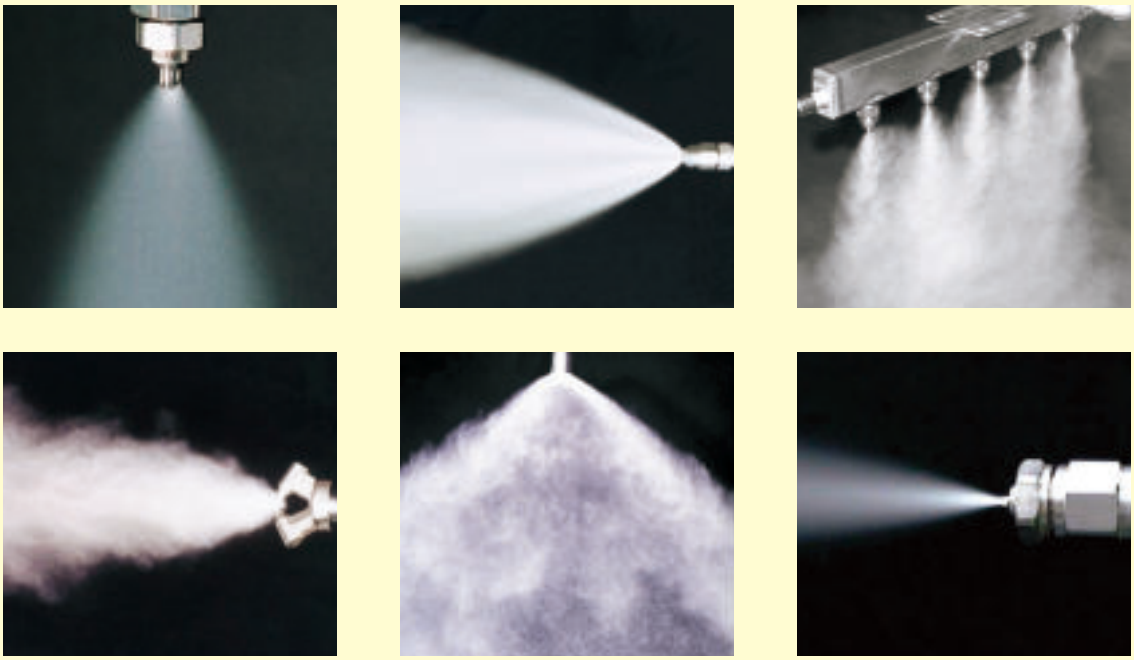
PA-8_231030E Rev.1

IKEUCHI

Pneumatic Spray Nozzles



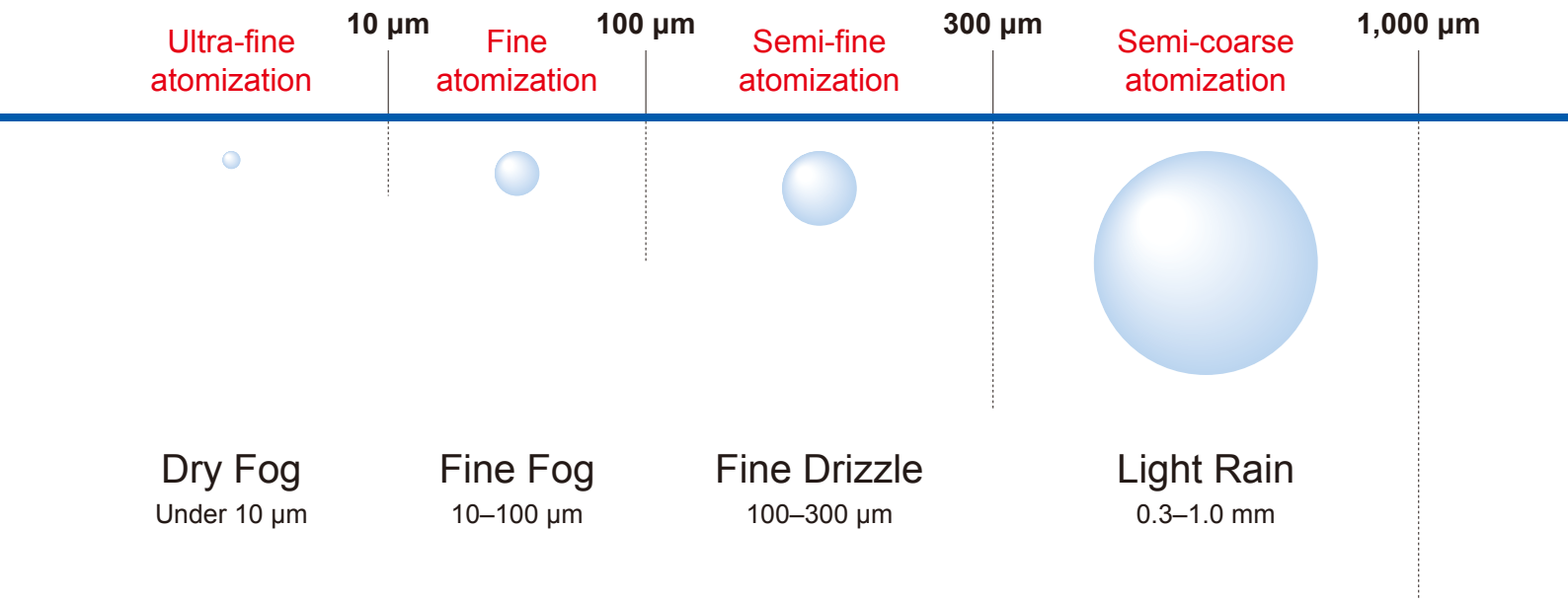
"The Fog Engineers"

H. IKEUCHI & CO., LTD.

23PA

Although there are many opinions on the classification of spray droplet sizes, IKEUCHI, "The Fog Engineers", classify them as shown below so that we are able to offer fog as an industrial material.

Fog Classification System



Dry Fog
Under 10 μm

Fine Fog
10–100 μm

Fine Drizzle
100–300 μm

Light Rain
0.3–1.0 mm

This classification is based on the spray droplet size, by measuring the spray droplet diameter with the immersion sampling method.
For comparison with other measuring methods, see the correlation of spray droplet diameter between measuring methods on page 8.

Coarse atomization

Rain–Storms

Over 1.0 mm

CONTENTS

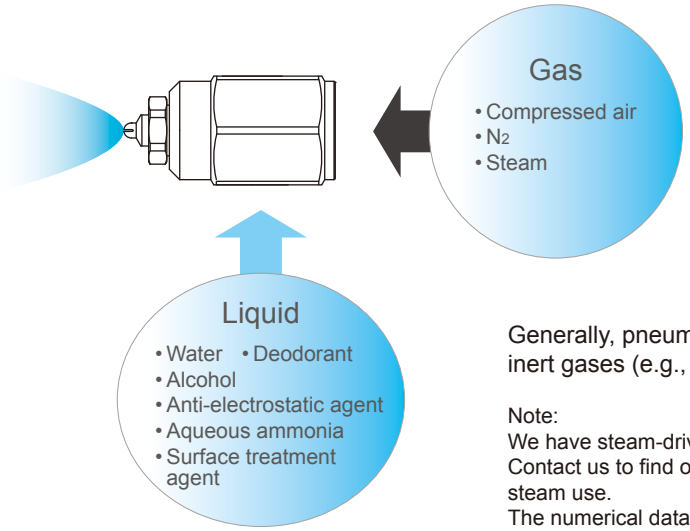
Scan a QR code on each product page to access its 3D CAD models available on the website of PARTCommunity. Sign up for an account for free.

https://ikeuchi.partcommunity.com/3d-cad-models/?languageIso=en&info=ikeuchi/metric_unit/2_fluid_nozzle

For Effective Use of Pneumatic Spray Nozzles

Pneumatic spray nozzles utilize a high-velocity flow of compressed air for atomizing liquids, and there are various types of pneumatic spray nozzles. Select optimal spray nozzles that meet your purpose.

Mechanism of Pneumatic Spray Nozzles



Generally, pneumatic spray nozzles are driven by compressed air, but inert gases (e.g., N_2) or steam can also be used.

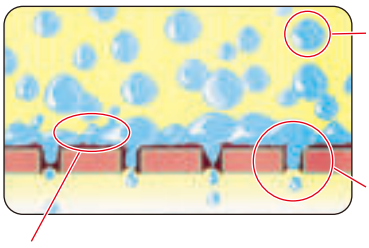
Note:
We have steam-driven pneumatic spray nozzles, JOKIJet series available. Contact us to find out whether each series other than JOKIJet is compatible with steam use.
The numerical data in this catalog are based on compressed air and tap water at room temperature, unless otherwise specified.

Various Applications

When fine atomization is required

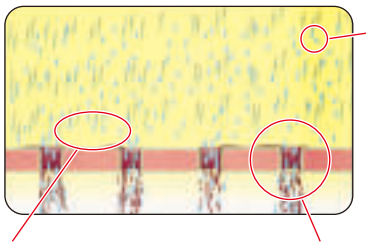
■ In cleaning process

●Cleaning with hydraulic nozzles



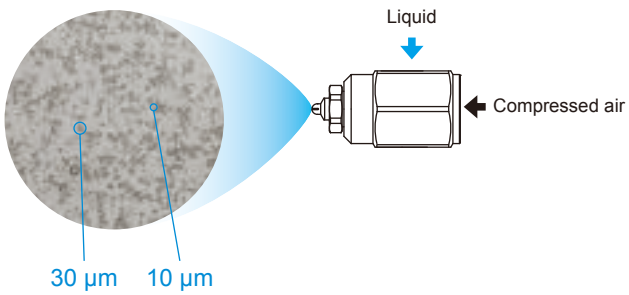
Puddles generated on the surface

●Cleaning with pneumatic nozzles



Atomized air blows off puddles

Precise cleaning with high-impact, high-velocity fine fog spray using air



Advantages of Pneumatic Spray Nozzles

Excellent atomizing performance

Pneumatic spray nozzles are capable of producing fine atomization with a mean droplet diameter of 10 μm or less.[*1]

[*1] See pages 7–8 for droplet sizes and their measuring methods.

Large turn-down ratio

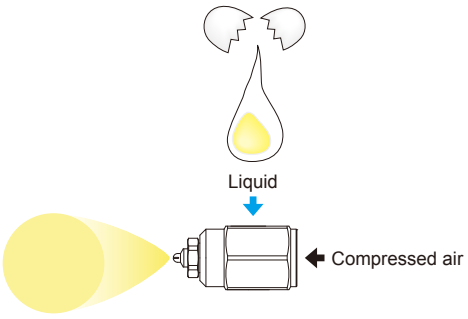
Pneumatic spray nozzles have a large turn-down ratio of spray flow rate[*2] with little variation in spray droplet size and flow distribution, which is ideal for spray flow adjustable nozzles.

[*2] Spray flow rate is expressed as spray capacity in this catalog. See page 4 for the turn-down ratio.

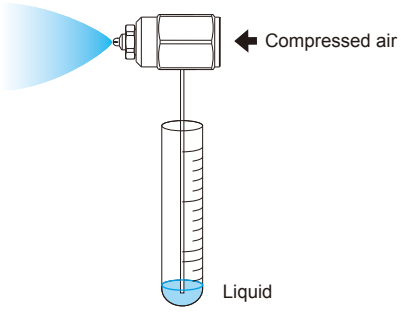
Large free passage diameter

Pneumatic spray nozzles have a larger free passage diameter than hydraulic spray nozzles, which is effective for clog prevention.

When spraying viscous liquid



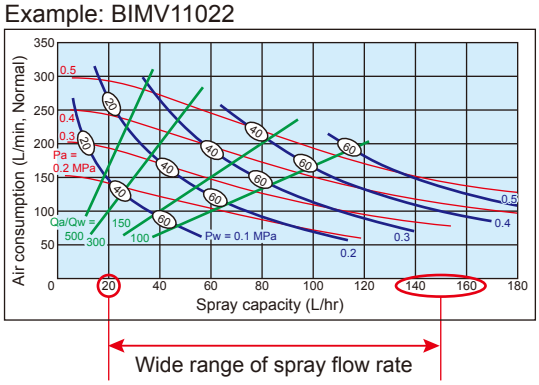
When extremely small spray capacity is required



When a large turn-down ratio is required

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

Example: BIMV11022



●Contact us for HACCP compliance.

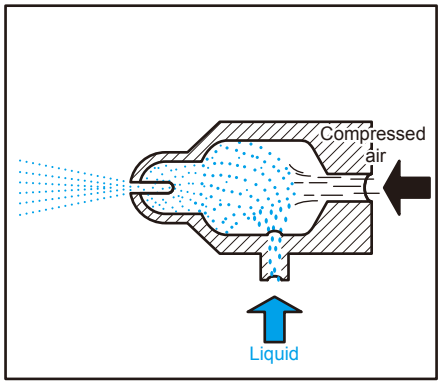
Advantages of Pneumatic Spray Nozzles

Air-liquid Mixing Systems for Excellent Atomization

There are three types of air-liquid mixing systems for atomizing liquid: internal mixing type, external mixing type, and impinging type, depending on the mixing method of compressed air and liquid.

Internal Mixing Type

Compressed air and liquid are mixed inside the nozzle and atomized. Generally, this type has excellent atomizing performance.
Internal mixing type is further classified into the following three types.



Inner air type

Inside the nozzle, compressed air flows in the center while liquid flows along its circumference. Its larger liquid passage diameter effectively prevents clogs.

Outer air type

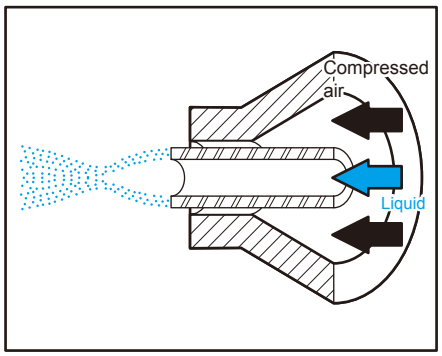
Inside the nozzle, liquid flows in the center while compressed air flows along its circumference. This common type can have a larger orifice size, resulting in slightly coarser spray droplet sizes.

Pre-mix type

Air and liquid mix before reaching the orifice. Even at low air-water ratios, droplet velocity accelerates prior to the orifice, resulting in a stronger impact force. Additionally, this nozzle type has a larger turn-down ratio, making it suitable for cooling objects at high temperatures.

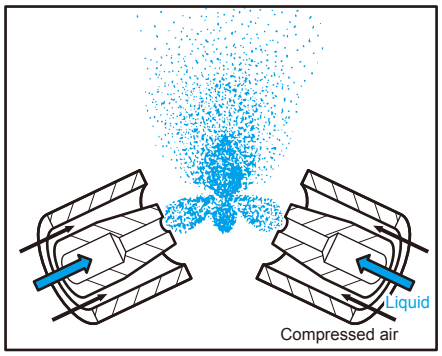
External Mixing Type

Compressed air and liquid are mixed outside the nozzle. In general, this type of nozzle is highly resistant to clogging.
External mixing type is further classified into the inner air type and the outer air type.



Impinging Type

Air-stream entraining fine fog jets out from the nozzle and impinges against another air-stream of the same property, shattering the fog into even finer, more uniform droplets.
This is IKEUCHI's unique system.

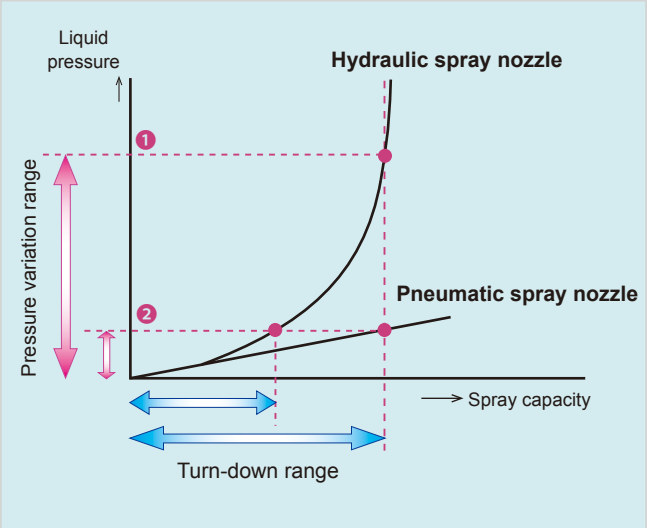


Turn-down Ratio

The turn-down range is a range of adjustable spray capacity, and the ratio of its minimum to maximum spray capacity is referred to as the turn-down ratio.

To cover a wide range of spray capacity with a single nozzle, it is not practical to use a hydraulic spray nozzle because it requires a huge pressure increase (❶ in the figure).
Pneumatic spray nozzles are adjustable in both air and liquid pressures, allowing adjustment of the spray capacity with minimum pressure change (❷ in the figure).

Thus, pneumatic spray nozzles are suitable for cooling combustion gases and other applications that require nozzles with small spray droplet sizes and a large turn-down ratio.

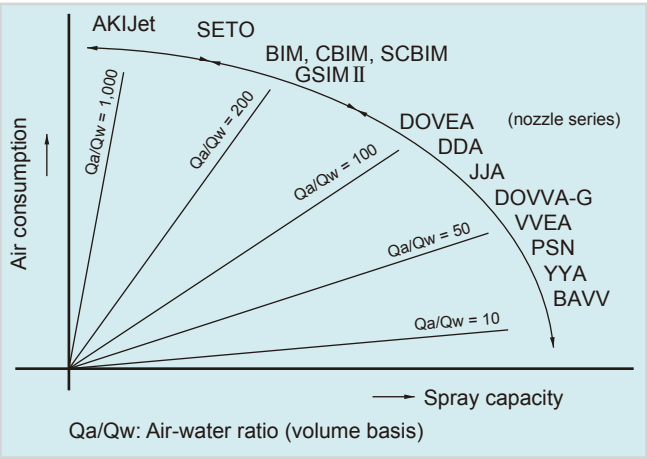


Select a pneumatic spray nozzle to obtain a large turn-down range under the same pressure range.

Air-water Ratio

Air-water ratio is the rate of air consumption divided by spray capacity. The ratio can be expressed in both volume and weight ratios.
For the same nozzle, a higher air-water ratio will result in a smaller spray droplet size.

The air-water ratio in this catalog is expressed as the volume ratio unless otherwise specified.



Qa/Qw: Air-water ratio (volume basis)

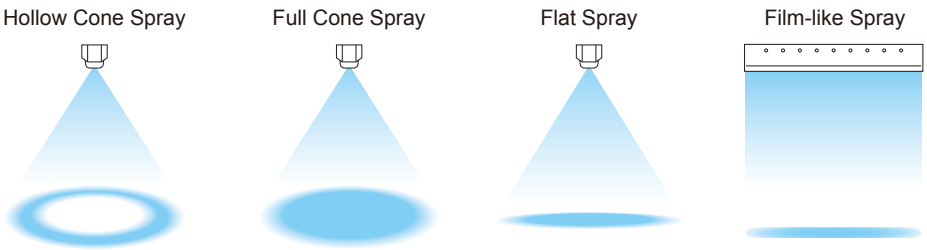
Nozzle Selection Factors

Spray Pattern

The spray pattern refers to the cross-sectional shape of the spray and is available in cone spray (hollow cone and full cone spray), flat spray, and liquid film-like spray.
Hollow cone and full cone spray patterns are suitable for applications such as humidification, gas cooling, chemical reactions, and moisture control, while flat spray and film-like spray patterns for cooling and coating.
To optimize nozzle performance and effects, it is important to select a spray pattern suited for each application.
Please note that the spray patterns of pneumatic spray nozzles deform significantly as the distance from the nozzle becomes greater.

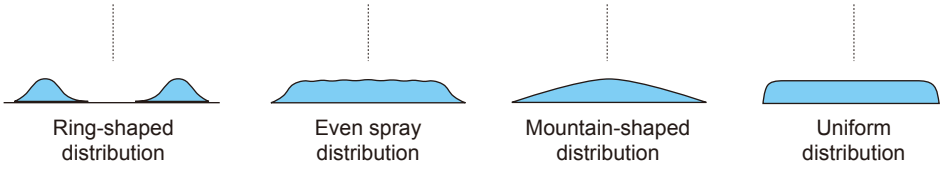
Spray Pattern

Spray pattern is defined as the horizontal cross sectional shape of the spray.



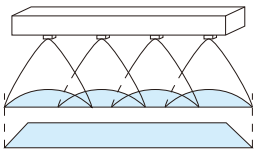
Spray Distribution

Spray distribution is defined as the distribution of the spray flow in the direction of spray width.



Multi-nozzle Arrangement

A mountain-shaped distribution is useful for producing a uniform spray distribution across the entire spray width in a multi-nozzle arrangement by overlapping patterns. On the other hand, an even spray distribution is suitable for applications that require a uniform spray distribution with a single nozzle. The spray distribution varies depending on the spray height and pressure.

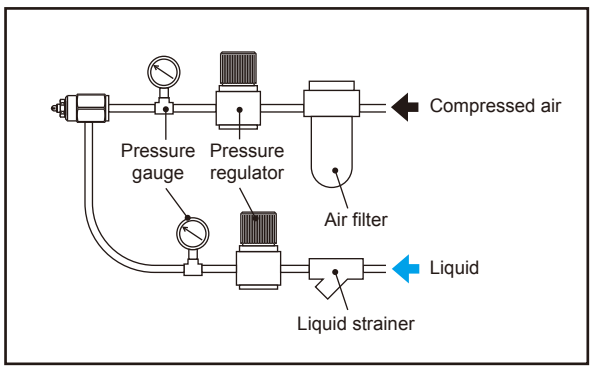


When installed at proper spacing in a multi-nozzle arrangement, flat spray nozzles with a mountain-shaped distribution can achieve a uniform distribution across the entire area.

Liquid Feeding System

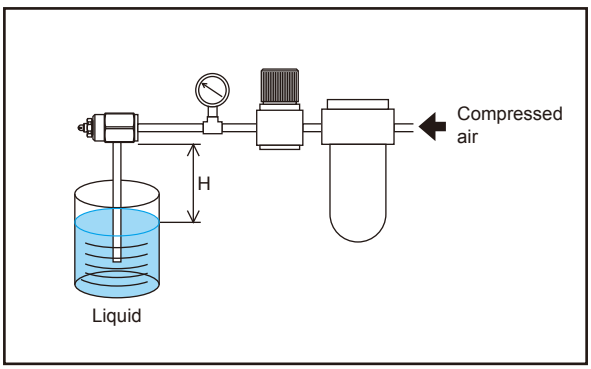
There are two types of liquid feeding systems: the liquid pressure type (feeding pressurized liquid to the nozzle) and the liquid siphon type (feeding liquid sucked up by compressed air).

Liquid Pressure Type



By changing the compressed air and liquid pressures, spray capacity can be changed over a wide range from small to large flows.

Liquid Siphon Type



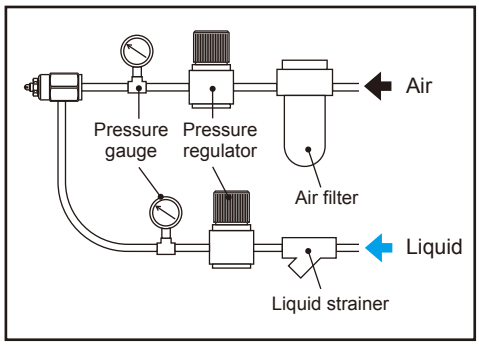
Spray capacity differs depending on liquid siphon height (H).

Measurement Standard

Each pneumatic spray nozzle series has a spray capacity inspection standard at each standard pressure.
We only ship the nozzles that pass the inspection.

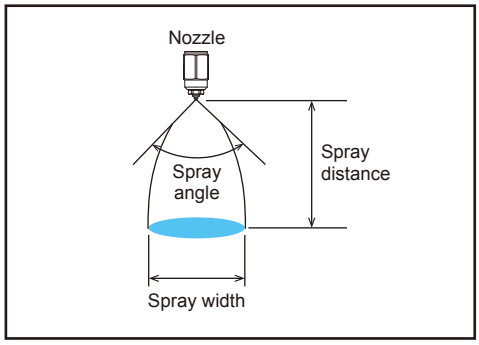
Spray Pressure

Each series of pneumatic spray nozzles is designed based on the standard pressure, which is either the pressure most commonly used or the pressure that maximizes the characteristics of each nozzle series. The air and liquid pressures in this catalog are measured immediately before the nozzle, using compressed air and room temperature tap water.



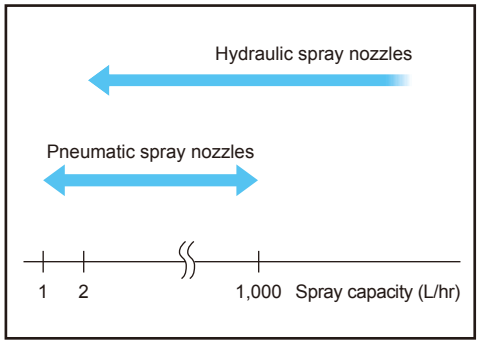
Spray Angle

The spray angle is defined as the angle of spray near the nozzle outlet. The flow velocity of pneumatic spray nozzles is so high that the above-mentioned spray angle is maintained only near the nozzle outlet.
When designing a nozzle layout, please refer to the spray width data in the performance table of each nozzle series.

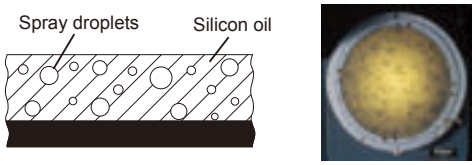
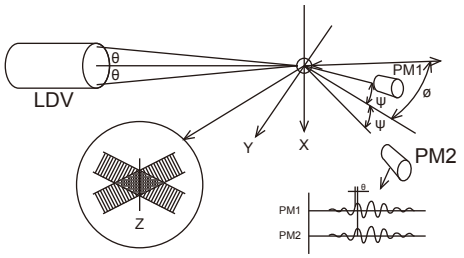
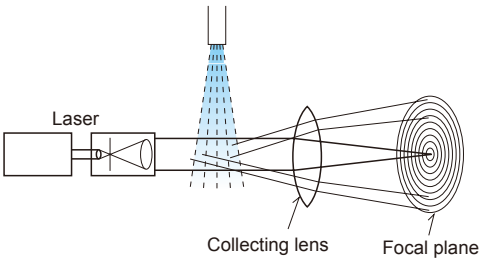
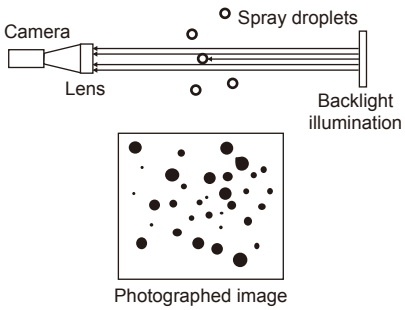


Spray Capacity

The spray capacity refers to the volume of water flow rate sprayed from the nozzle.
One of the features of pneumatic spray nozzles is their ability to produce a spray capacity as small as 0.1 L/hr (1.7 cc/min).
The numerical values of spray capacity in this catalog are based on tap water at room temperature. (The air consumption is the value under atmospheric pressure.)



Methods of Measuring Spray Droplet Diameter

Measuring method Principle and features	Range of measured droplet size
Immersion Sampling Method	
Droplets are collected on a glass plate coated with silicon oil and a magnified photo is taken immediately for subsequent scanning. The collected droplets remain suspended as perfect circles. This method is less affected by distance and droplet concentration. However, ultra-fine droplets are unable to break the surface tension of the oil and evaporate. This results in an average droplet size larger than the actual value. 	10–5,000 μm
Laser Analyzer	
1. Laser Doppler Method This method forms interference fringes by crossing two laser beams. Then, the spray droplet size is calculated from the phase difference at the time of detecting scattered light, which has resulted from droplets having passed through these interference fringes, by multiple photo detectors provided at a given distance. This method is less affected by droplet concentration because each droplet is measured one by one, while enabling simultaneous measurement of droplet velocity. However, measurement is only possible at a single point in the spray.  (LDV: Laser Doppler Velocimeter PM: Phase monitor)	0.5–2,500 μm
2. Fraunhofer Diffraction Method A laser beam scatters at the surface of droplets to form a diffracted image behind the droplets due to the interference of the scattered light (Fraunhofer diffraction). This method can simultaneously measure all droplets on the laser beam path, but if the droplet concentration is too high, the laser beam once scattered may be scattered again by other droplets (multiple scattering). This phenomenon may cause the measured droplet size to be smaller than the actual droplet size. 	1–1,000 μm
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. However, 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

Mean Droplet Diameter

Mean droplet diameter is one of the important factors in selecting nozzles and designing nozzle-related equipment.

Generally, the following average value models are used for mean droplet sizes:

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

In chemical processes such as cooling, evaporation, combustion and drying, the surface-to-volume ratio, i.e. specific surface area, is used to determine the efficiency. Because the rate of reaction is influenced more by a small number of large droplets than a large number of small droplets, it is advisable to use the Sauter Mean Diameter as a representative value for the droplet size.

The Sauter Mean Diameter is used most often and is the one used in this catalog.

■ Example of calculation of Sauter mean diameter

Range (μm)	Median d (μm)	Quantity n	nd^2	nd^3
0–100	50	1,664	4,160,000	208,000,000
100–200	150	2,072	46,620,000	6,993,000,000
200–300	250	444	27,750,000	6,937,500,000
300–400	350	161	19,722,500	6,902,875,000
400–500	450	73	14,782,500	6,652,125,000
500–600	550	35	10,587,500	5,823,125,000
600–700	650	17	7,182,500	4,668,625,000
700–800	750	4	2,250,000	1,687,500,000
	Total	4,470	133,055,000	3.987275×10^{10}

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

Correlation Between Measuring Methods in Droplet Diameter

Results will differ, depending on the method used to measure. If the Sauter mean droplet diameter measured with the immersion sampling method equals 1, as relative coefficient number, this value will be different when measured with other methods, as shown on the right.

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

Evaluation of Droplet Diameter

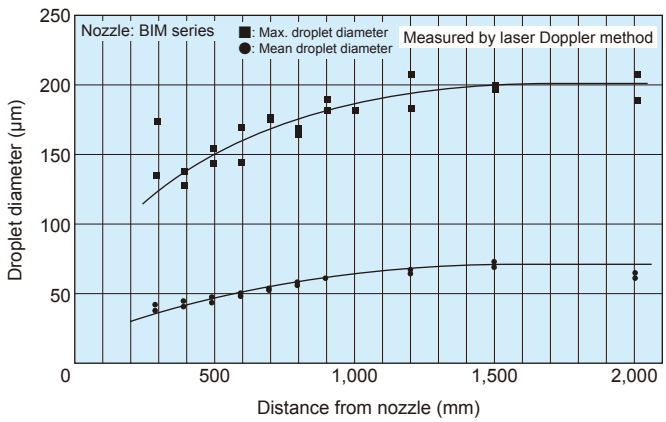
Good care must be exercised in evaluating droplet diameters because droplet diameters differ depending on each measuring method as described above.

In comparing spray droplet diameters of different spray nozzles, a standardized measuring method should be used. Likewise, when using the laser method, measurement distance, droplet concentration, etc. should be as consistent as possible.

Too high a concentration may cause multiple scattering both in the Fraunhofer laser diffraction method and in the laser Doppler method, which would not allow a correct evaluation of the droplet diameter.

Therefore, it is desirable to avoid measuring near the nozzle, and measure at a given distance from the nozzle.

■ Droplet diameters at various distances from the nozzle



At 0.49 MPa air pressure and 0.46 MPa liquid pressure

Pneumatic Spray Nozzle Lineup

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
				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.
If you need a specific nozzle material that is not mentioned in each series page, 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 options are 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, 32, 41
	0.1–4.7		80	3.75–92		15, 37, 42
	2.0–107		60	13–245		17, 34
	1.8–4.7		60	27–92		19, 38
	0.25–107		70, 20	2.6–245		21, 35, 41
15–30	2.2–10.0	L/hr	80	27–45	–	59
15–40	1.7–10.6		65, 55	27–75	T, SN, SP	53
–	1.2–25.9		–	33–151	SP	55
20–60	2.0–111		–	38–290	T	46
15–40	2.0–26.4		–	36–200	T	48
15–25	1.5–5.1		–	18–30	CSP	51
15–25	0.9–26.4		–	36–200	–	57
10–120*2	10–450	L/hr	–	340–2,150	T, H	92
40–80	15–2,000	L/hr	60, 20	150–4,000	T, SN, flange connection	61
50–200*3	0.42–40	L/min	110, 95, 70, 55	30–630	T	70
15–200*3	0.14–57.3		125, 110, 100, 80, 75	17–610	T	75
80–120	1–25		70, 55	100–1,700	Flange connection	81
20–400	0.23–3.0		80, 60	14–128	T*5	85, 87
150–650*2	1.1–24		–	70–720	Flange connection	78
–	8–28		–	520–1,700	–	89
30–100	9.0–123	L/hr	60	76–254	T	95
40–80	0–1,000		20	1,500–6,000	Flange connection	97
40–200*2	10–1,200	L/hr	–	–	Flange connection	101

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

Table of Chemical and Heat Resistance

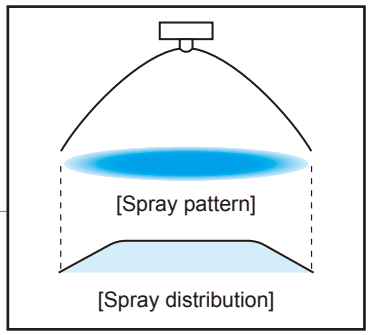
Items \ Materials		Metals				Plastics							Rubbers		
		S303	S304	S316 S316L	S321	PP	PPS	PVC	HTPVC	PTFE	PA	PE	NBR	FKM	FEPM
Chemical resistance	Hydrochloric acid	×	×	×	×	○	○	○	○	○	×	○	×	○	○
	Concentrated hydrochloric acid	×	×	×	×	△	○	○	○	○	×	○	×	○	○
	Sulfuric acid (35%)	×	×	×	×	○	○	○	○	○	×	○	×	○	○
	Concentrated 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.



●Figures showing simplified spray pattern and distribution

Performance data table

●Spray angle code (110)

●Air consumption code (02)

●Estimated air consumption at the specified pressures. In this example, air consumption is 25 normal liters per minute at air pressure 0.4 MPa and liquid pressure 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)

●Approx. minimum passage diameters for each flow channel (N/A for tip orifice in external mixing type nozzles. See page 3 for Air-Liquid Mixing Systems)

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

●Calculated spray capacity at the specified pressures. In this example, spray capacity is 4.7 liters per hour at air pressure 0.3 MPa and liquid pressure 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

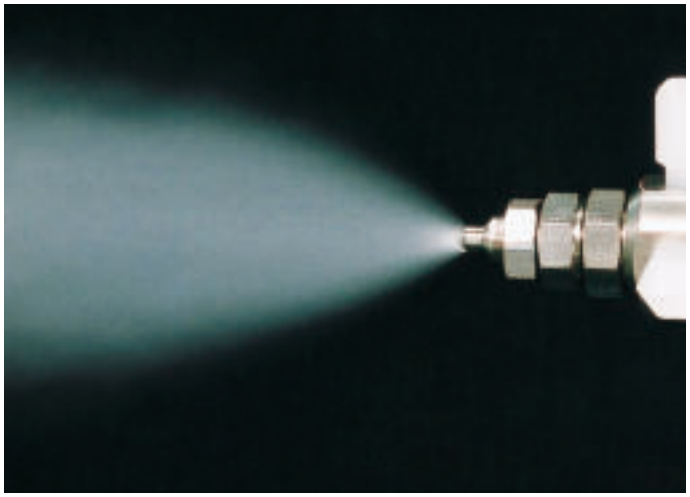
Thread type	ISO standard	Our thread code
Male tapered pipe threads	R1/4	1/4M
Female tapered pipe threads	Rc1/4	1/4F

Description of flange size

Pipe size		Our flange description
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



■The BIM/CBIM/SCBIM Series produce fine atomization with a mean droplet diameter of 20–100 µm measured by laser Doppler method.

■Unique clog-resistant design with reduced number of parts allows for easy maintenance and lower costs.

■Available in three spray patterns: BIMV/CBIMV/SCBIM flat spray, BIMK/CBIMK hollow cone spray, and BIMJ/CBIMJ/SCBIMJ full cone spray, and two types of liquid feeding systems: liquid pressure type or siphon type.

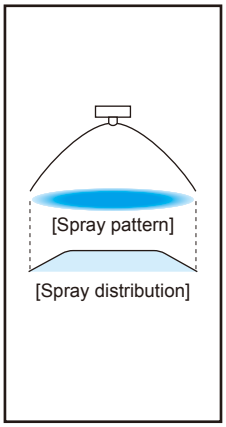
■Three types of spray patterns and two types of liquid feeding systems with various header configurations allow arrangements suited for a wide range of uses.

Contents

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

BIMV

BIMV with SNB 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.
■The spray distribution varies depending on the air-water ratio. At a low air-water ratio, the distribution takes a mountain shape, and it shifts to even, as the air-water ratio increases.

*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, castings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete
■Cleaning: Printed circuit boards, glass tubes

STRUCTURE

■Four-part structure: 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.

Download 3D CAD models (BIMV with various adaptors)

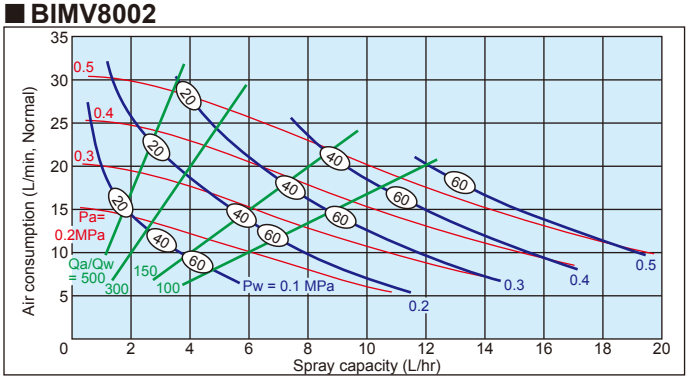
ACCESSORIES

■Mounting bracket is available as an option. See page 30.

