet diameter (μm)	Free passage diameter (mm)		Mass (g)
				0.01	0.05	0.1	0.2	0.01	0.05	0.1	0.2	Laser Doppler method	Liquid	Air	
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 measured at 100 mm from nozzle.

FLOW-RATE DIAGRAMS

■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Figures at the foot of each line indicate liquid pressures Pw in MPa.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.



HOW TO ORDER

Please inquire or order using this product code.

M5F YYA 8004 S303

Large Capacity Fine Fog Nozzles

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

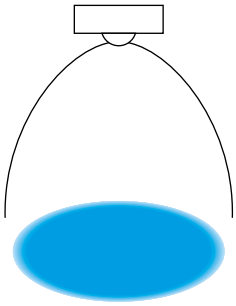
■GSIMⅡ series nozzles produce a large volume of fine atomization with a low consumption of compressed air, having very low air-water ratios.

■Simple structure, easy maintenance.

Contents

Large Capacity Fine Fog Nozzles

GSIM Ⅱ



【Spray pattern】

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 50 μm and a max. droplet diameter of 150 μm at an air-water ratio of 130.*1
■Energy-saving design that provides large amount of "fine fog" with smaller air consumption, yielding a spray capacity of 30–1,000 L/hr 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.

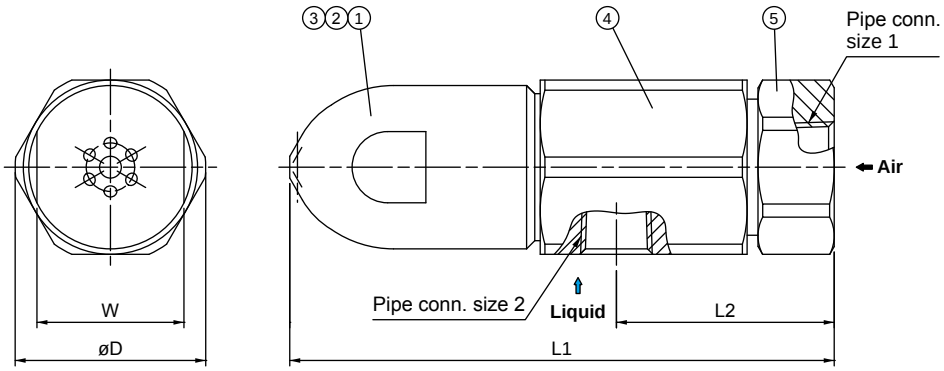
*1) Droplet diameter measured by laser Doppler method

APPLICATIONS

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

GSIM Ⅱ Nozzle with T-type Adaptor

DRAWING



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

■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle tip	S316L
2	Nozzle core	S316L
3	Whirler	S316L equivalent

No.	Components	Standard materials
4	Adaptor	S303
5	Air socket	S303

DIMENSIONS

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	øD	Air	Liquid*2	
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)	

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

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

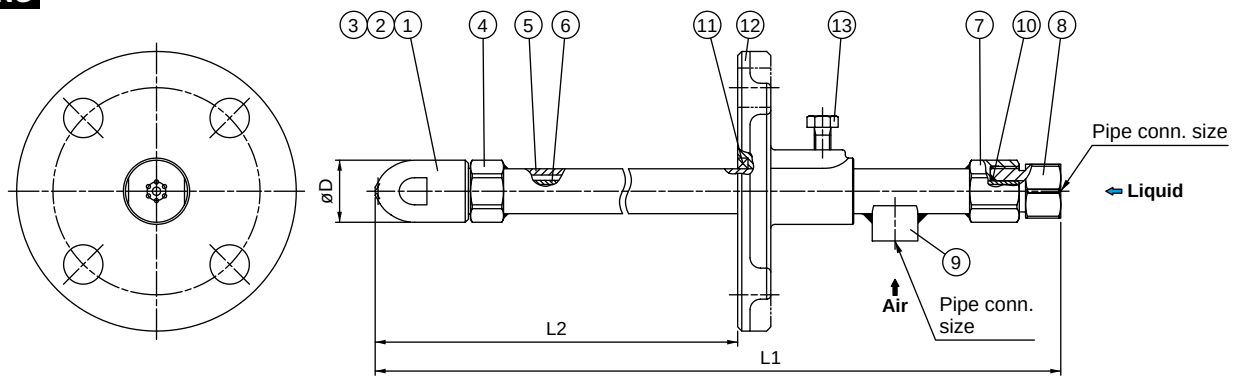
<Example> GSIM6037Ⅱ S316L + T S303

GSIM [60] [37] Ⅱ S316L + T S303

- 60: Spray angle code — ■60 ■20
- 37: Air consumption code — ■37 ■55 ■75 ■110 ■150 ■220
- Ⅱ
- S316L: Material of nozzle tip
- +
- T: Type of adaptor
- S303: Material of adaptor

Flange Type

DRAWING



■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

Spray angle code	Air consumption code	Pipe connection size		Outer diameter øD (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 GSIM Ⅱ 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

GSIM Ⅱ

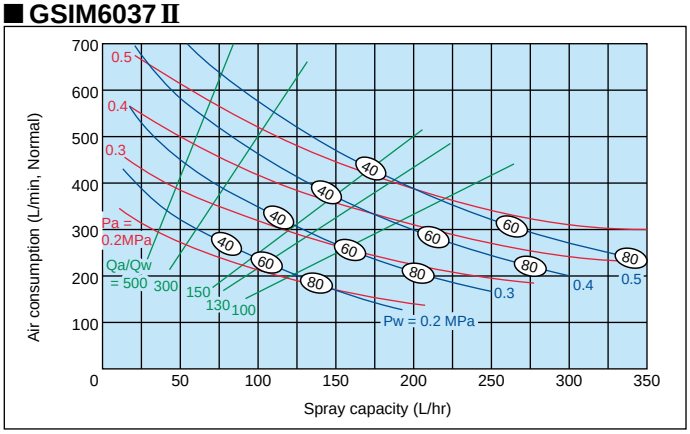
FLOW-RATE DIAGRAMS

SPRAY ANGLE 60° TYPE

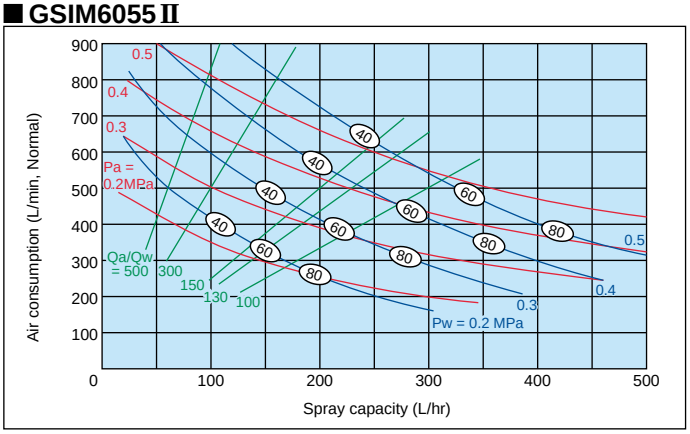
■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.

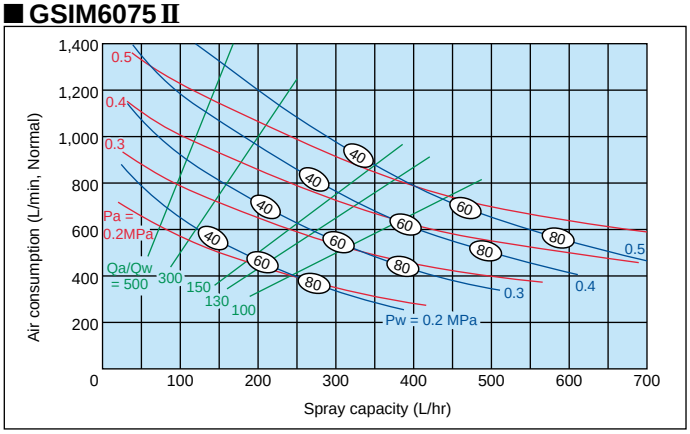
■ GSIM6037 II



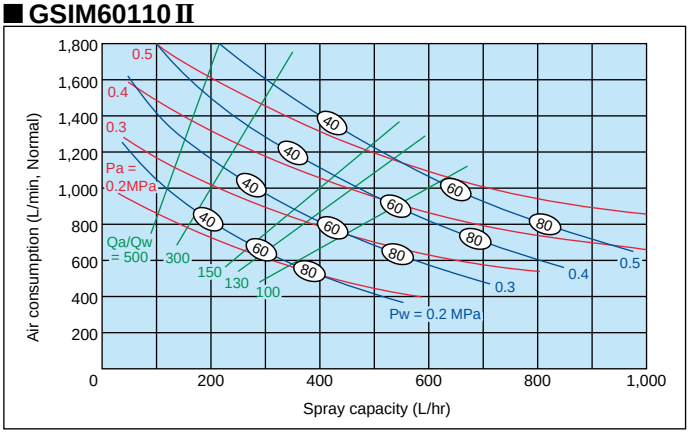
■ GSIM6055 II



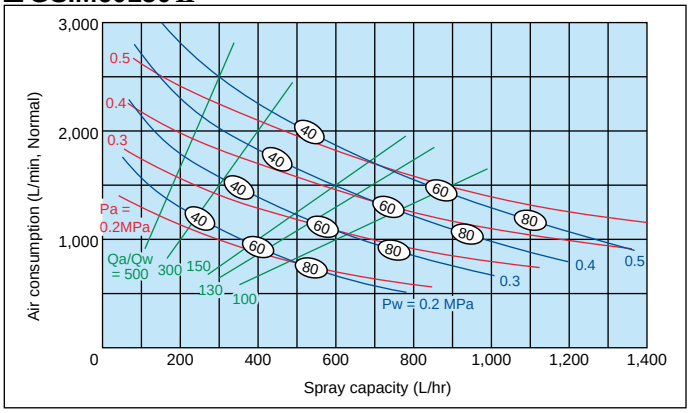
■ GSIM6075 II



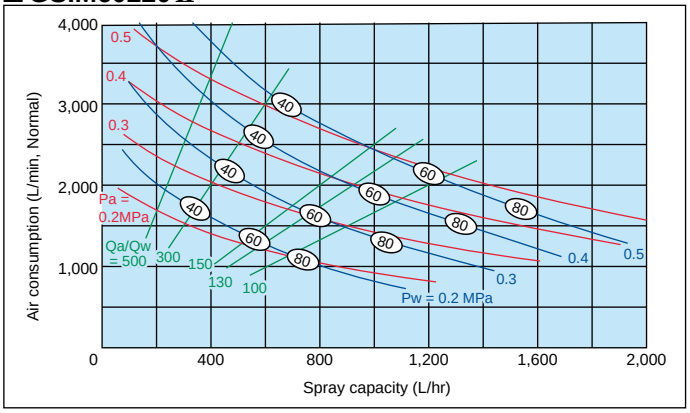
■ GSIM60110 II



■ GSIM60150 II



■ GSIM60220 II



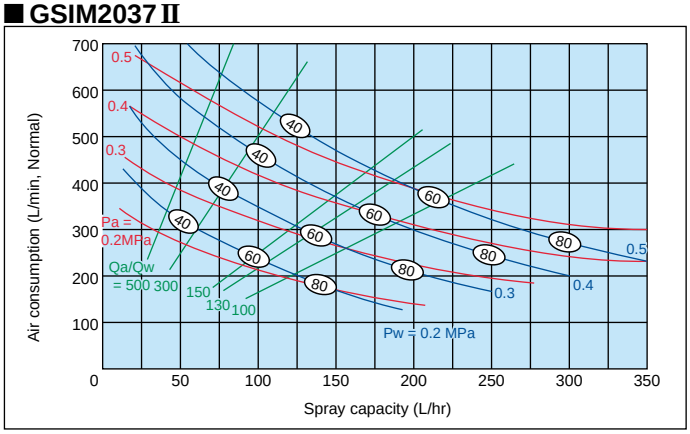
FLOW-RATE DIAGRAMS

SPRAY ANGLE 20° TYPE

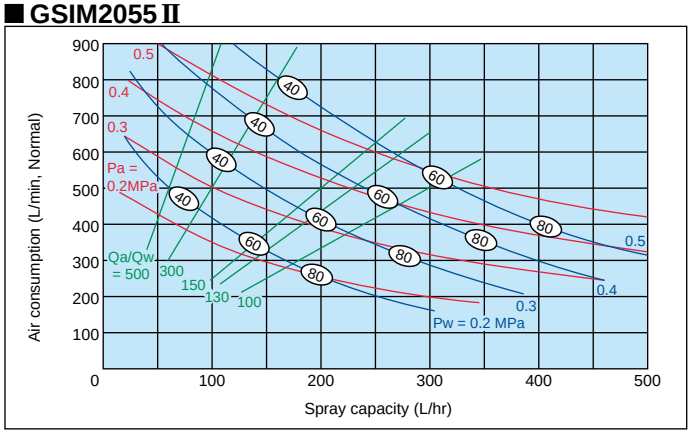
■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.

