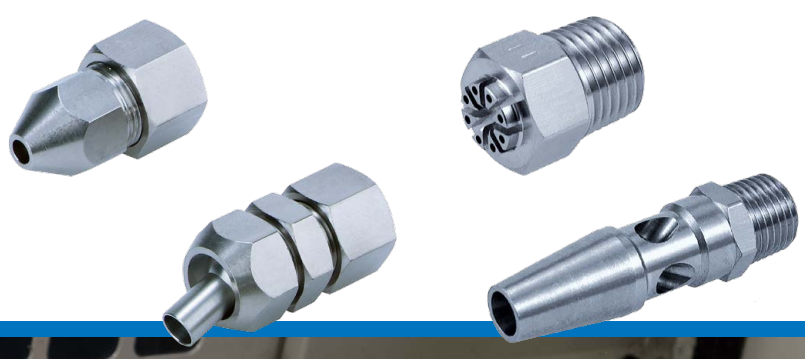
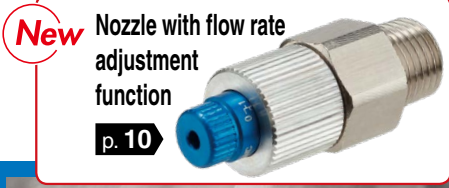
Blow Nozzles



New Nozzle with flow rate adjustment function

p. 10



CONTENTS

CAT.ES50-43A Ⓐ

Nozzle Selection

What is the purpose of blowing?

Removal of foreign matter

No

Yes

Foreign matter type

❶ Small foreign matter (Dust, Cutting chips, etc.)

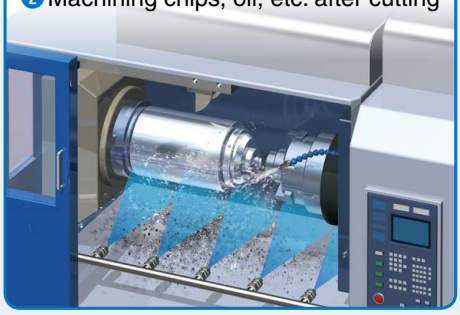
Removal of foreign matter across a wide area