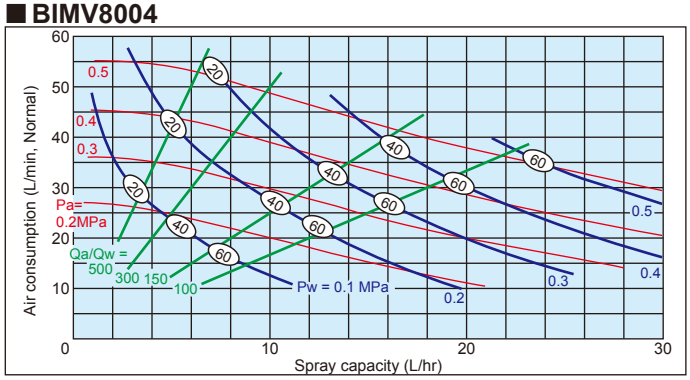
FLOW-RATE DIAGRAMS

■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. Numbers 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.

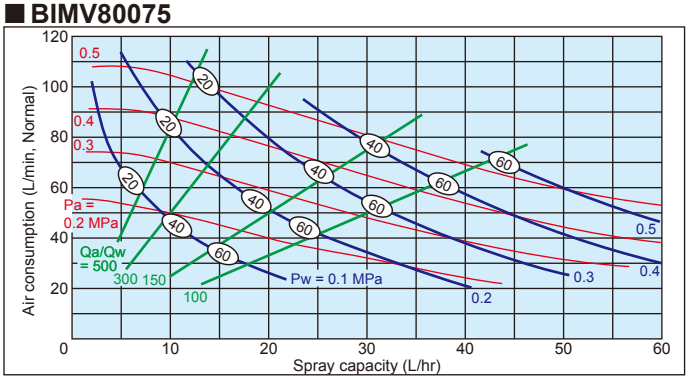
■ BIMV8002



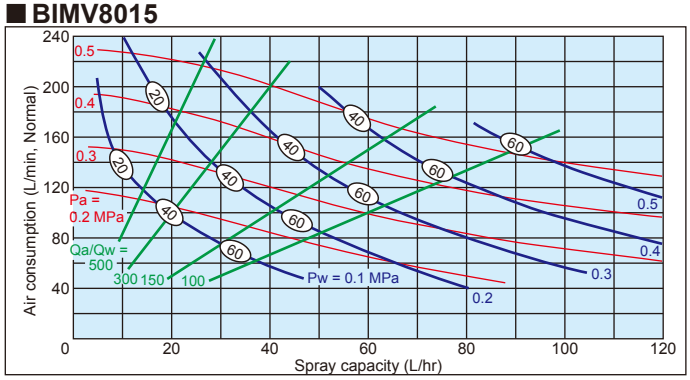
■ BIMV8004



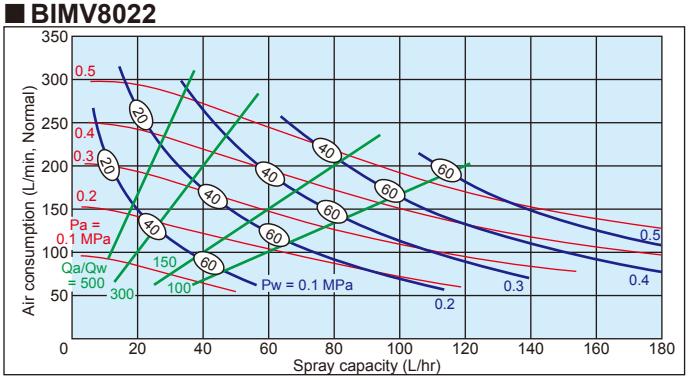
■ BIMV80075

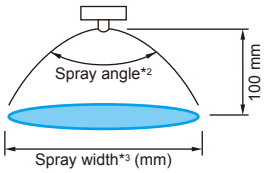


■ BIMV8015



■ 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) 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	—	—	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 spray distance of 100 mm from nozzle.

HOW TO ORDER

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

<Example> BIMV 11002 S303 + N S303

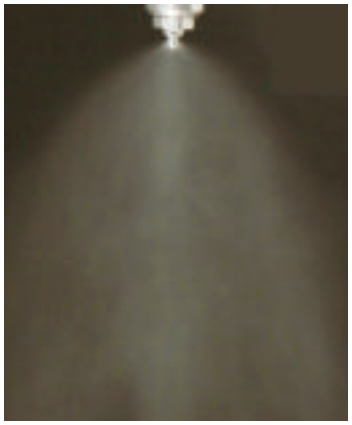
BIMV [110] [02] S303 + [N] S303

- 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

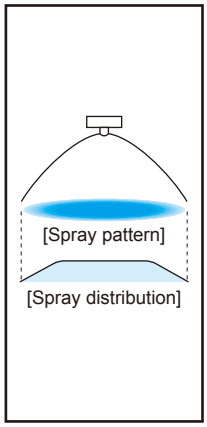
See pages 26 and 27 for details of adaptors.

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).
■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, castings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete
■Cleaning: Printed circuit boards, glass tubes

STRUCTURE

■Four-part structure: 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.

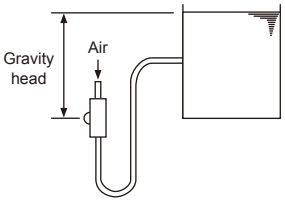
Download 3D CAD models (BIMV-S with various adaptors)

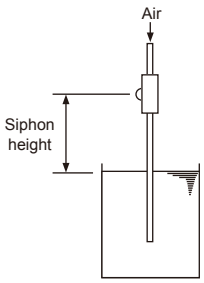
ACCESSORIES

■Mounting bracket is available as an option. See page 30.

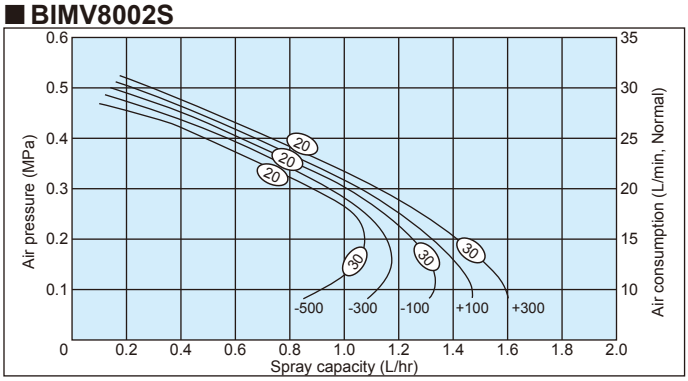
FLOW-RATE DIAGRAMS

■How to read the chart
1. The spray capacity shown is for one nozzle.
2. Numbers at foot of each curve indicate gravity head (+) and siphon height (–) in mm.
3. Numbers 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.

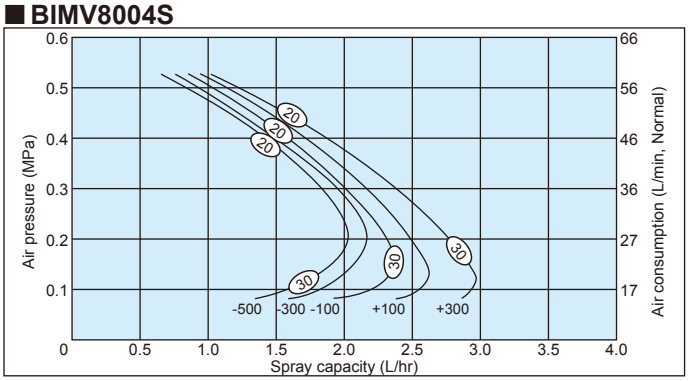




■ BIMV8002S



■ BIMV8004S



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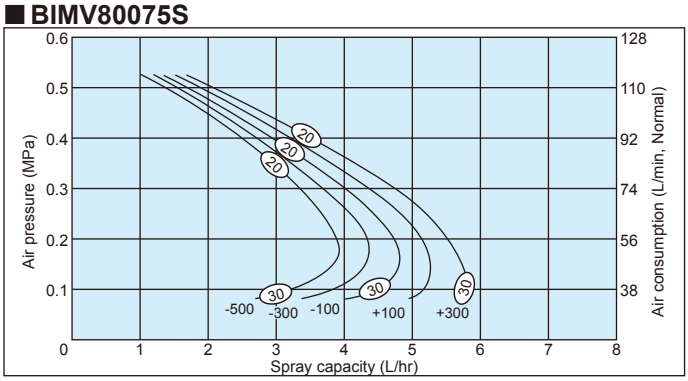
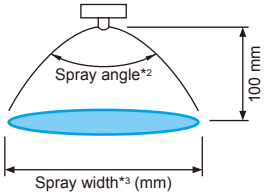




PERFORMANCE DATA

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 spray distance of 100 mm from nozzle and liquid siphon height of 100 mm.

HOW TO ORDER

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

<Example> BIMV 8002S S303 + N S303

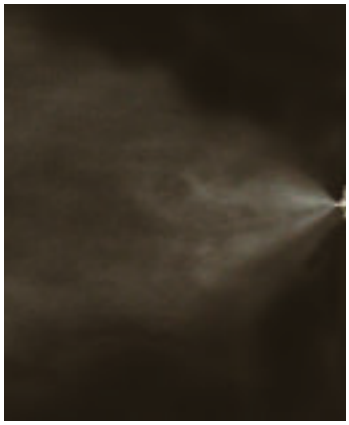
BIMV **80** **02** **S** **S303** + **N** **S303**

- **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

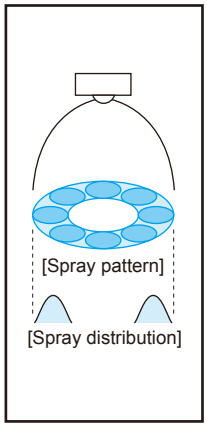
See pages 26 and 27 for details of adaptors.

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

BIMK



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.

*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, castings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete

STRUCTURE

■Four-part structure: 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.

Download 3D CAD models (BIMK with various adaptors)

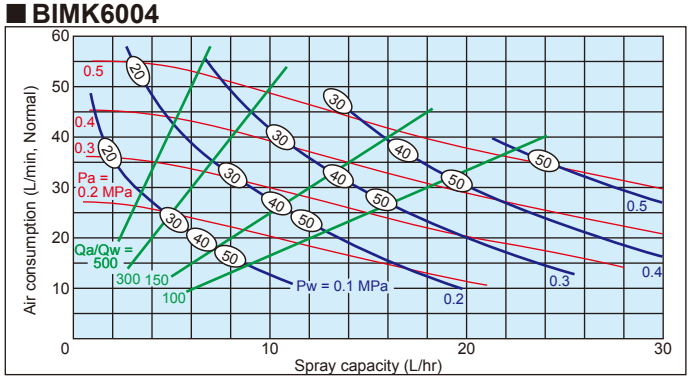
ACCESSORIES

■Mounting bracket is available as an option. See page 30.

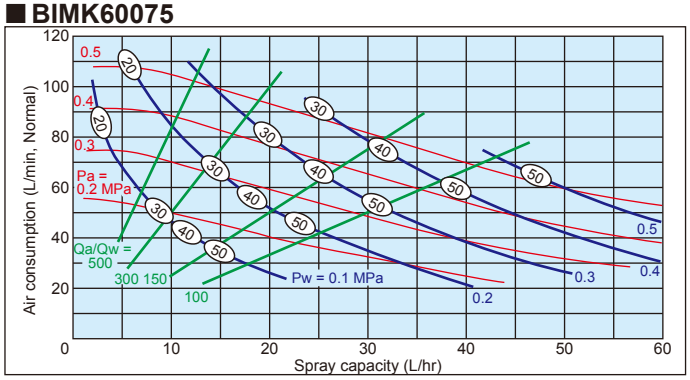
FLOW-RATE DIAGRAMS

■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. Numbers 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.

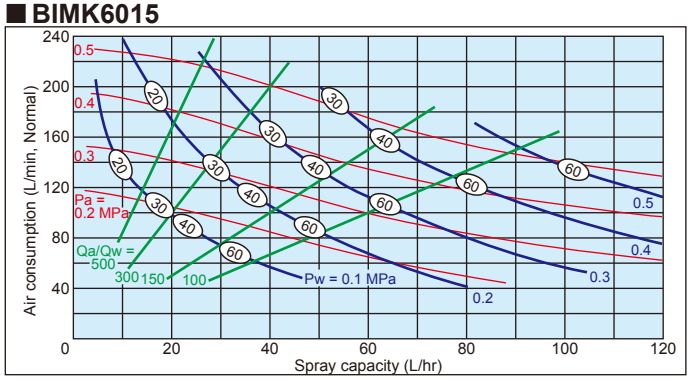
■ BIMK6004



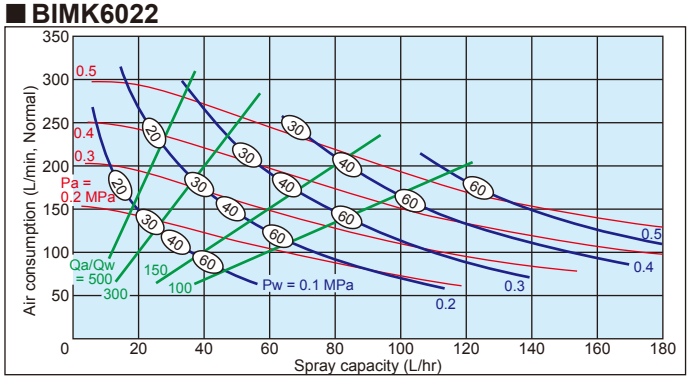
■ BIMK60075

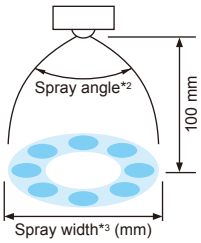


■ BIMK6015



■ 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 spray distance of 100 mm from nozzle.

HOW TO ORDER

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

<Example> BIMK 6004 S303 + N S303

BIMK	60	04	S303	+	N	S303
	Spray angle code	Air consumption code	Material of nozzle tip		Type of adaptor	Material of adaptor

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

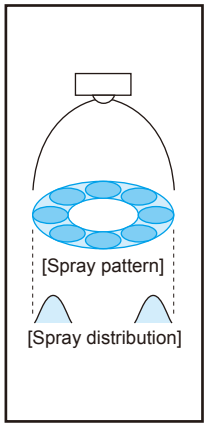
Type of adaptor: ■N ■T ■NDB ■UNDB ■SNB ■USNB ■SPB ■USPB

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).

*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, castings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete

STRUCTURE

■Four-part structure: 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.

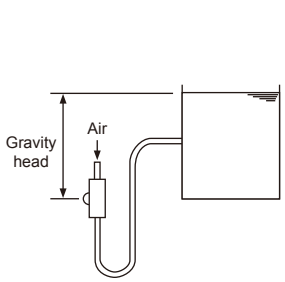
ACCESSORIES

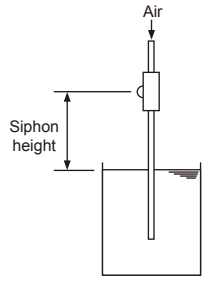
■Mounting bracket is available as an option. See page 30.

Download 3D CAD models (BIMK-S with various adaptors)

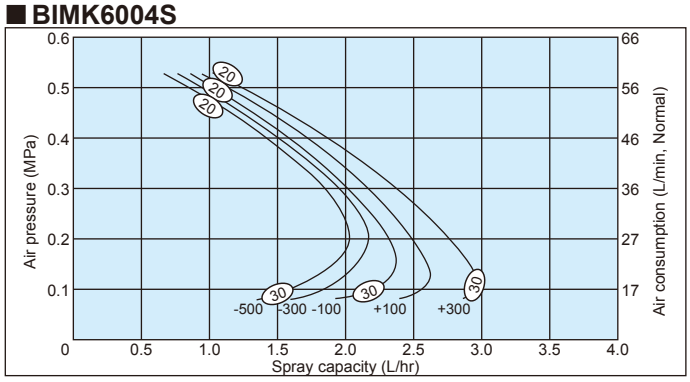
FLOW-RATE DIAGRAMS

■How to read the chart
1. The spray capacity shown is for one nozzle.
2. Numbers at foot of each curve indicate gravity head (+) and siphon height (–) in mm.
3. Numbers 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.

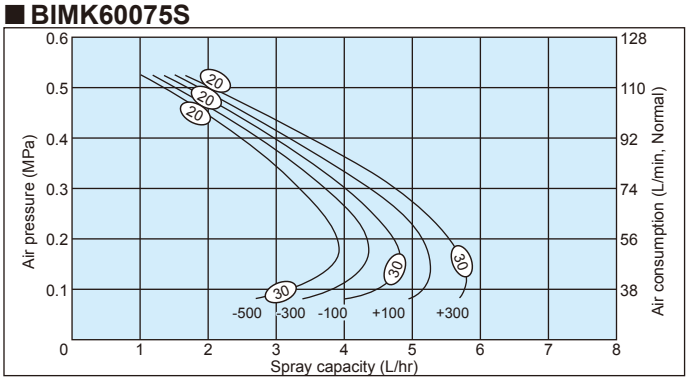


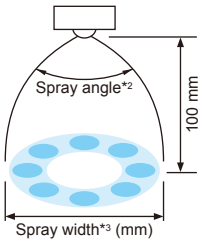


■ BIMK6004S



■ 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) Measure at spray distance of 100 mm from nozzle and liquid siphon height of 100 mm.

BIMK-S

HOW TO ORDER

To inquire about or order a specific product please refer to 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

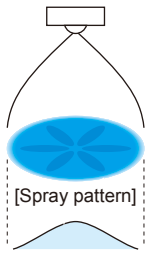
See pages 26 and 27 for details of adaptors.

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

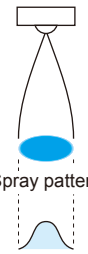
BIMJ

BIMJ with NDB adaptor

BIMJ70°



BIMJ20°



■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.

*1) Droplet diameter measured by laser Doppler method

Download 3D CAD models (BIMJ with various adaptors)

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, castings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete

STRUCTURE

■Four-part structure: 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.

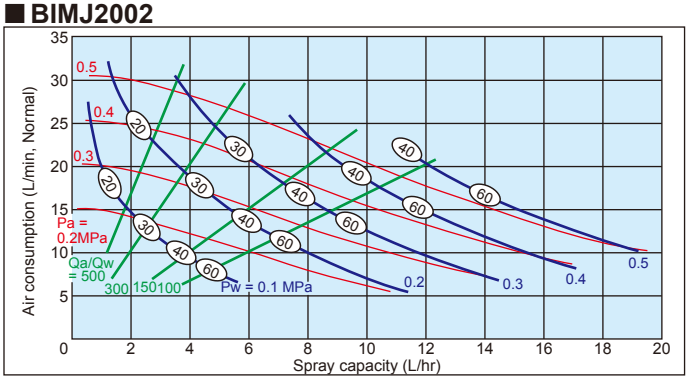
ACCESSORIES

■Mounting bracket is available as an option. See page 30.

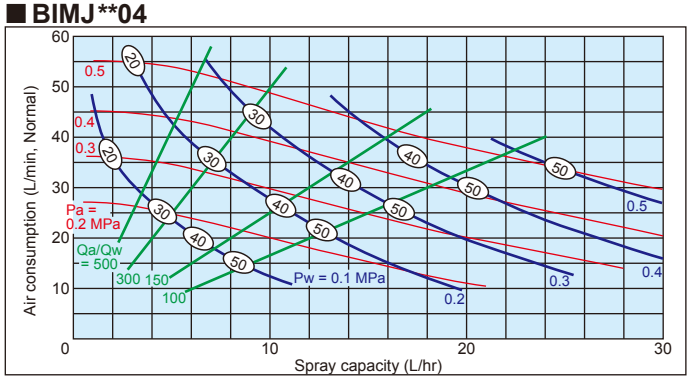
FLOW-RATE DIAGRAMS

■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. Numbers 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.

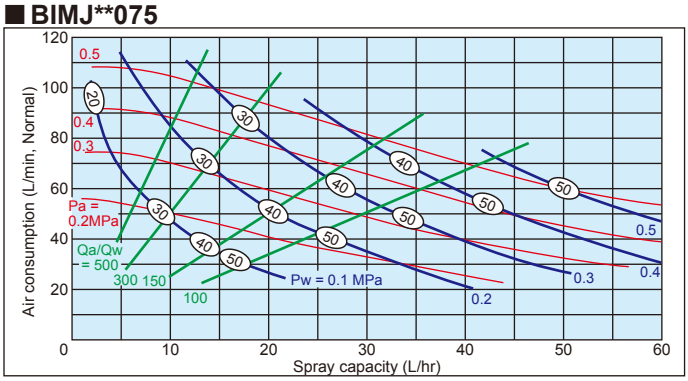
■ BIMJ2002



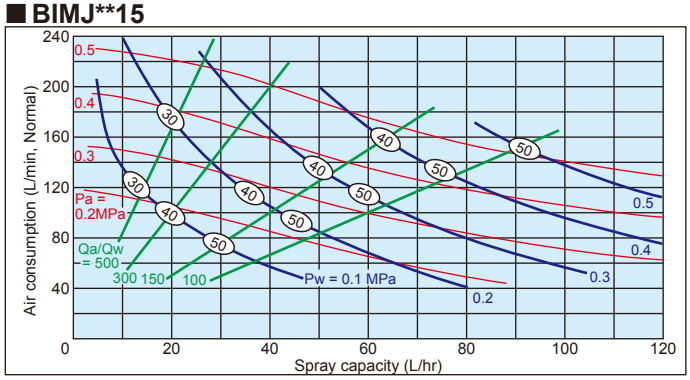
■ BIMJ**04



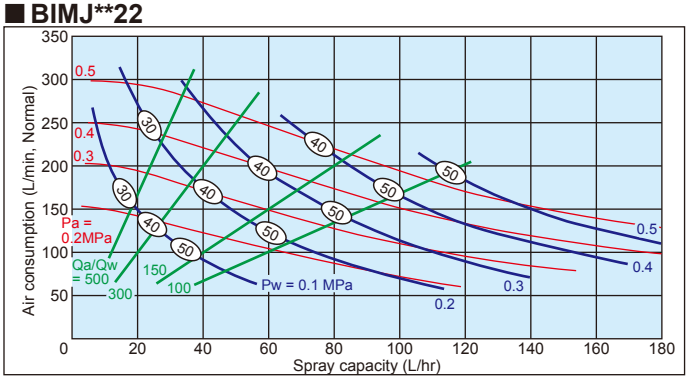
■ BIMJ**075

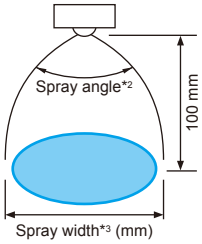


■ BIMJ**15



■ BIMJ**22





PERFORMANCE DATA

Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal)										Spray width*3 (mm)			Mean droplet diameter (μm)	Free passage diameter (mm)		
			Liquid pressure (MPa)																
			0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler method	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 spray distance of 100 mm from nozzle.

HOW TO ORDER

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

<Example> BIMJ 2004 S303 + N S303

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

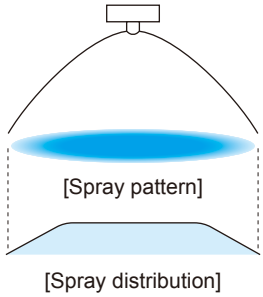
- **20** — Spray angle code: ■70 ■20
- **04** — Air consumption code: ■02 (for 20° only) ■04 ■075 ■15 ■22
- **S303** — Material of nozzle tip
- **N** — Type of adaptor: ■N ■NDB ■SNB ■SPB ■T ■UNDB ■USNB ■USPB
- **S303** — Material of adaptor

See pages 26 and 27 for details of adaptors.

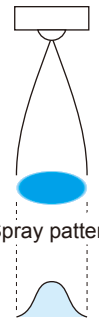
Low Flow Rate Fine Fog Nozzles Made of Polypropylene —Liquid Pressure Type—

BIM-PP

BIMV



BIMJ

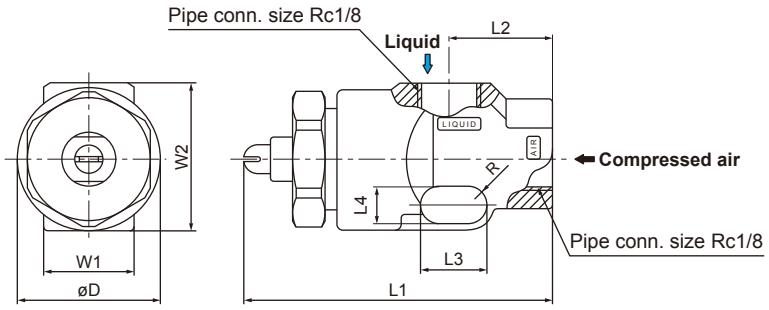


■Excellent chemical resistance with polypropylene construction.
■Two types, BIMV (flat spray pattern) and BIMJ (full cone spray pattern) are available.
Liquid pressure type with approx. 0.1 to 0.3 MPa.

APPLICATIONS

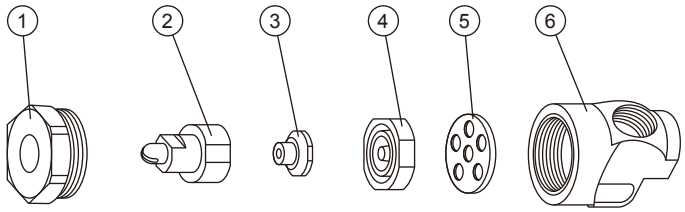
■Spraying: Deodorant, germicide, disinfectant
■Moisture control: Paper, textile, printing
■Cleaning: Printed circuit boards, electrical components

DRAWING



Download 3D CAD models

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)								Weight (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

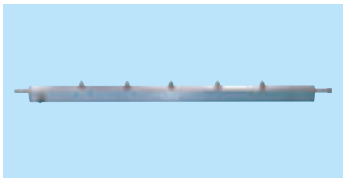
Please use these product codes to inquire about or order a specific nozzle.

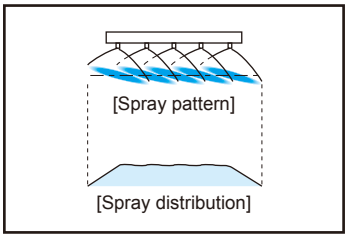
Flat spray type
BIMV 80075 PP + TPP-IN

Full cone spray type
BIMJ 2004 PP + TPP-IN

Integrated Spray Header with BIM Fine Fog Nozzles

BIM Header





■Spray header equipped with BIMV series nozzles (liquid pressure type) producing fine atomization with a mean droplet diameter of 100 μm or less.*1
■Integrates air and water pipes in one rectangular 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

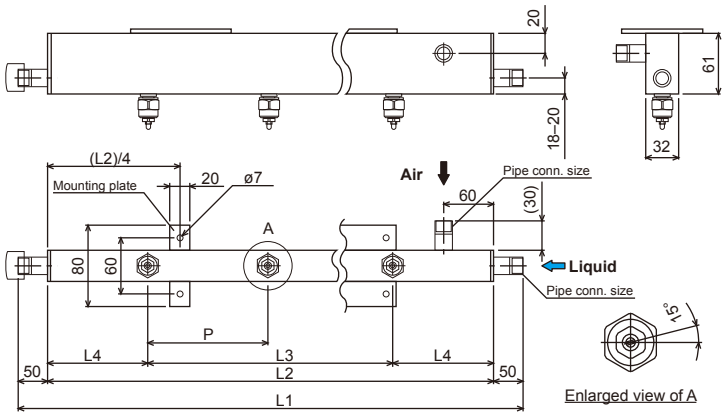
APPLICATIONS

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

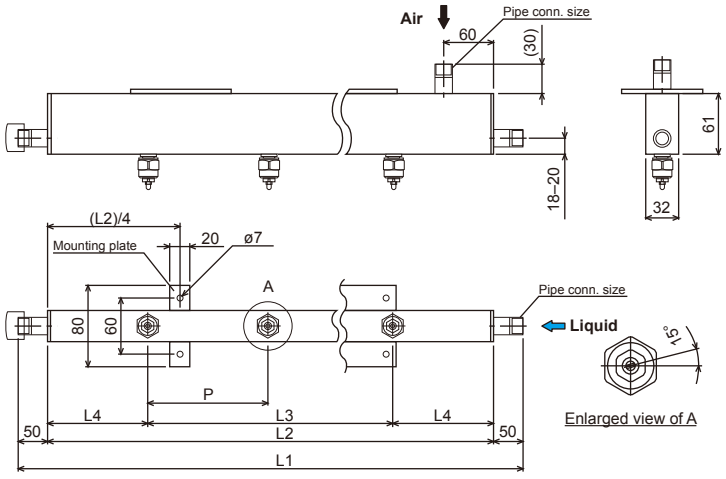
BIMV

DRAWING

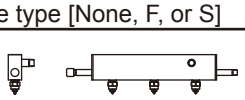
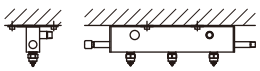
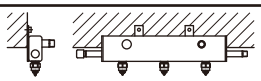
Air/Liquid inlet position type [A]



Air/Liquid inlet position type [B]



■Mounting plate type [None, F, or S]

None	
F	
S	

F: To install header vertically on wall.
S: To install header parallel to wall.

Unit: mm

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	R3/4	R1/2		
		200	10	1,800	100			R3/8	R1/4	R1/2	R3/8		

PERFORMANCE DATA

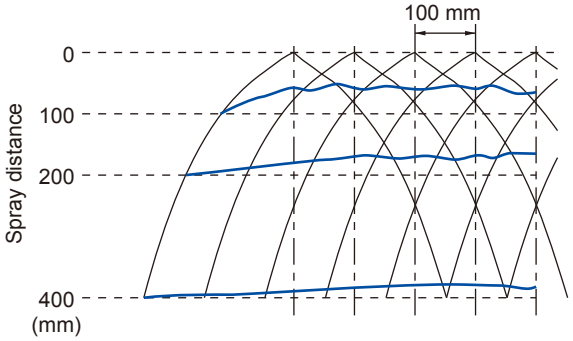
Nozzle code	Nozzle quantity	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) at liquid pressure of 0.1 MPa
BIMV11002	5	0.3	100	5.0
	10		200	10.0
	20		400	20.0
BIMV11004	5	0.3	180	10.0
	10		360	20.0
	20		720	40.0
BIMV110075	5	0.3	370	20.0
	10		740	40.0
	20		1,480	80.0

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

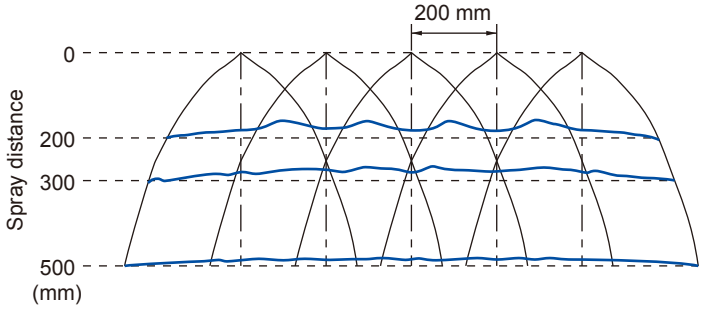
■ BIMV11004S303

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, specify a nozzle code, nozzle quantity, nozzle spacing, and header length etc., using this coding system. For more details, please request our **inquiry drawing**.

<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 indicates 0°)	■**1100**
■**BIMV11004**	■**10**	■**200**	■**B**	■**2000**	■**S**	■**15°**	■**2100**
■**BIMV110075**	■**20**				■**None** (Blank indicates "without plate")		

Note: For details of BIMV nozzles, see pages 13 and 14.

Adaptors for BIM Series Fine Fog Nozzles

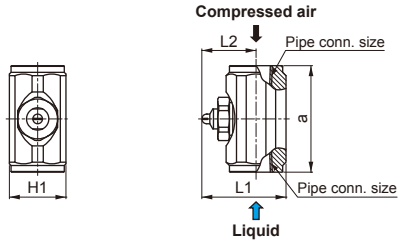
The following eight types of adaptors are available for BIM series Low Flow Rate Fine Fog Nozzles: BIMV, BIMV-S, BIMK, BIMK-S, and BIMJ, which are introduced on pages 13 to 22.
See page 27 for dimensions and pipe connection sizes of each adaptor.
Drawings with parts list (each description and material)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

TYPES OF ADAPTORS

Type N

Liquid and air enter into adaptor from both sides.

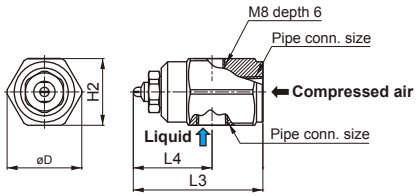
■Material: S303



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.

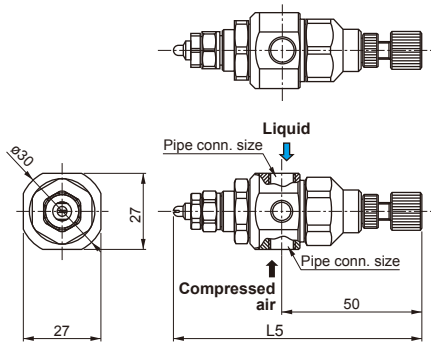
■Material: S303



Type NDB

Needle valve allows for reducing and stopping the spray flow rate.

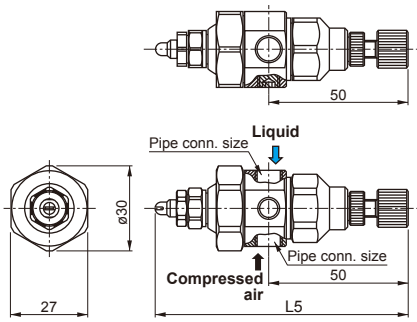
■Material: S303, FKM, PTFE, and NBR



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.

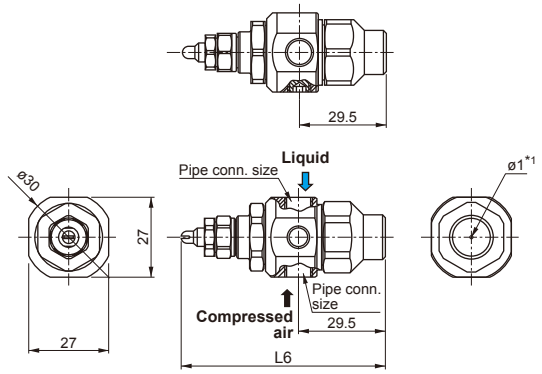
■Material: S303, FKM, PTFE, and NBR



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.

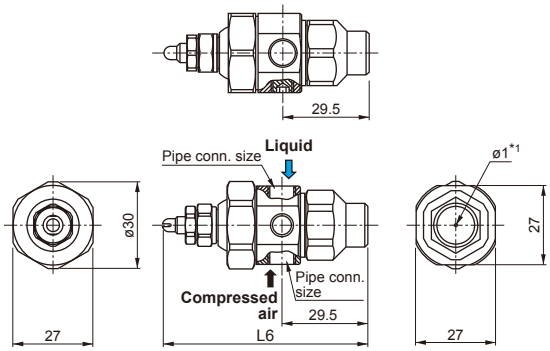
■Material: S303, FKM, PTFE, and NBR



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.

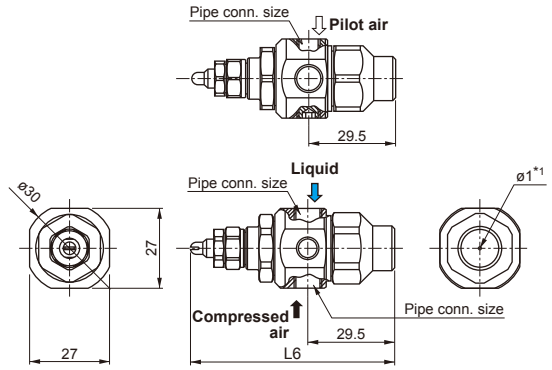
(Unit: mm)

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.

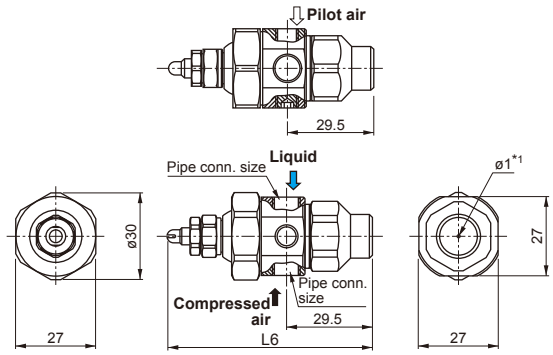
■Material: S303, FKM, PTFE, and NBR



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

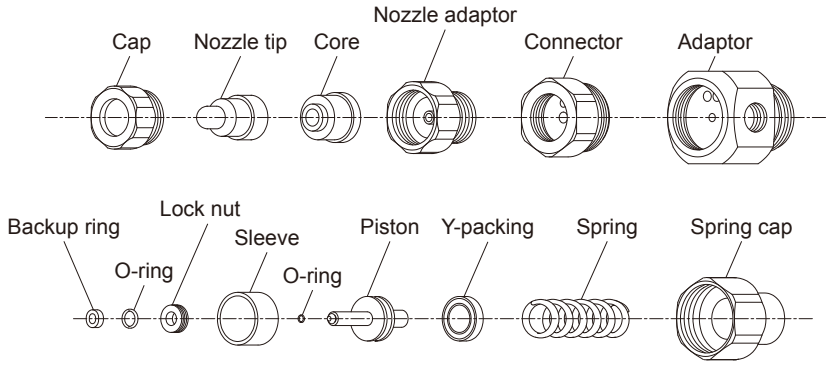


*1) Hole ø1 is for air relief.