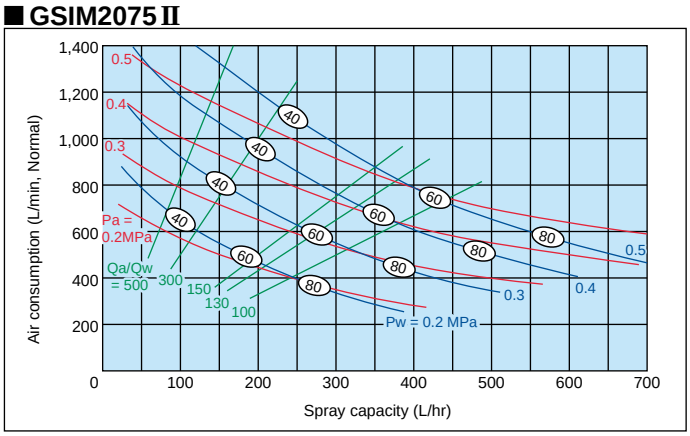
■ GSIM2037 II



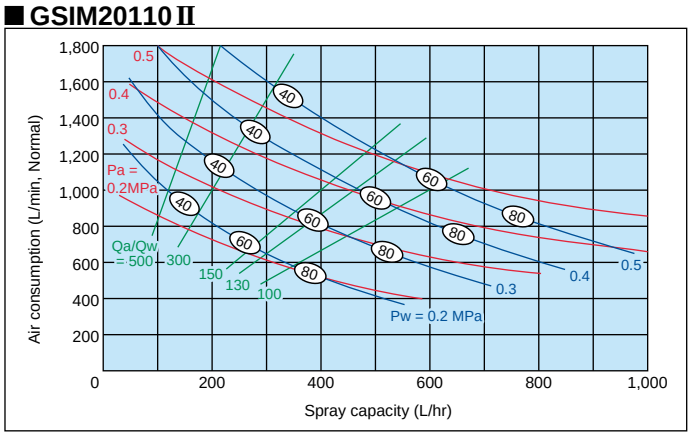
■ GSIM2055 II



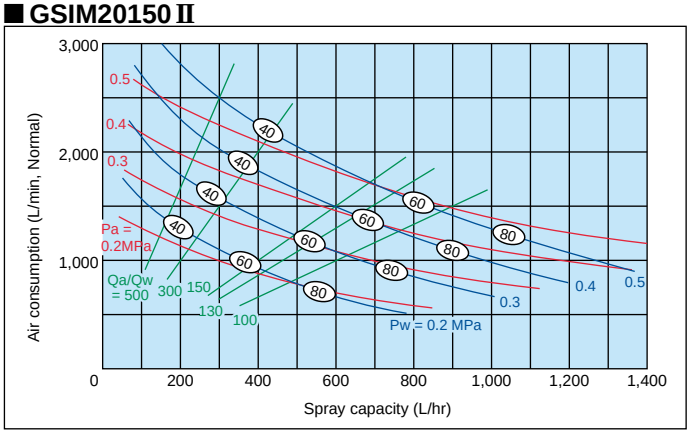
■ GSIM2075 II



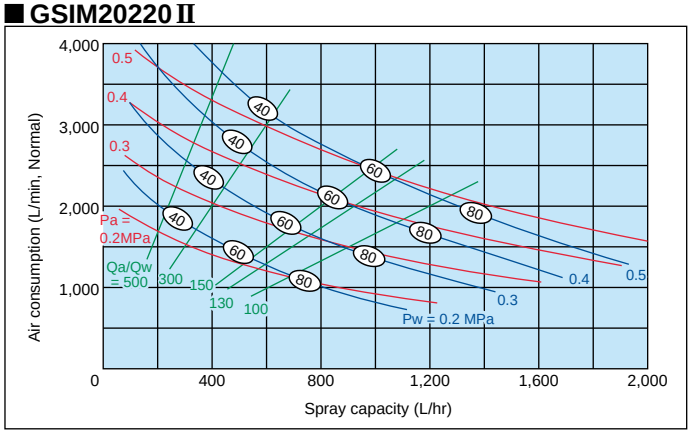
■ GSIM20110 II



■ GSIM20150 II



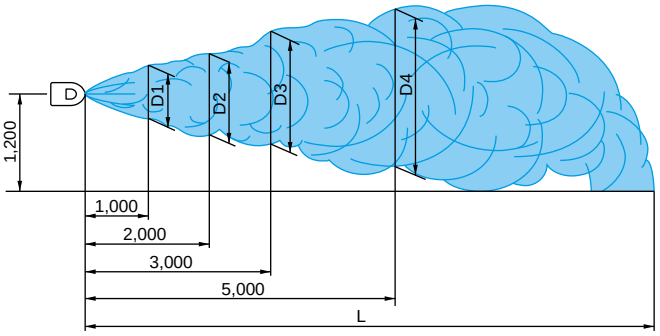
■ GSIM20220 II



SPRAY DIMENSIONS

■Spray angle code: 60

Air consumption code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)				
			D1	D2	D3	D4	L
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



Unit: mm

■Spray angle code: 20

Air consumption code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)				
			D1	D2	D3	D4	L
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.

GSIM Ⅱ

HOW TO ORDER

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

Flange Type

<Example> GSIM6037Ⅱ B S316L+1*1/4T10 SCS13 (L2)

GSIM **60** **37** Ⅱ **B** S316L + **1*1/4T10** SCS13 (L2)

- **60** — Spray angle code
  - ■60
  - ■20
- **37** — Air consumption code
  - ■37
  - ■55
  - ■75
  - ■110
  - ■150
  - ■220
- Ⅱ
- **B** — Type of length (Total length)
  - ■A
  - ■B
  - ■C
  - ■D
- S316L — Material of nozzle tip
- **1*1/4T10** — Flange size
  - ■1*1/4T10
  - ■1*1/2T10
  - ■2T10

  The minimum flange sizes
  (Air consumption code: Flange size)
  37Ⅱ, 55Ⅱ: 1*1/4T10
  75Ⅱ, 110Ⅱ: 1*1/2T10
  150Ⅱ, 220Ⅱ: 2T10
- SCS13 — Flange material
- (L2) — Length between the nozzle head and flange

See the drawing and table on page 58 for type of length and length L2.
For details please ask for our inquiry drawing.

Please send us an inquiry for a different flange size.

Semi-Fine Fog, Semi-Coarse Fog Nozzles

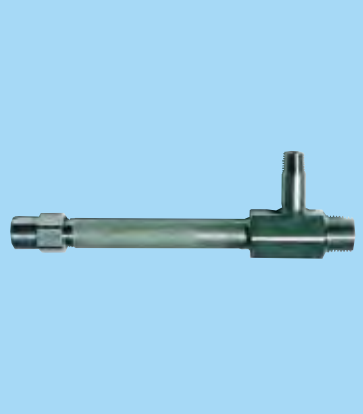
■DOVEA, DDA, JJA, and DOVVA-G series, developed to satisfy the crucial requirements for spray nozzles in the continuous casting process of steel making, feature stable spray angles and distributions with large turndown ratios, having fine and uniform spray droplet size distributions across the entire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

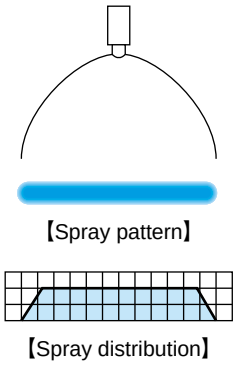
With these features, DOVEA, DDA, JJA, and DOVVA-G series are highly effective nozzles for steel/gas cooling.

■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

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





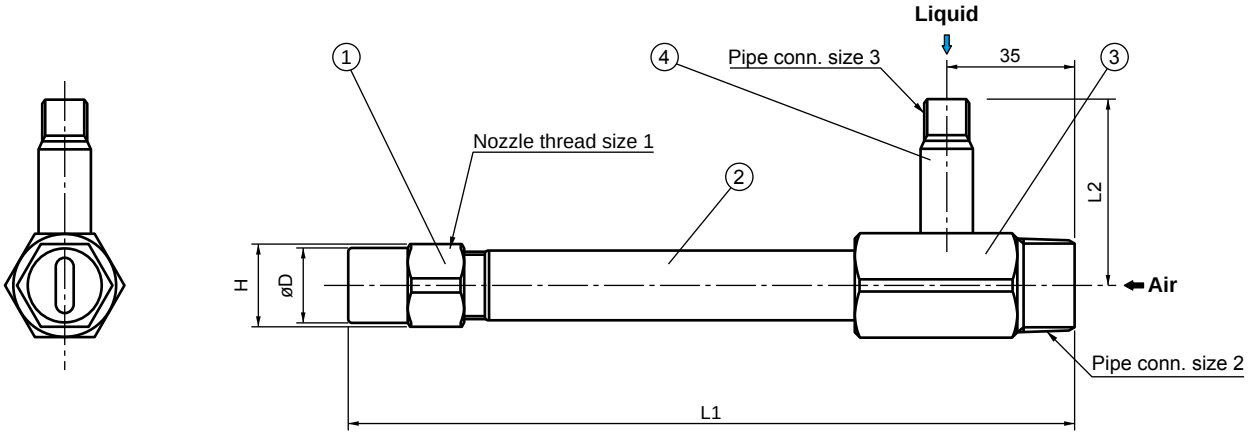
■Flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 µm or more.*1
■Large turn-down ratio with minimal variation in spray angle.
■Uniform spray droplet size distribution across the entire spray area.
■Even spray flow distribution suitable for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

DRAWING



■COMPONENTS AND MATERIALS

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

DIMENSIONS

Spray capacity code	Nozzle thread size	Pipe connection size		Outer dimensions (mm)				Mass*3 (g)
	1	2 (Air)	3 (Liquid)	L1*2	L2	H	øD	
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) Total length L1 is available from 200 mm to 1,500 mm.
*3) The mass shown is when L1 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 L1 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

PERFORMANCE DATA

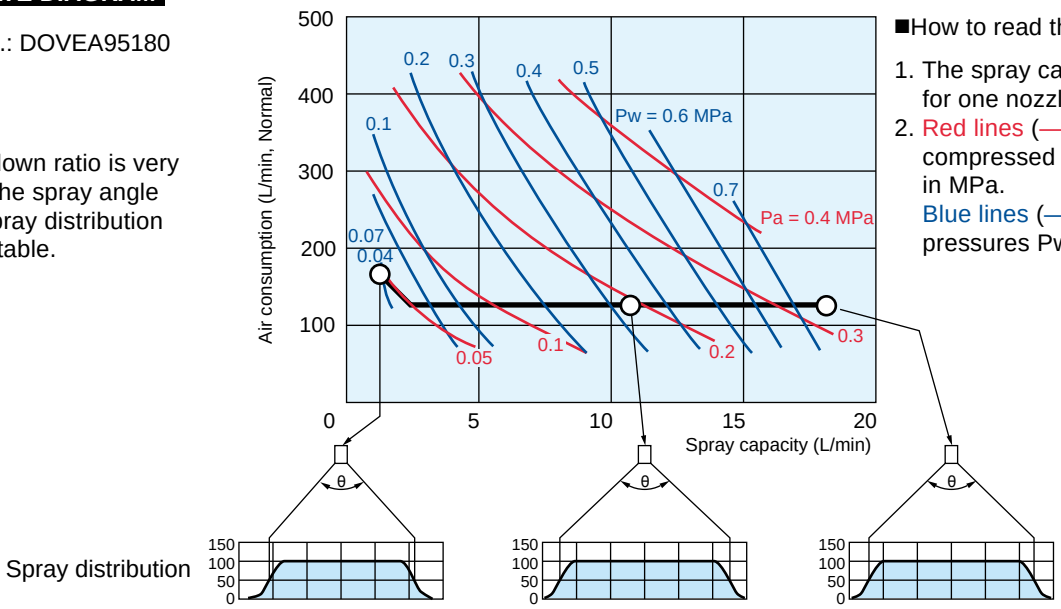
Spray angle code*4	Spray capacity code	Air pressure (MPa)	Spray capacity (L/min) & Air consumption (L/min, Normal)										Mean droplet diameter (μm)		Free passage diameter (mm)		
			Liquid pressure (MPa)														
			0.07		0.1		0.2		0.4		0.7		Immersion sampling method	Fraunhofer diffraction method	Tip 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

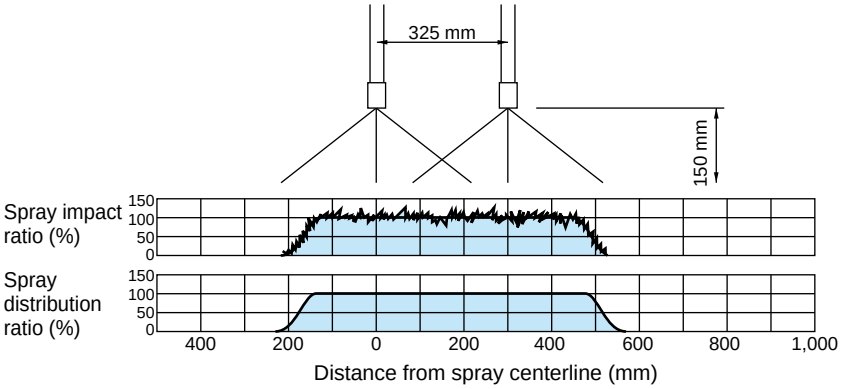
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.

SPRAY FLOW DISTRIBUTION & SPRAY IMPACT DISTRIBUTION

Nozzle No.: DOVEA95180

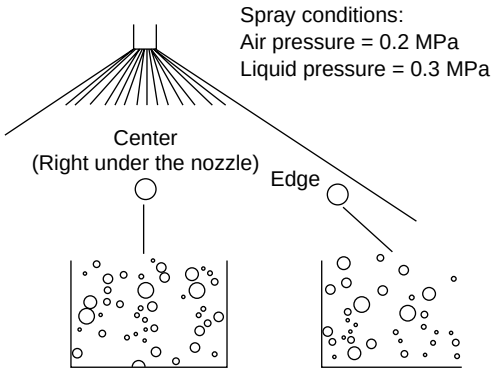
Spray conditions:
Air pressure = 0.2 MPa
Liquid pressure = 0.3 MPa

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

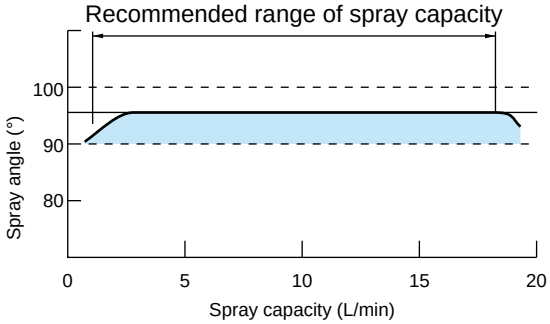
Nozzle No.: DOVEA95180



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

VARIATION IN SPRAY ANGLE

Nozzle No.: DOVEA95180

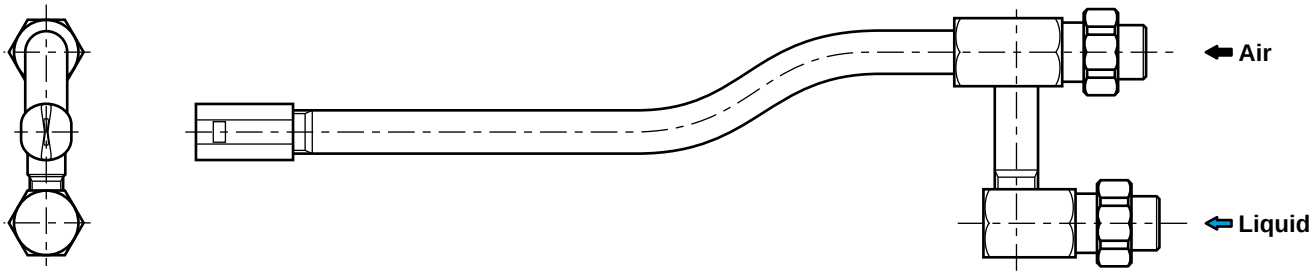


The variation in spray angle is minimized despite the large modulation of spray capacities.