p. 4

Twin Nozzle

KQ2LU, KQ2U + KN-Q□A

❷ Machining chips, oil, etc. after cutting



No

Fine adjustment of blowing direction and nozzle position

Yes

p. 11

Pivoting Nozzle

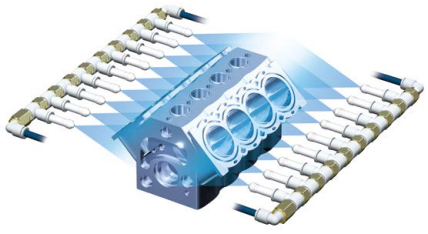
KNK Series

p. 14

Flexible Nozzle

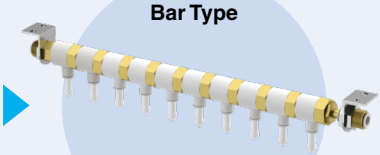
KN-X1567

❸ Water droplets, etc. after cleaning



p. 4

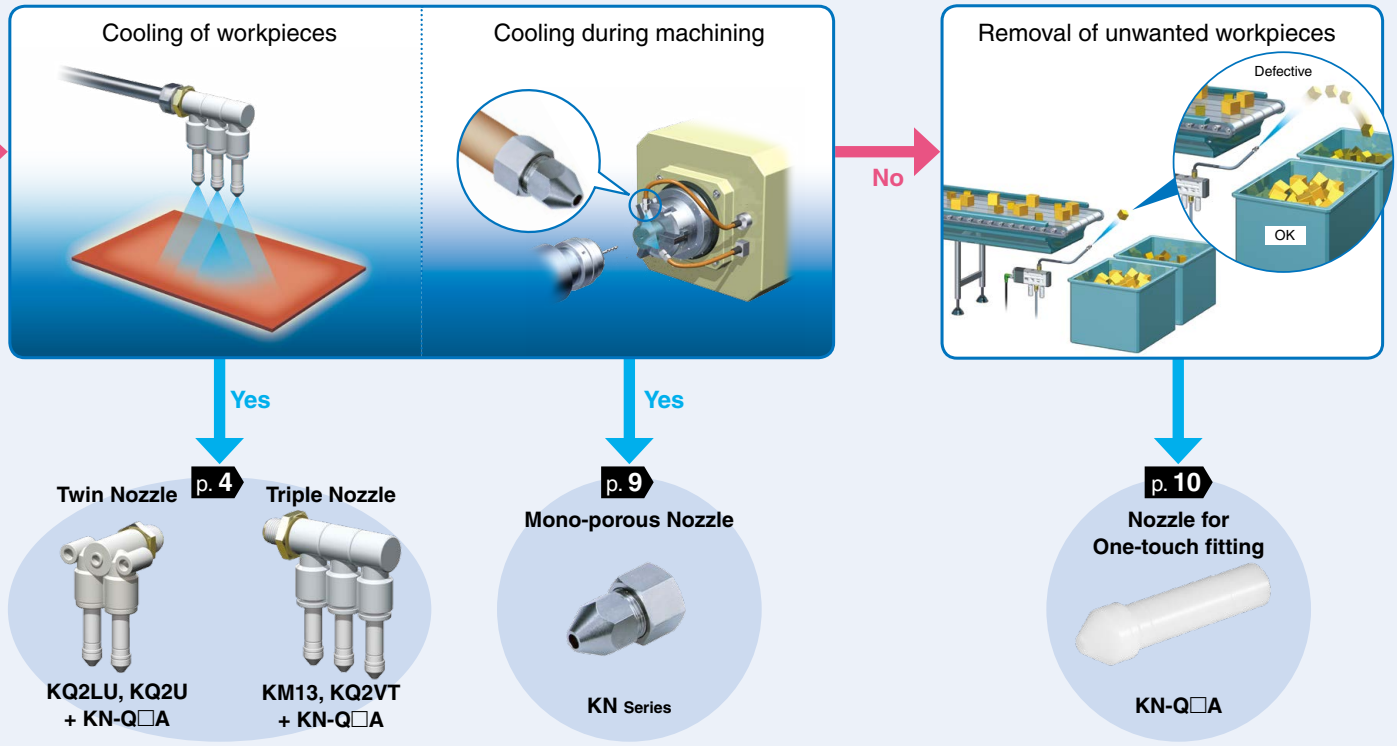
Bar Type



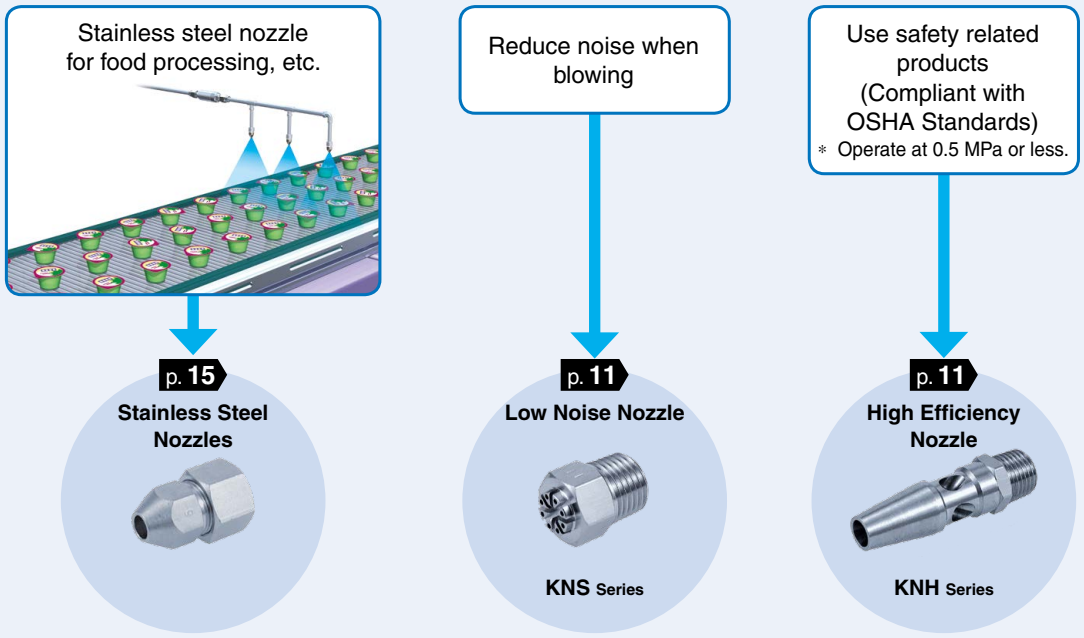
KQ2VF + KN-Q□A

⚠ Caution The applications described here are for reference only. For actual usage in various other applications, please conduct thorough evaluation and validation testing in order to determine the feasibility under your actual usage conditions.

Chart



Others



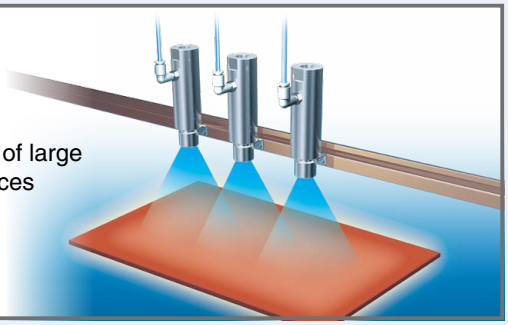
⚠ Caution The applications described here are for reference only. For actual usage in various other applications, please conduct thorough evaluation and validation testing in order to determine the feasibility under your actual usage conditions.

Related Products p. 16

High-flow blow can be performed.

Vacuum Flow
ZH-X249

Cooling of large workpieces

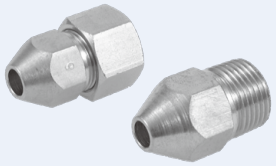


Nozzle Variations

High-pressure blow with minimal pressure loss

p. 9

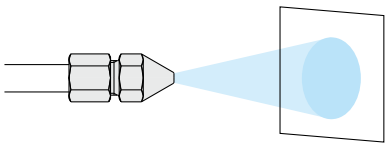
Mono-porous Nozzle
KN Series



- Pressure loss is significantly reduced and increasing efficiency by implementing a design that uses a large conductance until just before the nozzle outlet.
- This enables a high-pressure blow with minimal pressure loss.
- Connection type: Self-align fitting, Male thread
- Nozzle cover (p. 12)

Nozzle diameter	Self-align fitting	ø1, ø1.5, ø2, ø2.5, ø3, ø3.5, ø4, ø6
	Male thread	ø1, ø1.5, ø2, ø2.5, ø4, ø6, ø8

Blow example



Flow rate can be adjusted at the most downstream side of the blow process.