(Unit: mm)

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 WEIGHT

Adaptor type	Air consumption code	Pipe connection sizes			Weight (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

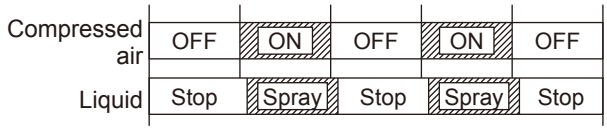
Air consumption code	Dimensions (mm)									
	L1	L2	L3	L4	L5	L6	a	H1	H2	øD
02	25.3	16.3	40.8	24.8	87.3	66.8	32	17	21	23.5
04	26.8	17.8	42.3	26.3	88.8	68.3	32	17	21	23.5
075	28.1	19.1	43.6	27.6	90.1	69.6	32	17	21	23.5
15	39.1	26.6	60.1	38.1	97.6	77.1	43	23	29	32.5
22	41.3	28.8	62.3	40.3	99.8	79.3	43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

How to Use Spray ON/OFF Control Adaptors

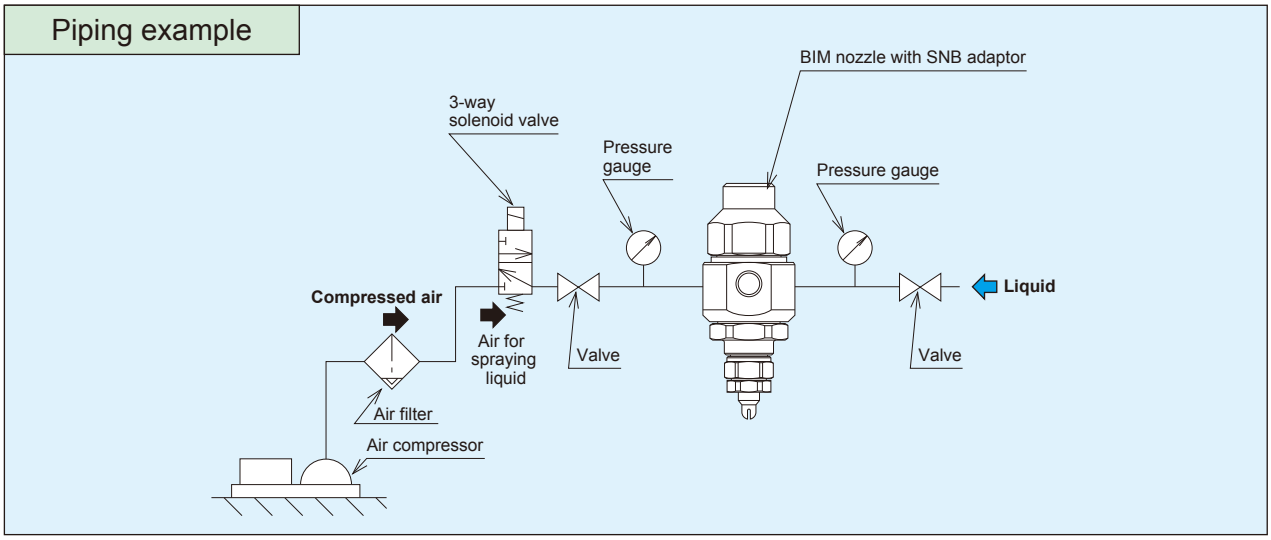
■**SNB Adaptor** (CSN, SN Adaptors)

The spray is turned ON/OFF by turning the compressed air ON/OFF.
Use with compressed air pressure of 0.2 MPa or higher.
Adaptor types **CSN** (see page 31) and **SN** (page 40) are used in the same way.

Operation Timing Diagram



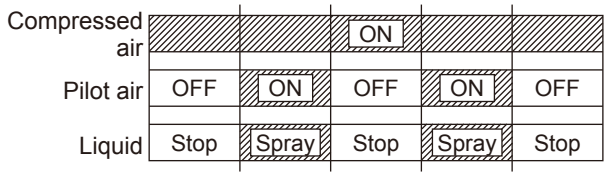
Piping example



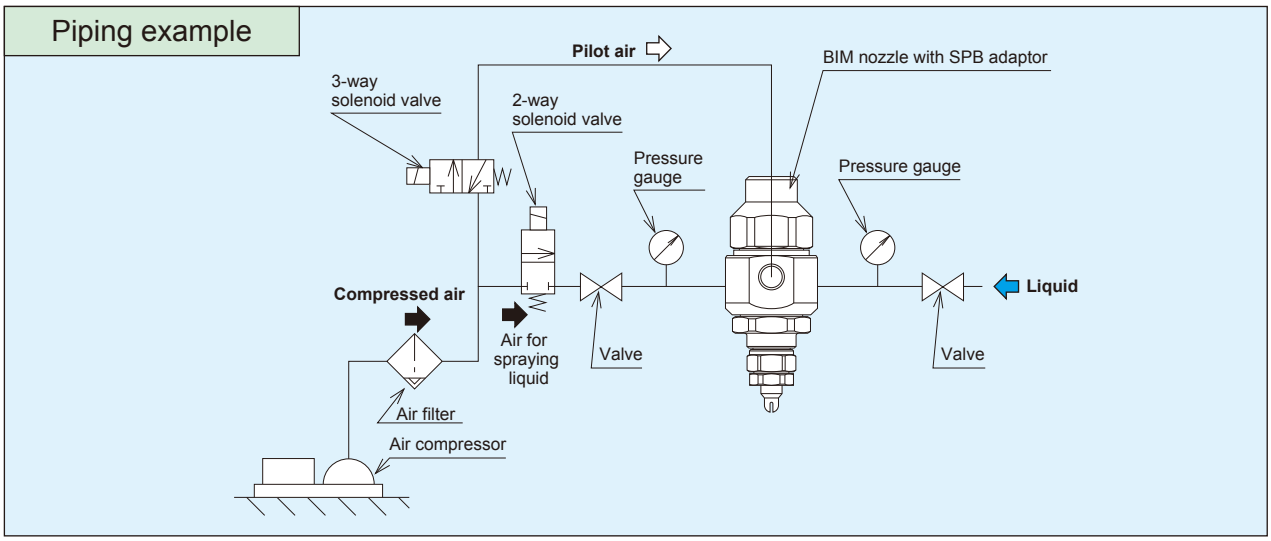
■**SPB Adaptor** (CSP, SP Adaptors)

This type has a built-in shutoff piston that operates on pilot air pressure. The spray is turned ON/OFF by turning the pilot air ON/OFF. Use with pilot air pressure of 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 31) and **SP** (page 40) are used in the same way.

Operation Timing Diagram



Piping example



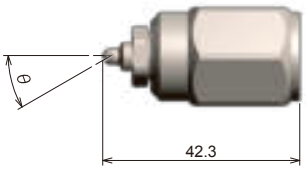
Customized Options (Made-to-order) for BIM Series Fine Fog Nozzles

The BIM Series nozzles can be customized to meet special design requirements.
Please refer to the following examples of tailored options and contact us for further information.

(Unit: mm)

Off-Center Spray Type

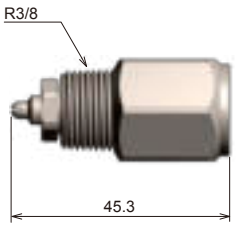
Designed to spray at a specified angle.



Pictured above is a nozzle with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.

Screw-in Type

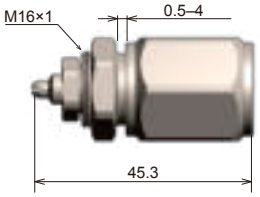
This type, equipped with a threaded adaptor, can be directly screwed into a plate or container with female threads.



Pictured above is a nozzle with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.

Wall Mounting Type

This type can minimize nozzle exposure to the atmosphere inside the equipment or duct.



Pictured above is a nozzle with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.

Hand-tightening Type

Hand-tightening nozzle tip is easy to detach and maintain.

Pictured above is a nozzle with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.

Long Neck Type

Incorporates a pipe to allow spraying at the target at a distance.

Pictured above is a nozzle with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.
Also available for the wall mounting type.
Contact us for customizable length.

90-degree Bend Long-neck Type

Long neck type with a 90-degree angle at the tip.

Pictured above is a nozzle with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.
Also available for the wall mounting type.
Contact us for customizable length.

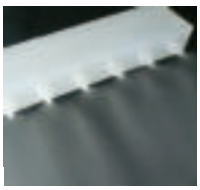
Spray Direction Adjustable Type (Wall Mounting)

Incorporates a flexible tube to allow versatile adjustment of the spray direction.

Pictured above is wall mounting type with a T-type adaptor.
Available in various adaptor types as shown on pages 26 and 27.

Special Material Nozzles

We offer nozzles made of special materials, such as PP, HTPVC, PTFE, and Titanium, upon request, particularly for applications that require enhanced chemical resistance. Contact us for further information.

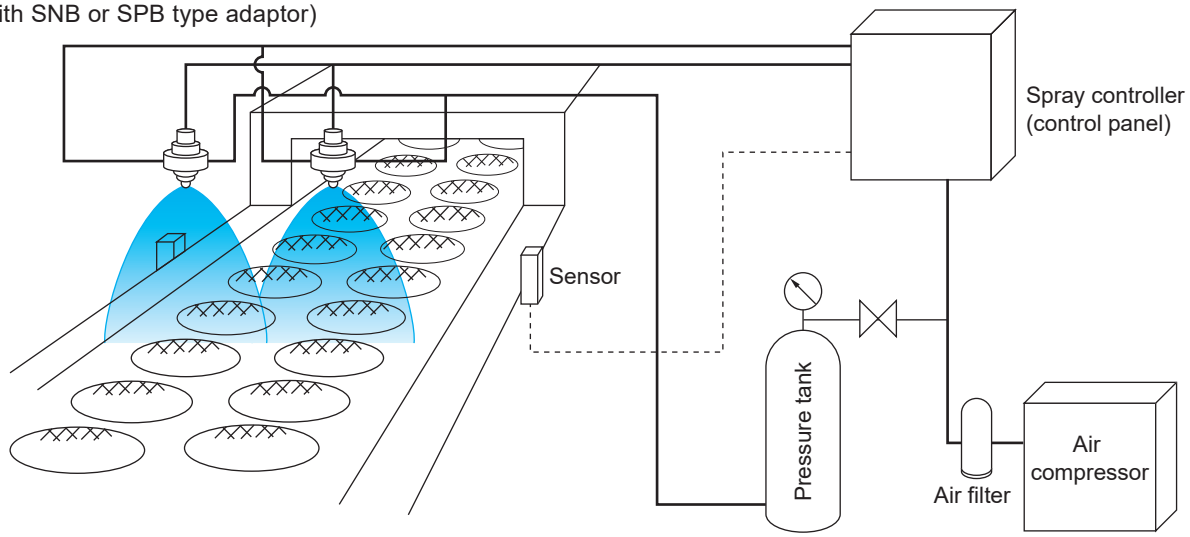


Spray header made of HTPVC

Installation Example and Related Products for BIM Series

Installation Example of BIM Automatic Spray System

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



Related Products

■Mounting Bracket (product code: MBW)

This mounting bracket allows for easy installation of BIM series nozzles to a metal pole/rod in the desired spray direction.
Available in two sizes for pipe diameters of 8 mm and 10 mm.
When ordering, specify **BIM ø8 MBW** for ø8 mounting bracket, or **BIM ø10 MBW** for ø10 mounting bracket.

Available for all adaptor types except N-type adaptor.

Download 3D CAD models

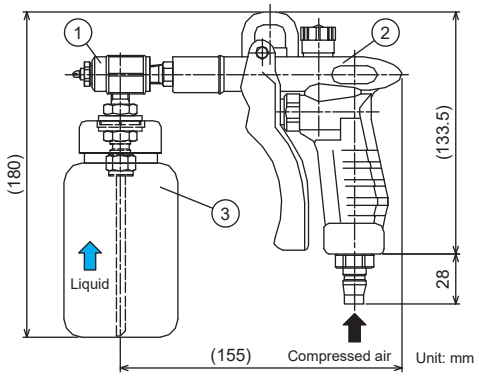
■Spray Gun Unit with BIM nozzles: BIM-GUN

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. (Unit: mm)

HOW TO ORDER Please use these product codes to inquire about or order a specific BIM-GUN.

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

(Hollow cone spray) BIMK-S 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.

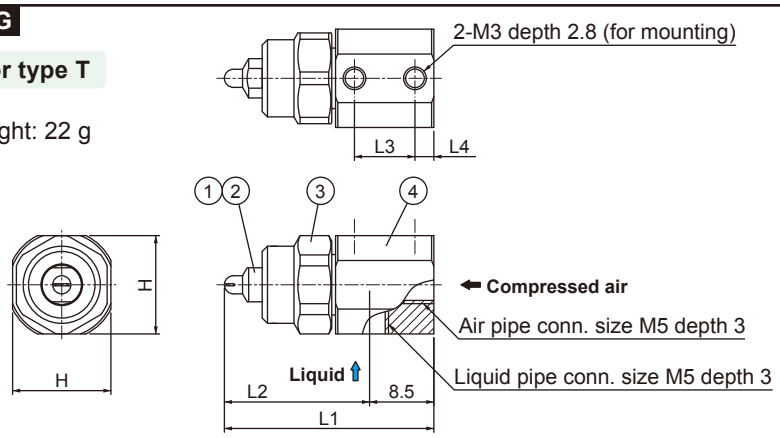
APPLICATIONS

■Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea
■Cooling: Dies, gas, glass, steel plates, steel pieces, castings, 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

■Weight: 22 g

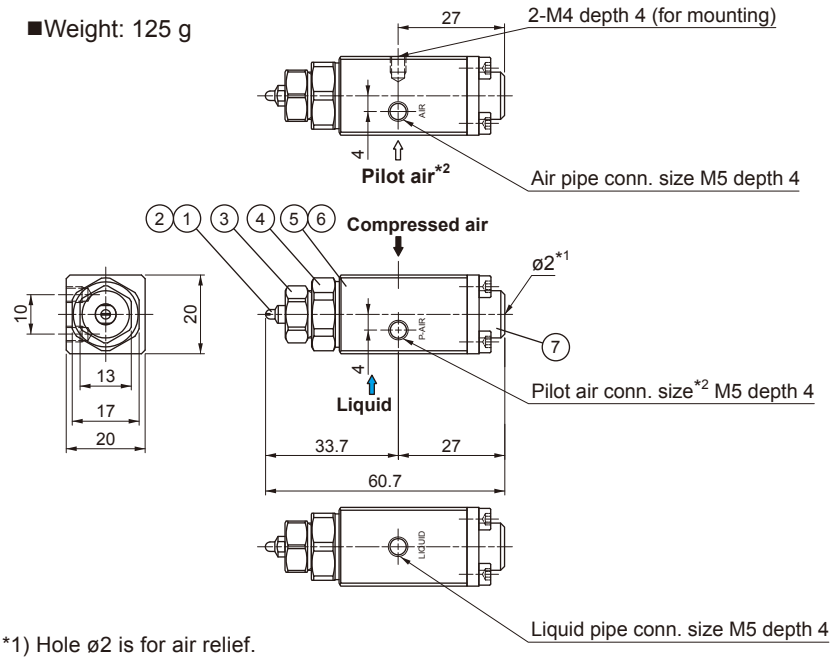


■COMPONENTS AND MATERIALS

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

Adaptor type CSN/CSP (Spray control adaptor)

■Weight: 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.

Unit: mm

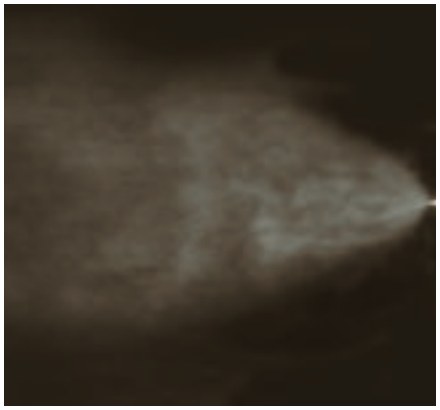
DIMENSIONS

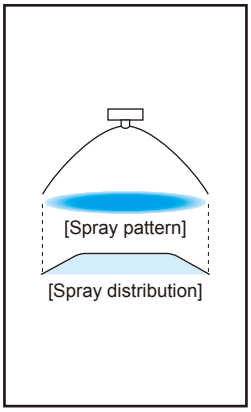
Air consumption code	Dimensions (mm)				
	L1	L2	L3	L4	H
005	27.7	19.2	8	2.5	13
01	27.7	19.2			
02	28.0	19.5			
04	31.3	22.8			
075	32.6	24.1			

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.
■The spray distribution varies depending on the air-water ratio. At a low air-water ratio, the distribution takes a mountain shape, and it shifts to even, as the air-water ratio increases.

*1) Droplet diameter measured by laser Doppler method

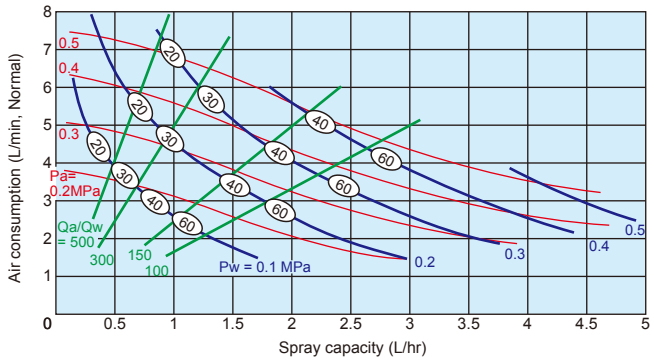




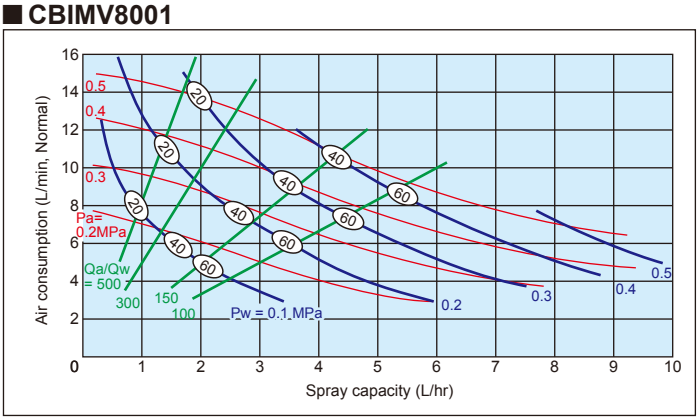
FLOW-RATE DIAGRAMS

■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. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.
4. These flow-rate diagrams are only applicable when using T-type adaptor.
5. Flow-rate diagrams for spray angle code of 110 and 45 are available on request.

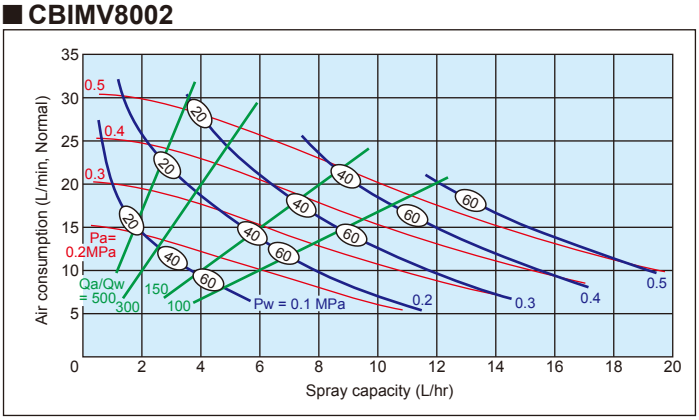
■ CBIMV80005



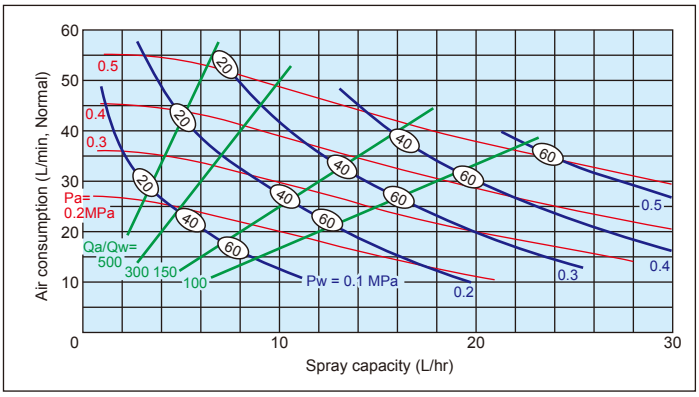
■ CBIMV8001



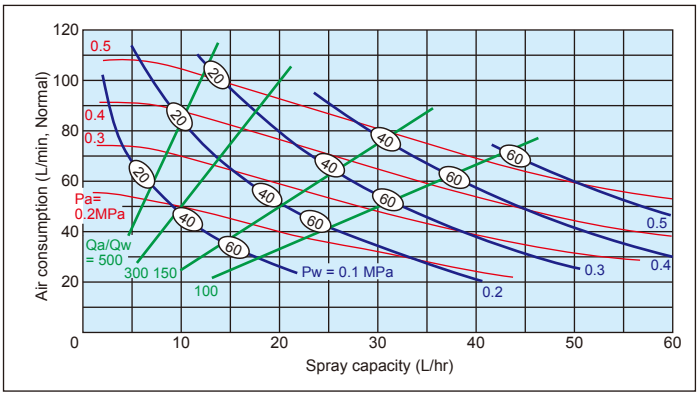
■ CBIMV8002



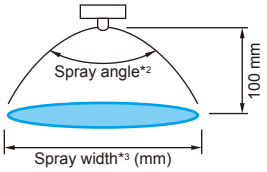
■ CBIMV8004



■ CBIMV80075



CBIMV (Flat Spray)



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				

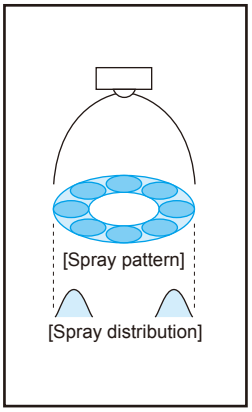
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at spray distance of 100 mm from nozzle.
*4) ○ shows the availability of adaptor for each model number.

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.

*1) Droplet diameter measured by laser Doppler method

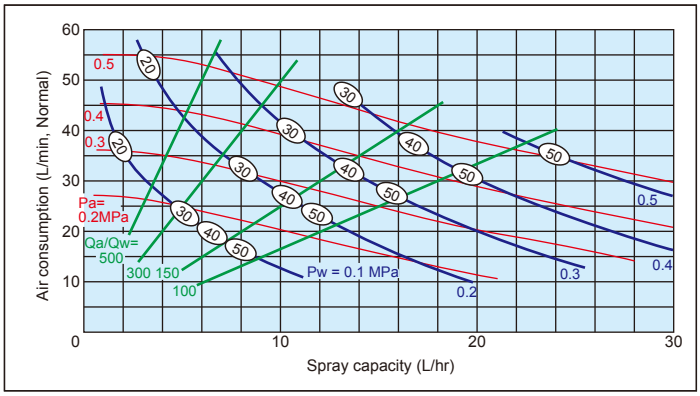


FLOW-RATE DIAGRAMS

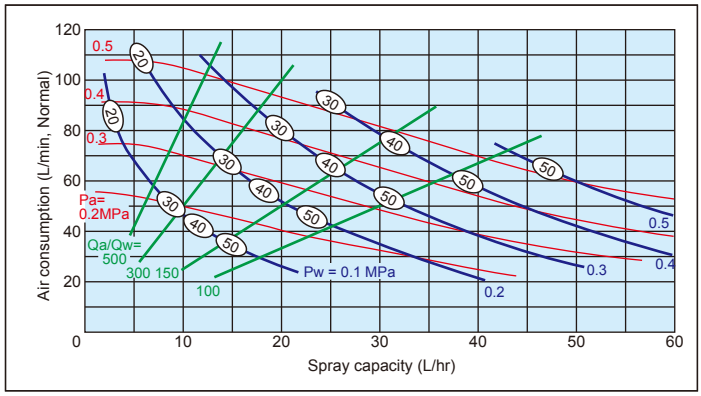
■How to read the chart

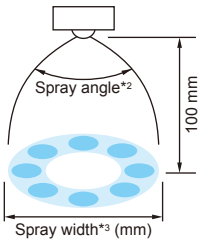
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler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

■ CBIMK6004



■ CBIMK60075





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 dia. (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
○	—	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				

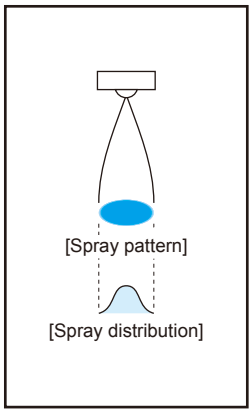
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at spray distance of 100 mm from nozzle.
*4) ○ shows the availability of adaptor for each model number.

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.

*1) Droplet diameter measured by laser Doppler method

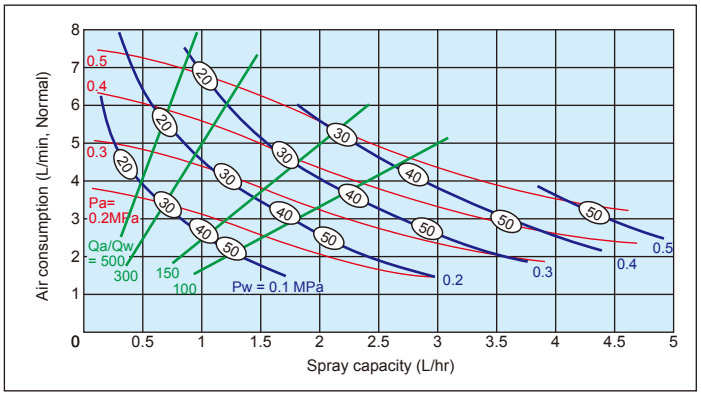


FLOW-RATE DIAGRAMS

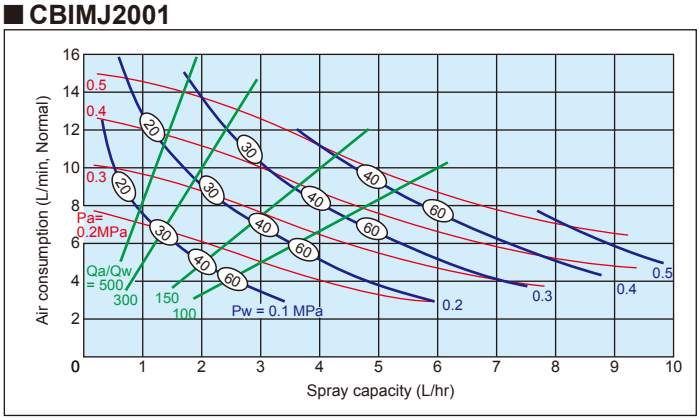
■How to read the chart

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. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.
4. These flow-rate diagrams are only applicable when using T-type adaptor.

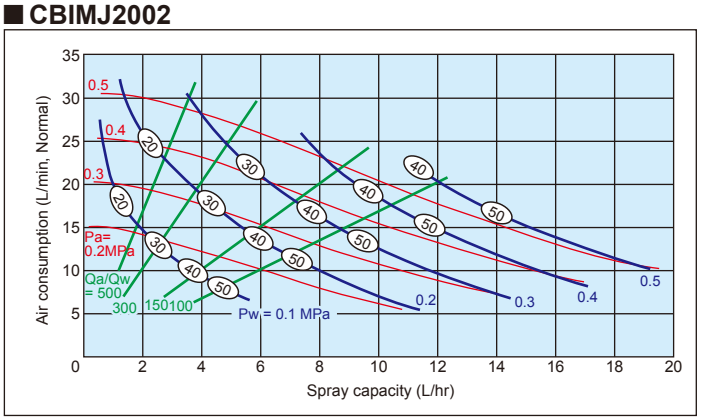
■ CBIMJ20005



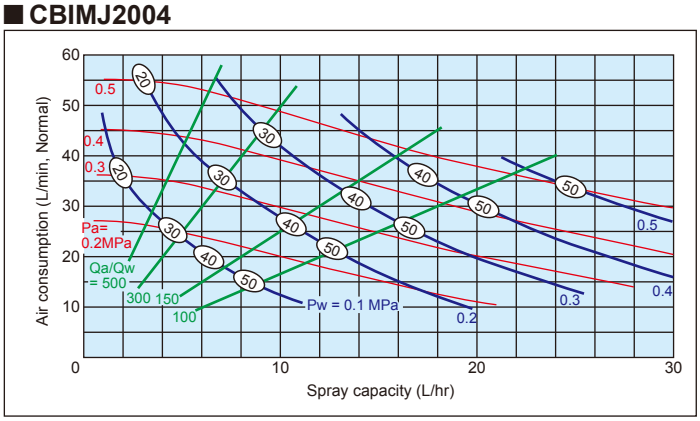
■ CBIMJ2001



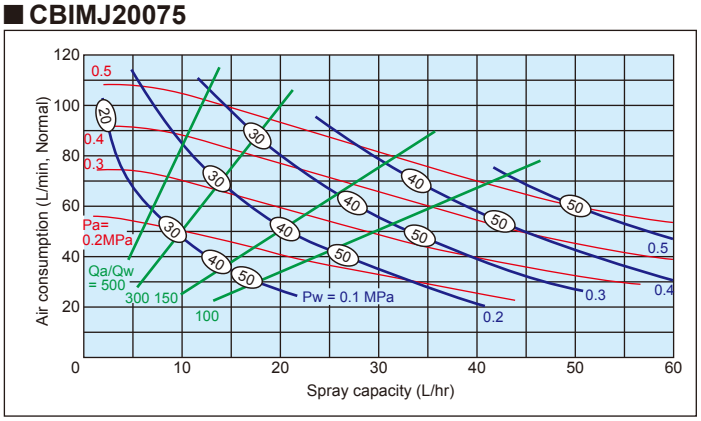
■ CBIMJ2002



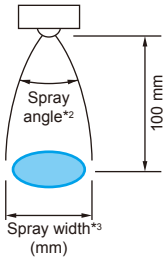
■ CBIMJ2004



■ CBIMJ20075



CBIMJ (Full Cone Spray)



PERFORMANCE DATA

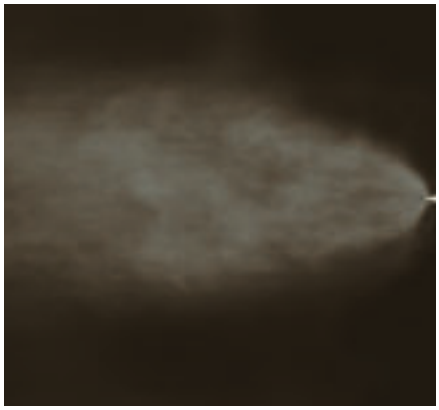
Adaptor type*4		Spray angle code *2	Air con-sump-tion code	Air press. (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa)										Spray width*3 (mm)			Mean droplet dia. (μm)	Free passage diameter (mm)		
					0.1		0.15		0.2		0.25		0.3		Liquid press. (MPa)			Laser Doppler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

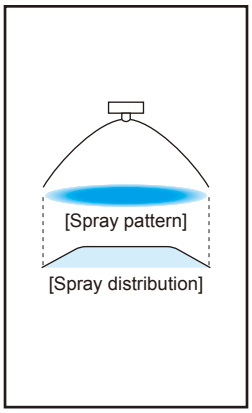
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at spray distance of 100 mm from nozzle.
*4) ○ shows the availability of adaptor for each model number.

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).
■Even spray distribution across the entire spray area.

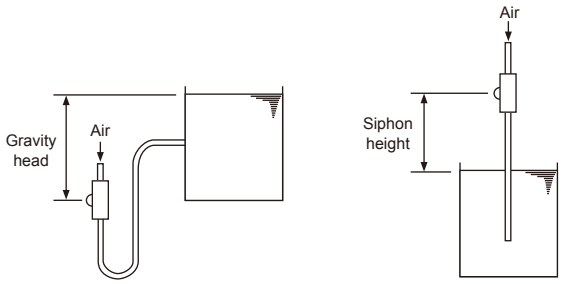
*1) Droplet diameter measured by laser Doppler method



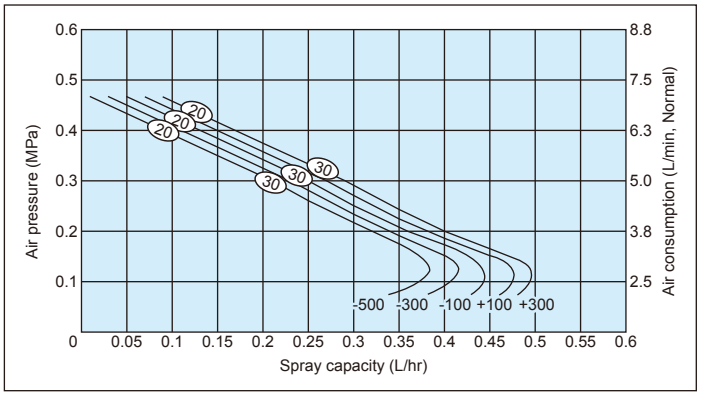


FLOW-RATE DIAGRAMS

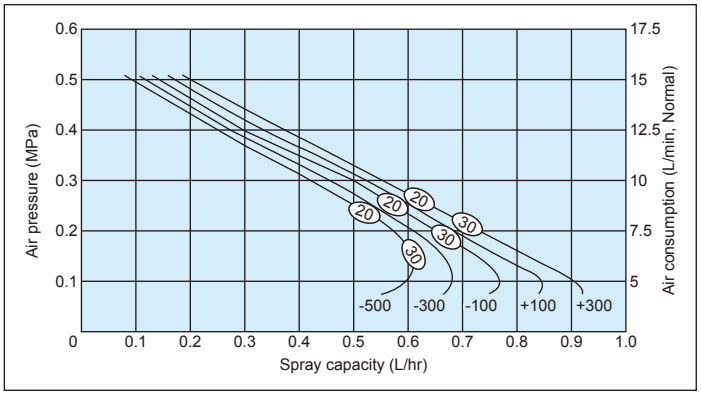
■How to read the chart
1. The spray capacity shown is for one nozzle.
2. Numbers at foot of each curve indicate gravity head (+) and siphon height (–) in mm.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.
4. These flow-rate diagrams are only applicable when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



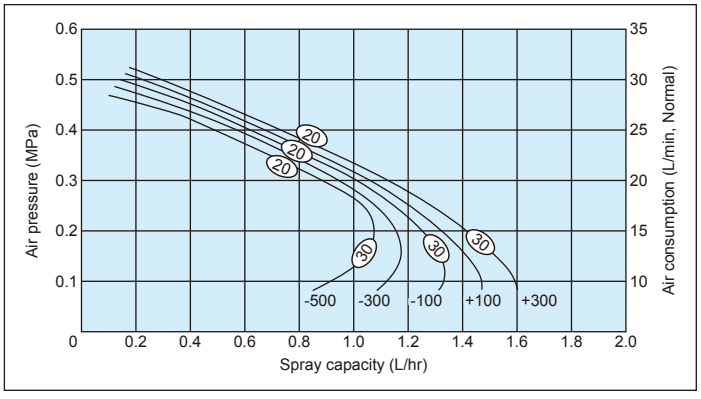
■ CBIMV80005S



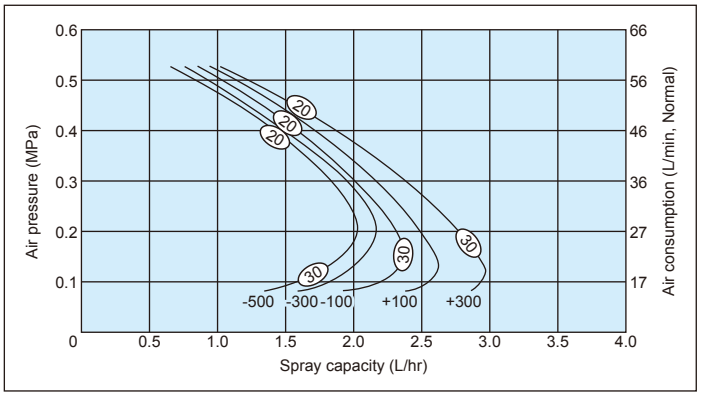
■ CBIMV8001S



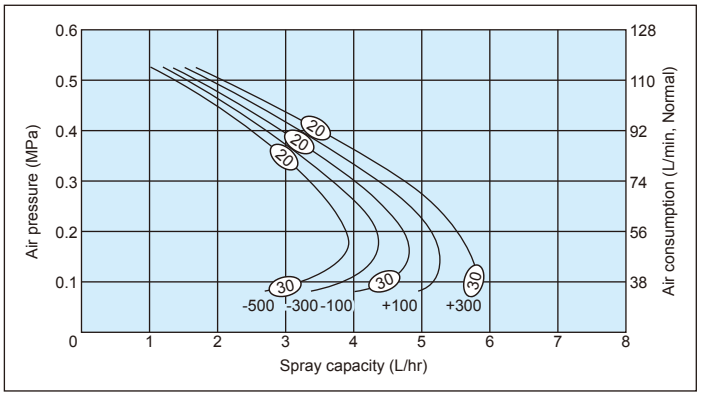
■ CBIMV8002S



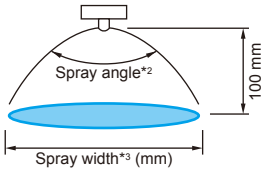
■ CBIMV8004S



■ CBIMV80075S



CBIMV-S (Flat Spray)



PERFORMANCE DATA

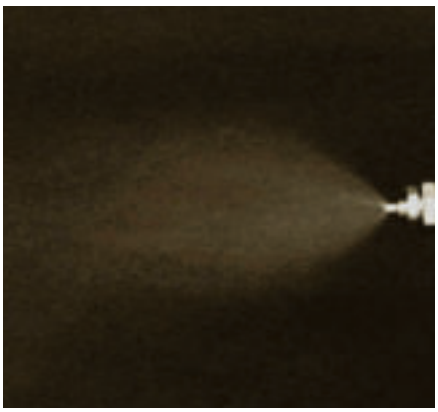
Adaptor type*4		Spray angle code *2	Air con-sump-tion code	Air press. (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr)					Spray width*3 (mm)	Mean droplet diameter (μm)	Free passage dia. (mm)		
						Gravity head (mm)		Siphon height (mm)						Adaptor	
T	CSN CSP					+300	+100	-100	-300	-500		Laser Doppler method	Tip orifice	Liquid	Air
○	○	80	005S	0.2 0.3 0.4	3.75 5.0 6.25	0.4 0.29 0.16	0.38 0.27 0.15	0.36 0.25 0.13	0.34 0.23 0.11	0.32 0.21 0.1	160 165 170	20–30	0.2	0.4	0.3
○	○		01S	0.2 0.3 0.4	7.5 10 12.5	0.74 0.55 0.38	0.68 0.52 0.34	0.65 0.5 0.3	0.61 0.47 0.27	0.57 0.43 0.25	160 165 170	20–30	0.2	0.6	0.5
○	○		02S	0.2 0.3 0.4	15 20 25	1.4 1.1 0.7	1.3 1.0 0.7	1.2 1.0 0.6	1.2 0.9 0.6	1.1 0.9 0.5	160 165 170	20–30	0.3	0.6	0.7
○	—		04S	0.2 0.3 0.4	27 36 46	2.8 2.4 1.9	2.5 2.1 1.7	2.3 2.0 1.6	2.2 1.9 1.5	2.0 1.8 1.4	165 170 175	20–30	0.5	0.9	0.9
○	—		075S	0.2 0.3 0.4	56 74 92	5.5 4.7 3.5	5.1 4.3 3.2	4.7 4.0 2.9	4.3 3.7 2.7	3.9 3.3 2.5	170 180 190	20–30	0.7	1.2	1.4

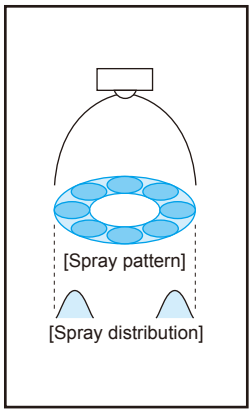
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid siphon height of 100 mm.
*3) Measured at spray distance of 100 mm from nozzle and liquid siphon height of 100 mm.
*4) ○ shows the availability of adaptor for each model number.