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

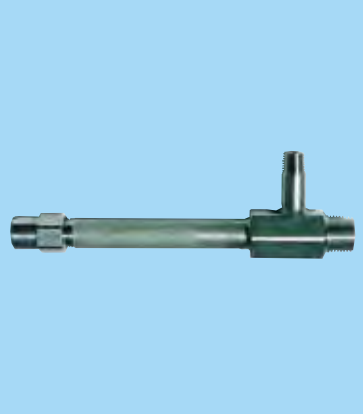
1/4	DOVEA	95	82	- M ×	500	S303	-	n
Nozzle thread size 1		Spray angle code	Spray capacity code		Total length L1	Material of nozzle body		Code of bent pipe*
■1/4 ■3/8 ■1/2		■110 ■95 ■70 ■55	■82 ■110 ■180 ■230 ■400		■Min. 200 ■Standard 500 ■Max. 1500			

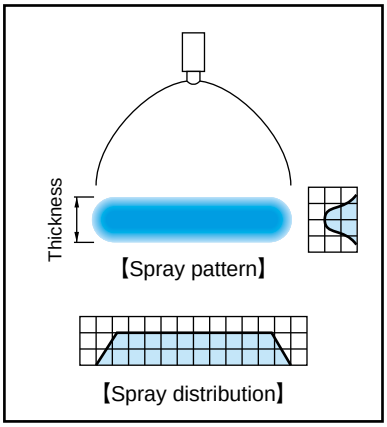
(*This code will be determined upon receipt of an inquiry.)

Sister product

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

DOVEA-W





■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)

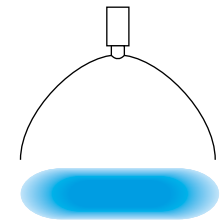
DOVEA-W series

Conventional nozzles (DOVEA series)

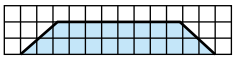
The increased thickness of the flat spray from this nozzle allows for more effective cooling in the space between rolls.

For further information, please contact our sales office.

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



【Spray pattern】



【Spray distribution】

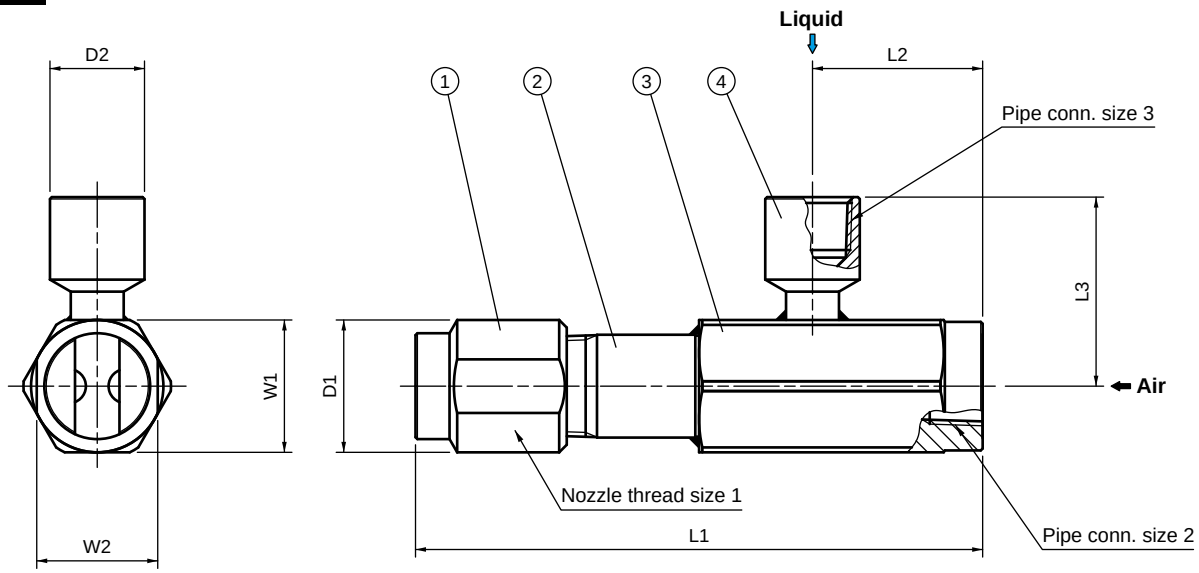
■Thick even flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 µm or more.*1
■Thicker flat spray pattern covers wider area.
■Large turn-down ratio with minimal variation in spray angle.
■Spray droplet size is uniform across the entire spray area.
■Even 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

DRAWING



■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 Pipe (component# 2) depending on the nozzle codes.

DIMENSIONS

Nozzle thread size 1	Pipe connection sizes 2 & 3*2	L1*3 (mm)	L2 (mm)	L3 (mm)	W1 (mm)	W2 (mm)	øD1 (mm)	øD2 (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 for each 100 mm of length as listed below.

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

PERFORMANCE DATA

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	Tip orifice	Adaptor Liquid	Adaptor 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					

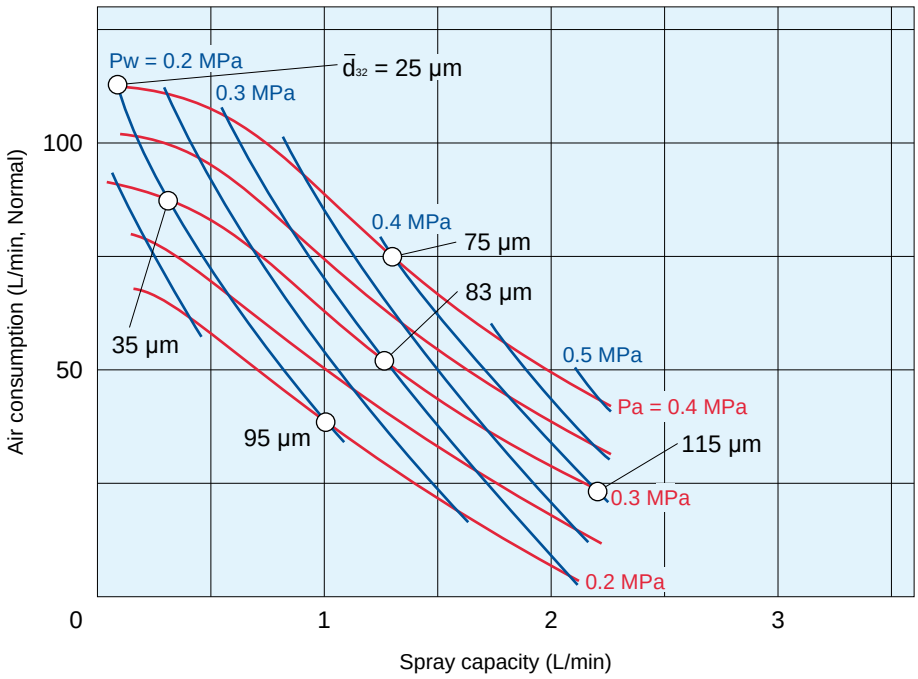
Note: Criteria for spray angle measurement differs depending on nozzle codes.

FLOW-RATE DIAGRAMS

Nozzle No.: DDA1001525

■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
3. Droplet diameter $\bar{d}_{32}$ is Sauter mean diameter measured by the immersion sampling method.



DDA

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 L1		Material of nozzle body		Code of bent pipe*6

■1/8
■1/4
■1/2
■3/4

■125
■110
■100
■80
■75

■45
■25
■20
■15

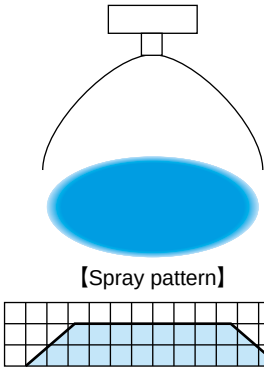
■14
〃
■580

■Standard (70–150)*5
■Max. 1500

*6This code will be determined upon receipt of an inquiry.

*5Standard total length L1 varies with Nozzle thread size 1. See the table of DIMENSIONS on page 68.

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



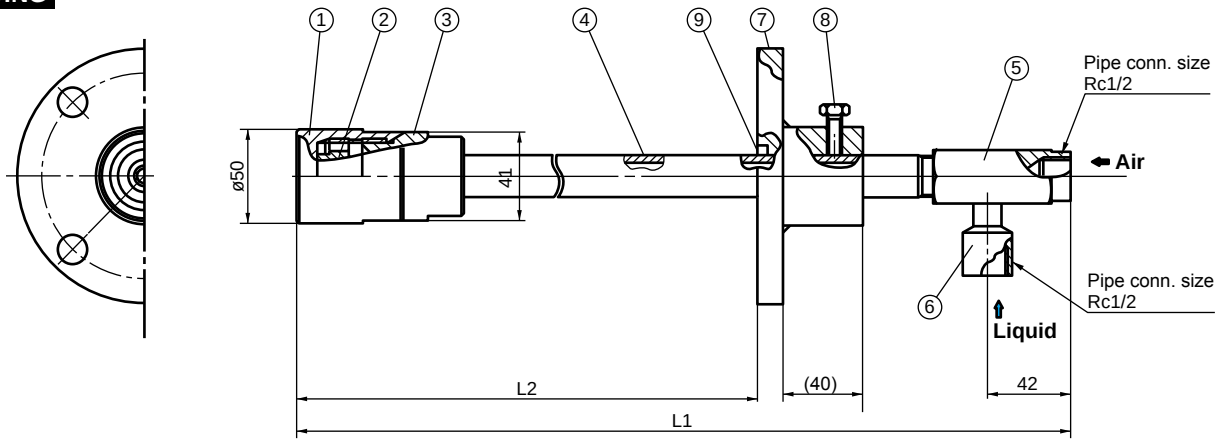
■Full cone spray pneumatic nozzle producing a large volume of semi-fine to semi-coarse atomization with a mean droplet diameter of 130 μm or more.*1
■Large turn-down ratio.
■Uniform spray droplet size distribution across the entire spray area.
■Large free passage diameter minimizes clogging. Ideal for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

DRAWING



■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

No.	Components	Standard materials
6	Liquid socket	S304
7	Flange	S304
8	Bolt	S304
9	Packing	Metal wire reinforced AES wool

DIMENSIONS

Type	Total length L1 (mm)	Length L2 (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.

PERFORMANCE DATA

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)		
		0.05		0.1		0.3		0.5		0.7		Immersion sampling method	Tip orifice	Mixing adaptor	
		Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air			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				

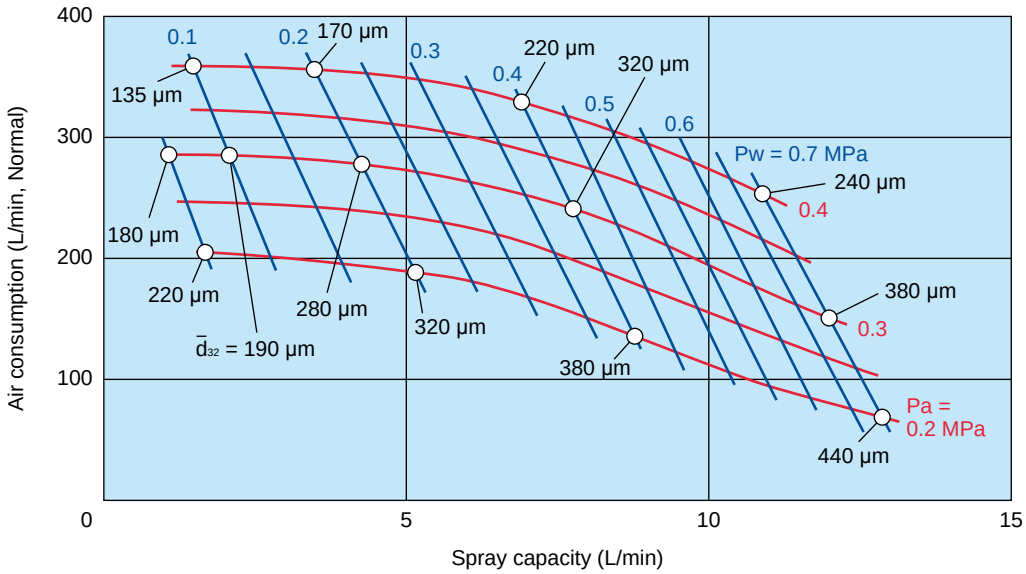
Spray capacity code	Air pressure (MPa)	Spray capacity (L/min) & Air consumption (L/min, Normal) — Liquid pressure (MPa)										Mean droplet diameter (μm)	Free passage diameter (mm)		
		0.05		0.1		0.2		0.3		0.35		Immersion sampling method	Tip orifice	Mixing adaptor	
		Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air			Liquid	Air
24 (LIQ.ø6)	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

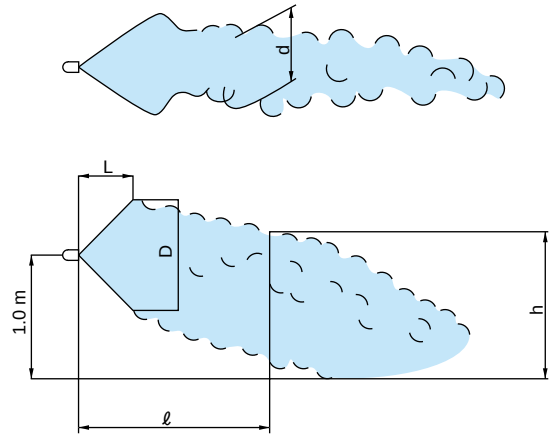
■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
3. Droplet diameter $\bar{d}_{32}$ is Sauter mean diameter measured by the immersion sampling method.



JJA

SPRAY DIMENSIONS



■Spray capacity code: 12

Pressure (MPa)		Spray dimensions (m)					
		L	D	h/d			
Air	Liquid			ℓ = 2.0	ℓ = 3.0	ℓ = 4.0	ℓ = 5.0
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: 24 (LIQ. ø6)

Pressure (MPa)		Spray dimensions (m)					
		L	D	h/d			
Air	Liquid			ℓ = 2.0	ℓ = 3.0	ℓ = 4.0	ℓ = 5.0
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.