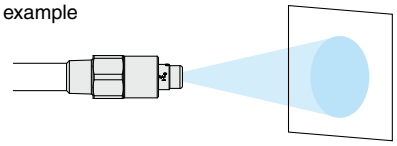
p. 10

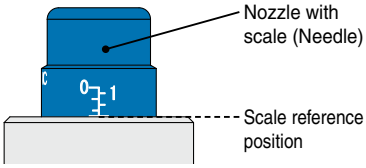
Nozzle with flow rate adjustment function
KNC Series

- Nozzle with male thread - Flow rate can be adjusted to ø2.0 equivalent or less.

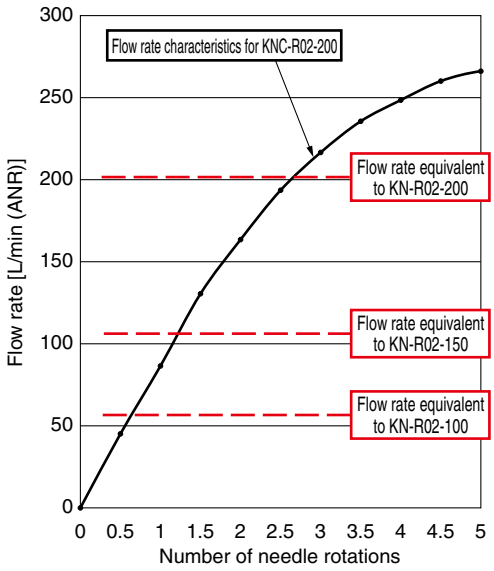
Nozzle diameter	ø2.6

Blow example





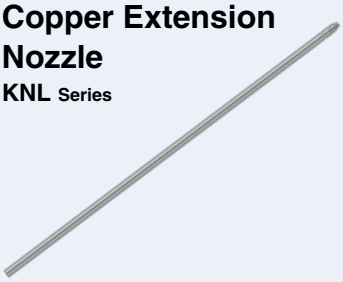
The number of rotations and Flow rate



Nozzle length: 300 mm, 600 mm

p. 10

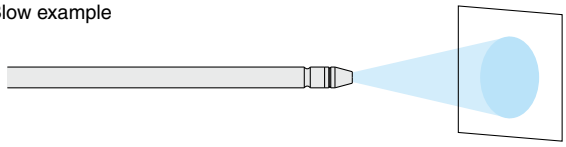
Copper Extension Nozzle
KNL Series



- Secluded and difficult to reach areas
- Blowing at high places, etc.
- With fitting (p. 10)
- Nozzle cover (p. 12)

Nozzle diameter	ø1.5, ø2, ø2.5, ø3

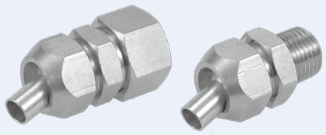
Blow example



Fine adjustment of blow

p. 11

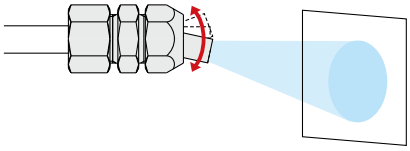
Pivoting Nozzle
KNK Series



- The pivoting construction of the tip enables fine adjustment of the nozzle direction after setting.
- Connection type: Self-align fitting, Male thread

Nozzle diameter	ø4, ø6

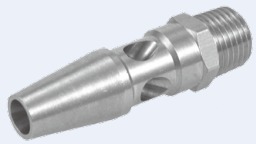
Blow example



Nozzle Variations

High impact pressure and large flow rate, Compliant with OSHA Standards p. 11

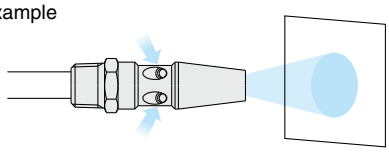
High Efficiency Nozzle
KNH Series

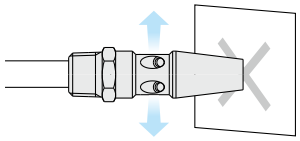


- Entrains the surrounding air increasing the blow flow rate through the nozzle
- Increases the blow flow to about double the supply air quantity
- This nozzle prevents any pressure buildup when the outlet is blocked for safety. (Compliant with OSHA Standards: Operate at 0.5 MPa or less.)

Nozzle diameter	ø1, ø1.5, ø2

Blow example

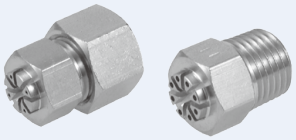




Compliant with OSHA Standards:
Air is discharged from the ports on the side of the product to prevent pressure building up when the outlet of the nozzle tip is blocked.