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).

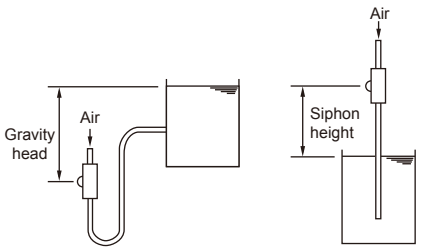
*1) Droplet diameter measured by laser Doppler method



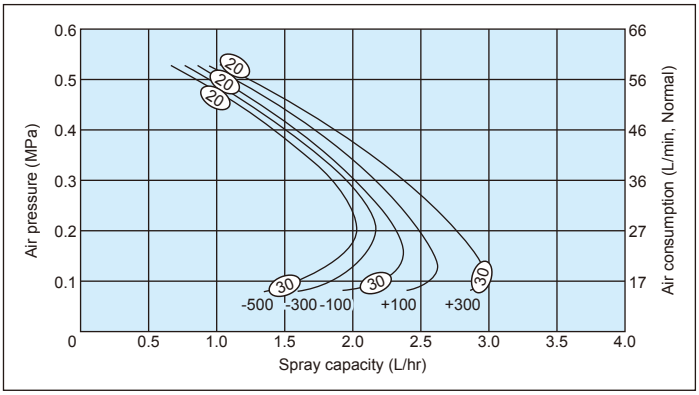


FLOW-RATE DIAGRAMS

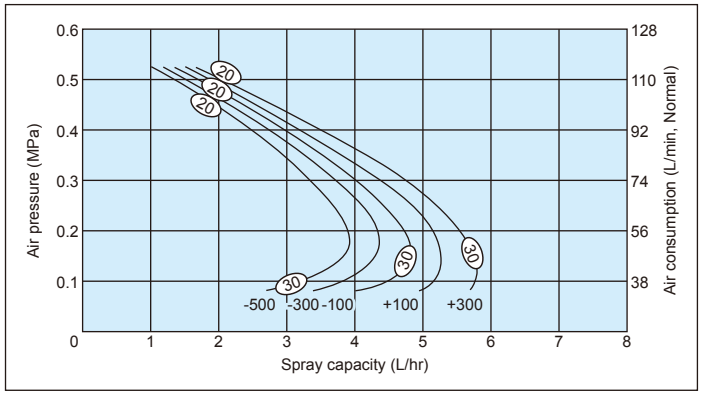
■How to read the chart
1. The spray capacity shown is for one nozzle.
2. Numbers at foot of each curve indicate gravity head (+) and siphon height (–) in mm.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.
4. These flow-rate diagrams are only applicable when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



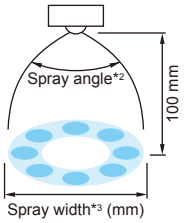
■ **CBIMK6004S**

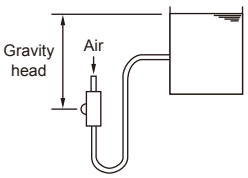


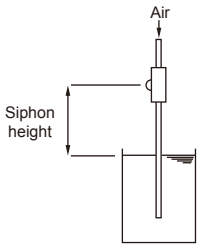
■ **CBIMK60075S**



CBIMK-S (Hollow Cone Spray)







PERFORMANCE DATA

Adaptor type*4		Spray angle code *2	Air con-sump-tion code	Air press. (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr)					Spray width*3 (mm)	Mean droplet diameter (μm) Laser Doppler method	Free passage dia. (mm)		
						Gravity head (mm)		Siphon height (mm)					Tip orifice	Adaptor	
T	CSN CSP					+300	+100	-100	-300	-500				Liquid	Air
○	—	60	04S	0.2 0.3 0.4	27 36 46	2.8 2.4 1.9	2.5 2.1 1.7	2.3 2.0 1.6	2.2 1.9 1.5	2.0 1.8 1.4	120 120 120	20–30	0.6	0.9	0.9
○	—		075S	0.2 0.3 0.4	56 74 92	5.5 4.7 3.5	5.1 4.3 3.2	4.7 4.0 2.9	4.3 3.7 2.7	3.9 3.3 2.5	120 120 120	20–30	0.8	1.2	1.4

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

CBIM

HOW TO ORDER

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

Liquid Pressure Type

<Example> CBIMV 80005 S303 + CSP S303

CBIMV	80	005	S303	+	CSP	S303
Nozzle series ■CBIMV ■CBIMK ■CBIMJ	Spray angle code ■110 ■80 ■60 ■45 ■20	Air consumption code*5 ■005 ■01 ■02 ■04 ■075	Material of nozzle tip		Type of adaptor ■T ■CSN ■CSP	Material of adaptor

Liquid Siphon Type

<Example> CBIMV 80005S S303 + CSP S303

CBIMV	80	005S	S303	+	CSP	S303
Nozzle series ■CBIMV ■CBIMK	Spray angle code ■80 ■60	Air consumption code*5 ■005S ■01S ■02S ■04S ■075S	Material of nozzle tip		Type of adaptor ■T ■CSN ■CSP	Material of adaptor

*5) Air consumption codes 04(S) and 075(S) are only available for T-type adaptor.
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

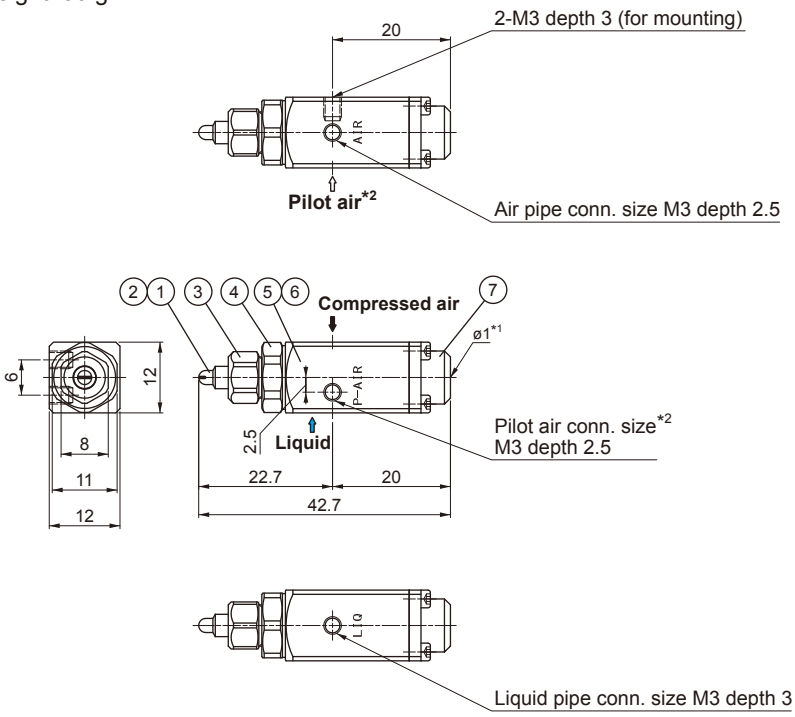
■Further miniaturized version of CBIM series producing fine atomization.
All SCBIM models come with a spray ON/OFF control adaptor.
■Available in liquid pressure or liquid siphon feed type, two spray pattern types (flat spray or full cone spray)—nine varieties in total.
■Able to provide the lowest flow 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, castings, automobile bodies, plastic products
■Moisture control: Paper, flue gas, ceramics, concrete
■Cleaning: Printed circuit boards, glass tubes (for SCBIMV and SCBIMV-S only)

DRAWING

■Weight: 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

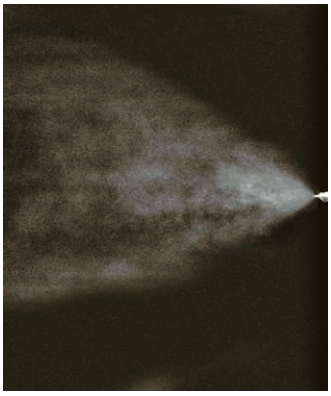
*1) Hole ø1 is for air relief.
*2) No pilot air for SN-type adaptor.

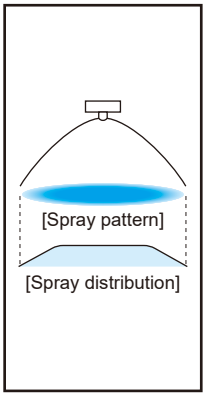
Unit: mm

SCBIMV (Flat Spray)

■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 100 µm or less.*1
■Flat spray pattern.
■Features large turn-down ratio under liquid pressures of 0.1–0.3 MPa.
■The spray distribution varies depending on the air-water ratio.
At a low air-water ratio, the distribution takes a mountain shape, and it shifts to even, as the air-water ratio increases.

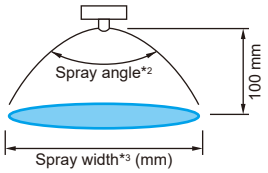
*1) Droplet diameter measured by laser Doppler method





FLOW-RATE DIAGRAMS

See the flow-rate diagrams for CBIMV on page 32.



PERFORMANCE DATA

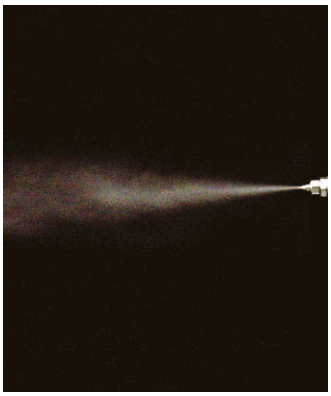
Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet dia. (µm) Laser Doppler method	Free passage diameter (mm) Tip orifice	Adaptor Liquid	Adaptor Air
110	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				

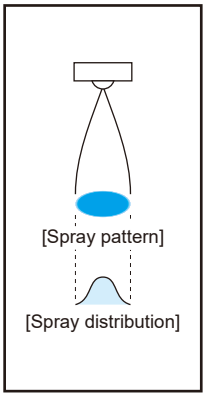
*2) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.1 MPa.
*3) Measured at spray distance of 100 mm from nozzle.

SCBIMJ (Full Cone Spray)

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

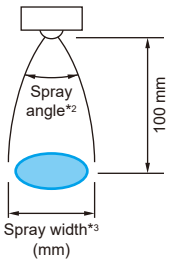
*1) Droplet diameter measured by laser Doppler method





FLOW-RATE DIAGRAMS

See the flow-rate diagrams for CBIMJ on page 35.



PERFORMANCE DATA

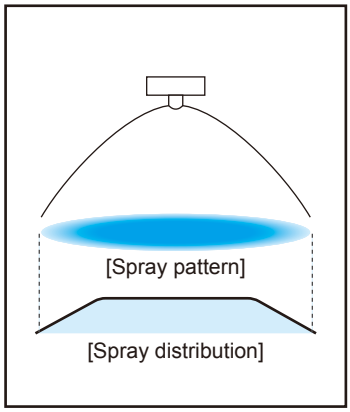
Spray angle code *2	Air consumption code	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa) 0.1 Liquid	0.1 Air	0.15 Liquid	0.15 Air	0.2 Liquid	0.2 Air	0.25 Liquid	0.25 Air	0.3 Liquid	0.3 Air	Spray width*3 (mm) Liquid press. (MPa) 0.1	0.15	0.25	Mean droplet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

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

SCBIMV-S (Flat Spray)

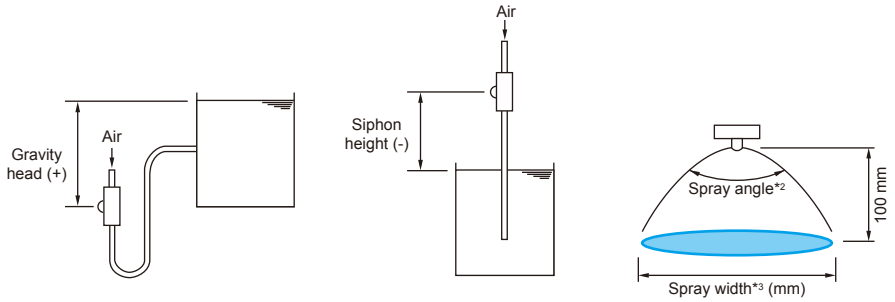
■Pneumatic spray nozzle producing fine atomization with a mean droplet diameter of 30 µm or less.*1
■Flat spray pattern.
■Liquid siphon feed type (liquid pressure device is not required).
■Even spray distribution across the entire spray area.

*1) Droplet diameter measured by laser Doppler method



FLOW-RATE DIAGRAMS

See the flow-rate diagrams for CBIMV-S on page 37.



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 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	3.75	0.4	0.38	0.36	0.34	0.32	160	20–30	0.2	0.4	0.3
		0.3	5.0	0.29	0.27	0.25	0.23	0.21	165				
		0.4	6.25	0.16	0.15	0.13	0.11	0.1	170				
	01S	0.2	7.5	0.74	0.68	0.65	0.61	0.57	160	20–30	0.2	0.6	0.5
		0.3	10	0.55	0.52	0.5	0.47	0.43	165				
		0.4	12.5	0.38	0.34	0.3	0.27	0.25	170				

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

HOW TO ORDER

To inquire about or order a specific product please refer to 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	11007.5	11015	11022	8002	8004	8007.5	8015	8022	4502	4504	4507.5	4515	4522	6004	6007.5	6015	6022	7004	7007.5	7015	7022	2002	2004	2007.5	2015	2022	8002S	8004S	8007.5S	6004S	6007.5S
Liquid pressure type	BIMV	11002		–	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
		11004	–		–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–	–
		11007.5	–	–		–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–
		11015	–	–	–		–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–
		11022	–	–	–	–		–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–
		8002	○	–	–	–	–		–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
		8004	–	○	–	–	–	–		–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–	–
		8007.5	–	–	○	–	–	–	–		–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–
		8015	–	–	–	○	–	–	–	–		–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–
		8022	–	–	–	–	○	–	–	–	–		–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–
		4502	○	–	–	–	–	○	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
		4504	–	○	–	–	–	–	○	–	–	–	–		–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–	–
		4507.5	–	–	○	–	–	–	–	○	–	–	–	–		–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–
		4515	–	–	–	○	–	–	–	–	○	–	–	–	–		–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–
		4522	–	–	–	–	○	–	–	–	–	○	–	–	–	–		–	–	–	○	–	–	–	○	–	–	–	–	○	–	–	–	–	–
	BIMK	6004	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–		–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–	–
		6007.5	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–		–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–
		6015	–	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–		–	–	–	○	–	–	–	–	○	–	–	–	–	–	–
		6022	–	–	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–		–	–	–	○	–	–	–	–	○	–	–	–	–	–
	BIMJ	7004	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–		–	–	–	–	○	–	–	–	–	–	–	–	–
		7007.5	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–		–	–	–	–	○	–	–	–	–	–	–	–
		7015	–	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–		–	–	–	–	○	–	–	–	–	–	–
		7022	–	–	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–		–	–	–	–	○	–	–	–	–	–
		2002	○	–	–	–	–	○	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–
		2004	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–		–	–	–	–	–	–	–	–
		2007.5	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–		–	–	–	–	–	–	–
		2015	–	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–		–	–	–	–	–	–
		2022	–	–	–	–	○	–	–	–	–	○	–	–	–	–	○	–	–	–	○	–	–	–	○	–	–	–	–		–	–	–	–	–
Liquid siphon type	BIMV-S	8002S	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
		8004S	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	○	–
		8007.5S	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	○
	BIMK-S	6004S	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–		–
		6007.5S	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	

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	11075	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	—	—		—	—	—	—	○	—	—	—	—	○	—	○	—	—	—	—	○	—	—	—	—	—	—	—	—
		11075	—	—	—		—	—	—	—	○	—	—	—	—	○	—	○	—	—	—	—	○	—	—	—	—	—	—	—	—
		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

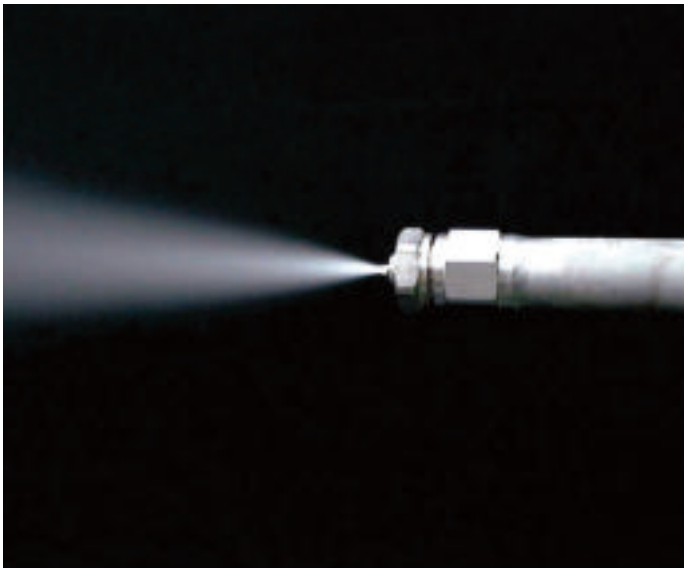
Caps with ○ are interchangeable with each other.

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



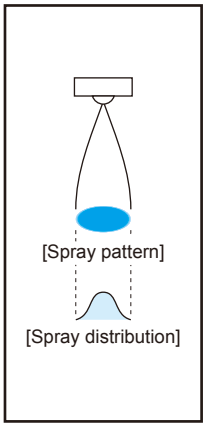
■The SETOJet, SETOV, SETO-SD, and YYA Series are the clog-resistant pneumatic nozzles specially designed for spraying viscous liquid.

■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

SETOJet



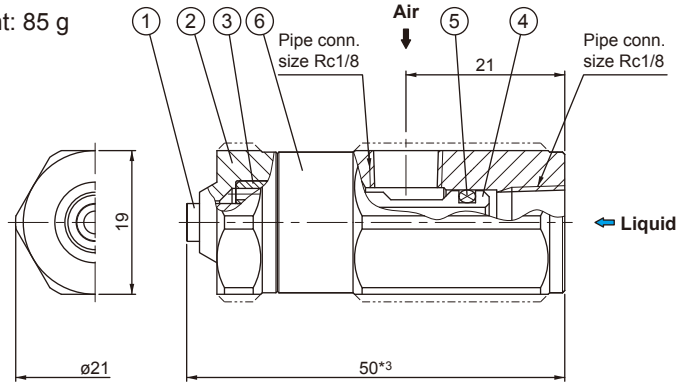
■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 60 μm or less.*1
■Clog-resistant design. Optimal for spraying viscous liquids.
■External mixing type (designed to mix air and liquid outside the nozzle for atomization).
*1) Droplet diameter measured by laser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

APPLICATIONS

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

DRAWING

■Weight: 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 integrated as one part in SETO04** and SETO075**.
*2) Optional material: S316L

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

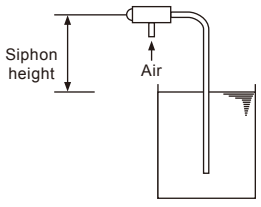
Unit: mm

Download 3D CAD models (SETOJet)

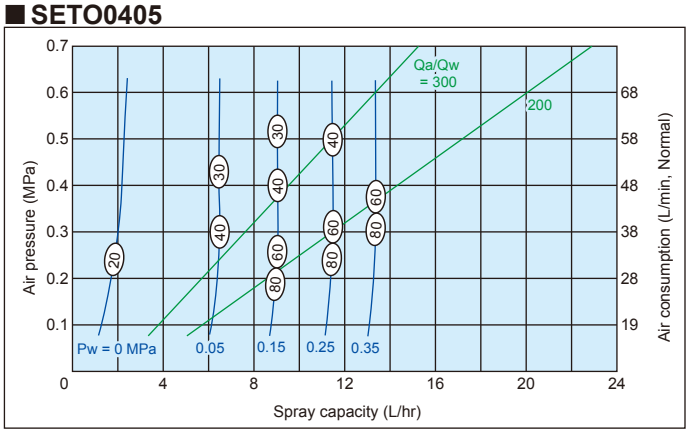
FLOW-RATE DIAGRAMS

■How to read the chart

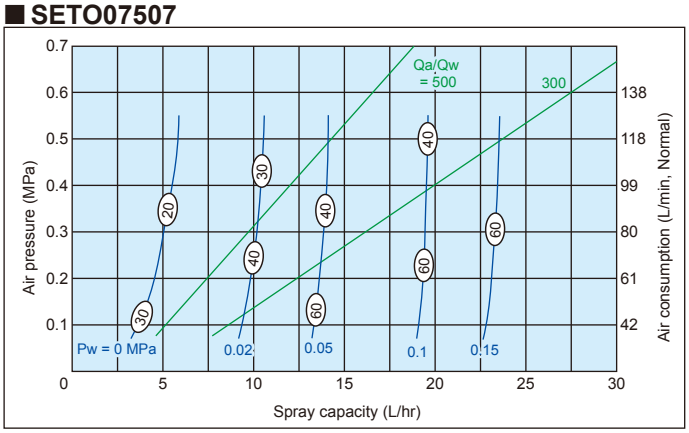
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa. Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at 100 mm liquid siphon height with Pw at 0 MPa.
4. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method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



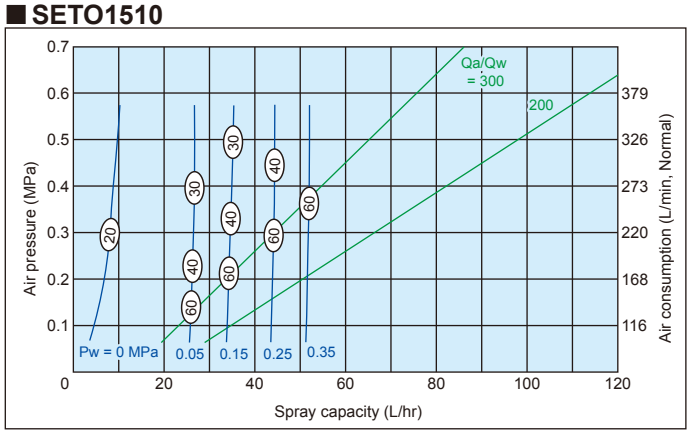
■ SETO0405



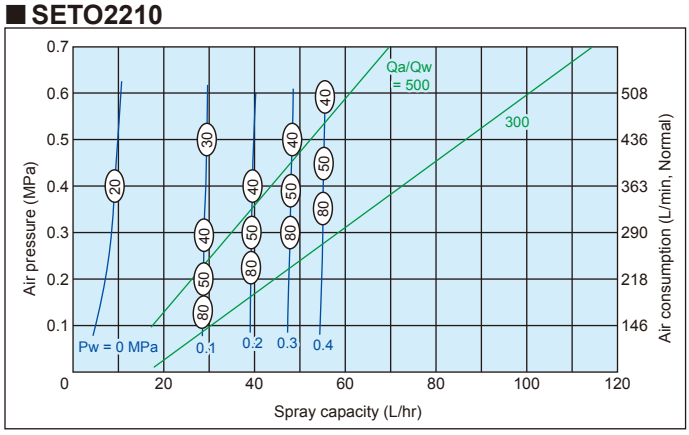
■ SETO07507

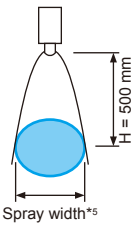


■ SETO1510



■ 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

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

<Example> SETO 0405 S303 + T S303

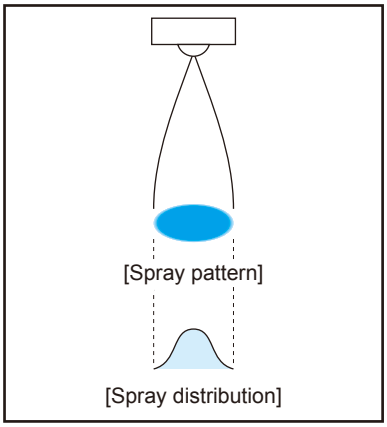
SETO [04] [05] S303 + T S303

- [04] Air consumption code: ■04 ■075 ■15 ■22
- [05] Spray capacity code: ■05 ■07 ■10 ■20
- S303 Material of nozzle tip
- T Type of adaptor
- S303 Material of adaptor

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

Clog-resistant Fine Fog Nozzles
Full Cone Spray

SETOJet-R



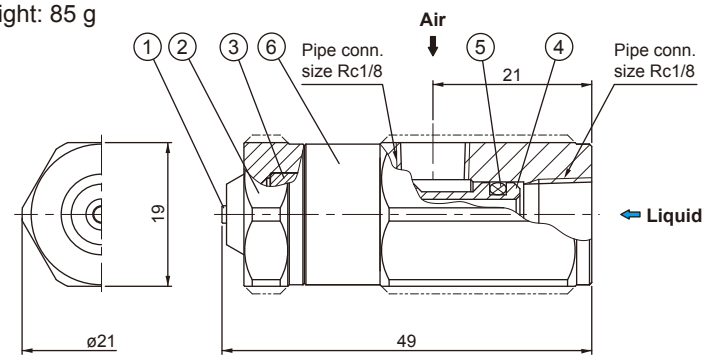
■Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 40 μm or less.*1
■Eddies from air makes further fine atomization.
■Optimal for spraying viscous liquids.
■External mixing type (designed to mix air and liquid outside the nozzle for atomization).
*1) Droplet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

APPLICATIONS

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

DRAWING

■Weight: 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

*2) Optional material: S316L

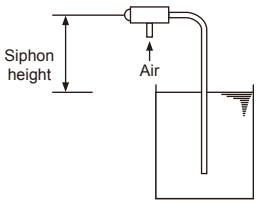
Unit: mm

Download 3D CAD models (SETOJet-R)

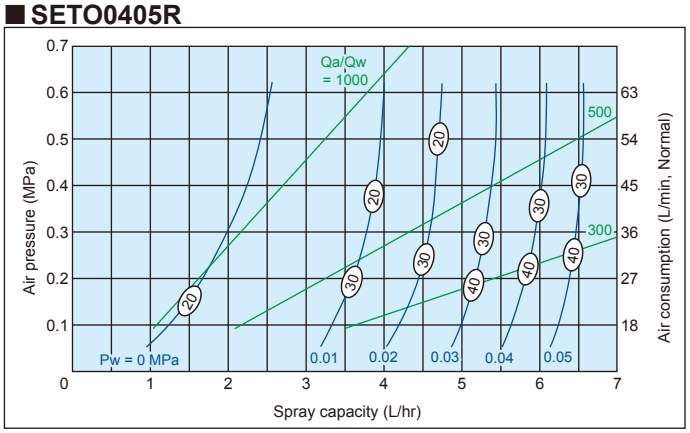
FLOW-RATE DIAGRAMS

■How to read the chart

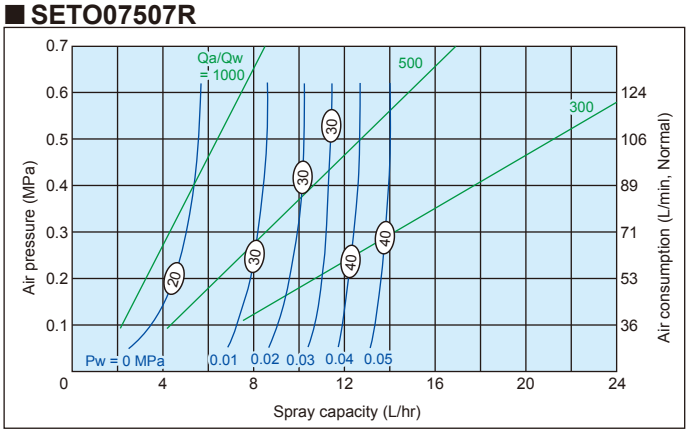
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at 100 mm liquid siphon height with Pw at 0 MPa.
4. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method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



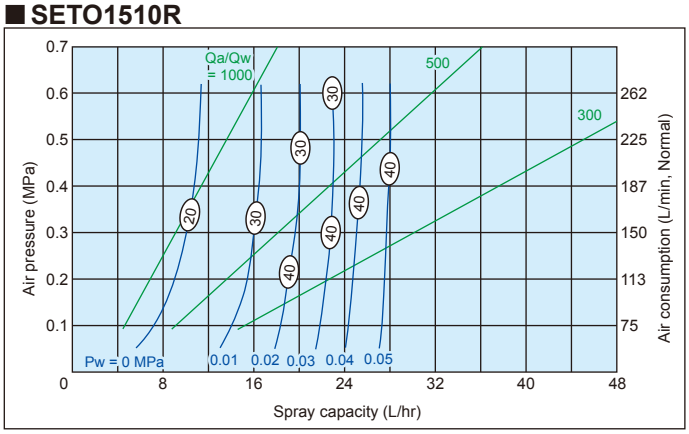
■ SETO0405R



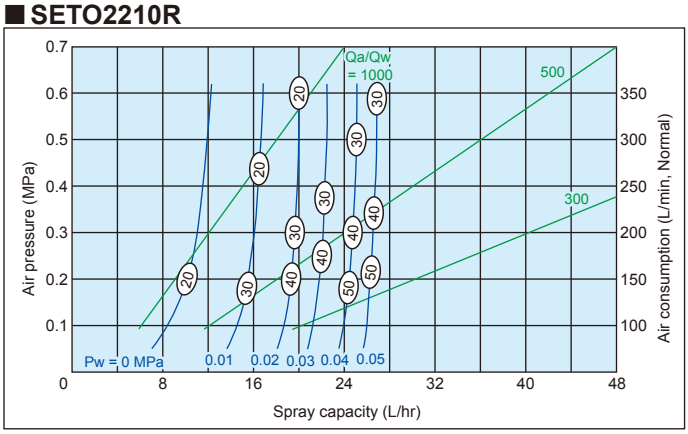
■ SETO07507R

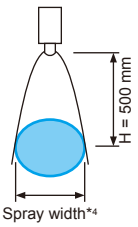


■ SETO1510R



■ SETO2210R





PERFORMANCE DATA

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

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

<Example> SETO 0405R S303 + T S303

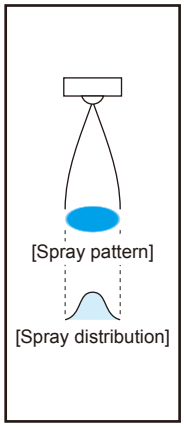
SETO [04] [05R] [S303] + [T] [S303]

- [04] Air consumption code: ■04 ■075 ■15 ■22
- [05R] Spray capacity code: ■05R ■07R ■10R
- [S303] Material of nozzle tip
- [T] Type of adaptor
- [S303] Material of adaptor

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

Clog-resistant Fine Fog Nozzles for Wafer Cleaning

SETOJet-PTFE

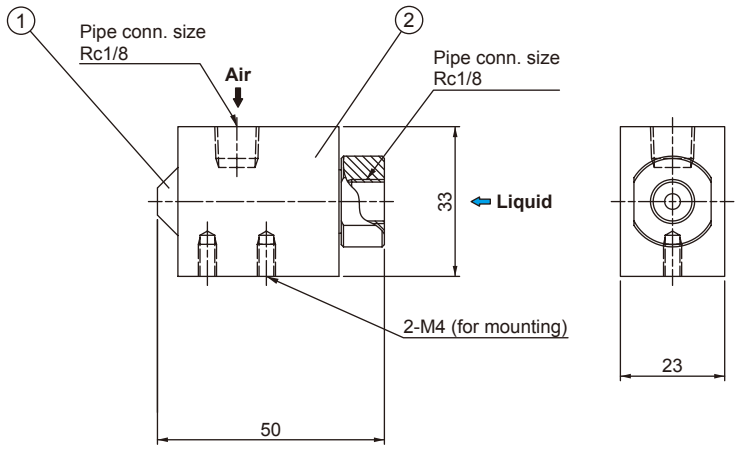


■Pneumatic spray nozzle made of PTFE.
Capable of spraying chemical solutions.
■External mixing type preventing contamination.

APPLICATIONS

■Cleaning: Precise cleaning for semiconductor wafers

DRAWING



■COMPONENTS AND MATERIALS

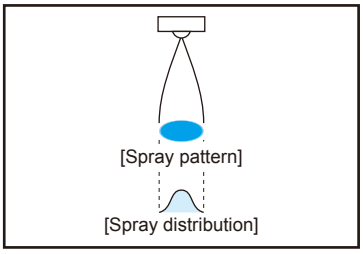
No.	Components	Standard materials
1	Nozzle tip	PTFE
2	Nozzle body	PTFE

Unit: mm

This series is made-to-order. Custom designs can be tailored to your needs.
Please contact our sales office for more details.

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

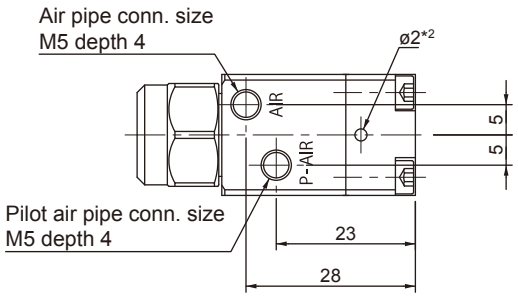
APPLICATIONS

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

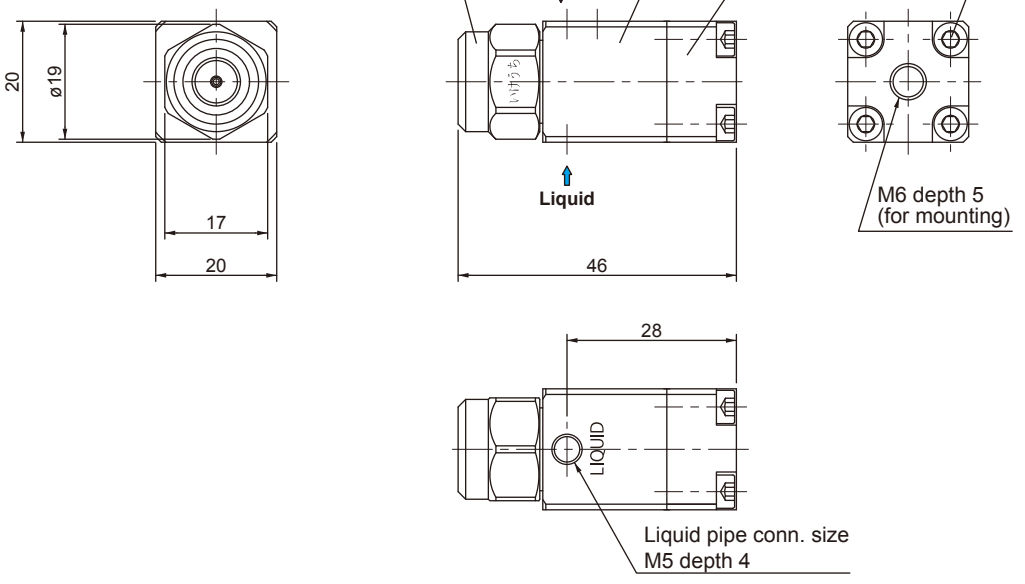
DRAWING

■Weight: 110 g

*2) Hole ø2 is for air relief.



Download 3D CAD model (SETO-SP)



■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 (M3 × 14 mm)	S304 equivalent

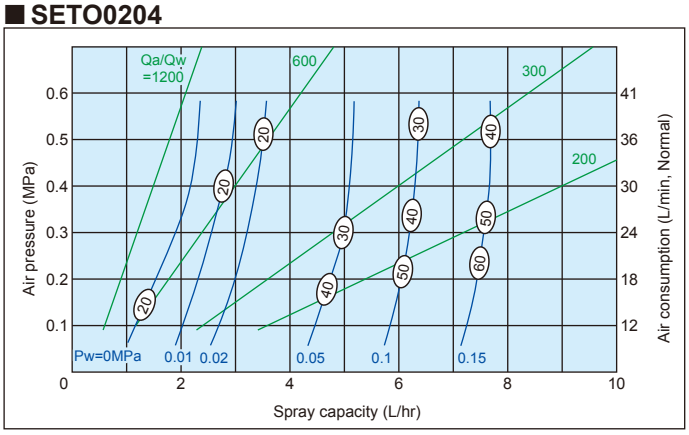
Unit: mm

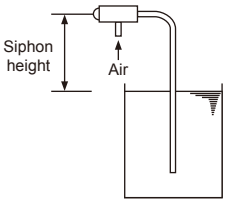
FLOW-RATE DIAGRAMS

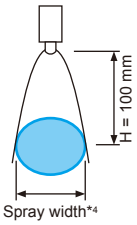
■How to read the chart

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 100 mm liquid siphon height with Pw at 0 MPa.
4. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method (measured at 300 mm from the nozzle).

■ **SETO0204**







SETO-SP

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

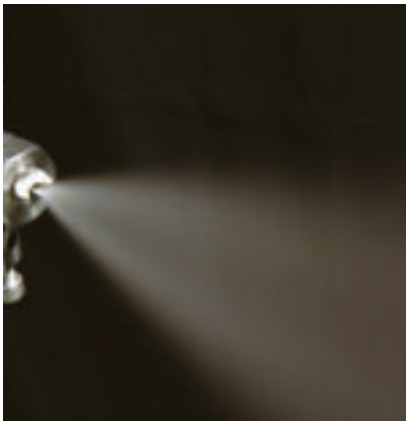
Please inquire about or order using this product code.

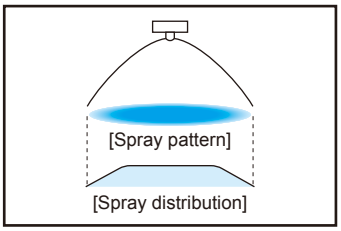
SETO 02 04 S303 + CSP S303

- 02 04: Air consumption code & Spray capacity code
- S303: Material of nozzle tip
- CSP: Type of adaptor
- S303: Material of adaptor

Clog-resistant Fine Fog Nozzles
Flat Spray

SETOV





■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.