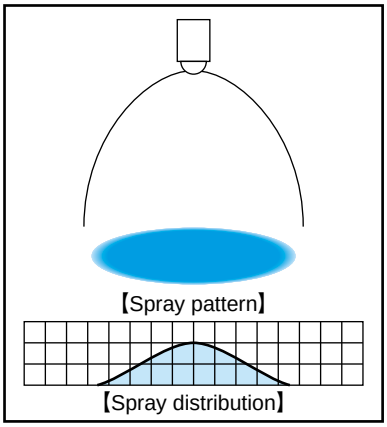
<Example> 1/2F JJA 12 B S316L + 2T10 S304

1/2F	JJA	12	B	S316L	+	2T10	S304
Pipe conn. size (Rc1/2)		Spray capacity code ■12 ■24 (LIQ.ø6)	Type of length ■A ■B ■C ■D ■E (See p.71)	Material of nozzle body		Flange size	Material of Flange

Please send us an inquiry for a different flange size.
For details please ask for our inquiry drawing.

Flat Spray
Semi-Fine, Semi-Coarse Fog Nozzles

DOVVA-G



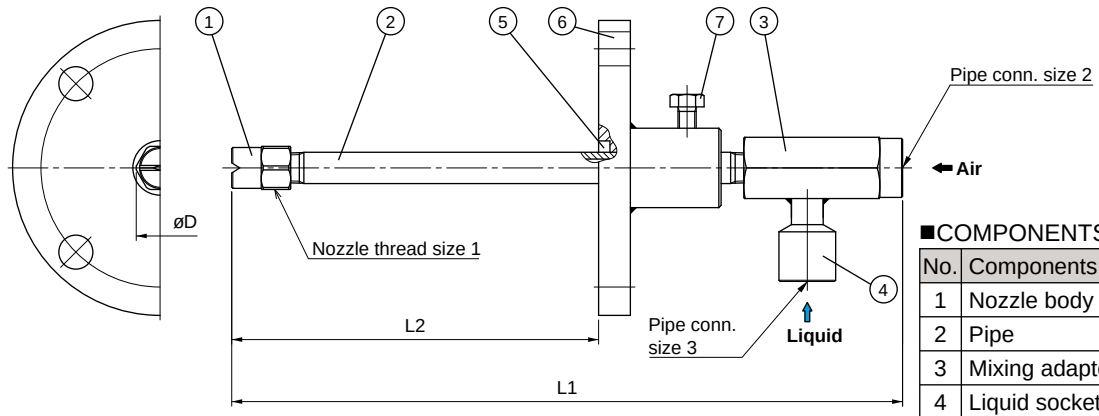
■Flat spray pneumatic nozzle producing semi-fine atomization with a mean droplet diameter of 80 μm or more.*1
■Clog-resistant design due to large free passage diameter is suitable for spraying factory effluents and waste water.
■Simple structure, easy maintenance.

*1) Droplet diameter measured by laser Doppler method

APPLICATIONS

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

DRAWING



■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 øD (mm)	Free passage diameter (mm)			
						Tip 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

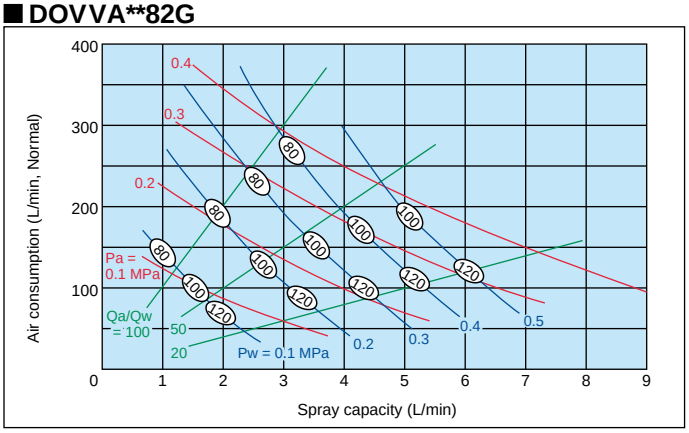
FLOW-RATE DIAGRAMS

■How to read the chart

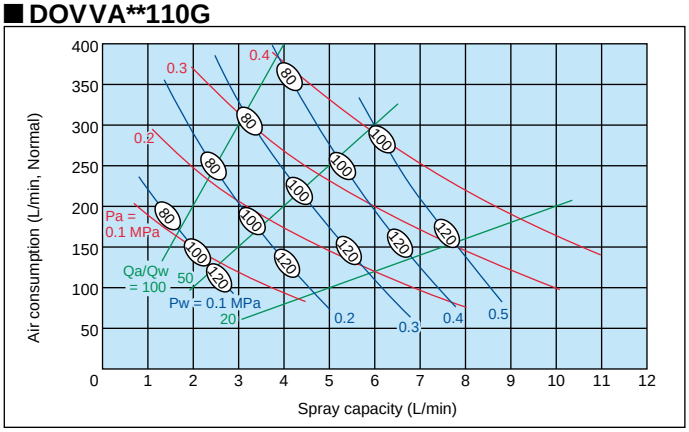
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler 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.

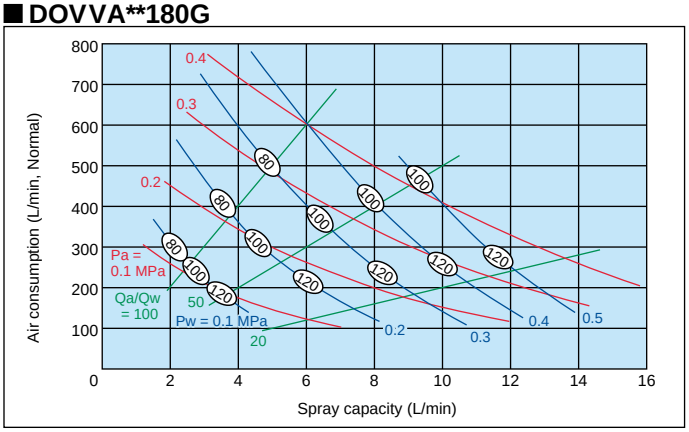
■ DOVVA**82G



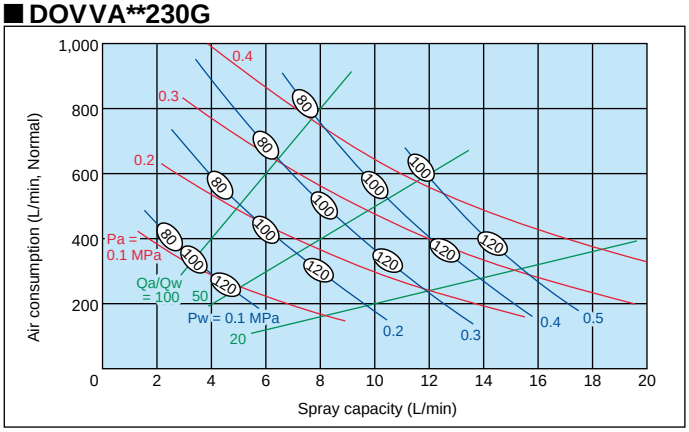
■ DOVVA**110G



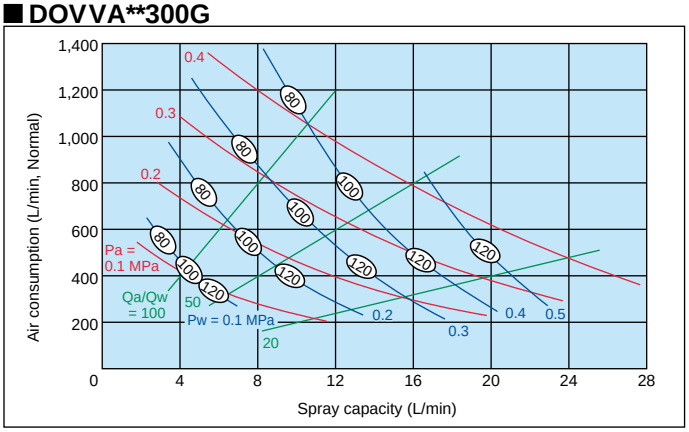
■ DOVVA**180G



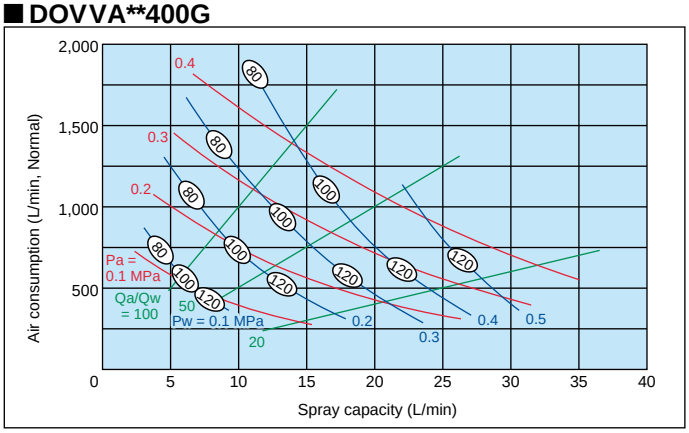
■ DOVVA**230G



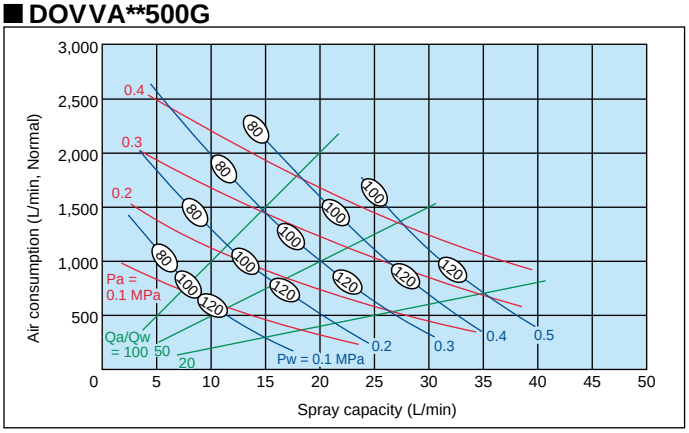
■ DOVVA**300G



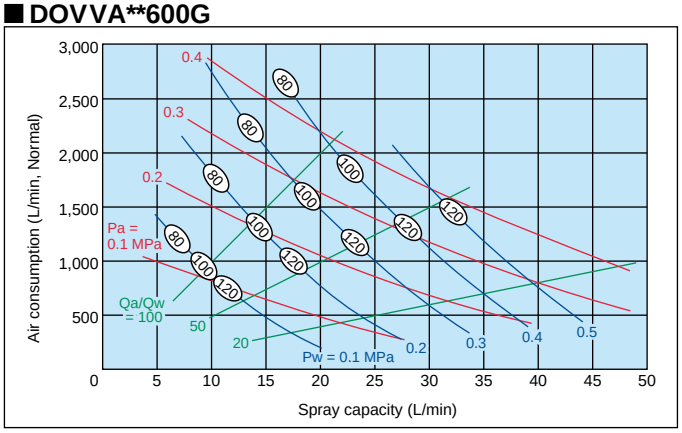
■ DOVVA**400G

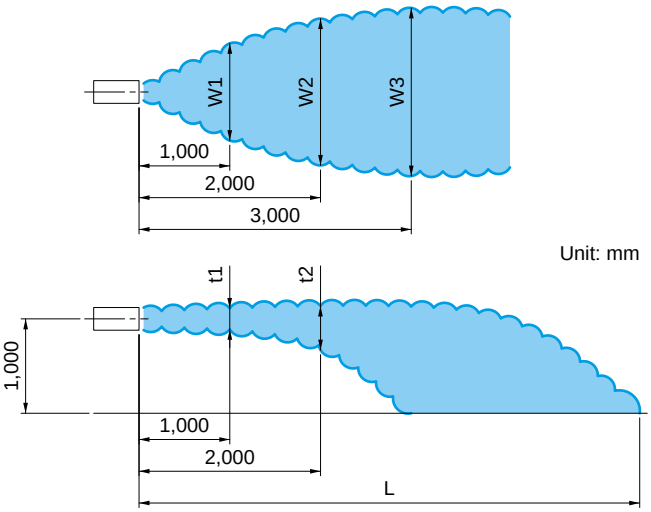


■ DOVVA**500G



■ DOVVA**600G





SPRAY DIMENSIONS

■Spray angle code: 70

Spray capacity code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)					
			W1	W2	W3	t1	t2	L
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
300	0.2	0.2	800	1,100	1,300	400	600	8,000
	0.3	0.3	800	1,100	1,400	400	700	9,000
		0.4	1,000	1,400	1,800	400	700	9,000
	0.4	0.4	900	1,300	1,700	400	800	10,000
		0.5	1,000	1,500	2,000	400	800	10,000
400	0.2	0.2	800	1,100	1,300	400	600	9,000
	0.3	0.3	800	1,100	1,400	400	700	10,000
		0.4	1,000	1,400	1,800	400	700	10,000
	0.4	0.4	900	1,300	1,700	400	800	11,000
		0.5	1,000	1,500	2,000	400	800	11,000
500	0.2	0.2	850	1,150	1,350	400	600	10,000
	0.3	0.3	850	1,150	1,450	400	700	11,000
		0.4	1,050	1,450	1,850	400	700	11,000
	0.4	0.4	950	1,350	1,750	400	800	12,000
		0.5	1,050	1,550	2,050	400	800	12,000
600	0.2	0.2	850	1,150	1,350	400	600	11,000
	0.3	0.3	850	1,150	1,450	400	700	12,000
		0.4	1,050	1,450	1,850	400	700	12,000
	0.4	0.4	950	1,350	1,750	400	800	13,000
		0.5	1,050	1,550	2,050	400	800	13,000

■Spray angle code: 55

Spray capacity code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)					
			W1	W2	W3	t1	t2	L
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
300	0.2	0.2	600	850	1,050	450	700	9,000
	0.3	0.3	650	950	1,150	450	800	10,000
		0.4	800	1,150	1,450	450	800	10,000
	0.4	0.4	700	1,050	1,350	450	900	11,000
		0.5	800	1,250	1,650	450	900	11,000
400	0.2	0.2	600	850	1,050	450	700	10,000
	0.3	0.3	650	950	1,150	450	800	11,000
		0.4	800	1,150	1,450	450	800	11,000
	0.4	0.4	700	1,050	1,350	450	900	12,000
		0.5	800	1,250	1,650	450	900	12,000
500	0.2	0.2	650	900	1,100	450	700	11,000
	0.3	0.3	700	1,000	1,200	450	800	12,000
		0.4	850	1,200	1,500	450	800	12,000
	0.4	0.4	750	1,100	1,400	450	900	13,000
		0.5	850	1,300	1,700	450	900	13,000
600	0.2	0.2	650	900	1,100	450	700	12,000
	0.3	0.3	700	1,000	1,200	450	800	13,000
		0.4	850	1,200	1,500	450	800	13,000
	0.4	0.4	750	1,100	1,400	450	900	14,000
		0.5	850	1,300	1,700	450	900	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> 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)	Material of nozzle body		Flange size	Material of flange	Length between the nozzle head and flange

Nozzle thread size 1
- **■1/4**
- **■3/8**
- **■1/2**
- **■3/4**

Spray angle code
- **■70**
- **■55**

Spray capacity code
- **■82** **■110**
- **■180** **■230**
- **■300** **■400**
- **■500** **■600**

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

Material of nozzle body

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

Material of flange

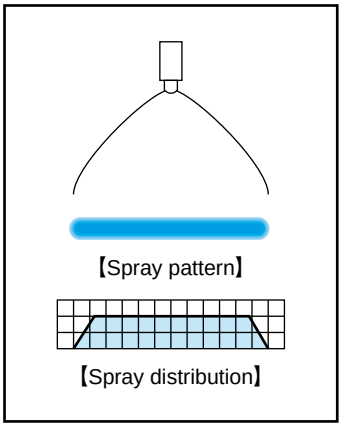
Length between the nozzle head and flange

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 74 for type of length and length L2.
Please send us an inquiry for a different flange size.
For details please ask for our inquiry drawing.