Noise reduction p. 11

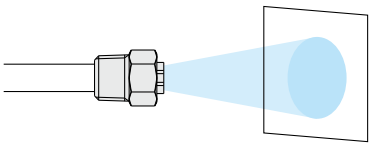
Low Noise Nozzle
KNS Series



- Small-diameter multi-hole structure to reduce noise and provide a large blow flow rate
- Connection type: Self-align fitting, Male thread

Nozzle diameter	Self-align fitting	ø0.75 x 4, ø1 x 4, ø0.9 x 8
	Male thread	ø0.75 x 4, ø1 x 4, ø0.9 x 8, ø1.1 x 8

Blow example

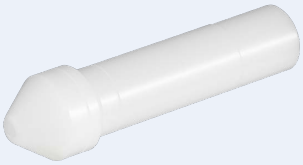


Nozzle Variations

Adjustable layout to match application

p. 10

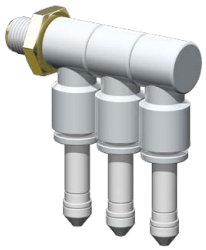
Nozzle for One-touch Fitting/Resin Type
KN-Q□A



- Can be used in combination with One-touch fittings to set up different blow system layouts.
- Uses a single-hole nozzle that ensures high-impact pressure.
- The nozzle diameter can be selected to change the impact pressure on the workpiece.
- This combination variation allows a significant reduction of air consumption by blowing an area wider than a comb-shaped nozzle.

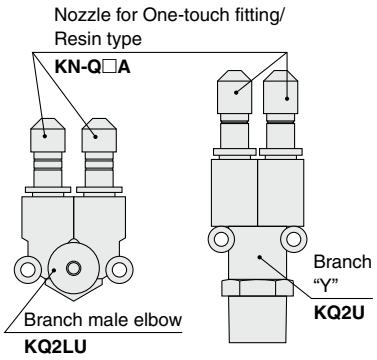
Applicable fitting size: ø6	Applicable fitting size: ø8	Applicable fitting size: ø10	Applicable fitting size: ø12
Nozzle diameter: ø1, ø1.5, ø2	Nozzle diameter: ø1.5, ø2	Nozzle diameter: ø2, ø2.5	Nozzle diameter: ø2.5, ø3

Mounting examples



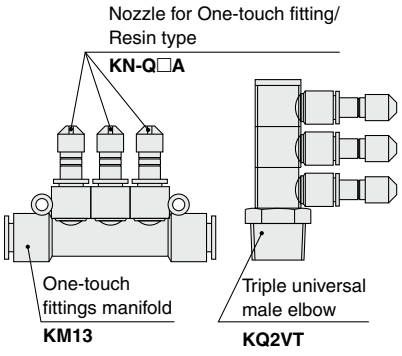
"Twin Nozzle"

Jet shape



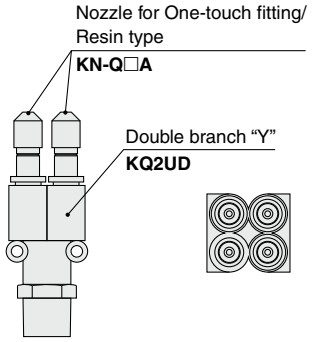
"Triple Nozzle"

Jet shape



"High-thrust Type"

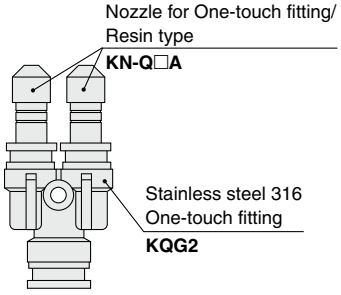
Jet shape



"Water-resistant Type"

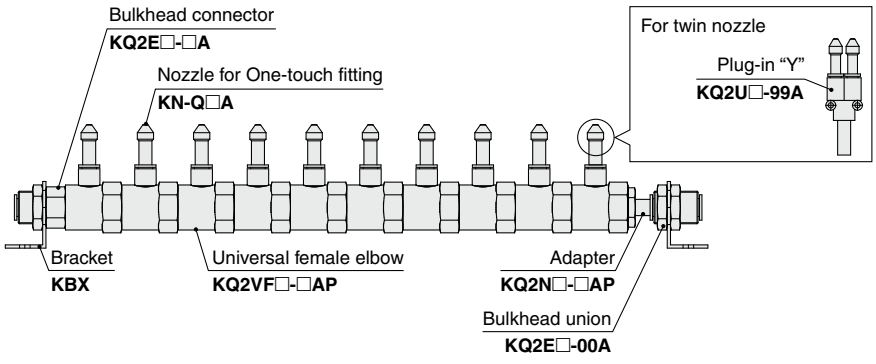
Jet shape

Fitting: Stainless steel 316, Nozzle: POM



"Bar Type Nozzle"

Jet shape



⚠ Caution The use of fittings not manufactured by SMC is extremely dangerous since the nozzle for One-touch fitting may be released with no warning. Make sure to purchase the One-touch fitting KQ2 series by SMC and use it in combination with the nozzle. For details on fittings, refer to the **Web Catalog**.

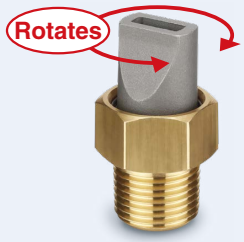
Nozzle Variations

Made to Order

For blowers

p. 13

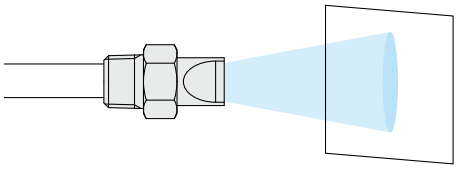
Blower Nozzle
KN-R03-400-X1484



- The spray direction can be adjusted.
- Spray: Fan shape

Nozzle port size	4 x 11
Connection thread	R3/8

Blow example



The nozzle position can be rotated after mounting.