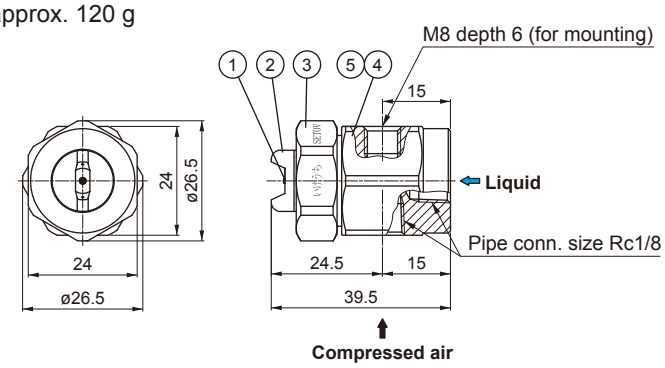
APPLICATIONS

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

DRAWING

Adaptor type T

■Weight: approx. 120 g



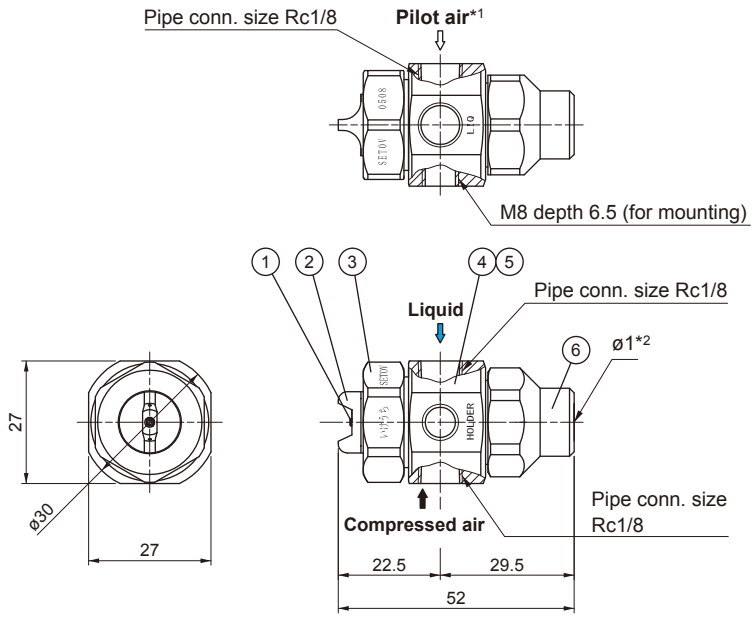
■COMPONENTS AND MATERIALS

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

Download 3D CAD models (SETOV)

Adaptor type SP/SN (Spray control adaptor)

■Weight: 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.

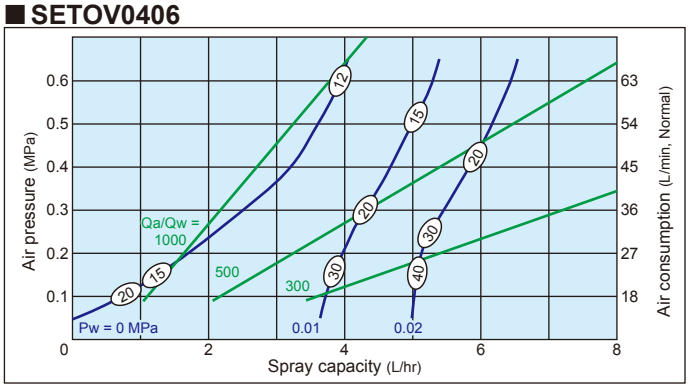
Unit: mm

FLOW-RATE DIAGRAMS

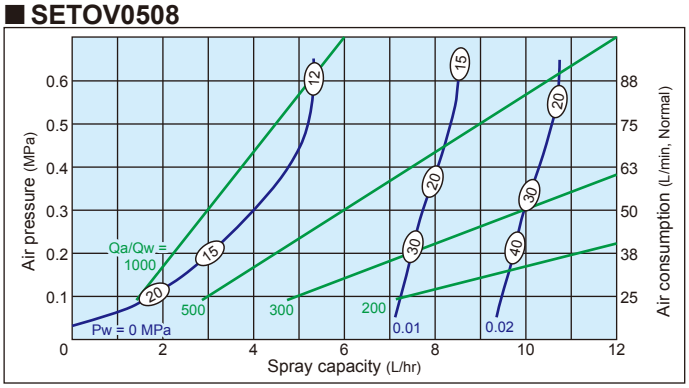
■How to read the chart

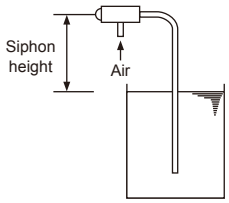
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at 100 mm liquid siphon height with Pw at 0 MPa.
4. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method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

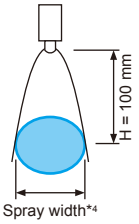
■ SETOV0406



■ SETOV0508







PERFORMANCE DATA

Spray angle *4	Air consumption code	Spray capacity code	Pipe conn. size		Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr)		Spray width*4 (mm)	Mean droplet diameter*4 (μm)	Free passage diameter (mm)	
							Liquid pressure (MPa)					
			Air	Liquid			0 (Siphon)*3	0.02	H = 100 mm	Laser Doppler method	Liquid	Air
65	04	06	Rc1/8		0.2	27	1.7	5.1	130	15–40	0.6	0.1
					0.3	36	2.5	5.5	130			
					0.4	45	3.2	5.8	120			
					0.5	54	3.6	6.2	115			
55	05	08			0.2	38	3.1	9.7	110		0.8	0.2
					0.3	50	4.0	10.0	100			
					0.4	63	4.8	10.3	95			
					0.5	75	5.2	10.6	95			

*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

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

<Example> SETOV 0406 S303 + TS303

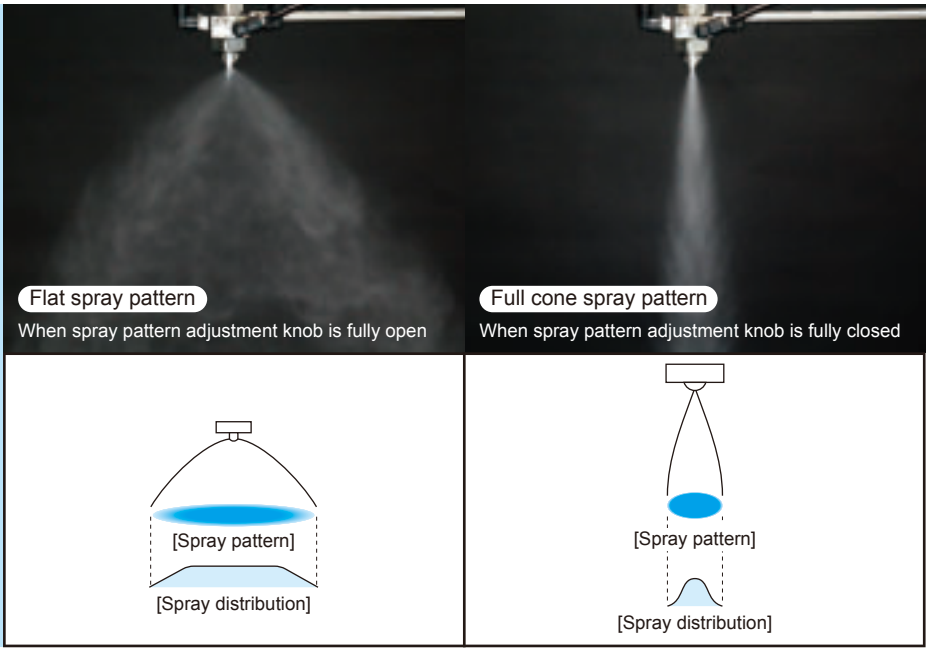
SETOV [04 06] S303 + [T] S303

- [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.

Spray Pattern Adjustable Nozzles for Coating Applications

SETOV-C



■Pneumatic spray nozzle with adjustable spray width and spray pattern.
When the spray pattern adjustment knob is fully open, it provides a flat spray pattern with the widest spray width. When the spray pattern adjustment knob 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 coating only where needed with minimal splatter and spraying high viscosity liquids up to 1,000 cP, such as egg yolk.
■External mixing type (designed to mix air and liquid outside the nozzle for atomization).

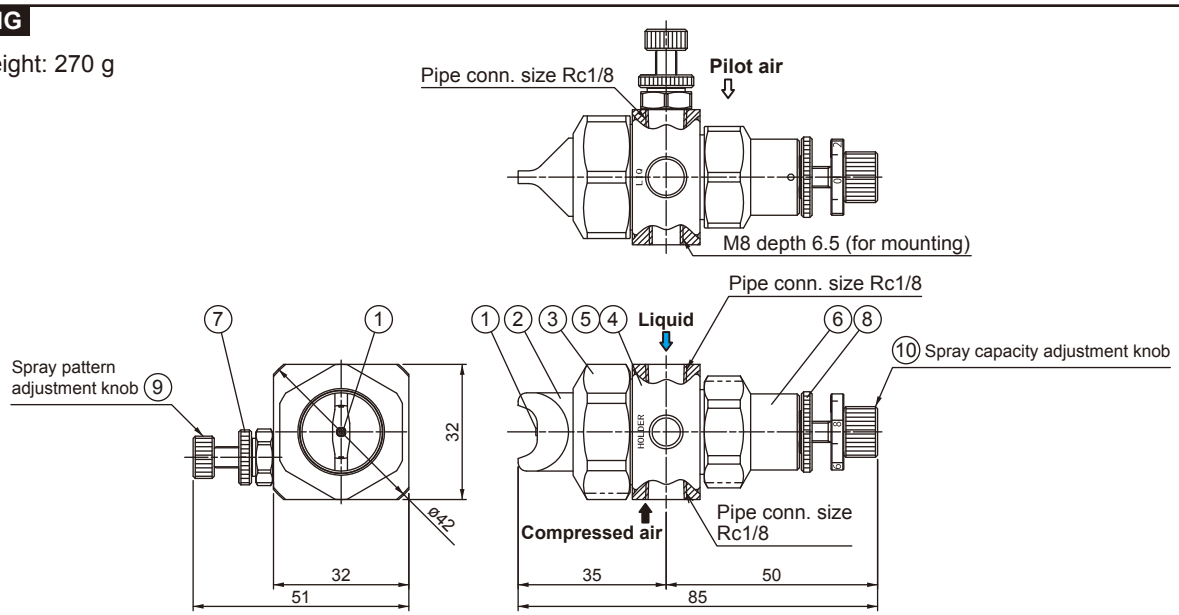
Download 3D CAD models (SETOV-C)

APPLICATIONS

■Coating

DRAWING

■Weight: 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	Spray pattern adjustment locknut	S303
8	Spray capacity adjustment locknut	S303
9	Spray pattern adjustment knob	S303
10	Spray capacity adjustment knob	S303

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

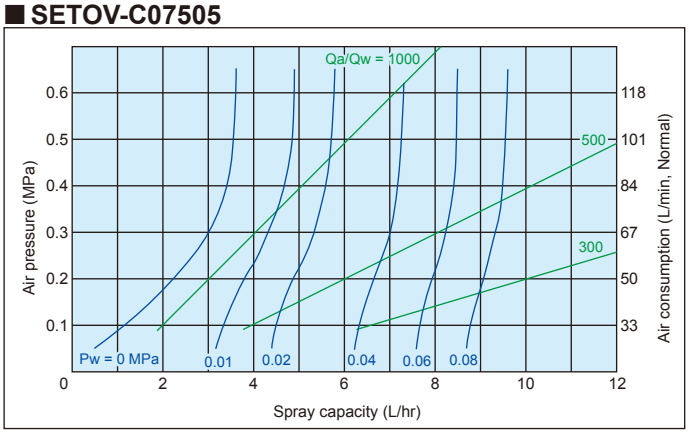
Unit: mm

FLOW-RATE DIAGRAMS

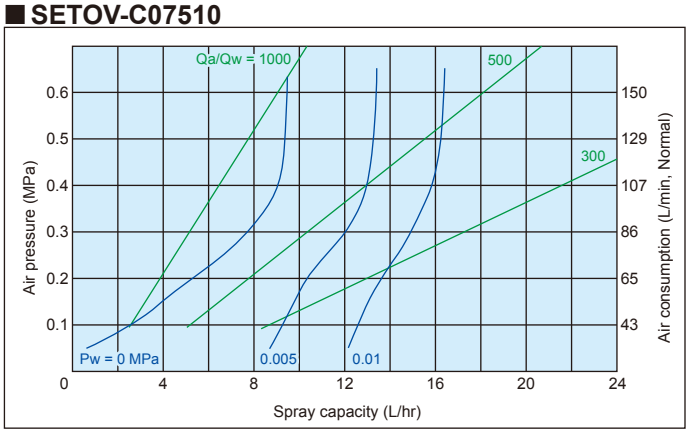
■How to read the chart

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 100 mm liquid siphon height with Pw at 0 MPa.
4. Spray capacity and air consumption shown are when both the spray pattern and capacity adjustment knobs are fully open.

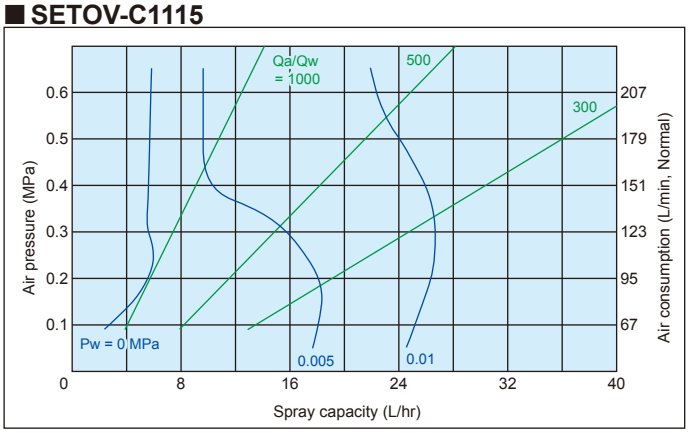
■ SETOV-C07505

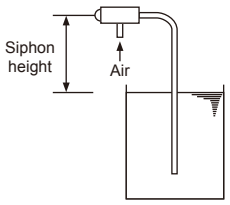


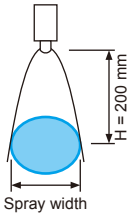
■ SETOV-C07510



■ 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)		Widest spray width*1 (mm) H = 200 mm Liquid pressure (MPa)		Free passage diameter (mm)	
				0 (Siphon)*2	0.01	0 (Siphon)*2	0.01	Liquid	Air
075	05	0.1	33	1.2	3.4	180	220	0.5	0.2
		0.2	50	2.2	3.8	250	260		
		0.3	67	3.0	4.3	250	260		
		0.4	84	3.4	4.7	250	260		
075	10	0.1	43	2.7	12.6	200	250	0.6	0.2
		0.2	65	5.3	13.6	250	270		
		0.3	86	7.7	14.9	250	270		
		0.4	107	9.0	15.9	250	270		
11	15	0.1	67	2.7	24.5	200	400	0.6	0.3
		0.2	95	5.5	26.4	250	400		
		0.3	123	5.5	26.6	250	300		
		0.4	151	5.6	25.9	250	280		

*1) Values with both spray pattern and capacity adjustment knobs fully open.
*2) Siphon height: 100 mm.

HOW TO ORDER

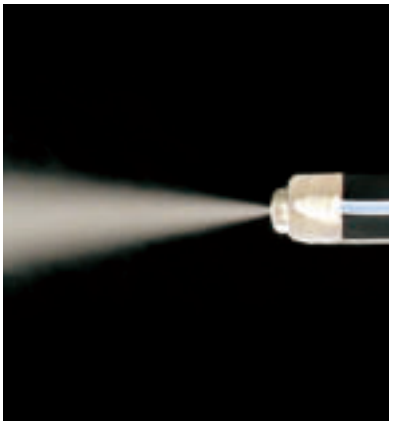
To inquire about or order a specific product please refer to this coding system.

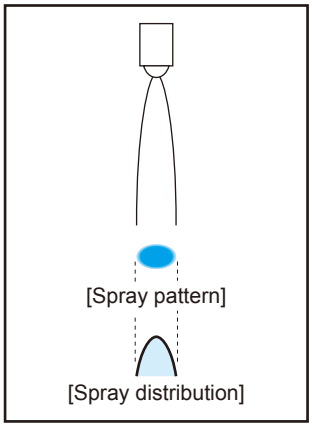
<Example> SETOV-C 07510 S303 + SP S303

SETOV-C [075 10] S303 + SP S303

- [075 10]: Air consumption code & Spray capacity code
  - ■07505
  - ■07510
  - ■1115
- S303: Material of nozzle tip
- SP: Type of adaptor
- S303: Material of adaptor

Solenoid-activated Spray Nozzles SETO-SD



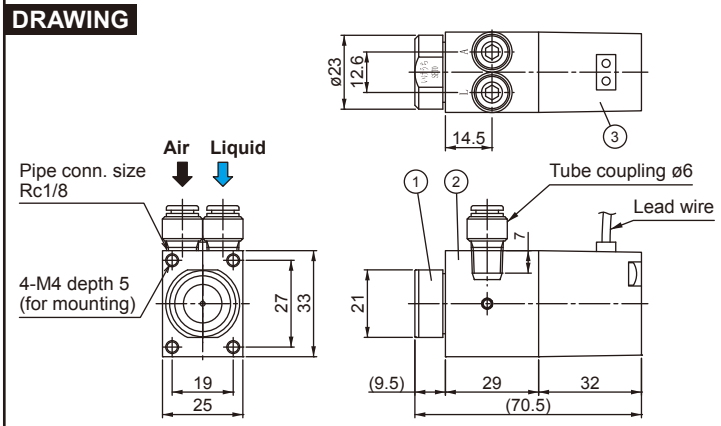


■Fast response action with solenoid activation: Intermittent pulse spray with 0.02 sec/shot and as little as 0.006 cc/shot is possible.
■Ideal for applying a small amount of coating with protective agents, etc.
■IP65, IP67 (dust-proof and water-proof) structure.
■SETO07503R-I+SD is an internal mixing outer air type (the other SETO models are external mixing type).

APPLICATIONS

■Spraying release agent for metal molds
■Intermittent minimal spray coating
■Mold cooling
Note: As this nozzle includes stainless steel parts, not all liquids can be used. Contact us for details.

DRAWING

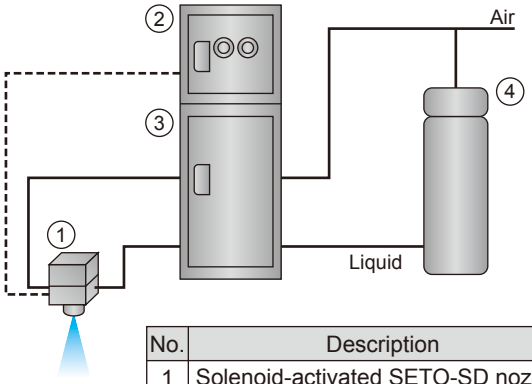


■COMPONENTS AND MATERIALS

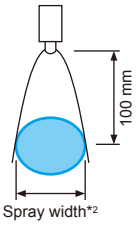
No.	Main components	Standard materials
1	Nozzle body	Aluminum alloy (tip: S303)
2	Adaptor	Aluminum alloy
3	Solenoid assembly	Various materials

Unit: mm

HOW TO USE



No.	Description
1	Solenoid-activated SETO-SD 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)		Weight (g)
		Liquid pressure (MPa)											Laser Doppler method	Adaptor		
		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 spray distance of 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).

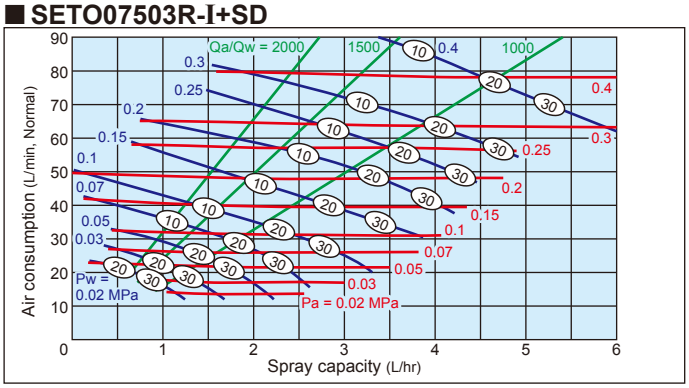
Valve function	Min. operating time (sec)	Max. operating pressure (MPa)	Current (A)	Voltage (VDC)	Max. allowable temperature
Single solenoid, normally closed	ON: 0.02 OFF: 0.02	0.5 for both air/liquid	0.26	24	50°C (120°F)

FLOW-RATE DIAGRAMS

■How to read the chart

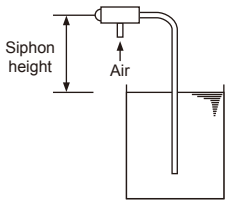
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler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

■ SETO07503R-I+SD

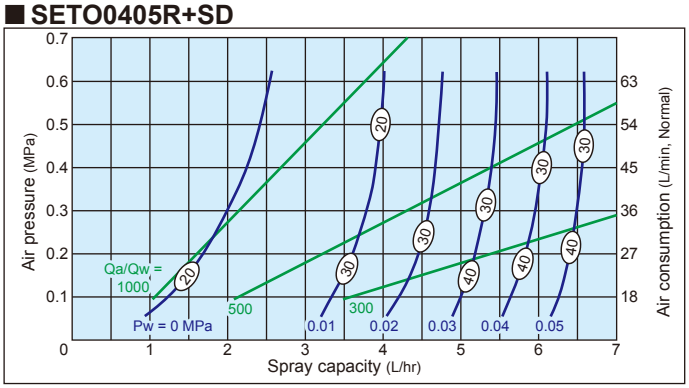


■How to read the chart

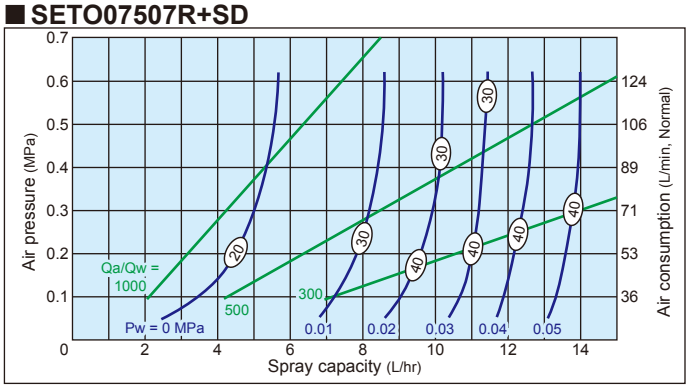
1. The spray capacity shown is for one nozzle.
2. Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Measured at 100 mm liquid siphon height with Pw at 0 MPa.
4. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method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



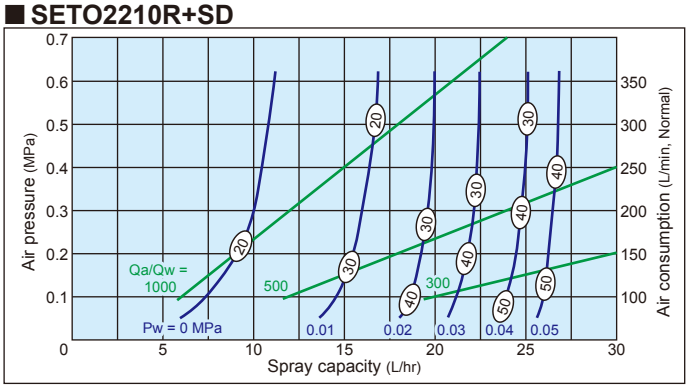
■ SETO0405R+SD



■ SETO07507R+SD



■ SETO2210R+SD



HOW TO ORDER

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

<Example> SETO 07503R-I +SD AL

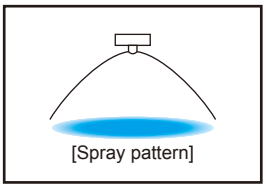
SETO [07503R-I] + SD AL

Nozzle code

■07503R-I
■0405R
■07507R
■2210R

Clog-resistant Fine Fog Nozzles
Wide-angle Flat Spray

YYA



■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

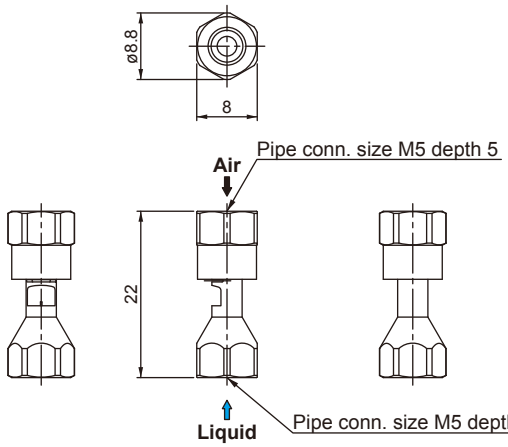
*1) Droplet diameter measured by laser Doppler method
*2) Spray capacity and spray angle are reduced when viscous liquid is sprayed. Raising the liquid pressure to 0.2–0.3 MPa is recommended when spray capacity is small, otherwise the spray pattern becomes irregular.

APPLICATIONS

■Spraying viscous liquid such as oil and honey

DRAWING

■Material: S303



Download 3D CAD model

Unit: mm

PERFORMANCE DATA

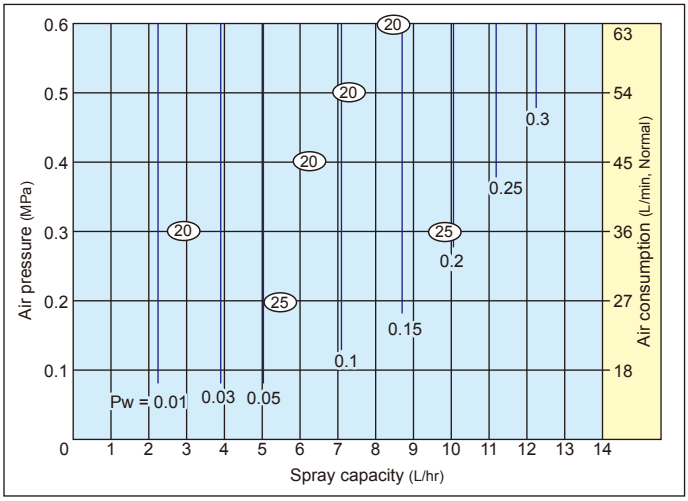
Spray angle code*3	Air consumption code	Air pressure (MPa)	Air consumption (L/min, Normal)	Spray capacity (L/hr) Liquid pressure (MPa)				Spray width*4 (mm) Liquid pressure (MPa)				Mean droplet diameter (μm)	Free passage diameter (mm)		Weight (g)
				0.01	0.05	0.1	0.2	0.01	0.05	0.1	0.2	Laser Doppler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

FLOW-RATE DIAGRAMS

■How to read the chart

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



HOW TO ORDER

Please inquire about or order using this product code.

M5F YYA 8004 S303

Large Capacity Fine Fog Nozzles

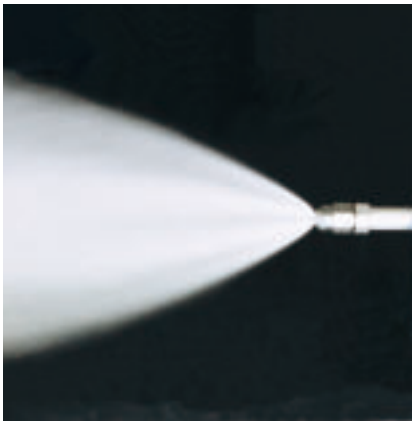
■The GSIM Ⅱ Series boast a remarkable combination of excellent atomization capabilities and an energy-saving design.

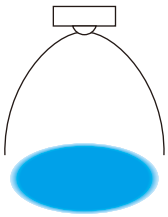
■This nozzle series produces a large volume of fine atomization with a low consumption of compressed air, having very low air-water ratios.

■Simple structure allows for 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

■The low air-water ratio nozzle that provides a large amount of "fine fog" while using minimal compressed air.

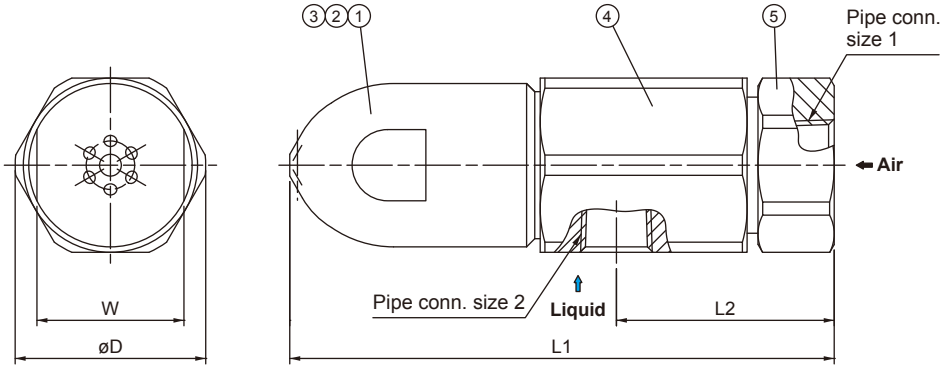
*1) GSIMII with spray angle code 60 and air consumption code 37–110, measured by laser Doppler method.

APPLICATIONS

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

GSIM II 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*2 (mm)			Weight (g)
		1 (Air)	2 (Liquid)	L1	L2	W	øD	Tip orifice	Air	Liquid	
60 20	37	Rc3/8	Rc1/4	100	40	27	35	1.8 (4.4)	1.6	1.8 (2.2)	500
	55							2.2 (5.3)	2.0	2.2 (2.2)	
	75	Rc1/2	Rc3/8	120	42	32	45	2.6 (6.3)	2.3	2.6 (3.2)	900
	110							3.2 (7.5)	2.9	3.2 (3.2)	
	150	Rc3/4	Rc1/2	140	44	46	50	3.7 (8.9)	3.3	3.7 (4.0)	1,200
	220							4.5 (10.8)	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

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

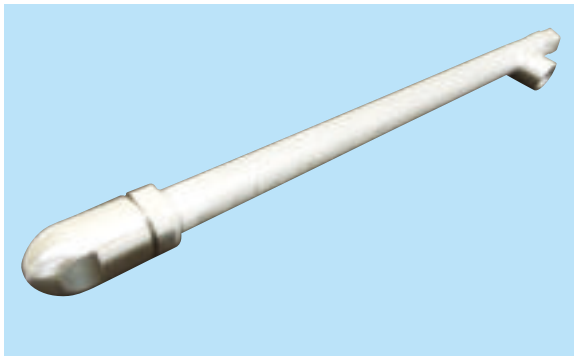
<Example> GSIM6037II S316L + T S303

GSIM [60] [37] II S316L + T S303

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

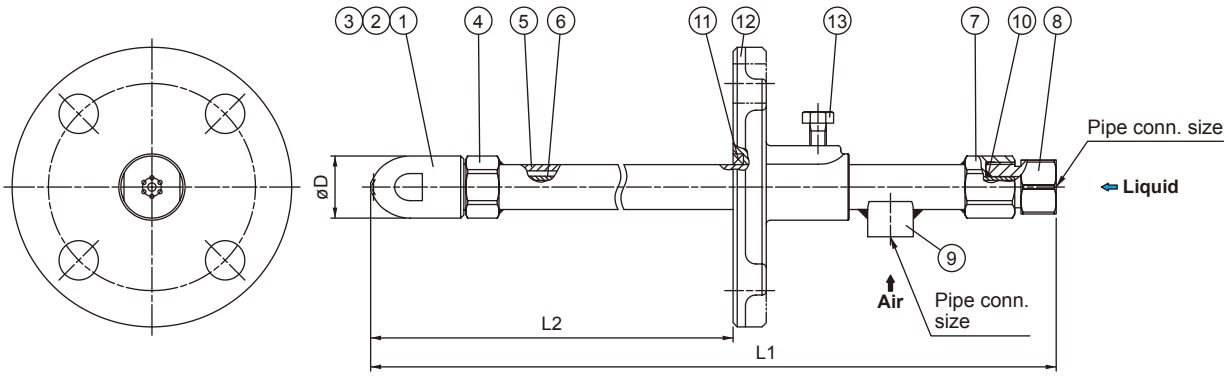
Flange Type

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
7	Joint	S304
8	Liquid socket	S304
9	Air socket	S304 equivalent
10	O-ring	FKM
11	Packing	Metal wire reinforced AES wool
12	Flange	SCS13 (S304)
13	Bolt	S304 equivalent



DIMENSIONS

Spray angle code	Air consumption code	Pipe connection size		Outer diameter øD (mm)	Free passage diameter*2 (mm)		
		Air	Liquid		Tip orifice	Air	Liquid
60 20	37	Rc3/8	Rc3/8	30	1.8 (4.4)	1.6	1.8 (2.2)
	55				2.2 (5.3)	2.0	2.2 (2.2)
	75	Rc1/2	Rc1/2	38	2.6 (6.3)	2.3	2.6 (3.2)
	110				3.2 (7.5)	2.9	3.2 (3.2)
	150	Rc3/4		50	3.7 (8.9)	3.3	3.7 (4.0)
	220				4.5 (10.8)	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

WEIGHT

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

HOW TO ORDER

When selecting a nozzle product, various factors must be considered, such as distance to target, number of nozzles required, and installation layout including air and liquid piping.
To ensure the best nozzle selection for your needs, consult our sales representatives during the design phase. Our engineering services are essential for efficient performance.

Inquiry forms with outline drawings are available to confirm dimensions and pipe connections.
Contact us for more details.