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

VVEA



■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

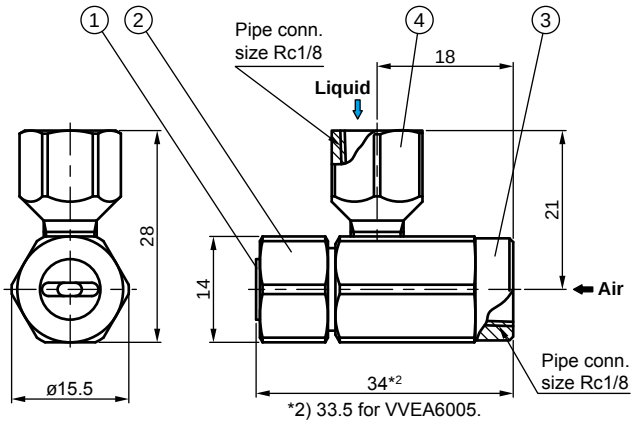
APPLICATIONS

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

DRAWING

Spray angle 60° type

■Mass: 50 g



*2) 33.5 for VVEA6005.

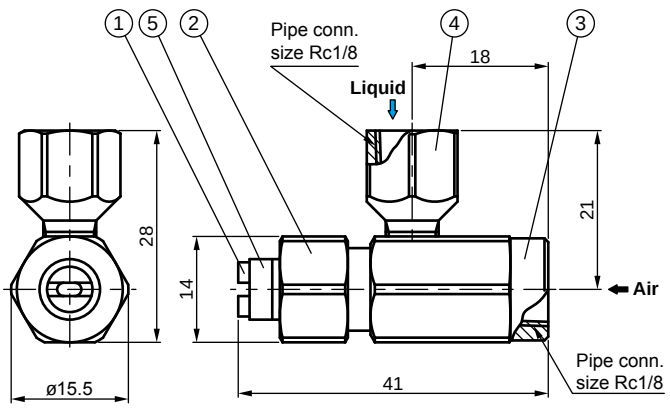
■COMPONENTS AND MATERIALS

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

*3) Optional material: S316

Spray angle 80° type

■Mass: 50 g



■COMPONENTS AND MATERIALS

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

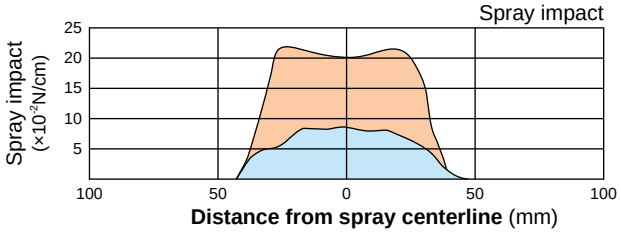
Note: No Sleeve (component# 5) for VVEA8005.

Unit: mm

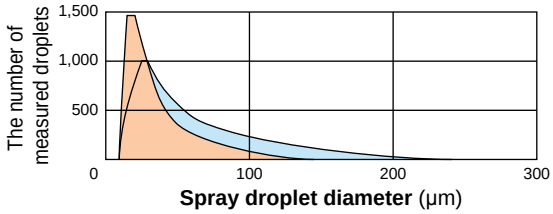
SPRAY IMPACT

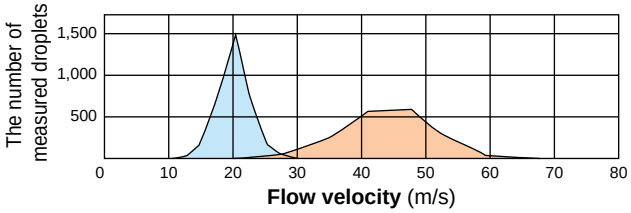
In comparison to a hydraulic spray nozzle with equal spray capacity at the same pressure, VVEA series nozzles achieve a more powerful spray impact (2.5 times higher) with fine droplets (at twice the speed).

■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 nozzle) ○ = VVP6510 (hydraulic nozzle)





PERFORMANCE DATA

Spray angle code*4	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)									
			0.2		0.3		0.5		Laser Doppler method	Tip orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air			Liquid	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				

*4) 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.

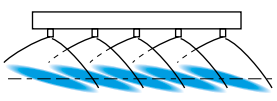
<Example> 1/8 VVEA 6010 S303

1/8 VVEA **60** **10** S303

- **60**: Spray angle code — ■80 ■60
- **10**: Spray capacity code — ■05 ■10 ■20 ■30
- S303: Material

Integrated Spray Header with VVEA series nozzles

VVEA Header



【Spray pattern】

【Spray distribution】

■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.

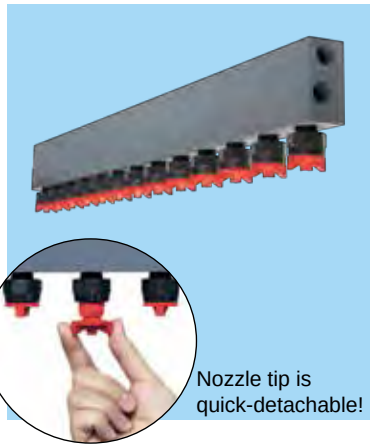
*1) Droplet diameter measured by laser Doppler method

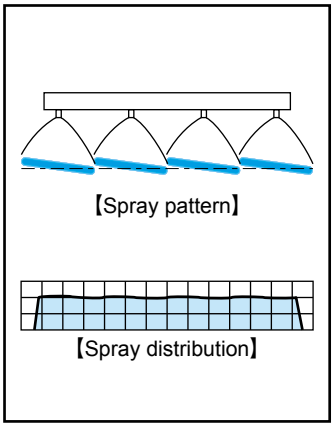
APPLICATIONS

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

High Impact Spray Header with Quick-Detachable Nozzles

INVVEA





- ■Integrated spray header equipped with INVVEA series nozzles producing semi-fine atomization with a mean droplet diameter of 50 μm or more.*1
- ■Provides the same performance as VVEA: high spray impact and uniform distribution with thin flat spray pattern.
- ■Ideal for washing away particles with fine fog spray.
- ■Quick-detachable nozzle tip design helps to greatly reduce maintenance time.
- ■Made of highly chemical-resistant plastic.
- ■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, PC boards
- ■Etching

DRAWING

The drawings below are just a few examples. Dimensions and pipe connection sizes differ depending on the nozzle code, nozzle quantity, nozzle spacing, and other requirements. For details please ask for our inquiry drawing.

*2) The number of fixing screws required increases as the total length gets longer.

*3) The fixing screws should be placed between the nozzles to avoid interference.

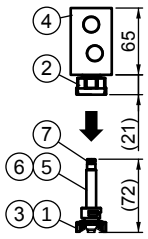
*4) When the total length is more than 1,000 mm, two or more headers are combined into one INVVEA Header.

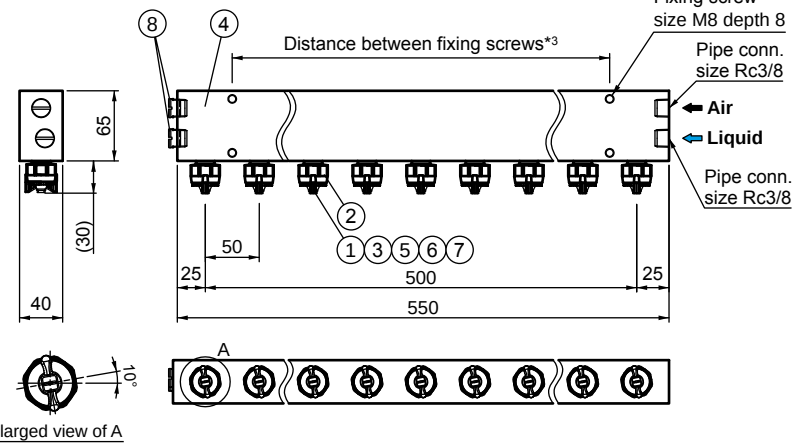
Total length: 1,000 mm or less (available from 150 mm in total length)

Example) INVVEA6010PP+PPS+11(P50)550(10°)HTPVC

Space required to remove a nozzle tip

To detach a nozzle tip set of component# 1+3+5+6+7 from the header for replacement or maintenance, a space of 93 mm and more is required in the vertical downward direction.



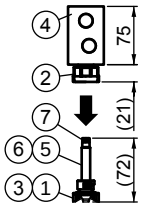


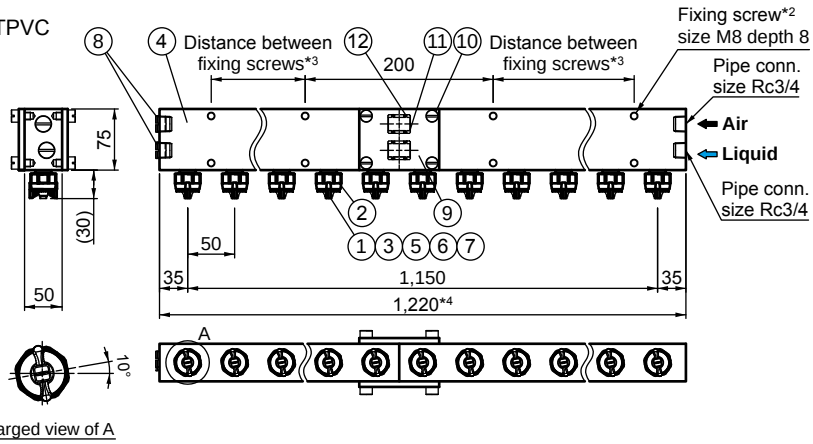
Total length: 1,000 mm or more

Example) INVVEA6010PP+PPS+24(P50)1220(10°)HTPVC

Space required to remove a nozzle tip

To detach a nozzle tip set of component# 1+3+5+6+7 from the header for replacement or maintenance, a space of 93 mm and more is required in the vertical downward direction.





■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle tip	PP
2	Adaptor	PPS
3	Packing	FEPM equivalent
4	Header	HTPVC
5	Mixing adaptor	PP
6	O-ring	FEPM equivalent

No.	Components	Standard materials
7	O-ring	FEPM equivalent
8	Plug	HTPVC
9	Plate	HTPVC
10	Bolt	HTPVC
11	Joint	HTPVC
12	O-ring	FEPM equivalent

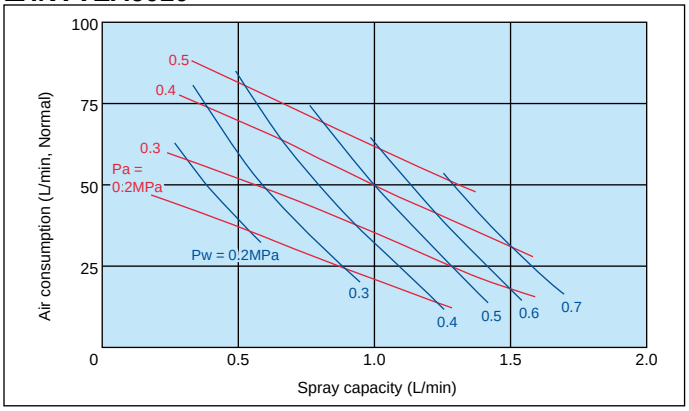
Unit: mm

FLOW-RATE DIAGRAMS

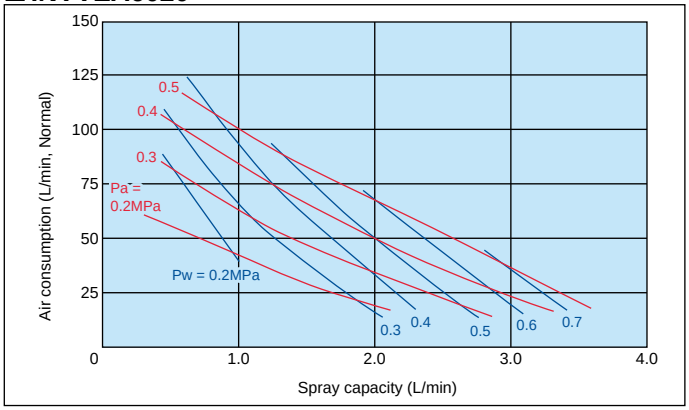
■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.