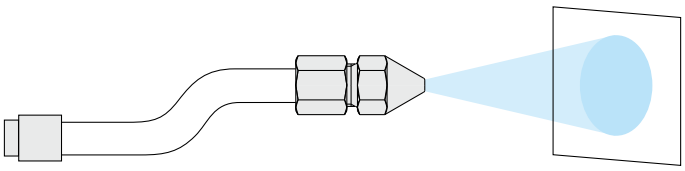
p. 14

Bender Tube
KN-06-150-X1567

- The nozzle position can be easily adjusted by using a flexible tube.
- The tube can be cut in any length.

Nozzle diameter	ø1.5
Connection thread	R1/8
Tube length	300 mm

Blow example



Improved corrosion resistance, heat resistance, and chemical resistance

p. 15

Stainless Steel Nozzles

- Use stainless steel nozzles for excellent anti-corrosion and chemical resistance properties
- Can be used in environments where contact with water or chemicals occurs

Material	Stainless steel 303, Stainless steel 304

	With self-align fitting	Nozzle with male thread	High efficiency	High noise reduction	2-port nozzle	3-port nozzle
						
Applicable tubing O.D.	ø6					
Nozzle dia.	ø2.0					
Connection thread		R1/8, R1/4	R1/4	R1/4	R1/8	Rc1/8
Nozzle dia.		ø1.5, ø2.5	ø2.0	ø1.1 x 8	ø1.5 x 2	ø1.5 x 3

Related Products

High-flow blow can be performed.

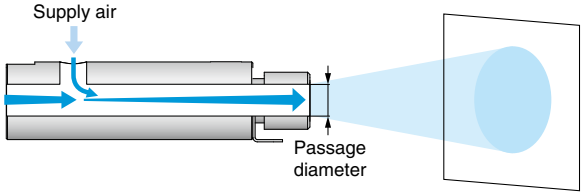
p. 16

Vacuum Flow (ZH)
ZH Series

- Entrains the surrounding air increasing the blow flow rate through the nozzle
- Increases the blow flow to about 2 to 4 times the supply air quantity

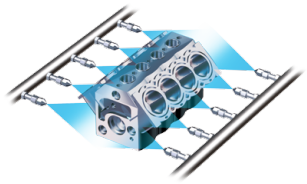
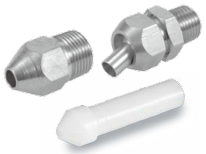
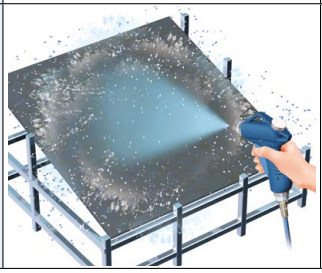
Fluid passage diameter	ø8, ø11.5, ø12

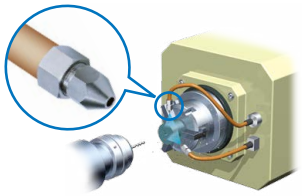
Blow example



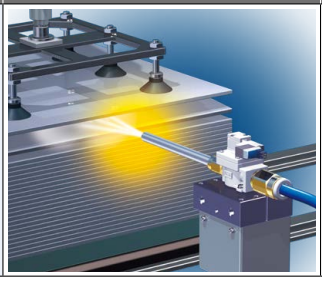
Applications

Nozzles for Blowing

Work process	Application example	Main series
Bottle cleaning	 High-pressure blow with minimal pressure loss Adjustable layout to match application	**KN-Q□A** p. 10 
Blowing water droplets off engine blocks	 High-pressure blow with minimal pressure loss Adjustable layout to match application Fine adjustment of blow	**KN** **KNK** **KN-Q□A** p. 9 to 11 
Water droplet removal		**KNK** p. 11 

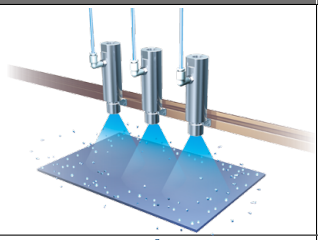
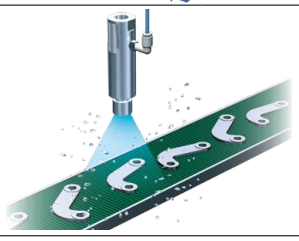
Work process	Application example	Main series
Cooling during machining		**KN** p. 9 
Blowing for deburring after machining		**KN** p. 9 

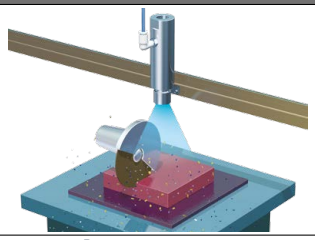
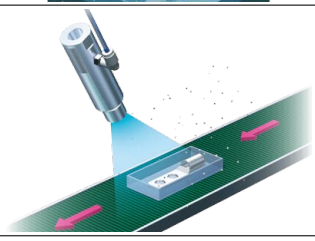
Nozzles for Impact Blow Guns/Blow Valves