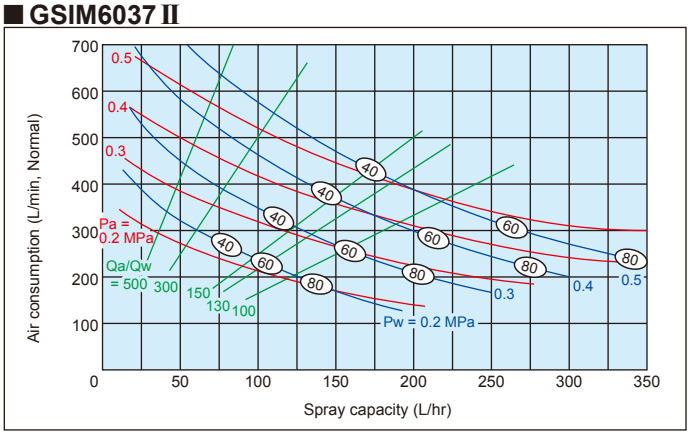
GSIM II with T-type Adaptor　Flange Type

FLOW-RATE DIAGRAMS　SPRAY ANGLE 60° TYPE

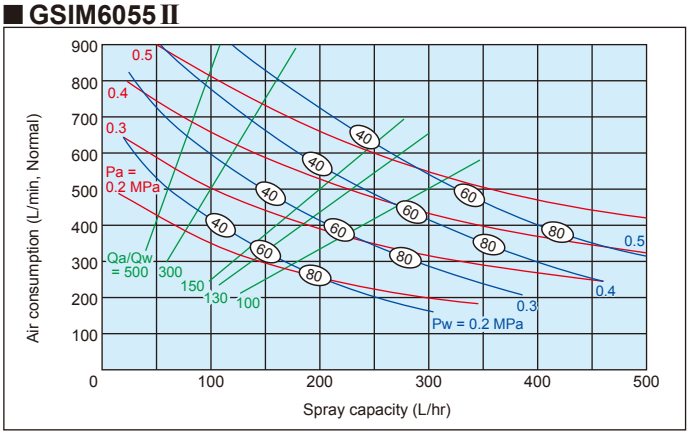
■How to read the chart

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

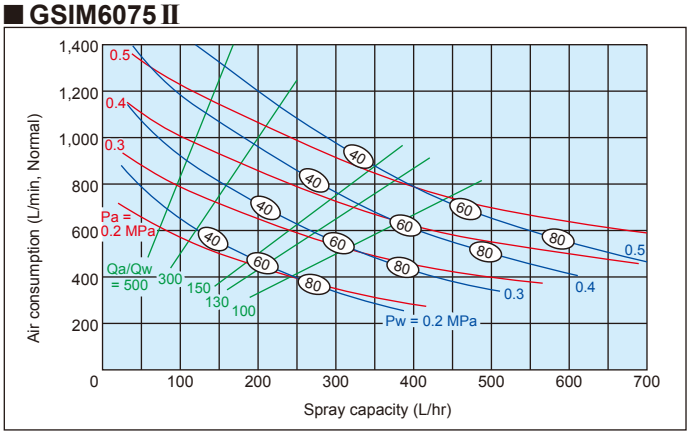
■ GSIM6037 II



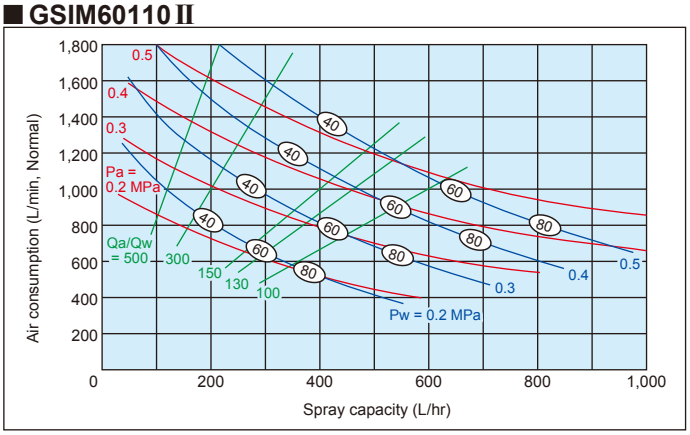
■ GSIM6055 II



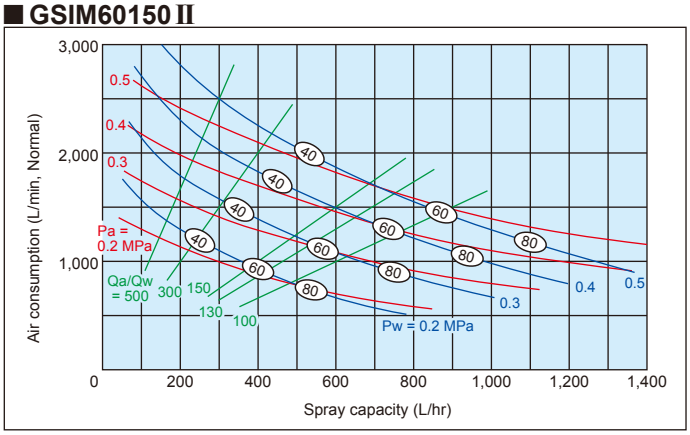
■ GSIM6075 II



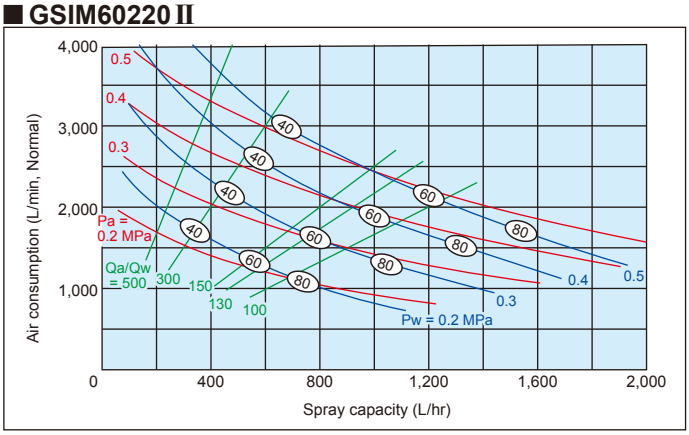
■ GSIM60110 II



■ GSIM60150 II



■ GSIM60220 II



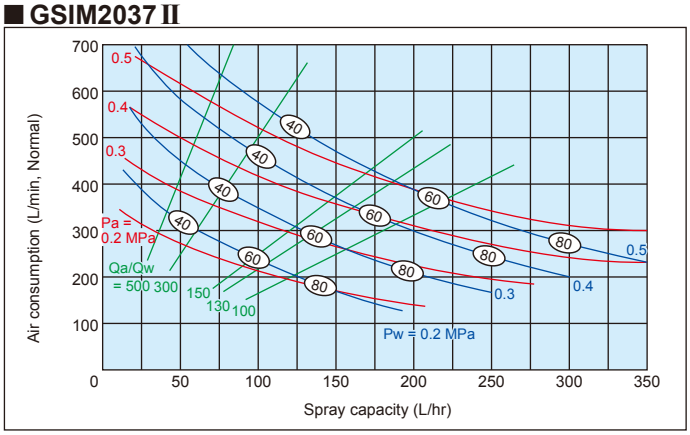
GSIM II with T-type Adaptor Flange Type

FLOW-RATE DIAGRAMS **SPRAY ANGLE 20° TYPE**

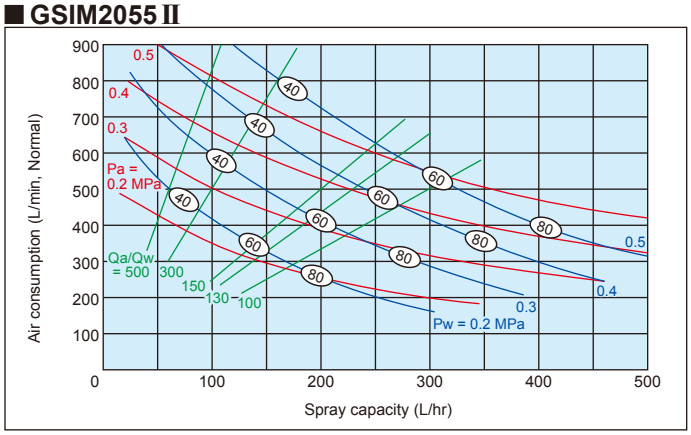
■How to read the chart

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

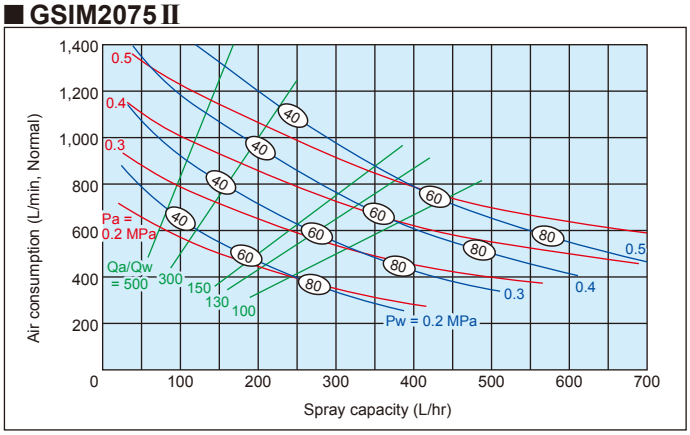
■ GSIM2037 II



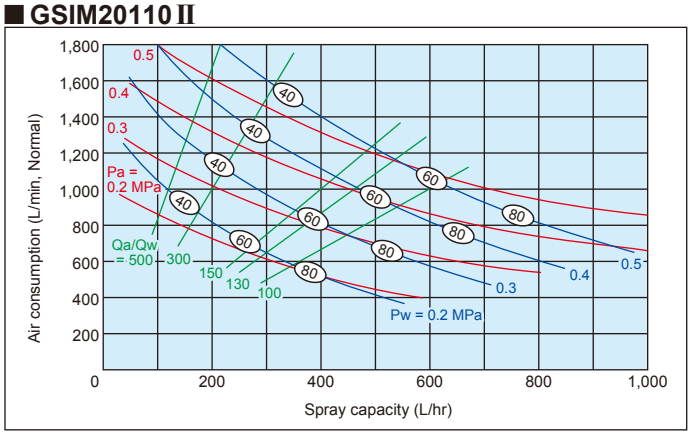
■ GSIM2055 II



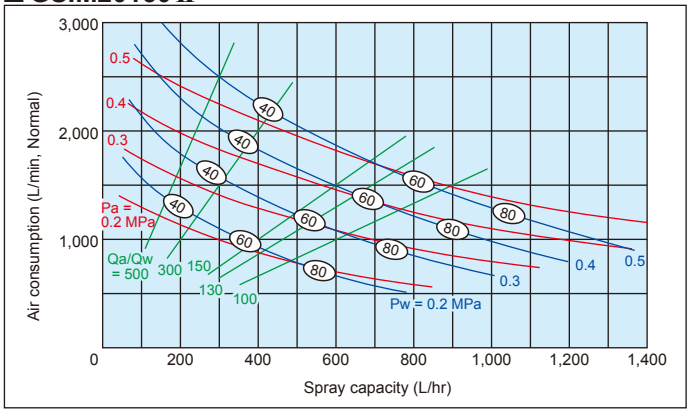
■ GSIM2075 II



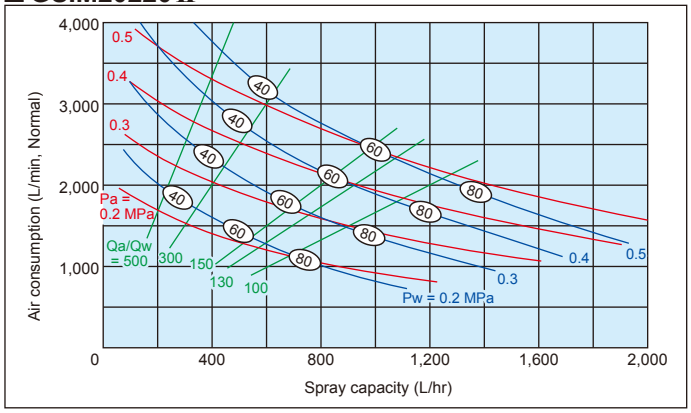
■ GSIM20110 II



■ GSIM20150 II



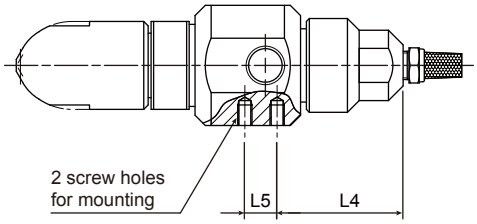
■ GSIM20220 II

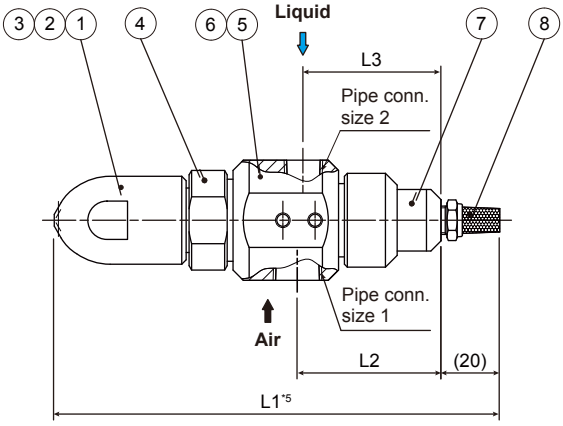


GSIM II with SN-type Adaptor

The SN-adaptor type, newly added to the large capacity pneumatic nozzle GSIM II Series, turns the spray on-off without dripping by only controlling the air supply.

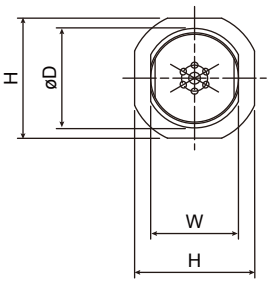
DRAWING





■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle tip	S316L
2	Nozzle core	S316L
3	Whirler	S316L equiv.
4	Nozzle adaptor	S303
5	Adaptor	S303
6	O-ring	FKM
7	Spring cap	S303
8	Silencer	Brass, etc.



Note: The above drawing is for GSIM6037IIS316L+SNS303.
Configurations of nozzle slightly differ depending on air consumption codes.

DIMENSIONS

Spray angle code	Air consumption code	Pipe connection size		Mounting screw hole size	Outer dimensions (mm)								Free passage diameter*6 (mm)			Weight (g)
		1 (Air)	2 (Liquid)		L1*5	L2	L3	L4	L5	H	W	øD	Tip orifice	Air	Liquid	
60 20	37	Rc3/8	Rc1/4	M5 depth 7	152	49	47	43	11	41	30	34	1.8 (4.4)	1.6	1.8 (2.2)	750
	55												2.2 (5.3)	2.0	2.2 (2.2)	
	75	Rc1/2	Rc3/8	M8 depth 10	192	64.5	60	55	17	50	41	45	2.6 (6.3)	2.3	2.6 (3.2)	1,500
	110												3.2 (7.5)	2.9	3.2 (3.2)	
	150	Rc3/4	Rc1/2	M8 depth 10	230	80	75	69	17	65	50	55	3.7 (8.9)	3.3	3.7 (4.0)	3,100
	220												4.5 (10.8)	4.0	4.0 (4.0)	

*5) The total length L1 may vary slightly depending on the tightness of the silencer.
*6) Free passage diameter in ( ) shows that of GSIM II with spray angle code of 20.

HOW TO ORDER

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

<Example> GSIM 6037II S316L + SN S303

GSIM [60] [37] II S316L + SN S303

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

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

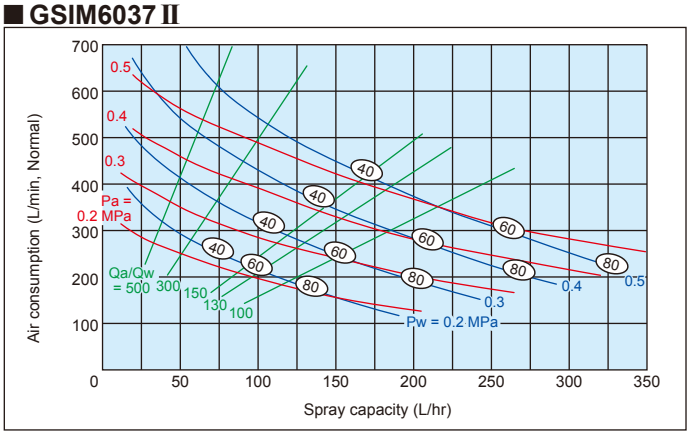
GSIM II with SN-type Adaptor

FLOW-RATE DIAGRAMS | **SPRAY ANGLE 60° TYPE**

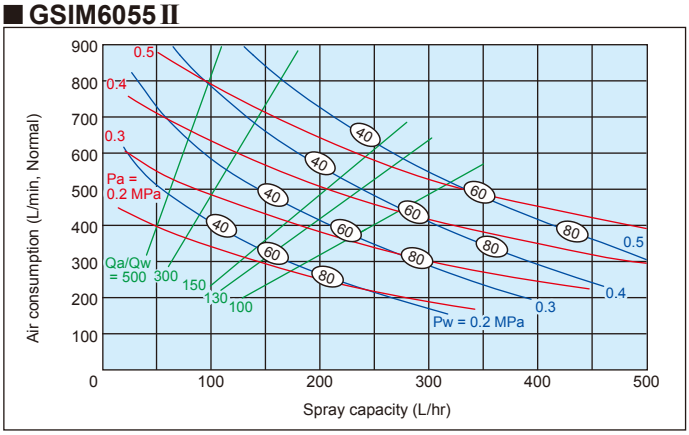
■How to read the chart

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

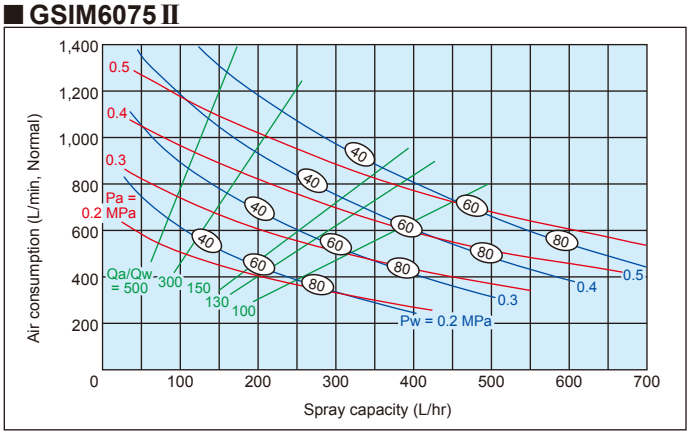
■ GSIM6037 II



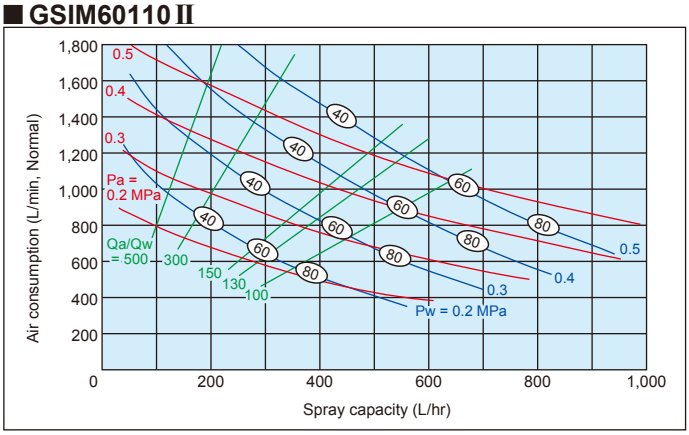
■ GSIM6055 II



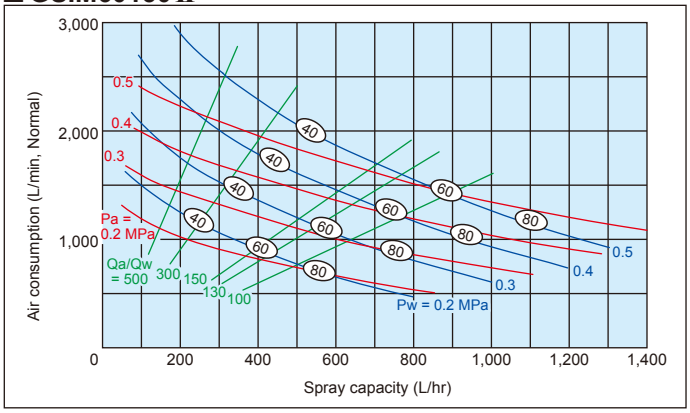
■ GSIM6075 II



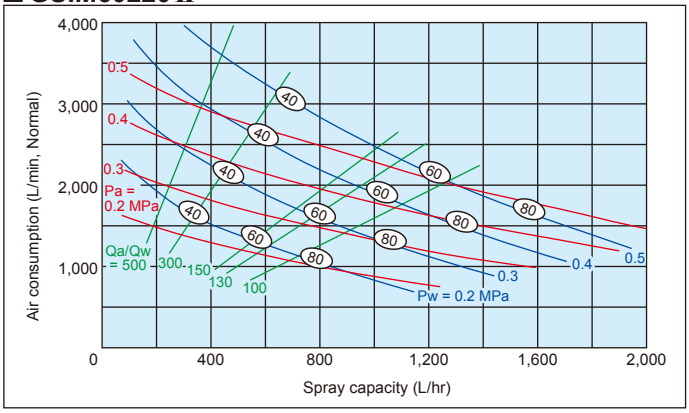
■ GSIM60110 II



■ GSIM60150 II



■ GSIM60220 II



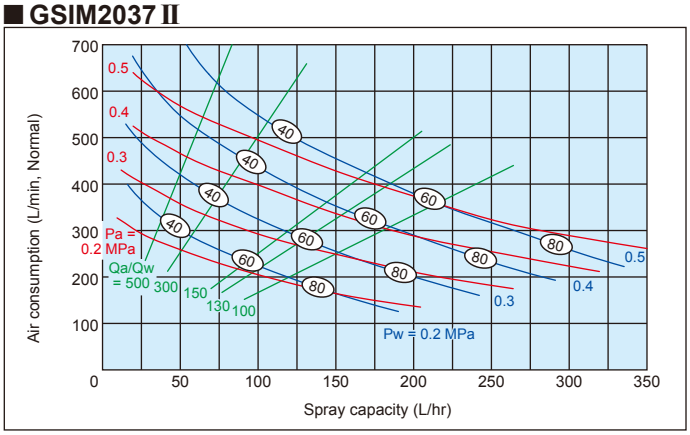
GSIM II with SN-type Adaptor

FLOW-RATE DIAGRAMS | **SPRAY ANGLE 20° TYPE**

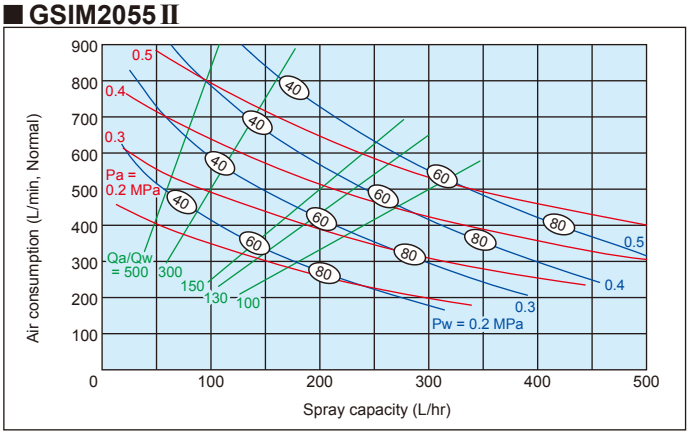
■How to read the chart

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

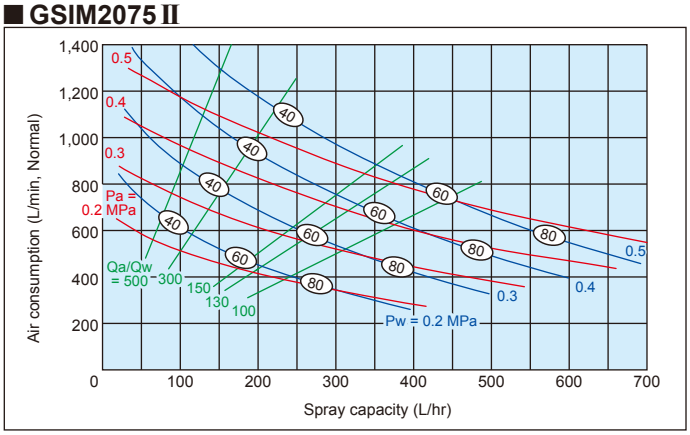
■ GSIM2037 II



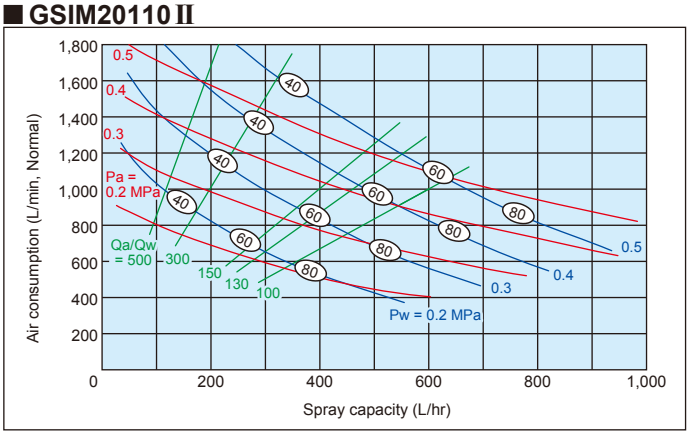
■ GSIM2055 II



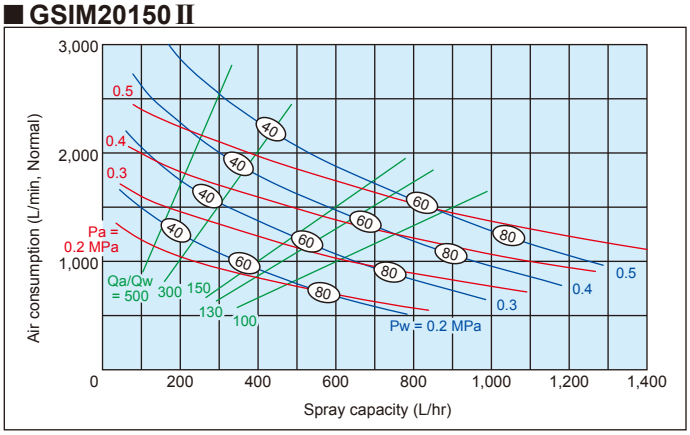
■ GSIM2075 II



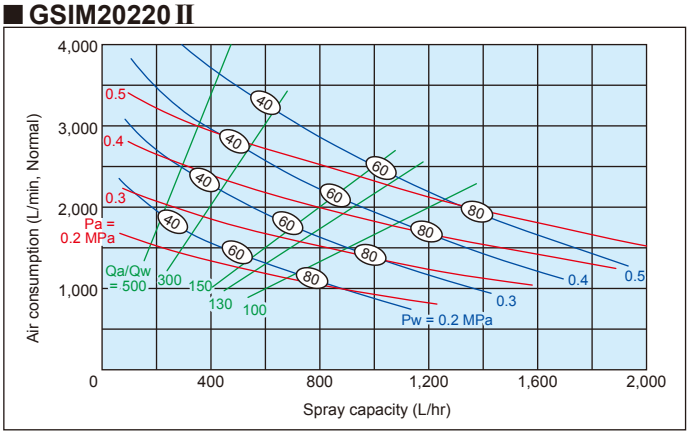
■ GSIM20110 II



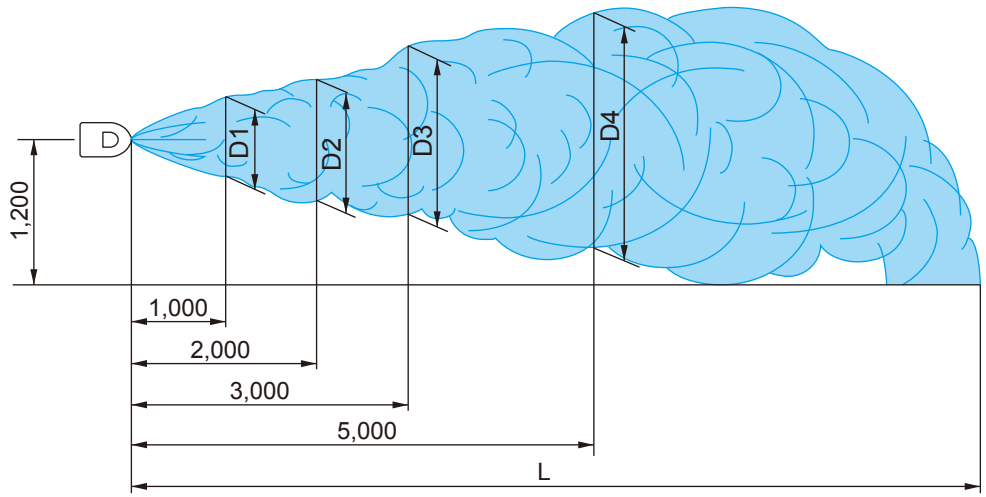
■ GSIM20150 II



■ GSIM20220 II



SPRAY DIMENSIONS (for GSIM II Series all types)



Unit: mm

■Spray angle code: 60

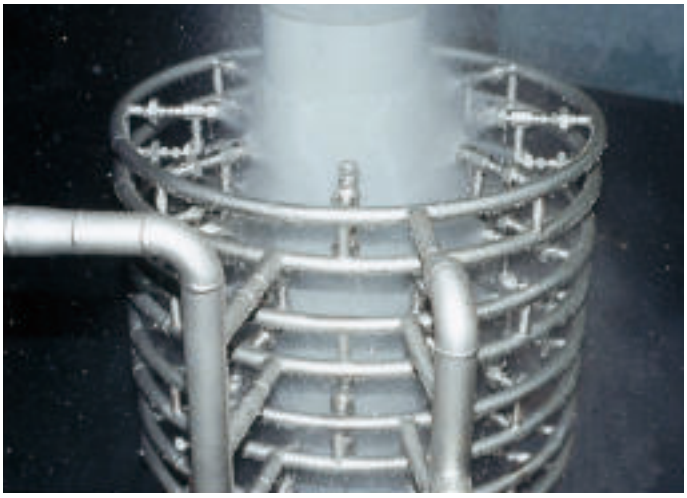
Air consumption code	Air pressure (MPa)	Liquid pressure (MPa)	Spray dimensions (mm)				
			D1	D2	D3	D4	L
37	0.3	0.25–0.30	600	950	1,200	1,700	8,000
		0.30–0.35	700	1,050	1,350	1,700	8,000
	0.4	0.35–0.40	550	850	1,100	1,700	8,000
		0.40–0.45	650	950	1,250	1,700	8,000
	0.5	0.45–0.50	500	800	1,000	1,700	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

■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.

Semi-Fine Fog, Semi-Coarse Fog Nozzles



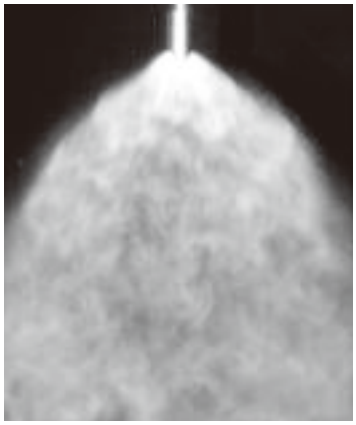
■The DOVEA, DDA, JJA, and DOVVA-G Series, developed to satisfy the crucial requirements for spray nozzles in the continuous casting process of steel making, feature stable spray angles and distributions with large turndown ratios, having fine and uniform spray droplet size distributions across the entire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

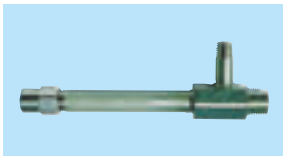
With such features, these series are highly effective for steel and gas cooling.

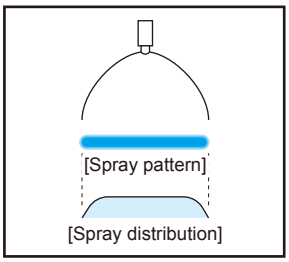
■The VVEA and PSN Series are innovative pneumatic spray nozzles developed for new cleaning method requiring high-velocity and concentrated spraying of fine atomization, which can wash out fine dirt particles that conventional cleaning could not clean.

Contents

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







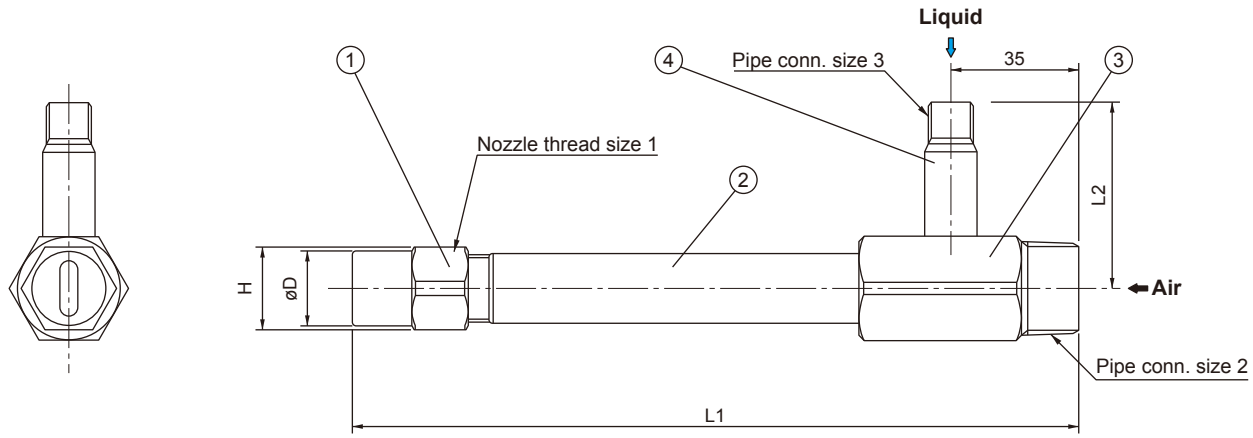
■Flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 µm or more.*1
■Large turn-down ratio with minimal variation in spray angle.
■Uniform spray droplet size distribution across the entire spray area.
■Even spray flow distribution suitable for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

*1) Droplet diameter measured by the Fraunhofer diffraction method.
Please see pages 7–8 for comparison with laser Doppler method.

APPLICATIONS

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

DRAWING



■COMPONENTS AND MATERIALS

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

Unit: mm

DIMENSIONS

Spray capacity code	Nozzle thread size	Pipe connection size		Outer dimensions (mm)				Weight*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 weight shown is when L1 is 500 mm of straight pipe.
For the weight of DOVEA with a longer/shorter pipe, add or subtract the corresponding weight (listed below) for each 100 mm of L1 length, according to the Nozzle thread size 1.

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

PERFORMANCE DATA

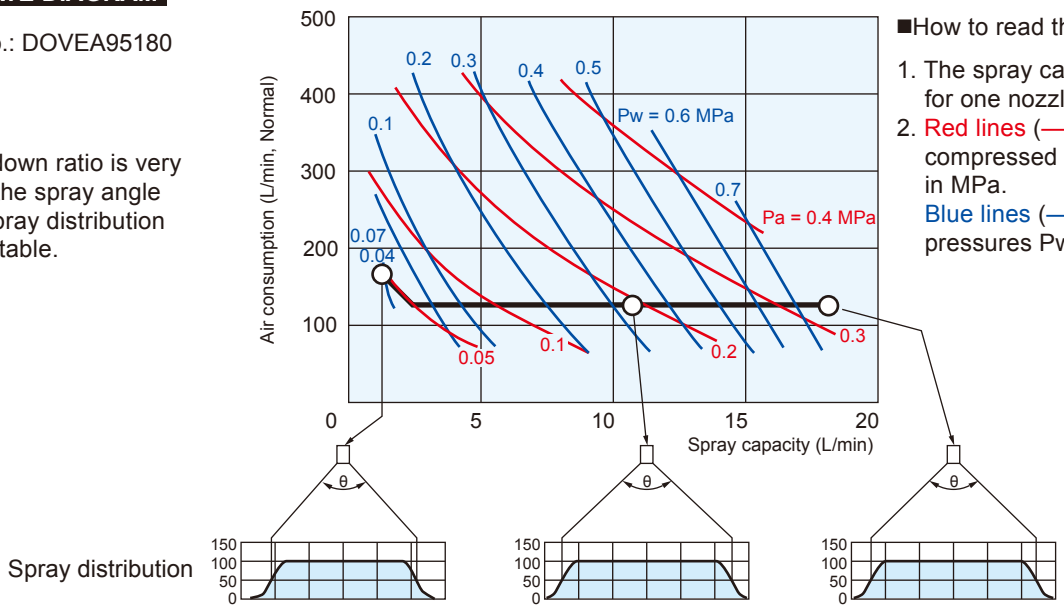
Spray angle code*4	Spray capacity code	Air pressure (MPa)	Spray capacity (L/min) & Air consumption (L/min, Normal)										Mean droplet diameter (μm)		Free passage diameter (mm)		
			Liquid pressure (MPa)														
			0.07		0.1		0.2		0.4		0.7						
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Immersion sampling method	Fraunhofer diffraction method	Tip orifice	Adaptor	
																Liquid	Air
110	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100–350	50–175	2.1	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	2.5	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	3.5	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					
95	82	0.1	0.42	125	1.45	85	4.19	30	—	—	—	—	100–300	50–150	1.9	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	3.2	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	4.6	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					
70	110	0.1	0.56	180	1.94	120	5.63	40	—	—	—	—	100–300	50–150	2.6	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	4.3	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	4.9	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

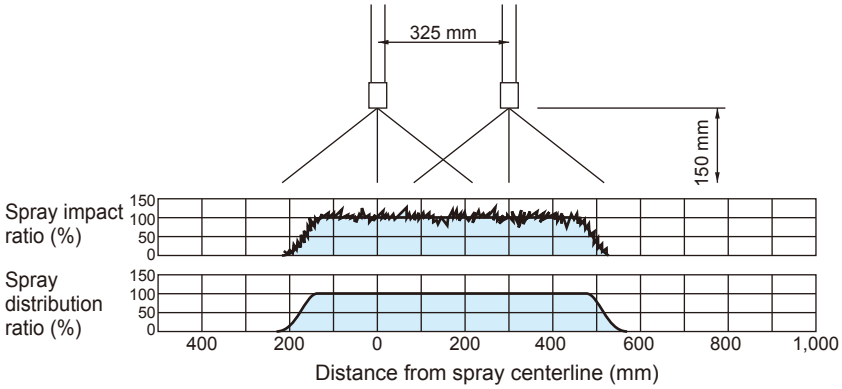
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.

SPRAY FLOW DISTRIBUTION & SPRAY IMPACT DISTRIBUTION

Nozzle No.: DOVEA95180

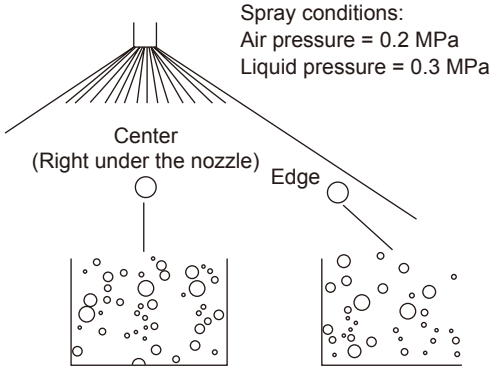
Spray conditions:
Air pressure = 0.2 MPa
Liquid pressure = 0.3 MPa

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

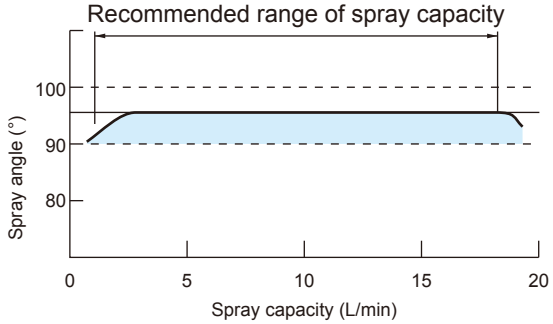
Nozzle No.: DOVEA95180



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

VARIATION IN SPRAY ANGLE

Nozzle No.: DOVEA95180

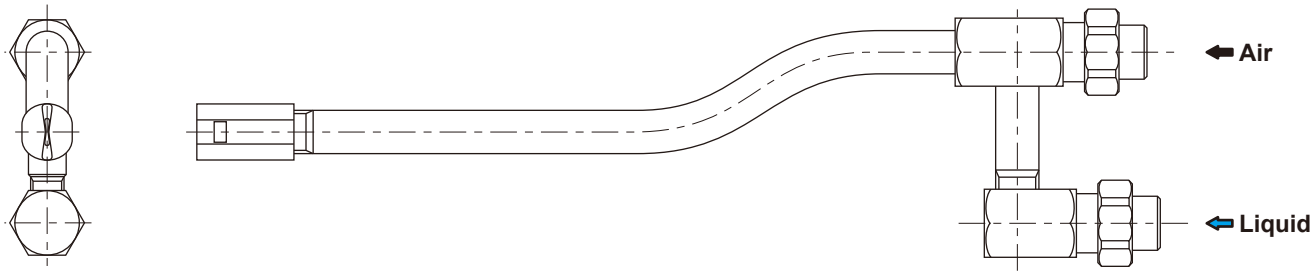


The variation in spray angle is minimized despite the large modulation of spray capacities.

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

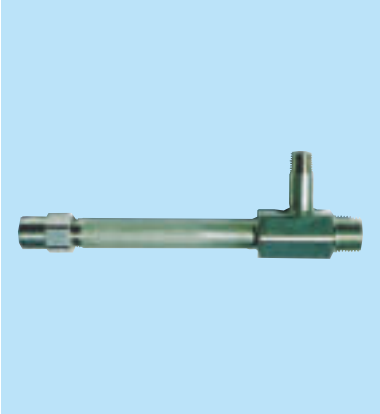
<Example> 1/4 DOVEA 9582-M × 500 S303-n

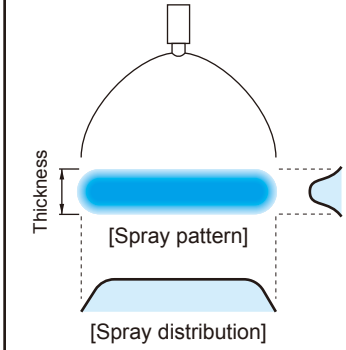
1/4	DOVEA	95	82	- M ×	500	S303	-	n
Nozzle thread size 1		Spray angle code	Spray capacity code		Total length L1	Material of nozzle body		Code of bent pipe*
■1/4 ■3/8 ■1/2		■110 ■95 ■70 ■55	■82 ■110 ■180 ■230 ■400		■Min. 200 ■Standard 500 ■Max. 1500			

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

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

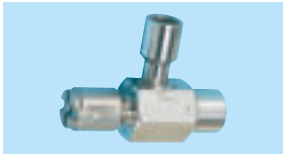
Conventional nozzles (DOVEA series)

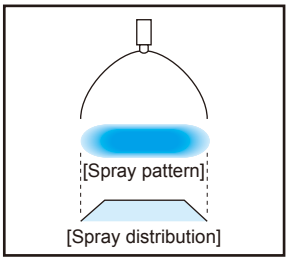
The increased thickness of the flat spray from this nozzle allows for more effective cooling in the space between rolls.

For further information, please contact our sales office.