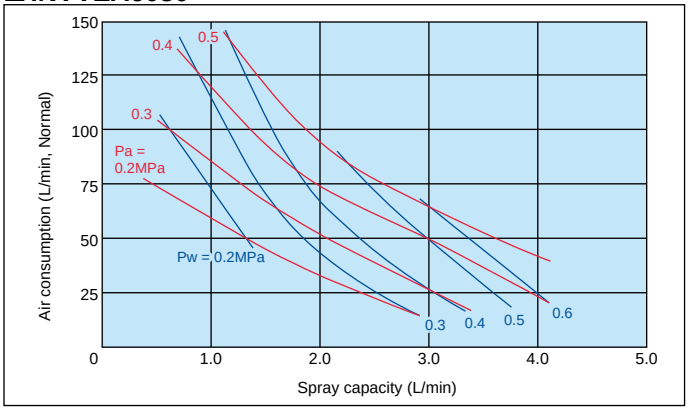
■ INVVEA6010



■ INVVEA6020



■ INVVEA6030



PERFORMANCE DATA

Spray angle code *5	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) Tip 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					

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

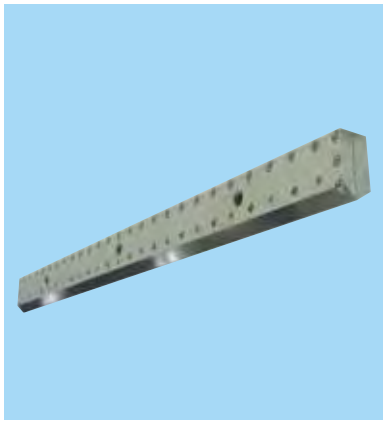
HOW TO ORDER

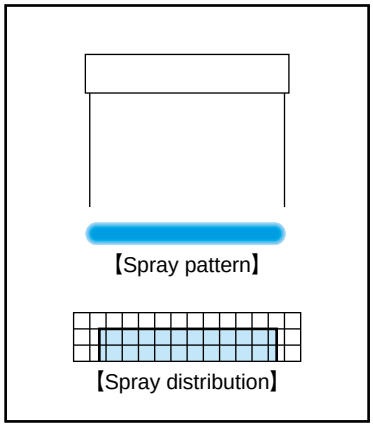
To determine the specifications, please specify a spray capacity code, nozzle quantity, nozzle spacing and more, using this coding system.

<Example> INVVEA 6010 PP + PPS + 11 (P50) 550 (10°) HTPVC

INVVEA	60	10	PP	+	PPS	+	11	(P	50	)	550	(	10°	)	HTPVC
	Spray angle code	Spray capacity code ■10 ■20 ■30	Material of nozzle tip		Material of adaptor		Nozzle quantity		Nozzle spacing		Total length		Offset angle ■10° ■0°(Blank denotes 0°.)		Material of header

For details please ask for our inquiry drawing.



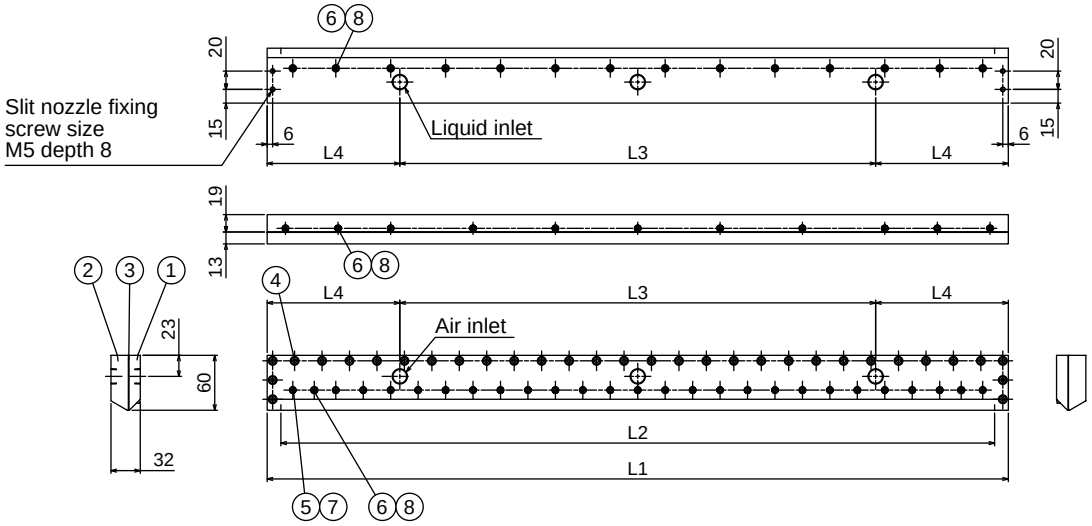


■Pneumatic slit-laminar nozzle with high spray impact.
■Uniform spray distribution throughout the entire spray pattern area allows for a complete cleaning with no spot unwashed.
■PSN series can be used at a short spray distance.

APPLICATIONS

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

DRAWING



■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle body (Air inlet side)	S304
2	Nozzle 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

Nozzle code		Number of inlets - Inlet thread size		L1*1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	Mass (kg)
Slit length L2 (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

*1) Total length L1 available from 250 to 3,200 mm.

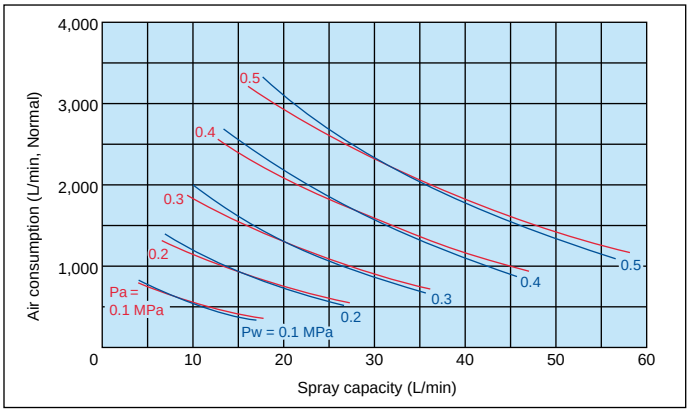
FLOW-RATE DIAGRAMS

■How to read the chart

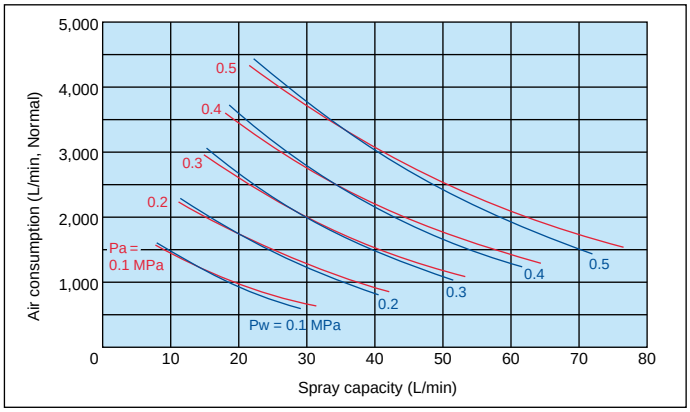
1. The air consumption and spray capacity shown are for one nozzle per 1,000 mm of slit length.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.

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)

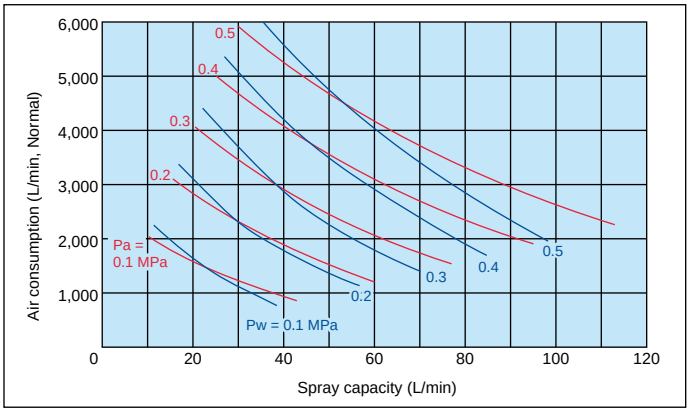
■ Slit opening: 0.05 mm



■ Slit opening: 0.1 mm



■ Slit opening: 0.15 mm



PSN

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 ■2 ■3 ■5		Inlet thread size (3/8F = Rc3/8)		Slit length ■460 ■600 ■700 ■780 ■1200		Slit opening ■0.05 ■0.1 ■0.15	Material of nozzle body

Please feel free to send us an inquiry for a different slit length.

Medium Capacity
Impinging-type Fine Fog 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.

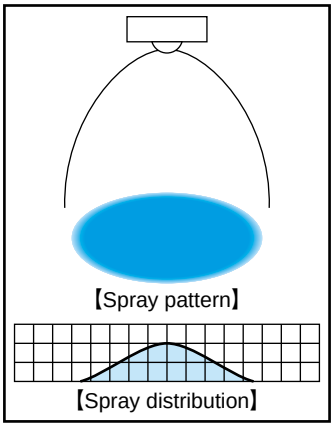
■Medium spray capacity AKIJet® series nozzle is an internal mixing type (compressed air and liquid are mixed inside the nozzle for atomization).

Contents

Medium Capacity Impinging-type Fine Fog Nozzles

AKIJet®

AKIJet® with T-type adaptor



■Capable of producing non-wetting "Dry Fog" with a mean droplet diameter of 10 μm or less.*1
■Fog stream, sprayed out from the two orifices apart, collides with each other and are further atomized by ultrasonic waves, resulting in creation of a uniform distribution of fine droplet sizes.
■Using a special mixing adaptor, AKIJet® can mix two different liquids outside of the orifices while spraying.

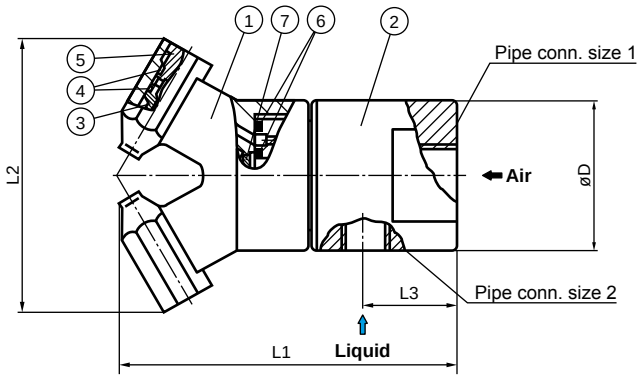
*1) Droplet diameter measured by the immersion sampling method.
Please see pages 6–7 for comparison with laser Doppler method.

APPLICATIONS

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

DRAWING

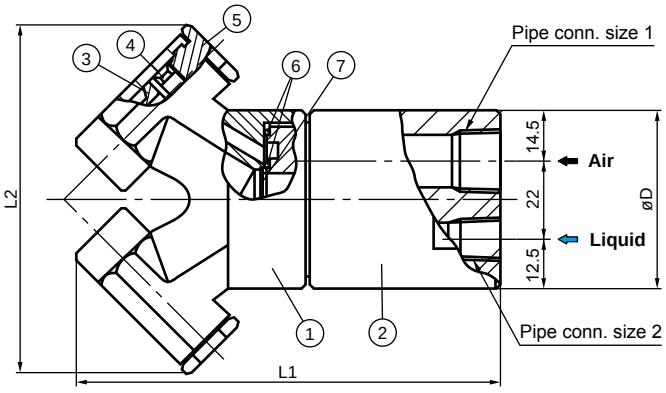
AKI37 S303 + TS303
AKI75 S303 + TS303



■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle body	S303 equivalent
2	Adaptor	S303
3	Nozzle tip	S303
4	O-ring	FKM
5	Plug	S303
6	Packing	PTFE
7	Strainer	S316

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



■COMPONENTS AND MATERIALS

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

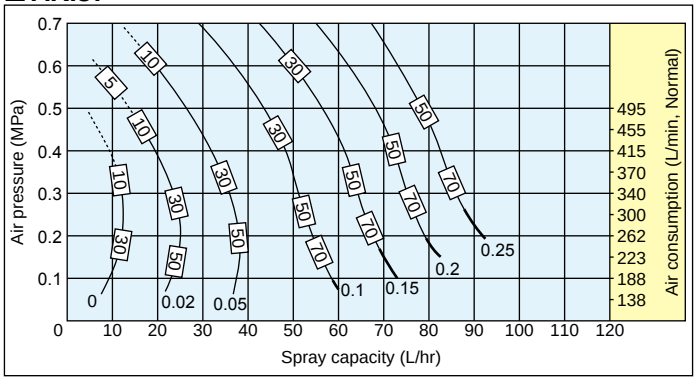
DIMENSIONS

Nozzle code	L1 (mm)	L2 (mm)	L3 (mm)	øD (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

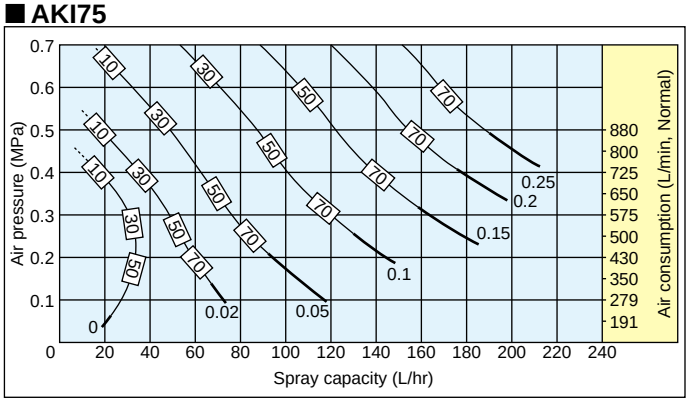
FLOW-RATE DIAGRAMS

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

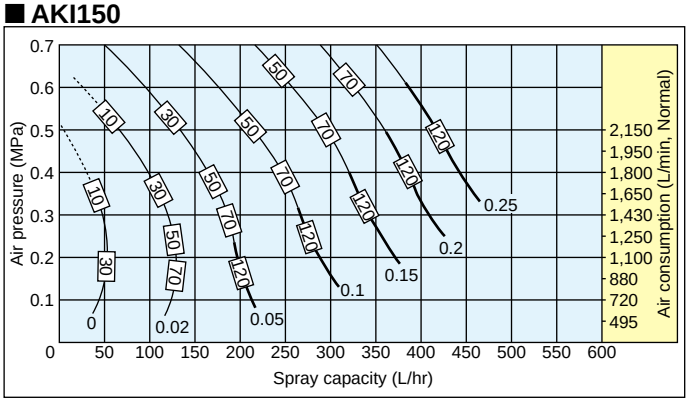
■ AKI37



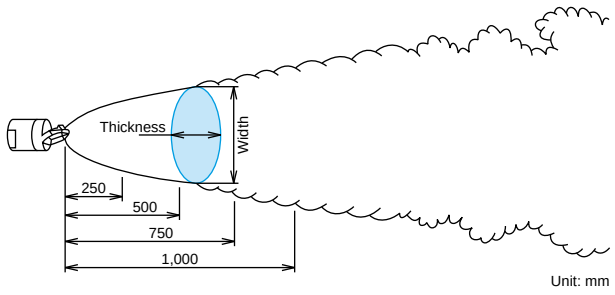
■ AKI75



■ AKI150



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.

HOW TO ORDER Please inquire or order for a specific nozzle as follows.