Work process	Application example	Main series
Blowing for separating laminated sheet		**IBG1-12-10-□** 

Work process	Application example	Main series
Blowing for cleaning after machining		**IBG1-12-10-□** 

Related Products Vacuum Flow

Work process	Application example	Main series
Pre-cleaning surfaces		**ZH-X249** p. 16 
Removal of foreign matter on the surface		**ZH-X249** p. 16 

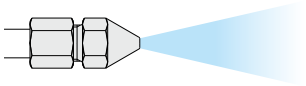
Work process	Application example	Main series
Removal of machining chips during shearing		**ZH-X249** p. 16 
Blowing away machining chips		**ZH-X249** p. 16 

⚠ Caution The applications described here are for reference only. For actual usage in various other applications, please conduct thorough evaluation and validation testing in order to determine the feasibility under your actual usage conditions.

Jet Shape and Impact Pressure Distribution Diagram

Nozzle with Self-align Fitting KN Series
Copper Extension Nozzle KNL Series p. 9, 10

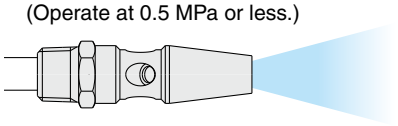
- Standard blow nozzle
- Highly effective with low pressure loss
- A wide variety of nozzle diameters are available for selection.
- Can be used with One-touch fittings, copper piping, and other applications in addition to mounting on male and female threads

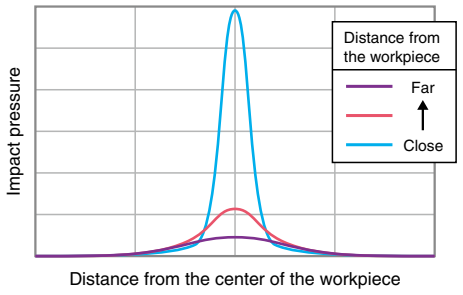


Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 100 mm		General air blow purposes

High Efficiency Nozzle KNH Series p. 11

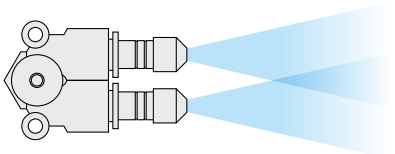
- Entrains the surrounding air and increases the blow flow rate
- Blow thrust improved by 10%
- OSHA Standards compliant product (Operate at 0.5 MPa or less.)

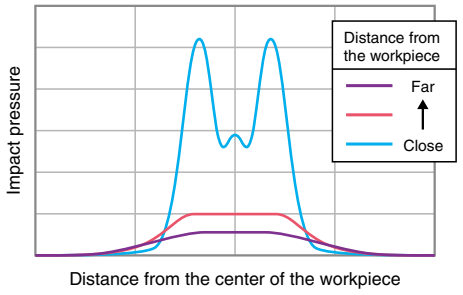


Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 100 mm		General air blow purposes

Branch Male Elbow + Nozzle for One-touch Fitting/Resin Type KQ2LU + KN-Q□A (2 pcs.) p. 4

- A type with two nozzles (resin type) for One-touch fitting inserted in a branch elbow
- Can be used for blowing a wide area
- Provides high impact pressure and a jet shape similar to a general comb-shaped nozzle
- Low air consumption (Compared to a comb-shaped nozzle)



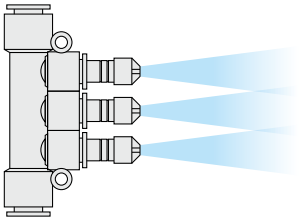
Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 100 mm		Blowing off of water droplets Removal of defective workpieces Drying Removal of foreign matter Blowing water droplets off engine blocks Workpiece alignment

Jet Shape and Impact Pressure Distribution Diagram

One-touch Fittings Manifold + Nozzle for One-touch Fitting/ Resin Type KM13 + KN-Q□A (3 pcs.)

p. 4

- Nozzle for One-touch fittings / resin type One-touch fittings manifold docking stations
- Optimum for blowing water, or other fluids off, a wide area
- For impact pressure and blowing area greater than a general comb-shaped nozzle!

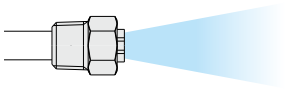


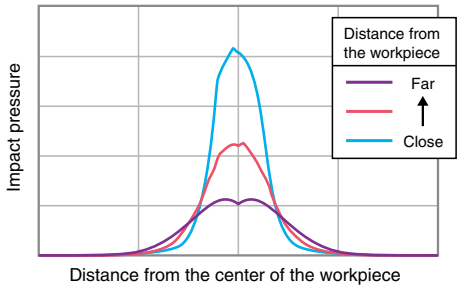
Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 100 mm		Blowing off the water of a wide area Drying Removal of foreign matter Cooling

Low Noise Nozzle with Self-align Fitting KNS Series

p. 11

- Designed to blow with 4 to 8 nozzles and high noise reduction. Can be used for a smaller area



Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 50 mm		Drying, Blowing off of water droplets Cooling: Highly precise cooling of resin-molded articles

Nozzles for Blowing
KN Series

RoHS

Specifications

Nozzle (KN, KNK, KNH, KNS, KNL)

Applicable tubing material		Nylon, Soft nylon, Flexible copper pipe (C1220T-O), OST pipe
Applicable tubing O.D.		ø4, ø6, ø8, ø10, ø12, ø16, ø20
Fluid		Air, Coolant*1
Max. operating pressure		1 MPa (0.3 MPa with OST pipe)
Ambient and fluid temperatures		–5 to 60°C (No freezing)
Threads	**Mounting**	JIS B 0203 (Taper threads for piping)
	Nut	JIS B 0205 (Metric fine thread)
Seal on the threads		None
Copper-free (Standard)		Brass parts are all electroless nickel plated.