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

DDA





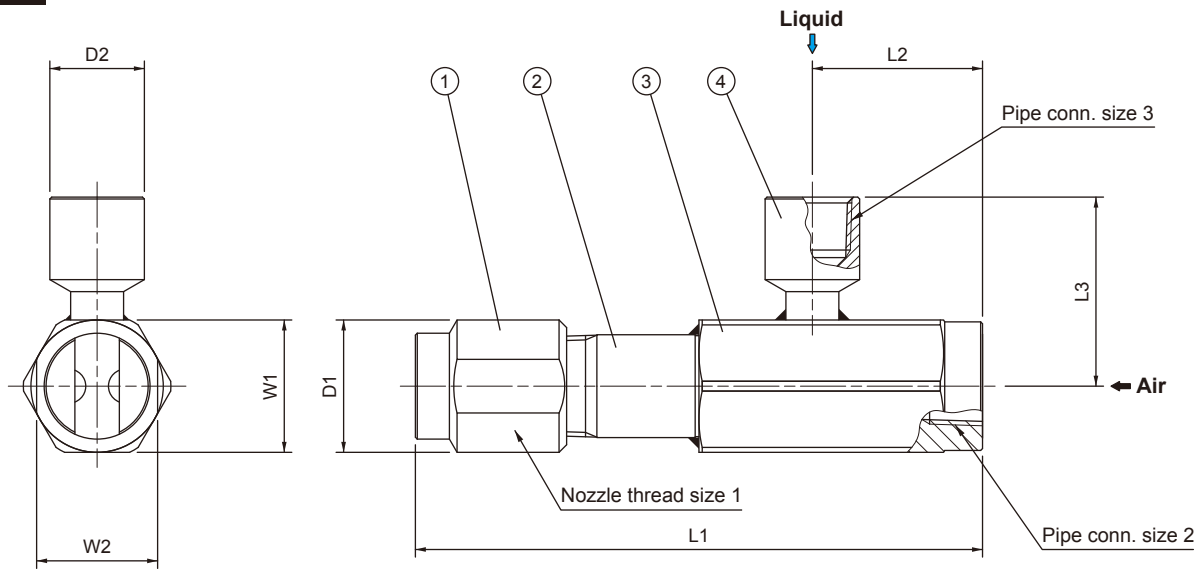
■Thick even flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 µm or more.*1
■Thicker flat spray pattern covers wider area.
■Large turn-down ratio with minimal variation in spray angle.
■Spray droplet size is uniform across the entire spray 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 7–8 for comparison with laser Doppler method.

APPLICATIONS

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

DRAWING



■COMPONENTS AND MATERIALS

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

Component #2 is not included for the DDA series with Rc1/4 pipe connection size.

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

Nozzle thread size 1	Weight 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	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					

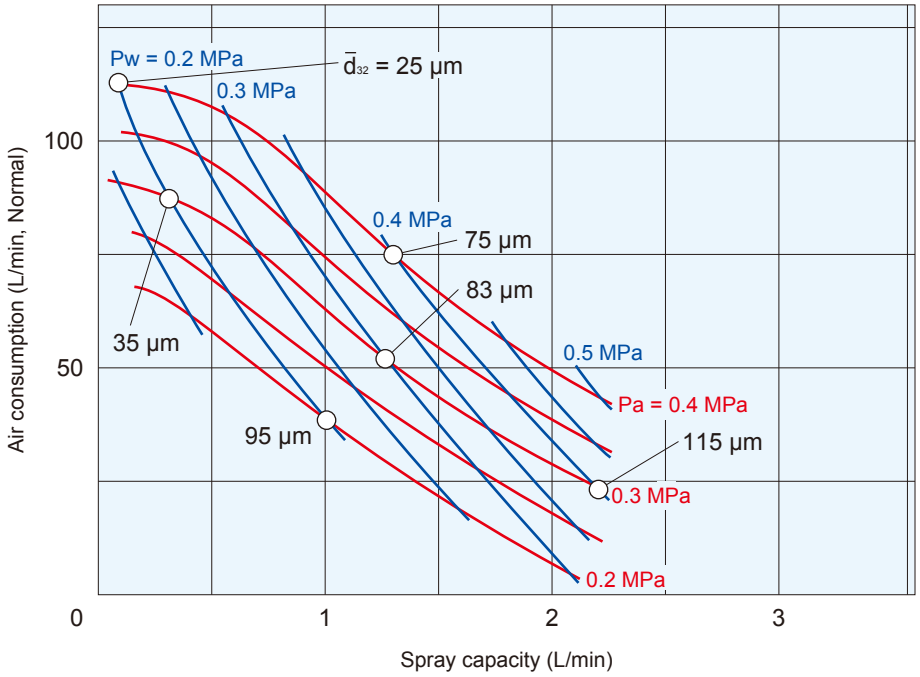
Note: Criteria for spray angle measurement differs depending on nozzle codes.

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

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

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

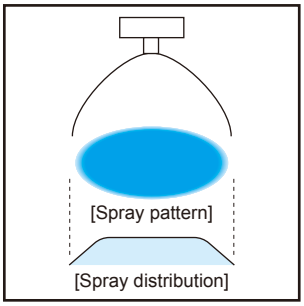
1/4	DDA	125	20	70	×	(	70	)	S303	-	n
Nozzle thread size 1		Spray angle code (Width)	Spray angle code (Thickness)	Spray capacity code			Total length L1		Material of nozzle body		Code of bent pipe*6
■1/8 ■1/4 ■1/2 ■3/4		■125 ■110 ■100 ■80 ■75	■45 ■25 ■20 ■15	■14 ≀ ■580			■Standard (70–150)*5 ■Max. 1500				

*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 75.

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

JJA



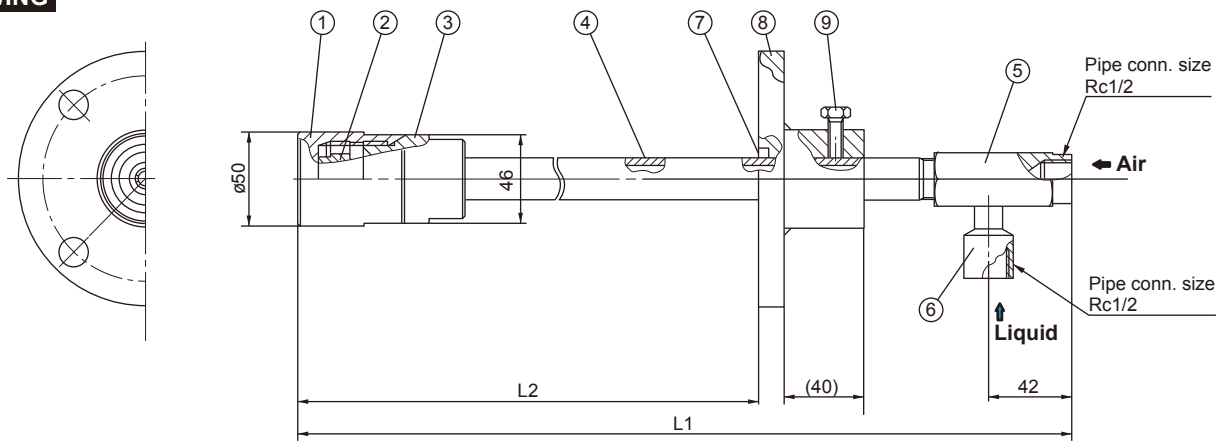
APPLICATIONS

■Cooling: Gas, castings
■Combustion: Waste water

■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 7–8 for comparison with laser Doppler method.

DRAWING



■COMPONENTS AND MATERIALS

No.	Components	Standard materials
1	Nozzle body	S316L
2	Mixing core	S316L
3	Nozzle adaptor	S316L
4	Pipe	S316L
5	Mixing adaptor	S304

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

Unit: mm

DIMENSIONS

Type	Total length L1 (mm)	Length L2 (mm)	Weight*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) Weight of flange is not included.

PERFORMANCE DATA

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

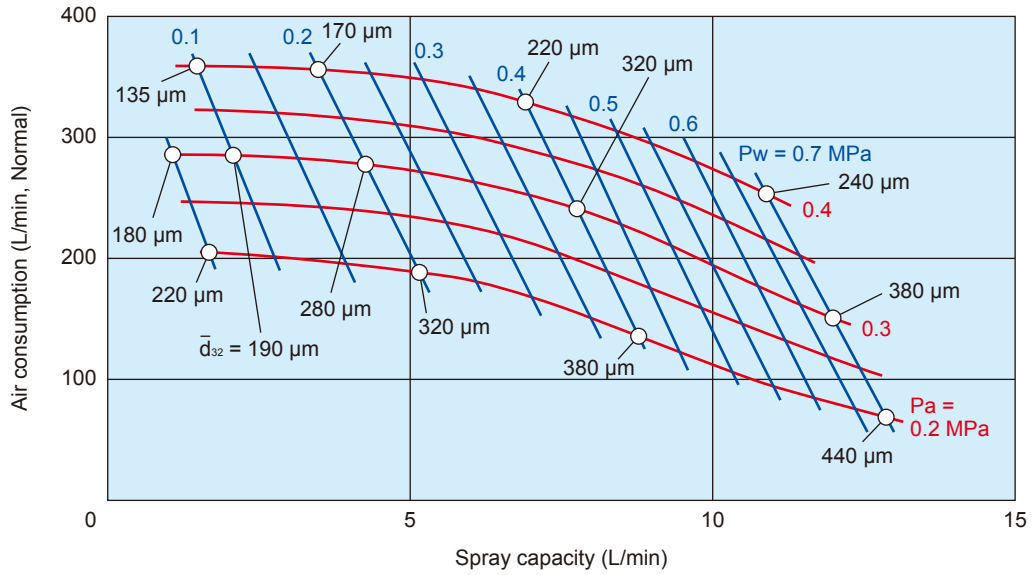
Spray capacity code	Air pressure (MPa)	Spray capacity (L/min) & Air consumption (L/min, Normal)										Mean droplet diameter (μm)	Free passage diameter (mm)		
		Liquid pressure (MPa)													
		0.05		0.1		0.2		0.3		0.35					
		Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Immersion sampling method	Tip orifice	Mixing adaptor	
														Liquid	Air
24-6	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

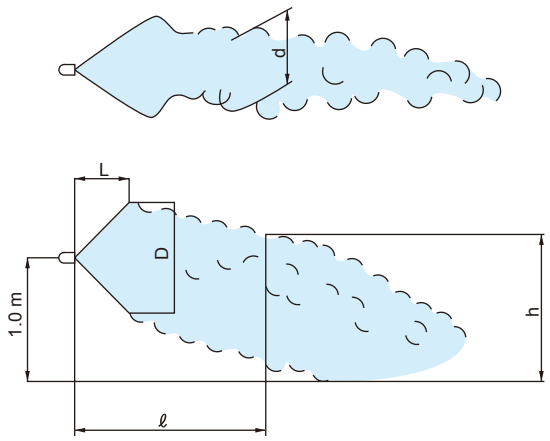
Nozzle No.: JJA12

■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.



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: 24-6

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.

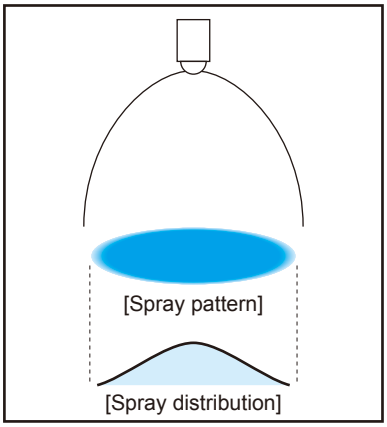
HOW TO ORDER

When selecting a nozzle product, various factors must be considered, such as distance to target, number of nozzles required, and installation layout including air and liquid piping.
To ensure the best nozzle selection for your needs, consult our sales representatives during the design phase. Our engineering services are essential for efficient performance.

Inquiry forms with outline drawings are available to confirm dimensions and pipe connections.
Contact us for more details.

Flat Spray
Semi-Fine, Semi-Coarse Fog Nozzles

DOVVA-G



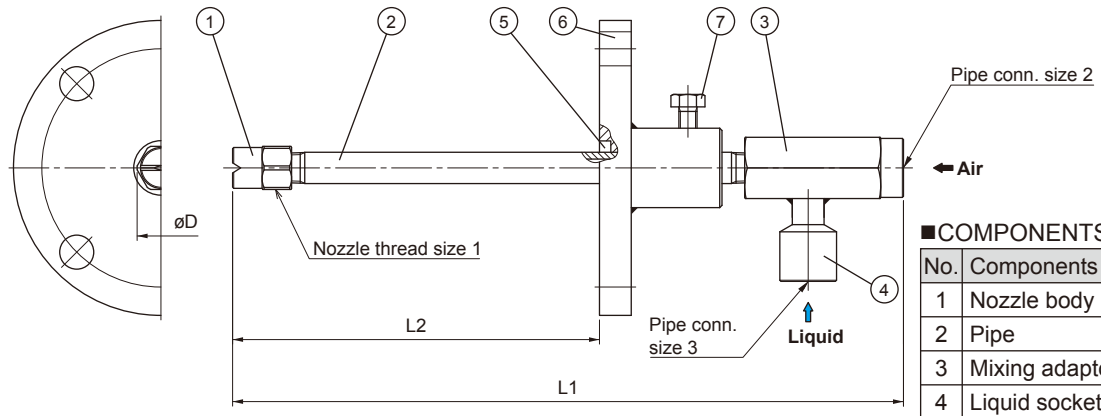
■Flat spray pneumatic nozzle producing semi-fine atomization with a mean droplet diameter of 80 μm or more.*1
■Clog-resistant design due to large free passage diameter is suitable for spraying factory effluents and waste water.
■Simple structure, easy maintenance.

*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	S316L
3	Mixing adaptor	S304
4	Liquid socket	S304
5	Packing	Metal wire reinforced AES wool
6	Flange	S304
7	Bolt	S304 equivalent

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

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

WEIGHT

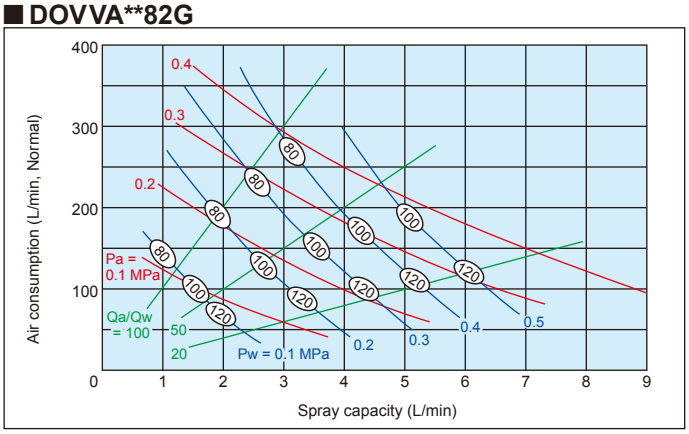
Nozzle thread size 1	Type of length	Weight*3 (g)
Rc1/4	A	750
	B	900
	C	1,100
	D	1,250
Rc3/8	A	900
	B	1,100
	C	1,350
	D	1,550
Rc1/2	A	1,350
	B	1,700
	C	2,000
	D	2,350
Rc3/4	A	2,050
	B	2,500
	C	2,950
	D	3,400

FLOW-RATE DIAGRAMS

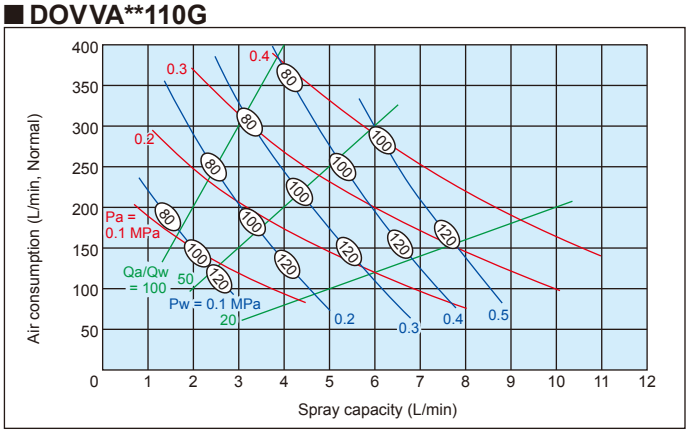
■How to read the chart
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured 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.

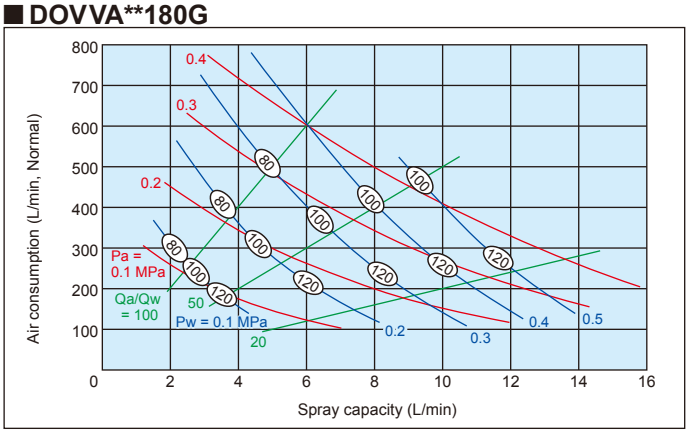
■ DOVVA**82G



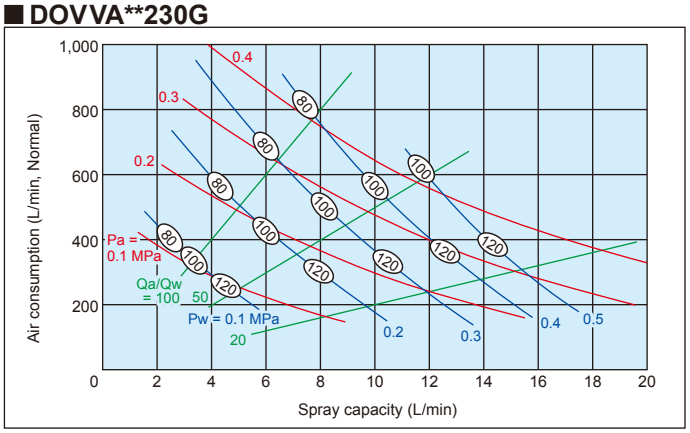
■ DOVVA**110G



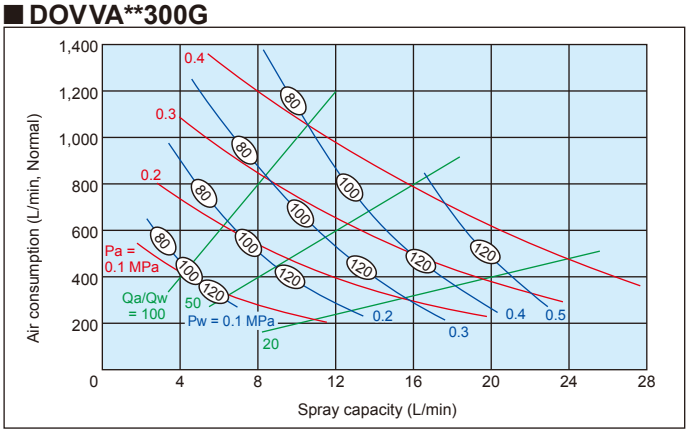
■ DOVVA**180G



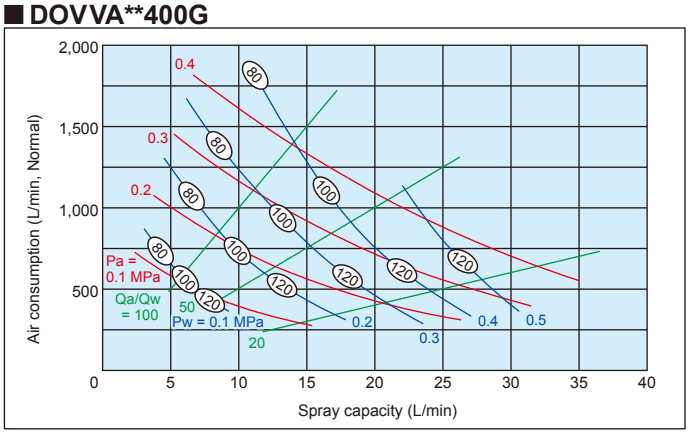
■ DOVVA**230G



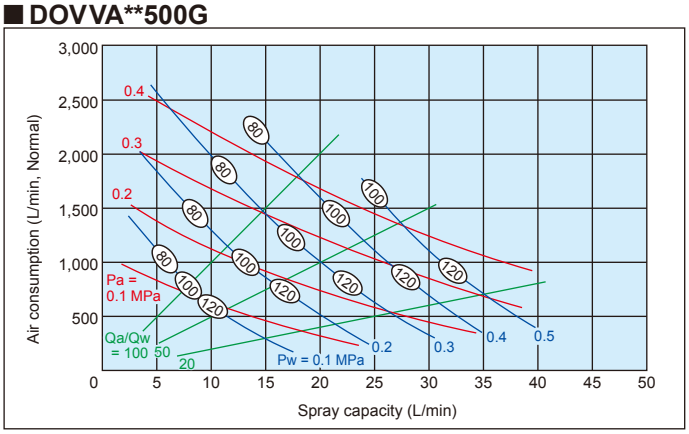
■ DOVVA**300G



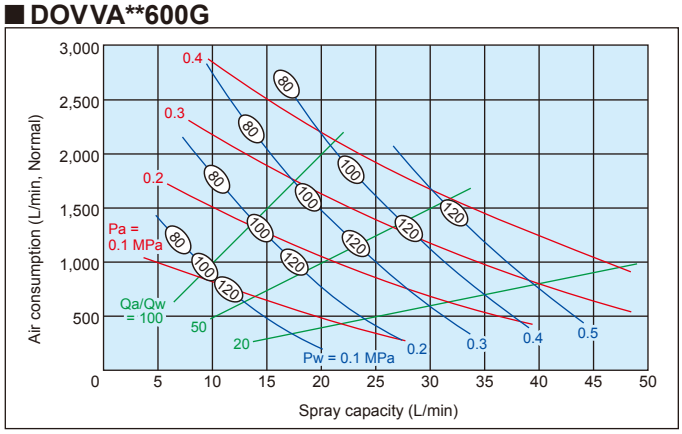
■ DOVVA**400G



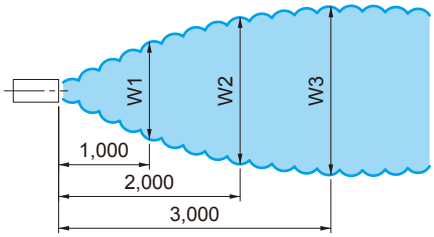
■ DOVVA**500G

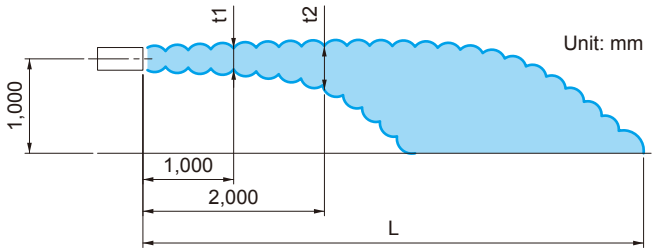


■ DOVVA**600G



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.

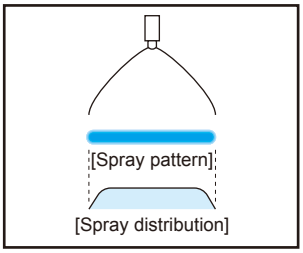
HOW TO ORDER

When selecting a nozzle product, various factors must be considered, such as distance to target, number of nozzles required, and installation layout including air and liquid piping.
To ensure the best nozzle selection for your needs, consult our sales representatives during the design phase. Our engineering services are essential for efficient performance.

Inquiry forms with outline drawings are available to confirm dimensions and pipe connections.
Contact us for more details.

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 minimal variation in spray angle.
■Compact design.

*1) Droplet diameter measured by laser Doppler method

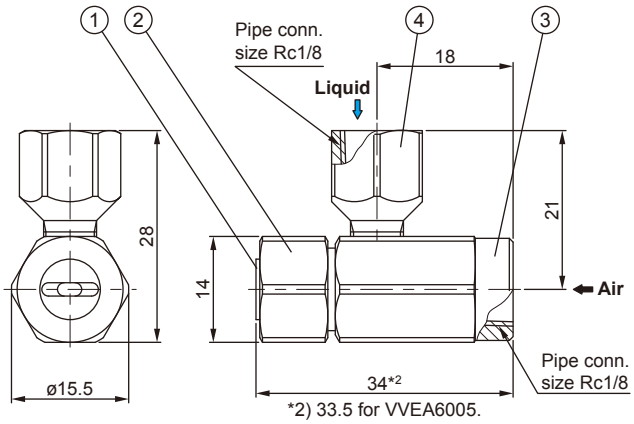
APPLICATIONS

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

DRAWING

Spray angle 60° type

■Weight: 40 g



*2) 33.5 for VVEA6005.

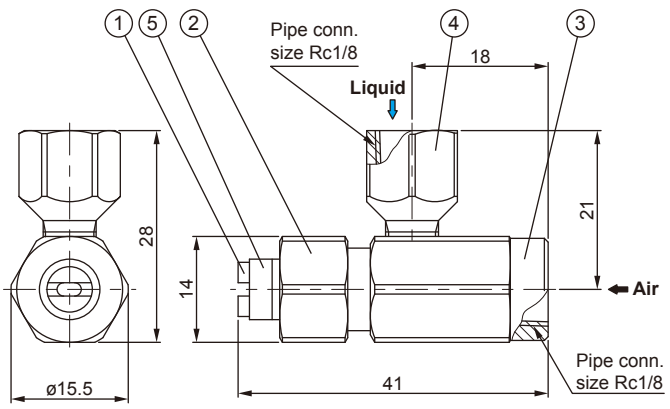
■COMPONENTS AND MATERIALS

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

■Weight: 44 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

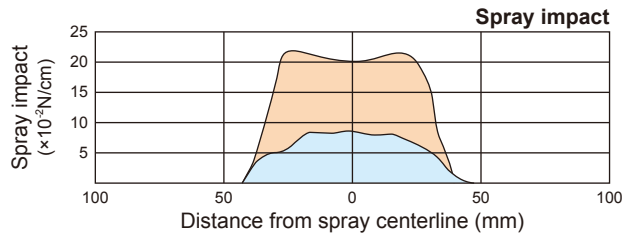
Note: No sleeve (component #5) for VVEA8005.

Unit: mm

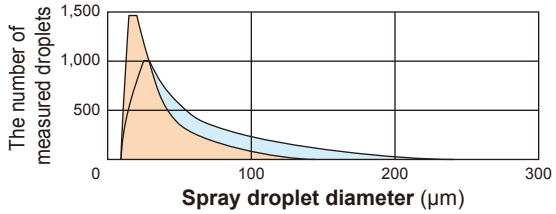
SPRAY IMPACT

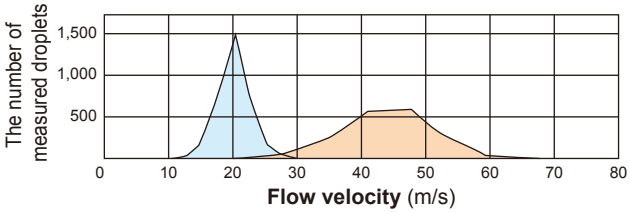
In comparison to a hydraulic spray nozzle with equal spray capacity at the same pressure, VVEA series nozzles achieve a more powerful spray impact (2.5 times higher) with fine droplets (at twice the speed).

■Air pressure: 0.3 MPa ■Air consumption: 59 L/min, Normal
■Liquid pressure: 0.3 MPa ■Spray capacity: 1.1 L/min
■Spray height: 50 mm
(Air pressure and air consumption apply only to 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

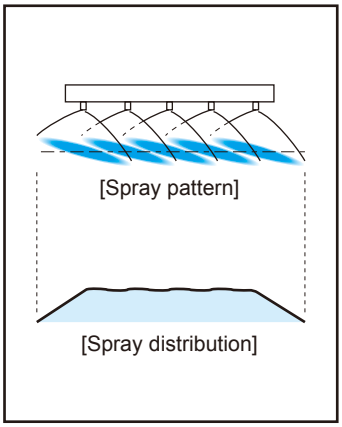
To inquire about or order a specific product please refer to this coding system.

<Example> 1/8 VVEA 6010 S303

1/8	VVEA	60	10	S303
		Spray angle code	Spray capacity code	Material
		■80 ■60	■05 ■10 ■20 ■30	

Integrated Spray Header with VVEA series nozzles

VVEA Header



■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.

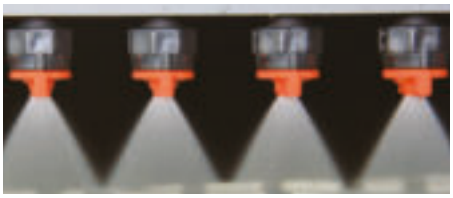
*1) Droplet diameter measured by laser Doppler method

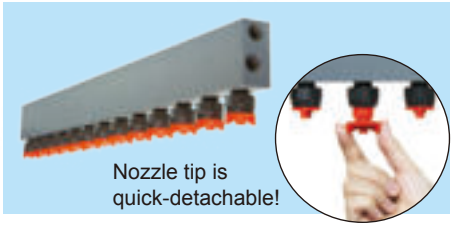
APPLICATIONS

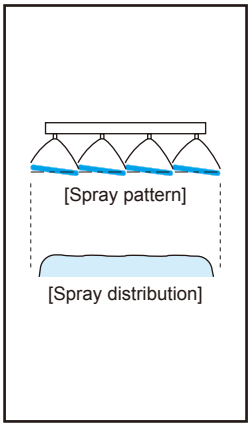
■Cleaning: Liquid crystal glass substrate, printed circuit boards, steel plates

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

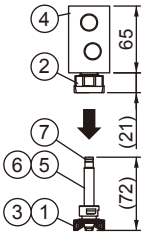
The drawings below are just a few examples. Dimensions and pipe connection sizes differ depending on the nozzle code, nozzle quantity, nozzle spacing, and other requirements. For details please ask for our inquiry drawing.
*2) The number of mounting screws required increases as the total length gets longer.
*3) The mounting 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.

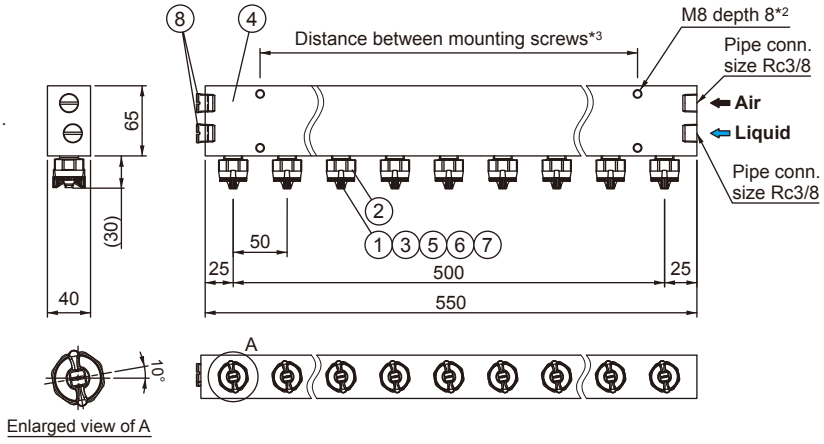
Total length: 1,000 mm or less (available from 150 mm in total length)

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.





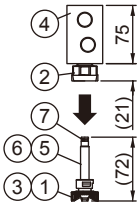
Enlarged view of A

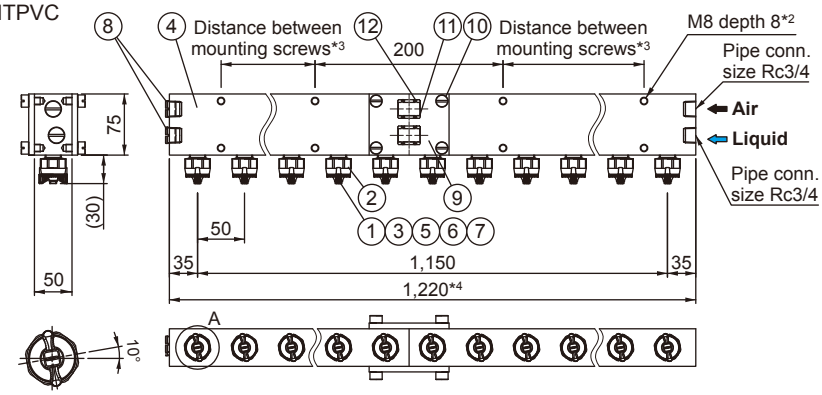
Total length: 1,000 mm or more

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.





Enlarged view of A

■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

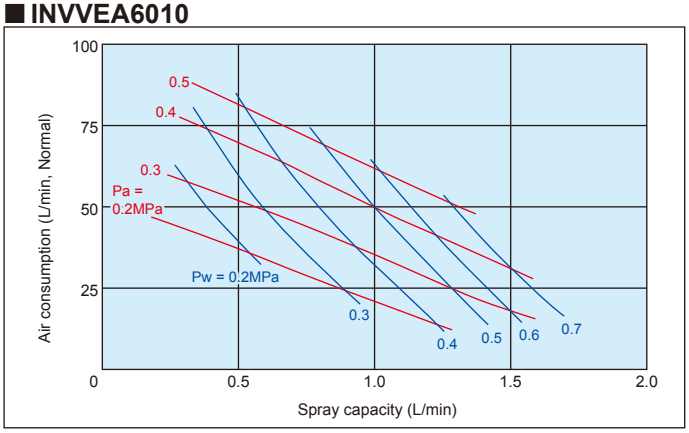
Unit: mm

FLOW-RATE DIAGRAMS

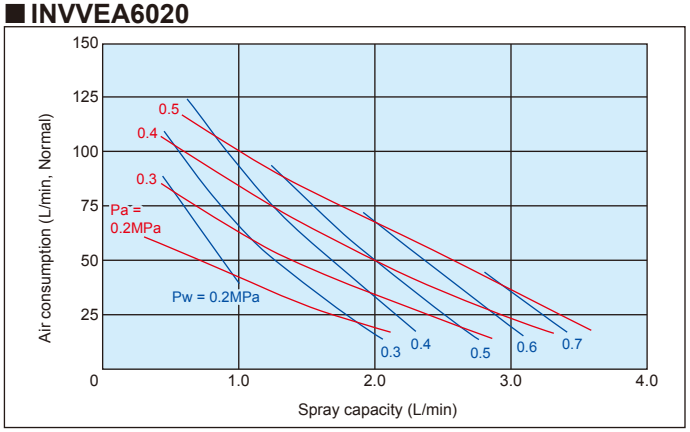
■How to read the chart

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.

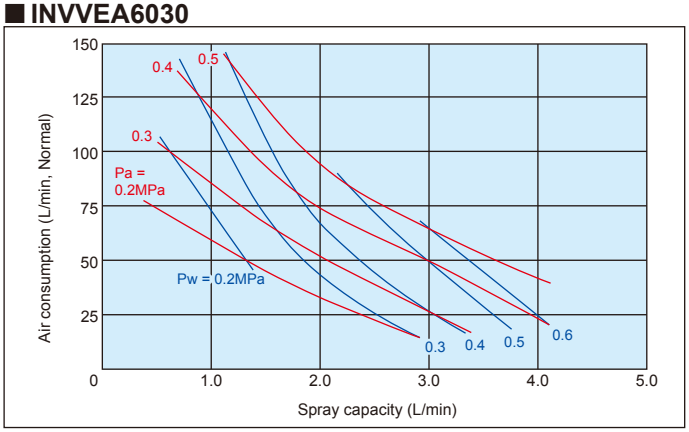
■ INVVEA6010



■ 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

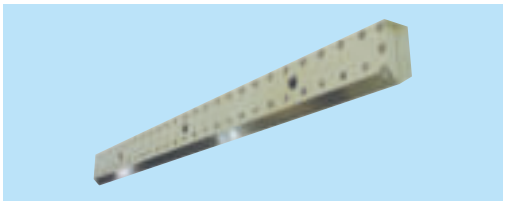
To determine the specifications, please specify a spray capacity code, nozzle quantity, nozzle spacing and more, using this coding system.

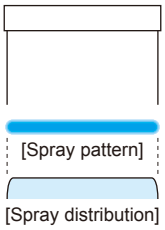
<Example> INVVEA 6010 PP + PPS + 11 (P50) 550 (10°) HTPVC

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.

INVVEA



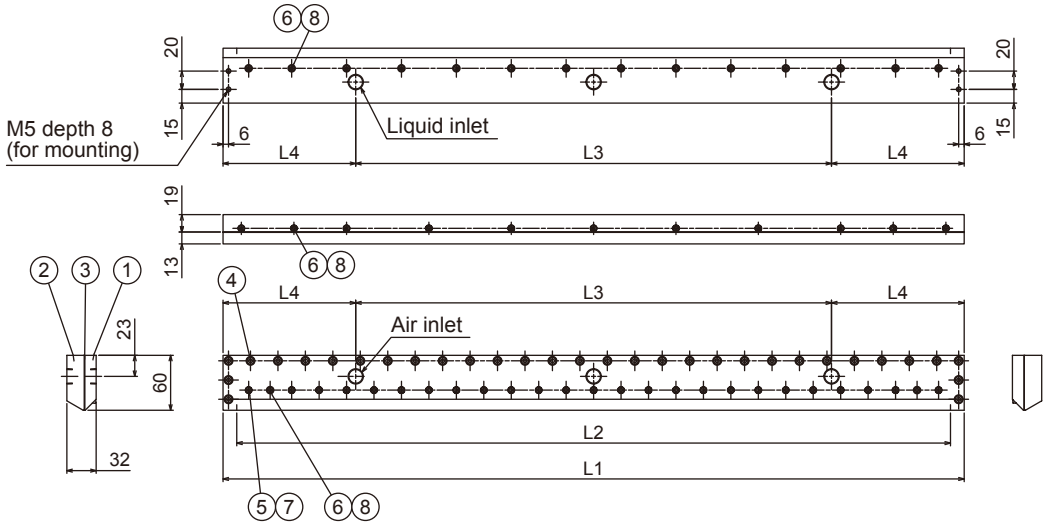


■Pneumatic slit-laminar nozzle with high spray impact.
■Uniform spray distribution throughout the entire spray pattern area allows for a complete cleaning with no spot unwashed.
■PSN series can be used at a short spray distance.

APPLICATIONS

■Cleaning: Glass substrate, liquid crystal
■Cooling: Steel plates, castings
■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 equivalent
5	Bolt (M4x8)	S304 equivalent
6	Bolt (M4x10)	S304 equivalent
7	O-ring (P4)	FKM
8	O-ring	FKM

Unit: mm

DIMENSIONS

Nozzle code		Number of inlets - Inlet thread size		L1*1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	Weight (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 3,950 mm.