AKI37 S303 + TS303

AKI75 S303 + TS303

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

Blower-Air Driven
Ultra-Low Pressure Nozzles

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

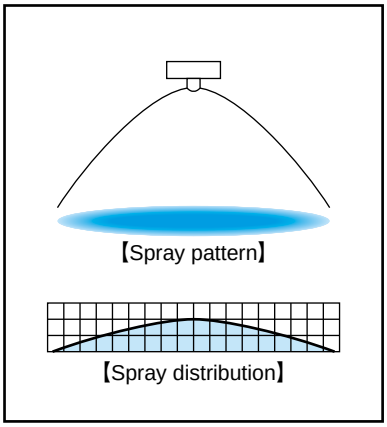
■Save on installation and operational costs due to utilization of blowers.

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

Contents

Ultra-Low Pressure
Flat Spray Fine Fog Nozzles

BAVV



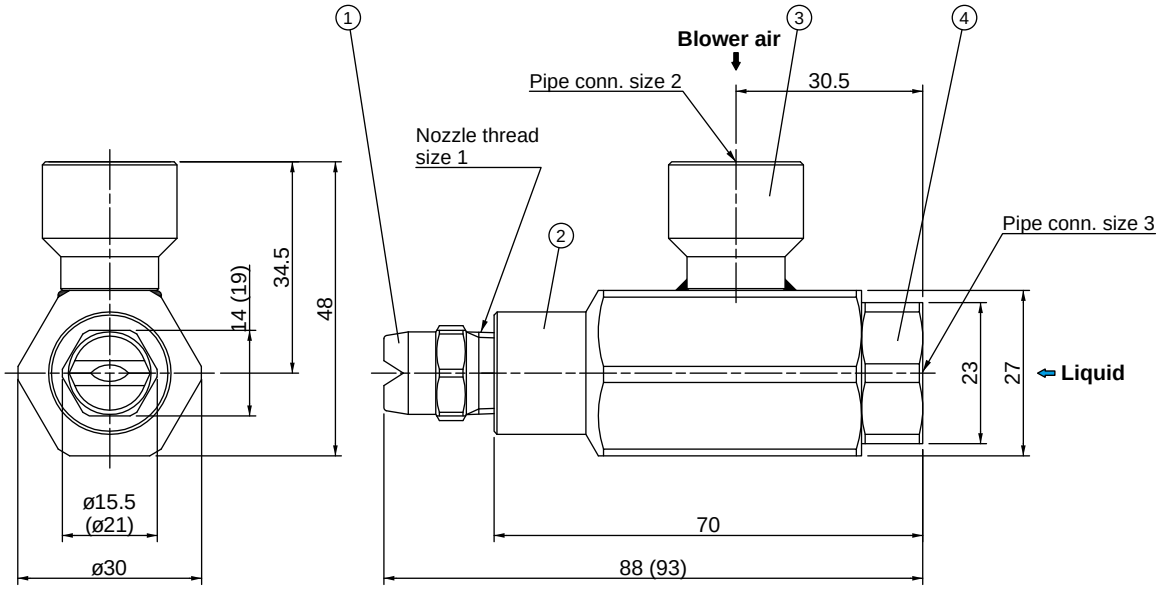
■Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 40 μm or more.*1
■Low operating costs due to the use of blower air for atomization.
■Large free passage diameter for minimal clogging.

*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

DRAWING



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 body	S303
2	Mixing adaptor	S304
3	Air socket	S304
4	Liquid socket	S303

Unit: mm

DIMENSIONS PERFORMANCE DATA

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)						Free passage diameter (mm)			Mass (g)
						Liquid pressure (MPa)									
						0.02		0.03		0.04		Tip 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

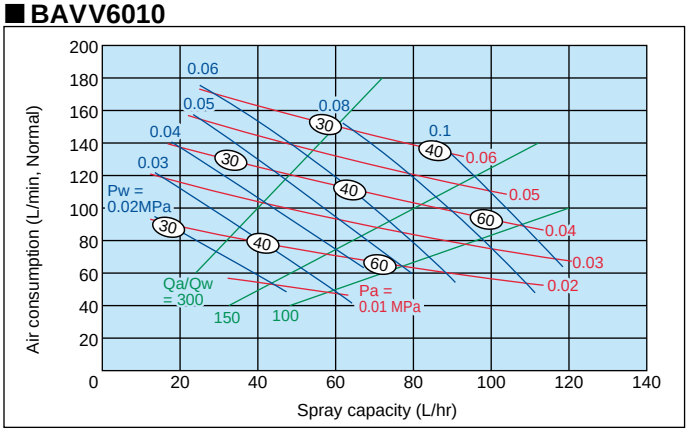
■How to read the chart

1. The spray capacity shown is for one nozzle.

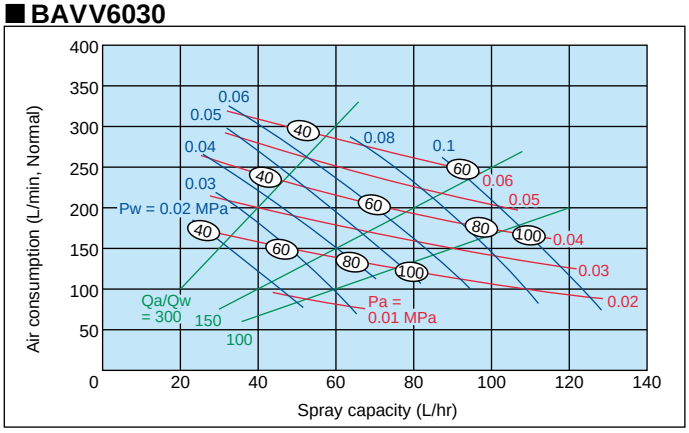
2. Red lines (—) represent blower air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.

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

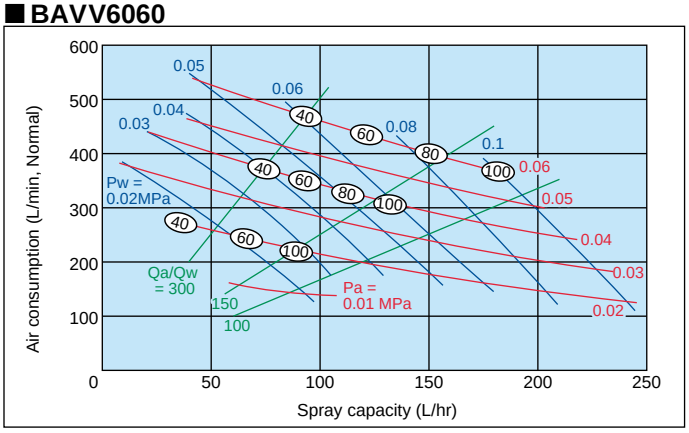
■BAVV6010



■BAVV6030



■BAVV6060



BAVV

HOW TO ORDER

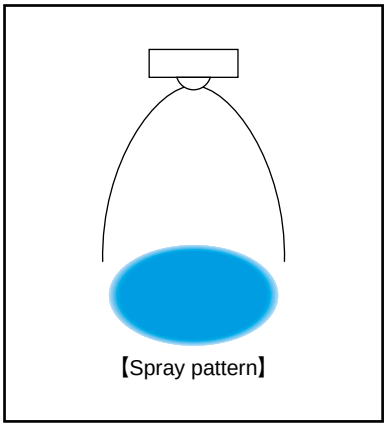
Please inquire or order for a specific nozzle using this coding system.

<Example> BAVV 6010 S303

BAVV	60	10	S303
	Spray angle code	Spray capacity code	Material of nozzle body

■**10**
■**30**
■**60**

Ultra-Low Pressure Semi-Fine Fog Nozzles



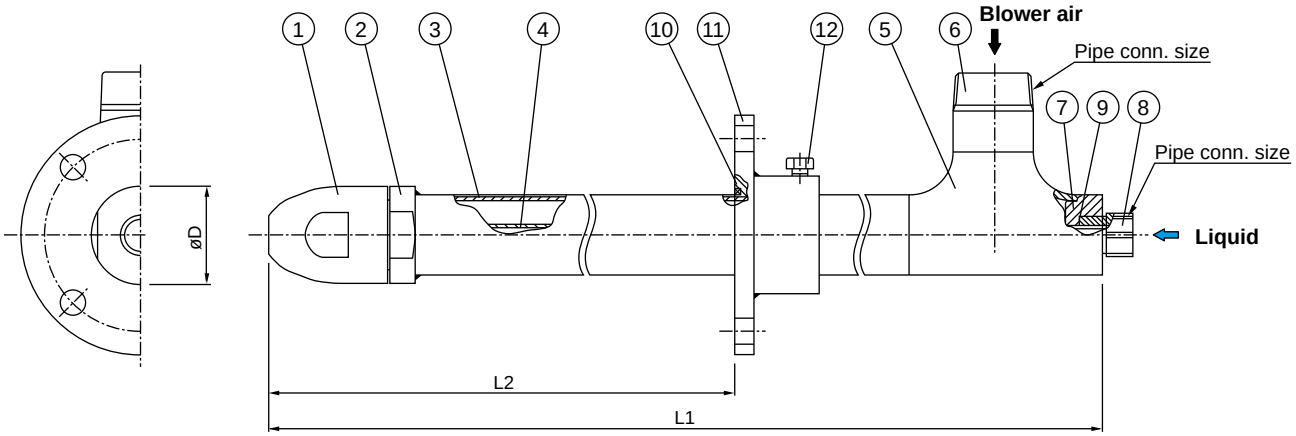
■Pneumatic spray nozzle, utilizing low-cost blower air for atomization, reduces operating cost to about 1/2 to 2/3 that of compressed air driven nozzles.
■Produces semi-fine atomization having no large droplets. When the mean droplet diameter is 80 μm, the maximum droplet diameter is 180 μm.*1
■Compact and lightweight design.
■Spray angle of 20°.

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

APPLICATIONS

■Cooling: Gas, refractories

DRAWING



■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

Nozzle code	Pipe connection size		Outer diameter øD (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)	
			Nozzle code	
			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)

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

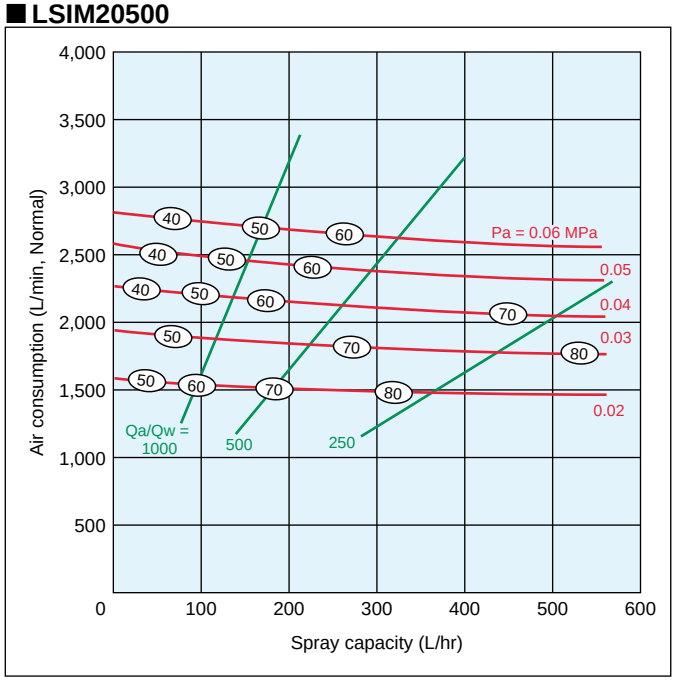
Flange for Nozzle code 201000
JIS5K 3B: 3.7 kg

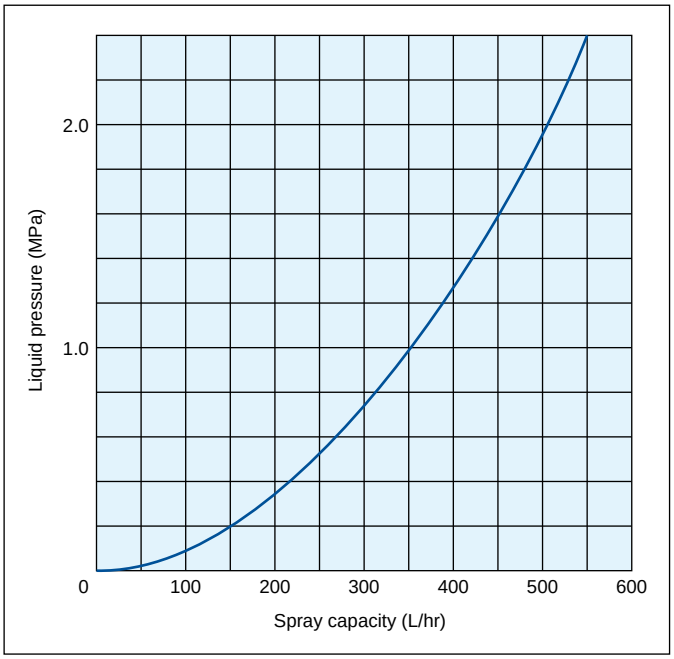
FLOW-RATE DIAGRAMS

■How to read the chart

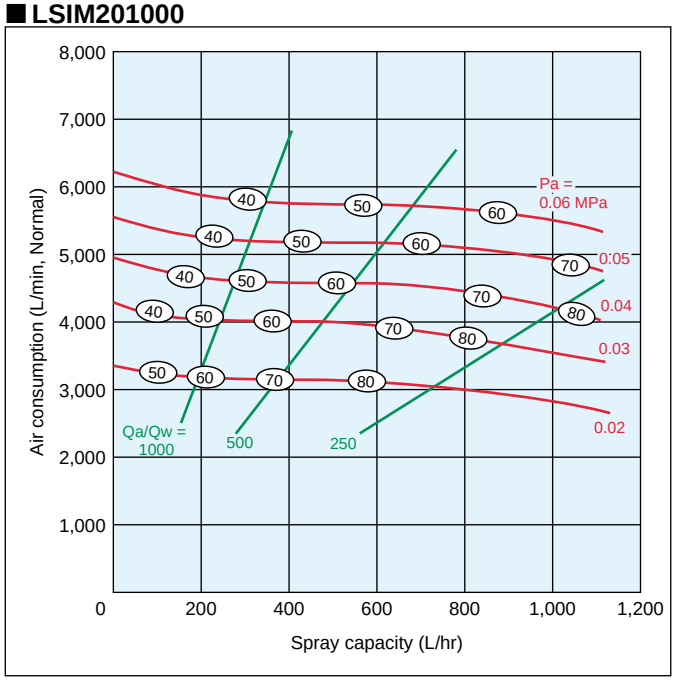
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent blower air pressures Pa in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.
4. Relation between liquid pressure and spray capacity of each nozzle is shown (as blue line) in the graphs to the right of flow-rate diagrams.