*1 Excludes the KNS and KN-Q□A

Principal Parts Material

KN, KNK, KNH, KNS

Body, Nut	C3604
Sleeve (Self-align fitting type)	C2700
Nozzle (Pivoting type)	Stainless steel 303

KN-Q□A

Nozzle	POM

KNL

Pipe	C1220T-0
Nozzle	C3604

KNC*1, *2

Body, Seat ring, Needle	C3604
Nozzle with scale, Lock nut	A2017
O-ring	NBR

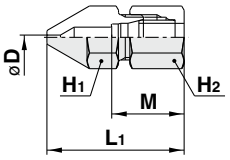
*1 The KNC is not allowed for coolant liquid.
*2 Copper-free specification: Excludes the KNC

Nozzle with self-align fitting/KN

[mm]

Air Coolant

Model	Nozzle dia. øD	Applicable tubing O.D.	Width across flats H1	Width across flats H2	L1	M	Weight [g]
KN-04-100	ø1	ø4	10	10	27	15	13
KN-04-150	ø1.5	ø4	10	10	27.7	15	14
KN-06-100	ø1	ø6	12	12	30.1	16	19
KN-06-150	ø1.5	ø6	12	12	30.8	16	20
KN-06-200	ø2	ø6	12	12	31.5	16	22
KN-08-150	ø1.5	ø8	14	14	33.8	16	28
KN-08-200	ø2	ø8	14	14	34.6	16	30
KN-10-250	ø2.5	ø10	14	17	35.6	17	35
KN-10-300	ø3	ø10	14	17	36.3	17	36
KN-10-350	ø3.5	ø10	14	17	37.1	17	37
KN-10-400	ø4	ø10	14	17	29.5	17	30
KN-10-600	ø6	ø10	14	17	27.7	17	28
KN-12-350	ø3.5	ø12	17	19	40.4	17	54
KN-12-400	ø4	ø12	17	19	41.3	17	55
KN-12-600	ø6	ø12	17	19	31.2	17	40
KN-16-400	ø4	ø16	22	24	40.1	17	77
KN-16-600	ø6	ø16	22	24	38.4	17	79
KN-20-400	ø4	ø20	26	27	45.6	17	117
KN-20-600	ø6	ø20	26	27	43.9	17	112

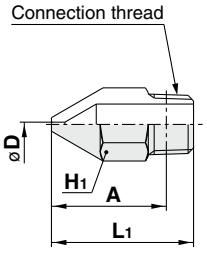


Nozzle with male thread/KN

[mm]

Air Coolant

Model	Nozzle dia. øD	Connection thread	Width across flats H1	L1	A*1	Weight [g]
KN-R01-100	ø1	R1/8	10	21.4	17.4	8
KN-R01-150	ø1.5	R1/8	10	21	17	8
KN-R02-100	ø1	R1/4	14	31.4	25.4	19
KN-R02-150	ø1.5	R1/4	14	31	25	20
KN-R02-200	ø2	R1/4	14	30.5	24.5	21
KN-R02-250	ø2.5	R1/4	14	30.1	24.1	21
KN-R02-600	ø6	R1/4	14	27.1	21.1	22
KN-R03-400	ø4	R3/8	17	31.8	25.4	36
KN-R03-600	ø6	R3/8	17	30.1	23.7	37
KN-R04-400	ø4	R1/2	22	41.8	33.6	75
KN-R04-600	ø6	R1/2	22	40.1	31.8	76
KN-R06-600	ø6	R3/4	27	49.6	40.1	149
KN-R06-800	ø8	R3/4	27	47.8	38	152
KN-R10-800	ø8	R1	36	62.8	52.4	328



*1 Reference dimensions after R thread installation

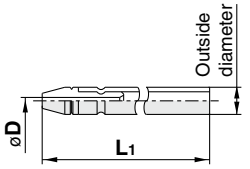
SMC

Copper extension nozzle/KNL

[mm]

Air Coolant

Model	Nozzle dia. ø**D**	Outside diameter	**L1**	Weight [g]
KNL3-06-150	ø1.5	ø6	300	43
KNL3-06-200	ø2	ø6	300	43
KNL3-08-200	ø2	ø8	300	61
KNL3-08-250	ø2.5	ø8	300	61
KNL3-10-250	ø2.5	ø10	300	94
KNL3-10-300	ø3	ø10	300	94
KNL6-06-150	ø1.5	ø6	600	84
KNL6-06-200	ø2	ø6	600	84
KNL6-08-200	ø2	ø8	600	117
KNL6-08-250	ø2.5	ø8	600	117
KNL6-10-250	ø2.5	ø10	600	183
KNL6-10-300	ø3	ø10	600	183