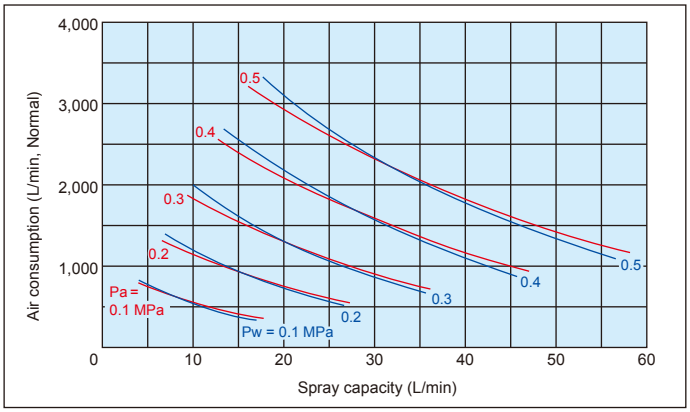
FLOW-RATE DIAGRAMS

■How to read the chart

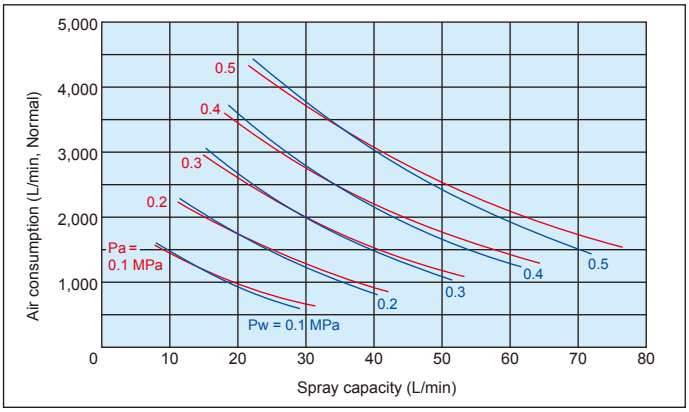
1. The air consumption and spray capacity shown are for one nozzle per 1,000 mm of slit length.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.

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)

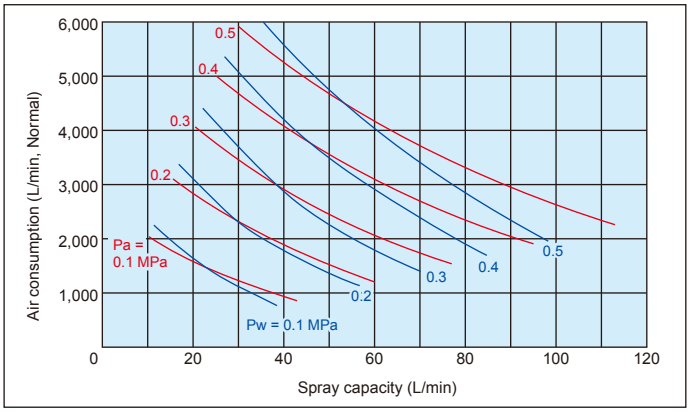
■ Slit opening: 0.05 mm



■ Slit opening: 0.1 mm



■ Slit opening: 0.15 mm



PSN

HOW TO ORDER

Total length can be tailored to your needs within the customizable range (see *1 on the previous page).
Inquiry drawing forms is available to verify dimensional specifications. Contact us for details.

Medium Capacity
Impinging-type Fine Fog Nozzles

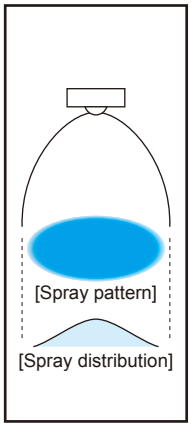
■The AKIJet Series are the impinging-atomization type pneumatic spray nozzles.
Atomized droplets are impinged against each other at optimum condition, which results in uniform distribution of droplet size.

■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 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.

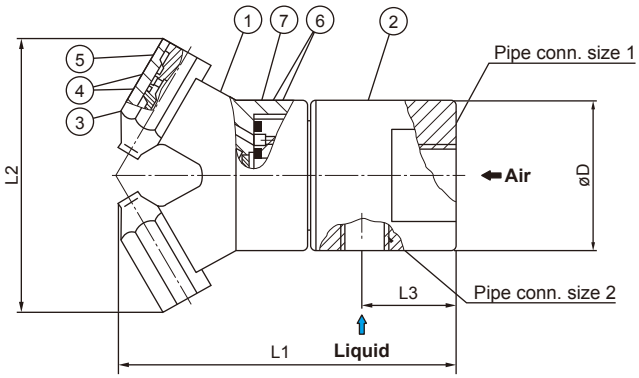
*1) Droplet diameter measured by the immersion sampling method.
Please see pages 7–8 for comparison with laser Doppler method.

APPLICATIONS

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

DRAWING

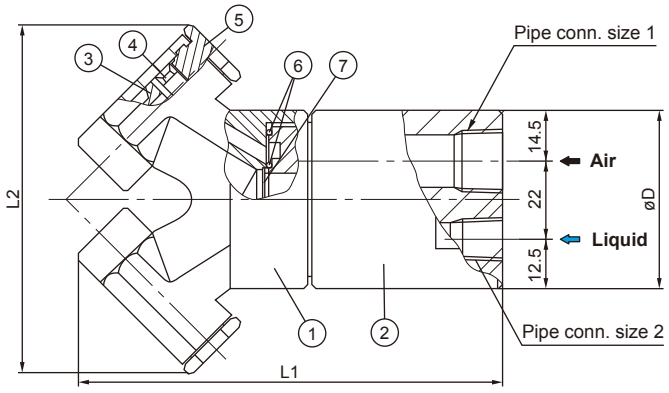
AKI37 S303 + TS303
AKI75 S303 + TS303



■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

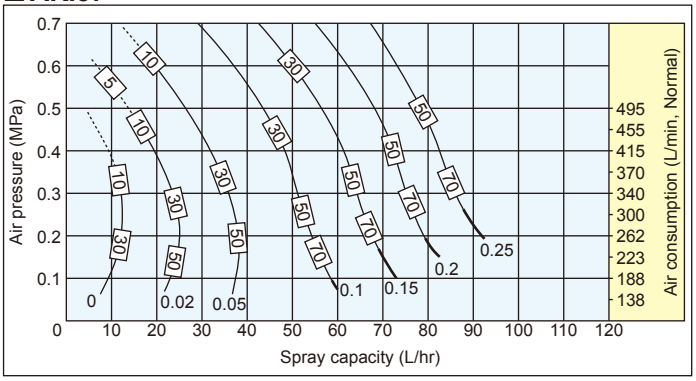
DIMENSIONS

Nozzle code	L1 (mm)	L2 (mm)	L3 (mm)	øD (mm)	Pipe connection size		Free passage diameter (mm)		Weight (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

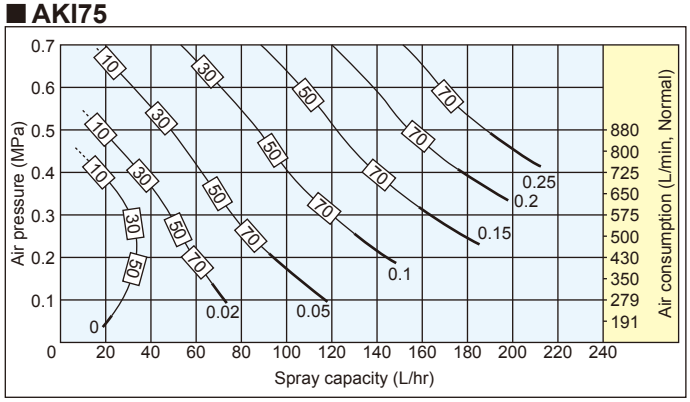
FLOW-RATE DIAGRAMS

■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. Numbers at foot of each curve indicate liquid pressures in MPa.
4. Numbers in squares ☐ on each curve indicate Sauter mean diameters (μm) measured by the immersion sampling method.

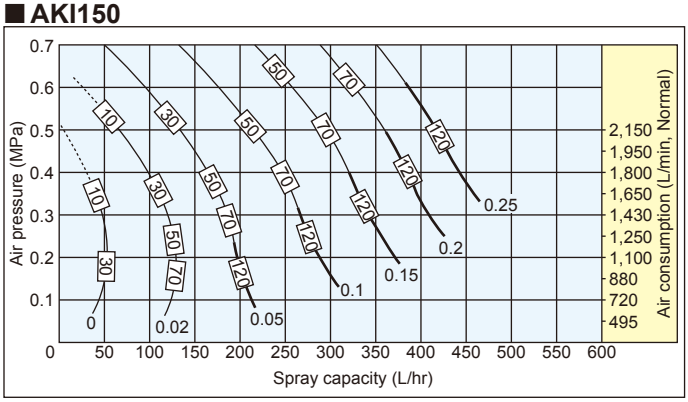
■ AKI37



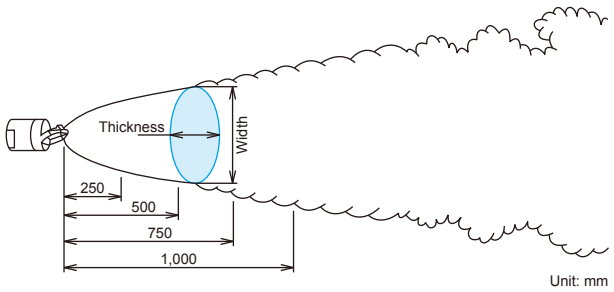
■ AKI75



■ 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.

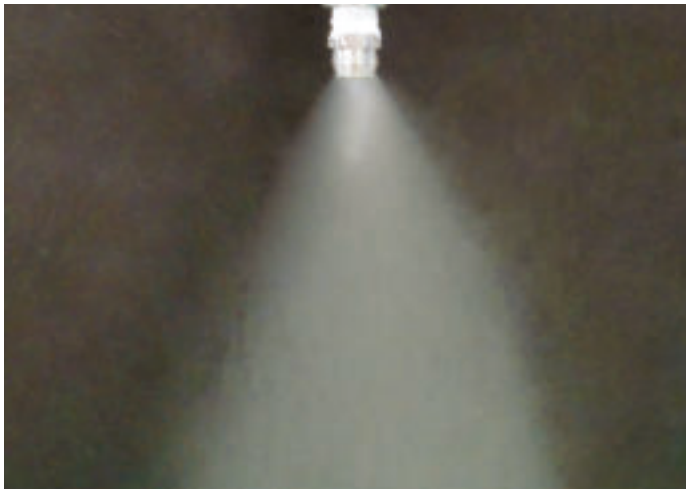
HOW TO ORDER Please use these product codes to inquire about or order a specific nozzle.

AKI37 S303 + TS303

AKI75 S303 + TS303

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

Blower-Air Driven Ultra-Low Pressure Nozzles



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

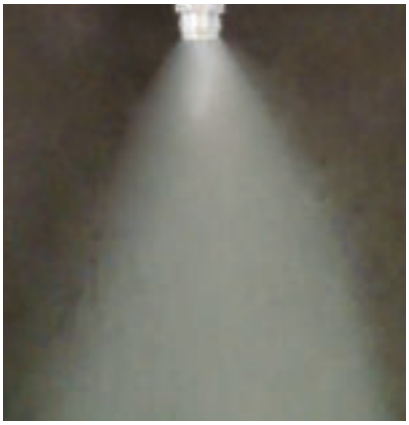
■Save on costs for installation and operation by utilizing blowers.

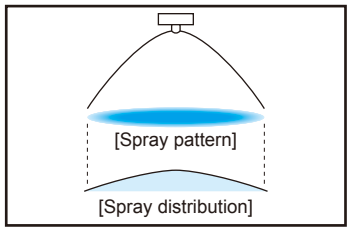
■Simple construction and compact design make maintenance and handling easy.

Contents

Ultra-Low Pressure
Flat Spray Fine Fog Nozzles

BAVV





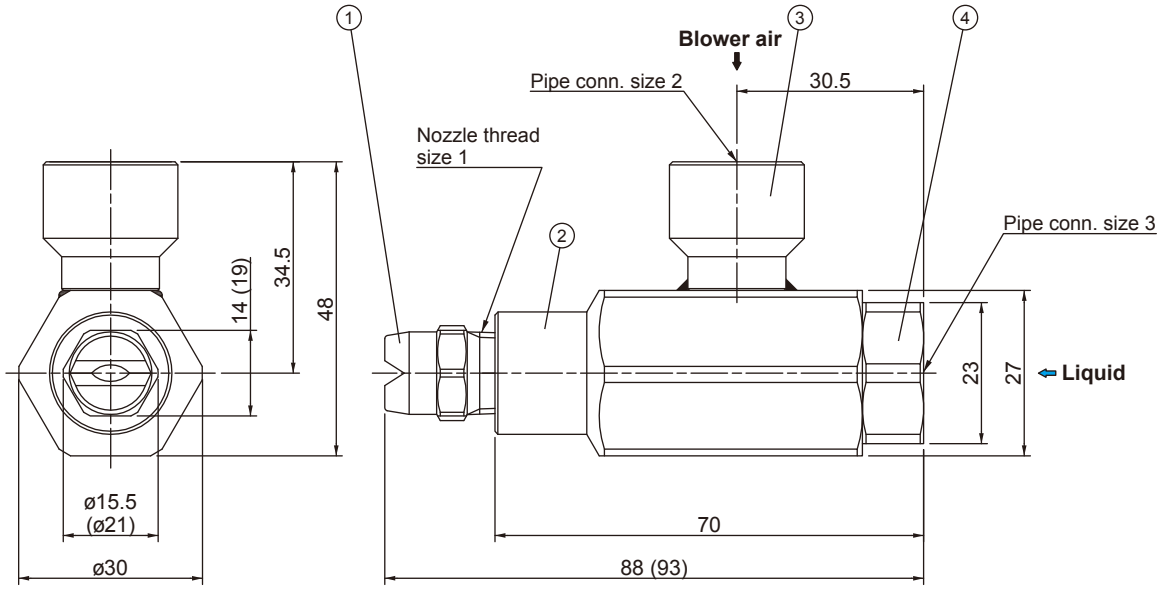
- ■Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 40 μm or more.*1
- ■Low operating costs due to the use of blower air for atomization.
- ■Large free passage diameter for minimal clogging.

*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 conn. size 2 Air	Pipe conn. size 3 Liquid	Air pressure (MPa)	Spray capacity (L/hr) & Air consumption (L/min, Normal) Liquid pressure (MPa) 0.02 Liquid	0.02 Air	0.03 Liquid	0.03 Air	0.04 Liquid	0.04 Air	Free passage diameter (mm) Tip orifice	Adaptor Liquid	Adaptor Air	Weight (g)
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

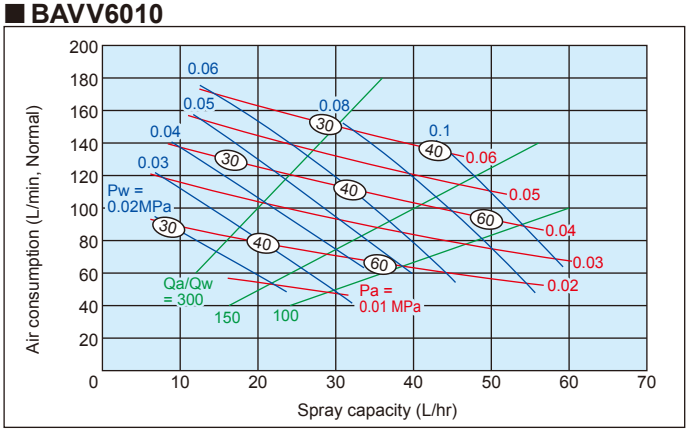
■How to read the chart

1. The spray capacity shown is for one nozzle.

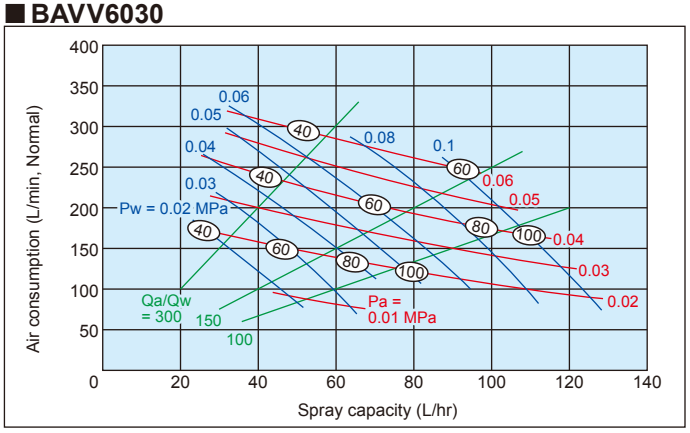
2. Red lines (—) represent blower air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.

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

■ BAVV6010



■ BAVV6030



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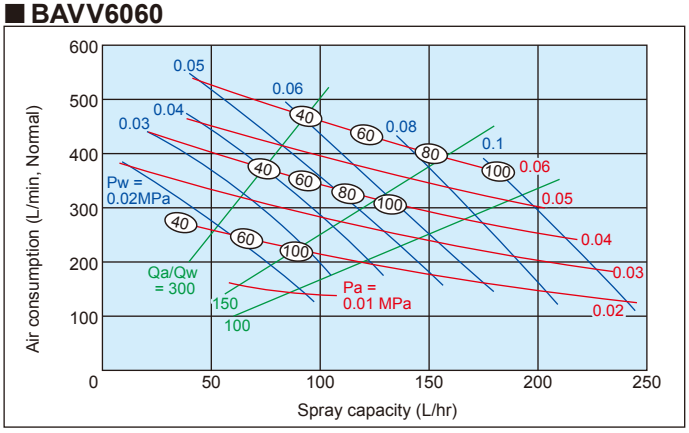


BAVV

HOW TO ORDER

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

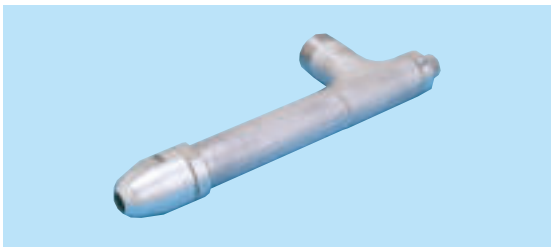
<Example> BAVV 6010 S303

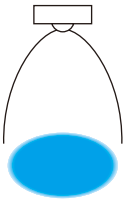
BAVV	60	10	S303
	Spray angle code	Spray capacity code	Material of nozzle body

■10
■30
■60

Ultra-Low Pressure Semi-Fine Fog Nozzles

LSIM





[Spray pattern]

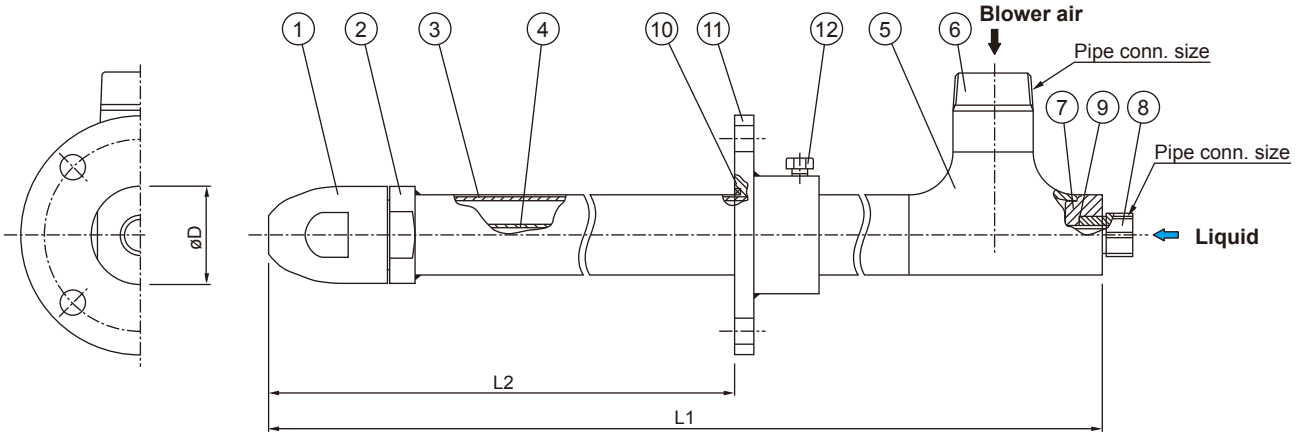
■Pneumatic spray nozzle, utilizing low-cost blower air for atomization, reduces operating cost to about 1/2 to 2/3 that of compressed air driven nozzles.
■Produces semi-fine atomization having no large droplets. When the mean droplet diameter is 80 μm, the maximum droplet diameter is 180 μm.*1
■Compact 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	S316L
4	Inner pipe	S304
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 equivalent

DIMENSIONS

Nozzle code	Pipe connection size		Outer diameter øD (mm)	Free passage diameter (mm)		
	Air (Blower)	Liquid		Tip orifice	Air	Liquid
20500	R1 1/2	Rc1/2	60	5.8	4.0	1.5
201000	R2	Rc1/2	74	7.7	5.9	2.0

TYPE OF LENGTH

Type	Total length L1 (mm)	Length L2 (mm)	Weight*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) Weight of flange is not included.

Weight of Flange (reference only)
Flange for Nozzle Code 20500
JIS5K 2*1/2B: 2.6 kg

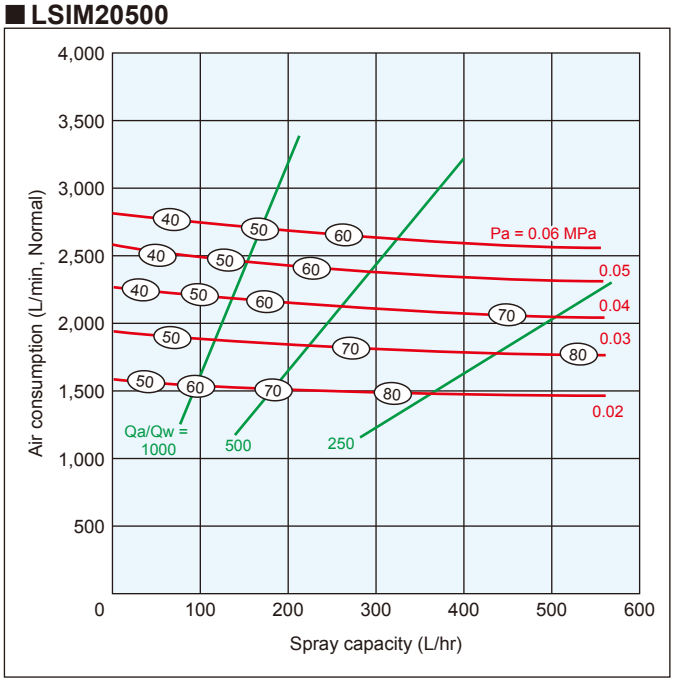
Flange for Nozzle Code 201000
JIS5K 3B: 3.7 kg

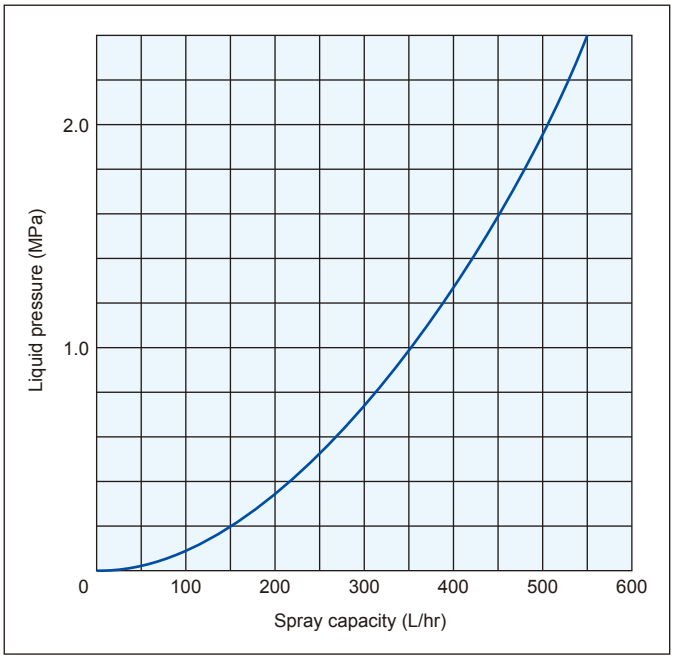
FLOW-RATE DIAGRAMS

■How to read the chart

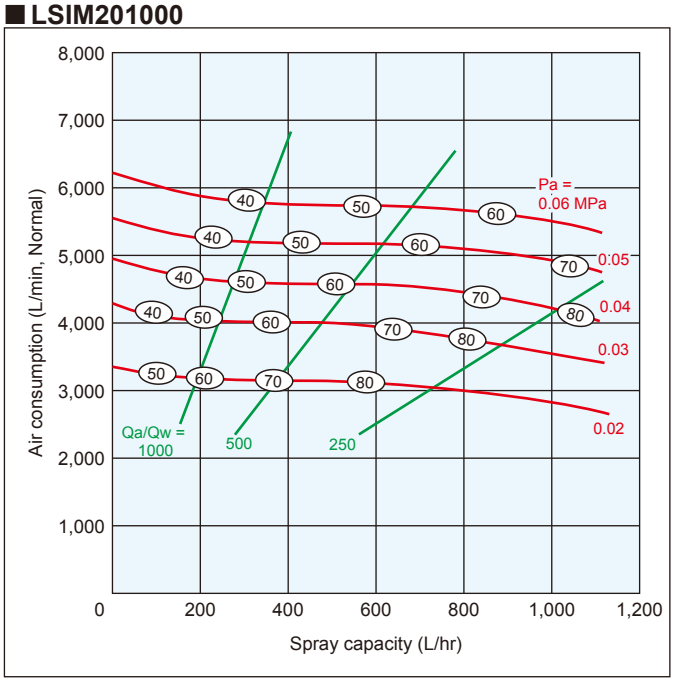
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent blower air pressures Pa in MPa.
   Green lines (—) represent air-water ratio Qa/Qw.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by laser Doppler method.
4. Relation between liquid pressure and spray capacity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

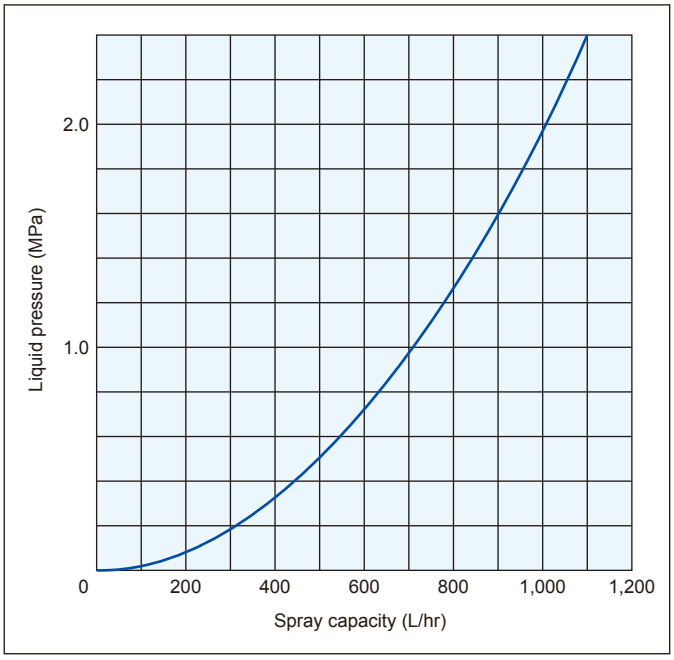
■ LSIM20500





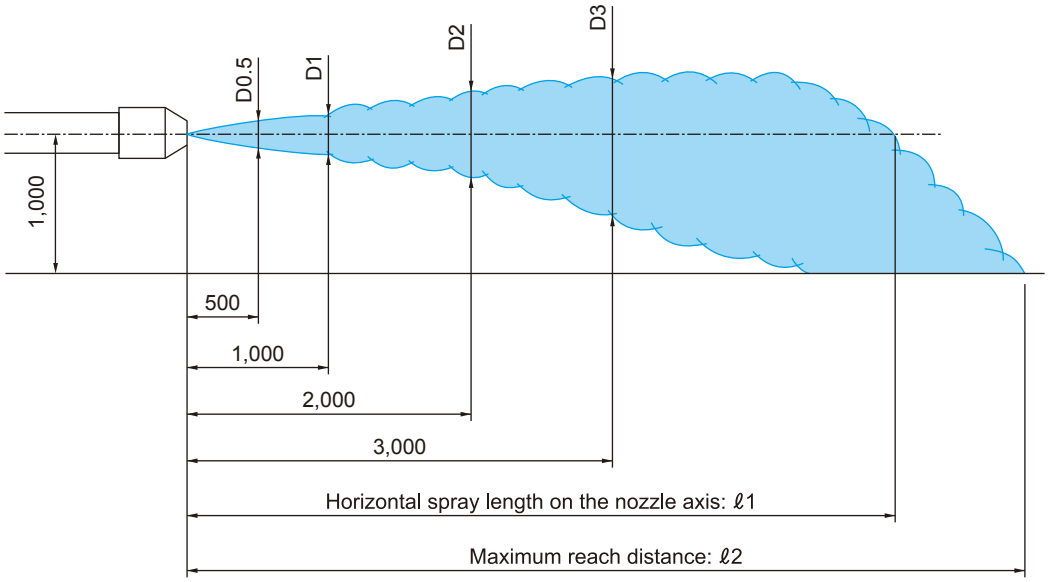
■ LSIM201000





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

When selecting a nozzle product, various factors must be considered, such as distance to target, number of nozzles required, and installation layout including air and liquid piping.
To ensure the best nozzle selection for your needs, consult our sales representatives during the design phase. Our engineering services are essential for efficient performance.

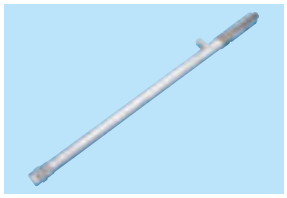
Inquiry forms with outline drawings are available to confirm dimensions and pipe connections.
Contact us for more details.

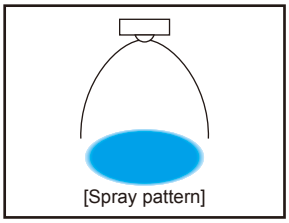
Steam-Driven Nozzles

■The JOKIJet Series are steam-driven pneumatic spray nozzles that use steam instead of compressed air to atomize liquid.

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

Contents



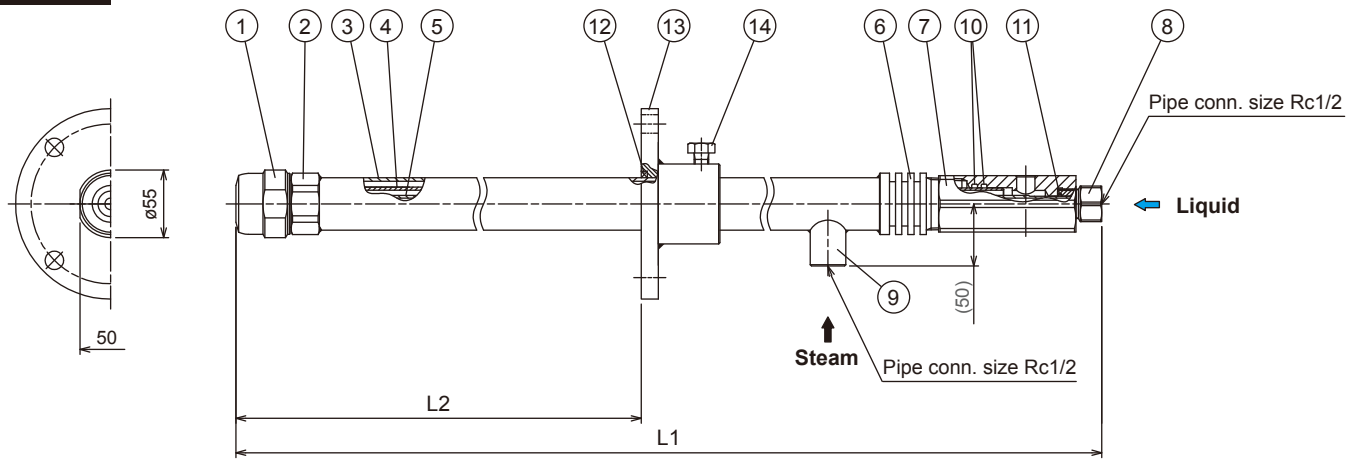


■Innovative pneumatic nozzles using steam instead of compressed air to produce semi-fine atomization.

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	S316L
4	Inner pipe	S304
5	Inner pipe	S304
6	Fin	S304
7	Joint	S304
8	Liquid socket	S304

No.	Components	Standard materials
9	Steam socket	S304
10	O-ring (P26)	FKM
11	O-ring (P12.5)	FKM
12	Packing	Metal wire reinforced AES wool
13	Flange	S304
14	Bolt (M12)	S304 equivalent

Unit: mm

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)	Weight* (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

*Weight of flange is not included.

FLOW-RATE DIAGRAMS

■How to read the chart

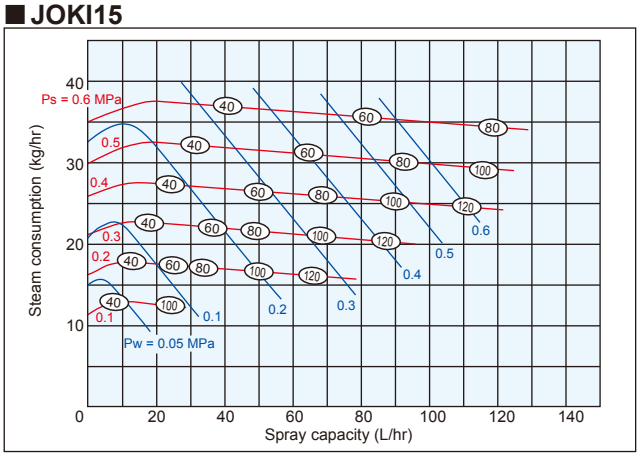
1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent steam pressures Ps in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
3. Numbers in ovals ⬭ indicate Sauter mean diameters (μm) measured by the immersion sampling method.
   (See pages 7–8 for comparison with laser Doppler method.)

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

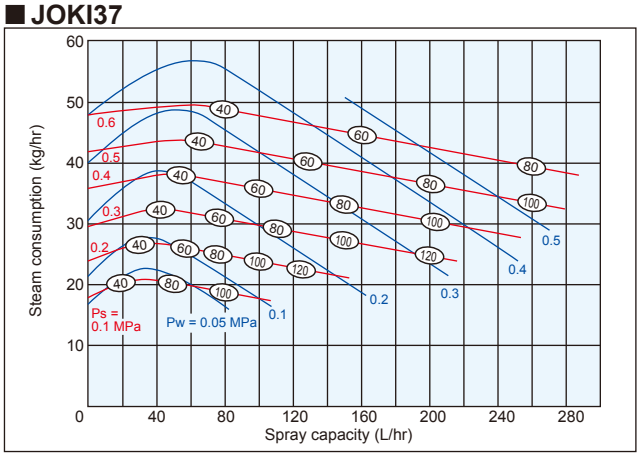
Note for spray control

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.

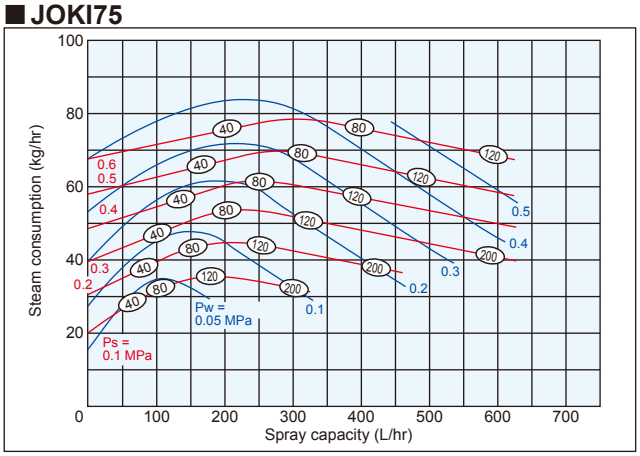
■ **JOKI15**



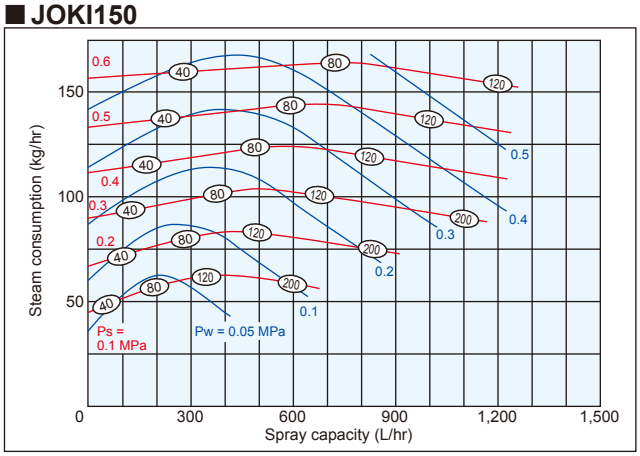
■ **JOKI37**



■ **JOKI75**



■ **JOKI150**



HOW TO ORDER

When selecting a nozzle product, various factors must be considered, such as distance to target, number of nozzles required, and installation layout including air and liquid piping.
To ensure the best nozzle selection for your needs, consult our sales representatives during the design phase. Our engineering services are essential for efficient performance.

Inquiry forms with outline drawings are available to confirm dimensions and pipe connections.
Contact us for more details.

■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
Weight	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 rate and proper pipe size

Nominal size		Steel pipe		Flow rate (L/min) when pressure loss is 0.01–0.03MPa per pipe length of 10m
A	B	Inside dia. (mm)	Outside dia. (mm)	
6A	1/8B	6.5	10.5	1.3–2.2
8A	1/4B	9.2	13.8	3–5.2
10A	3/8B	12.7	17.3	7–12
15A	1/2B	16.1	21.7	12–21
20A	3/4B	21.6	27.2	22–38
25A	1B	27.6	34.0	38–65
32A	1 1/4B	35.7	42.7	70–120
40A	1 1/2B	41.6	48.6	120–210
50A	2B	52.9	60.5	215–370
65A	2 1/2B	67.9	76.3	410–700
80A	3B	80.7	89.1	680–1,200
100A	4B	105.3	114.3	1,200–2,100
125A	5B	130.8	139.8	2,100–3,600
150A	6B	155.2	165.2	3,300–5,700

	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	7.48
	4.55×10^{3}	4.55	4.55×10^{-3}	0.16	1	1.2
	3.79×10^{3}	3.79	3.79×10^{-3}	0.134	0.833	1

	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

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"The Fog Engineers"

H. IKEUCHI & CO., LTD.

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