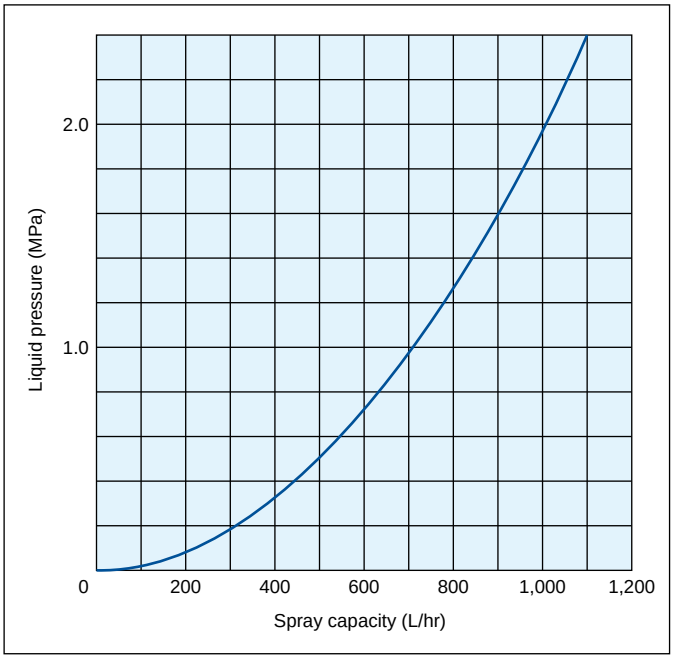
■ LSIM20500





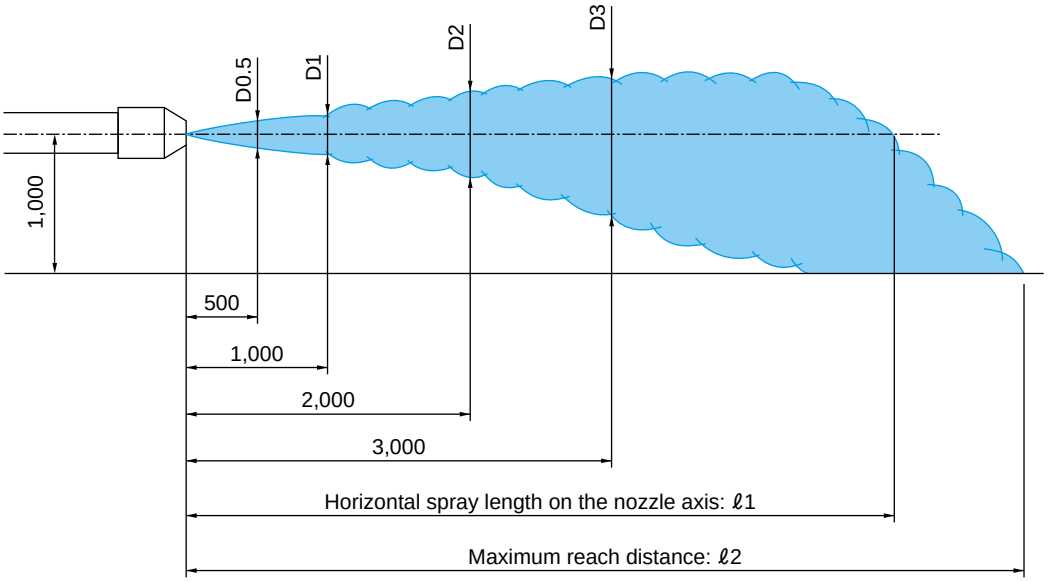
■ LSIM201000





LSIM

SPRAY DIMENSIONS



Unit: mm

Nozzle code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)					
			D0.5	D1	D2	D3	ℓ1	ℓ2
LSIM20500	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
LSIM201000	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

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> LSIM20500 C S316L + 2*1/2T5 S304 (L2)

LSIM	20500	C	S316L	+	2*1/2T5	S304	(L2)
	Nozzle code ■**20500** ■**201000**	Type of length (Total length) ■**A** ■**B** ■**C** ■**D**	Material of nozzle tip		Flange size ■**2*1/2T5** ■**3T5**	Material of Flange	Length between the nozzle head and flange

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

Please send us an inquiry for a different flange size.

See the drawing and table on page 90 for type of length and length L2.
For details please ask for our inquiry drawing.

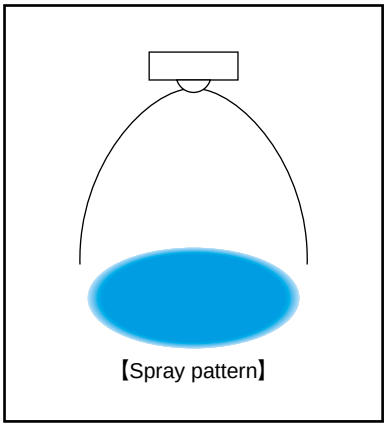
Steam-Driven Nozzles

■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

Steam-Driven Nozzles

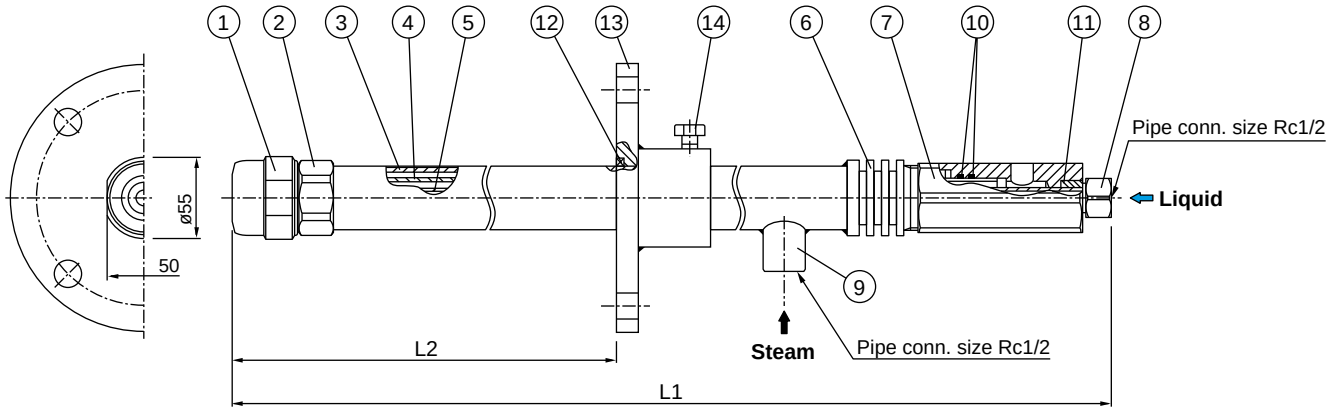


■Innovative pneumatic nozzles using steam instead of compressed air to produce semi-fine atomization.

APPLICATIONS

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

DRAWING



■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

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 L1 (mm)	Length L2 (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

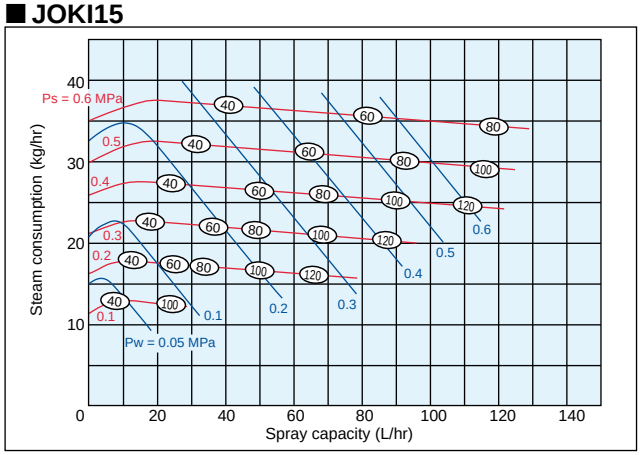
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent steam pressures Ps in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
3. Figures in ovals ⬭ indicate Sauter mean diameters (μm) measured by the immersion sampling method.
   (See pages 6–7 for comparison with laser Doppler method.)

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

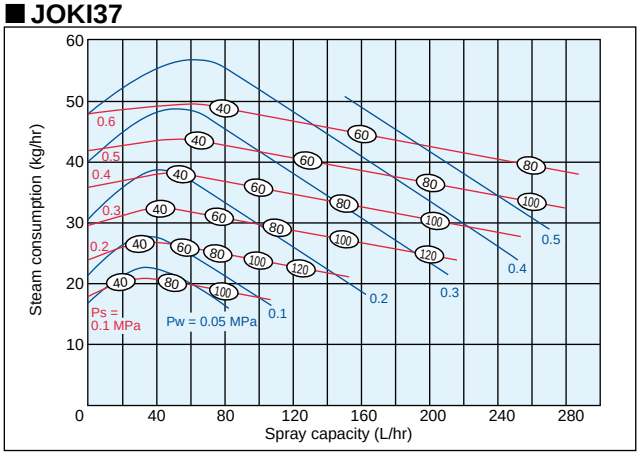
Note for spray control

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.

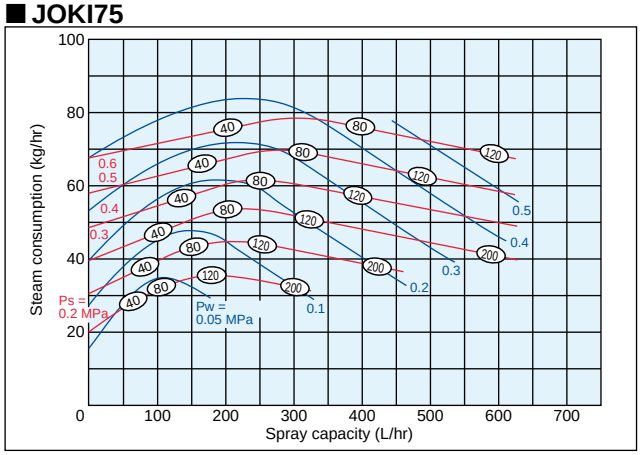
■ JOKI15



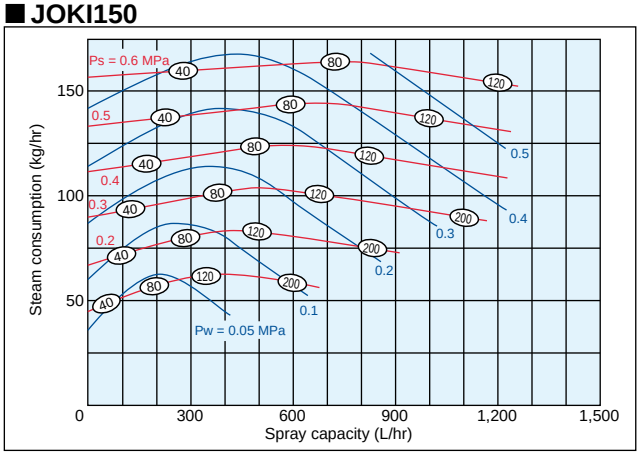
■ JOKI37



■ JOKI75



■ JOKI150



HOW TO ORDER

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

<Example> JOKI15 A S316L + 2*1/2T10 S304 (L2)

JOKI	15	A	S316L	+	2*1/2T10	S304	(L2)
	Spray capacity code	Type of length (Total length)	Material of nozzle body		Flange size	Material of flange	Length between the nozzle head and flange
	■15 ■37 ■75 ■150	■A ■B ■C ■D					

(See p.94)

Please send us an inquiry for a different flange size.
For details please ask for our inquiry drawing.

■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

■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)

	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

■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

	cm^3	L (Liter)	m^3 (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

いけうち

"The Fog Engineers"

H. IKEUCHI & CO., LTD.

ISO9001:2015 certified
(H. IKEUCHI & CO., LTD., Japan only)

Headquarters

Daiichi Kyogyo Bldg., 1-15-15, Awaza, Nishi-ku, Osaka 550-0011, Japan
Tel: 81-6-6538-4015 Fax: 81-6-6538-4022
Email: overseas@kirinoikeuchi.co.jp
URL: https://www.kirinoikeuchi.co.jp/eng/

Overseas network

IKEUCHI USA, INC.

4722 Ritter Avenue, Blue Ash, OH 45242, USA
Tel: 1-513-942-3060 Fax: 1-513-942-3064
info@ikeuchi.us
https://www.ikeuchi.us/
Georgia Office Tel: 1-706-850-3332 Fax: 1-706-850-3309

IKEUCHI EUROPE B.V.

Merwedeweg 6, 3621 LR, Breukelen, The Netherlands
Tel: 31-20-820-2175
info@ikeuchi.eu
https://www.ikeuchi.eu/

PT. IKEUCHI INDONESIA

Ruko Rodeo Drive, Jl. Hollywood Boulevard Blok B6 No. 18 & 19,
Jababeka, Bekasi, Jawa Barat 17530 Indonesia
Tel: 62-21-8938-4201 (or 4202)
sales@ikeuchi.id
https://www.ikeuchi.id/

SIAM IKEUCHI CO., LTD.

909 Ample Tower Bldg. 8FL., Unit 8/2, 8/3, Debaratana Road,
Bangna Nuea, Bangna, Bangkok 10260 Thailand
Tel: 66-2-348-3801 Fax: 66-2-348-3802
thai@ikeuchi.co.th
https://www.ikeuchi.co.th/

IKEUCHI (SHANGHAI) CO., LTD.

Room C, 21F, Electrical & Mechanical Bldg.,
600 Hengfeng Road, Shanghai 200070, P.R.China
Tel: 86-21-6140-9731 Fax: 86-21-6123-4239
mist@kirinoikeuchi.com
http://www.kirinoikeuchi.com/
Tianjin Branch Tel: 86-22-2320-1676 Fax: 86-22-2320-1675
Shenzhen Branch Tel: 86-755-8525-2221 Fax: 86-755-8525-2215
Wuhan Branch Tel: 86-27-8558-8299 Fax: 86-27-6560-5099

IKEUCHI TAIWAN CO., LTD.

11F-1, No, 27, Sec. 1, Chung Shan N. Rd., Taipei 10441,
Taiwan, R.O.C.
Tel: 886-2-2511-6289 Fax: 886-2-2541-6392
sales@ikeuchi.com.tw
http://www.ikeuchi.com.tw/