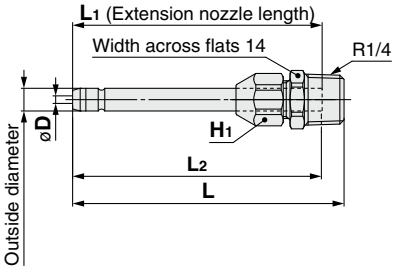


Copper extension nozzle set/VMG

[mm]

Air Coolant

Model	Nozzle dia. **D**	Outside diameter	**L1**	**L2**∗1	**L**∗1	Width across flats **H1**
VMG1-06-150-100	ø1.5	ø6	100	100	106	12
VMG1-06-200-100	ø2					
VMG1-06-150-150	ø1.5		150	150	156	
VMG1-06-200-150	ø2					
VMG1-06-150-300	ø1.5		300	300	306	
VMG1-06-200-300	ø2					
VMG1-06-150-600	ø1.5		600	600	606	
VMG1-06-200-600	ø2					
VMG1-08-250-100	ø2.5	ø8	100	100	106	14
VMG1-08-300-100	ø3					
VMG1-08-350-100	ø3.5					
VMG1-08-250-150	ø2.5		150	150	156	
VMG1-08-300-150	ø3					
VMG1-08-350-150	ø3.5					
VMG1-08-250-300	ø2.5		300	300	306	
VMG1-08-300-300	ø3					
VMG1-08-350-300	ø3.5					
VMG1-08-250-600	ø2.5		600	600	606	
VMG1-08-300-600	ø3					
VMG1-08-350-600	ø3.5					



∗1 Reference dimensions after installation

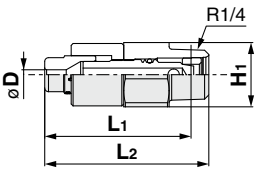
∗ Copper extension nozzle and self-align fitting are included in the same package but do not come assembled. Refer to "How to attach extension nozzle" in the VMG series operation manual for assembly procedures.

Nozzle with flow rate adjustment function/KNC

[mm]

Air

Model	Nozzle dia. ø**D**	Width across flats **H1**	**L1**	**L2**	Weight [g]
KNC-R02-200	ø2.6	17	38.7 (Max. 41.2)	43.4 (Max. 45.9)	42.4



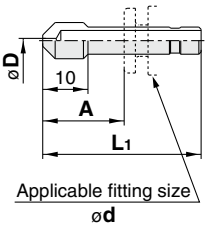
∗ Please refer to the operation manual for the specific product precautions.

Nozzle for One-touch fitting (Resin type)/KN-Q□A

[mm]

Air

Model	Nozzle dia. ø**D**	Applicable fitting size ø**d**	**L1**	**A**∗1	Weight [g]
KN-Q06A-100	ø1	ø6	35	21.8	1
KN-Q06A-150	ø1.5	ø6	35	21.8	1
KN-Q06A-200	ø2	ø6	35	21.8	1
KN-Q08A-150	ø1.5	ø8	39	24.8	2
KN-Q08A-200	ø2	ø8	39	24.8	2
KN-Q10A-200	ø2	ø10	43	27.4	3
KN-Q10A-250	ø2.5	ø10	43	27.4	3
KN-Q12A-250	ø2.5	ø12	45.5	28.5	4
KN-Q12A-300	ø3	ø12	45.5	28.5	4



∗1 Dimensions shown are for nozzle connected to the KQ2 series.

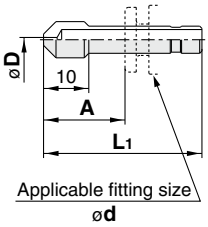
⚠Warning [Mounting / Piping] Applicable nozzle: Nozzle for One-touch fitting (Resin/Metal type)
When connecting the nozzle to the One-touch fitting, insert it securely until it cannot move any further. After setting the nozzle deep into the fitting, be sure to pull on the nozzle to confirm that it is firm and does not budge. If the nozzle is not secured all the way at the back of the fitting or if there is insufficient engagement with the One-touch fitting, the nozzle may dislodge during pressurization, which is dangerous and may result in injury or accident.

Nozzle for One-touch fitting (Metal type)/KN-Q□

[mm]

Air

Model	Nozzle dia. ø**D**	Applicable fitting size ø**d**	**L1**	**A**	Weight [g]
KN-Q06-100	ø1	ø6	35	18	5
KN-Q06-150	ø1.5	ø6	35	18	5
KN-Q06-200	ø2	ø6	35	18	5
KN-Q08-150	ø1.5	ø8	39	20.5	9
KN-Q08-200	ø2	ø8	39	20.5	9
KN-Q10-200	ø2	ø10	43	22	16
KN-Q10-250	ø2.5	ø10	43	22	16
KN-Q12-250	ø2.5	ø12	45.5	24	23
KN-Q12-300	ø3	ø12	45.5	24	23

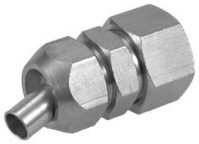


Connecting products with metal rods

Products with metal rods cannot be connected to the KQ2 series One-touch fittings (Available as a special order). If connected, the metal rod cannot be retained by the chuck of the One-touch fitting and products with metal rods may project during pressurization, causing serious personal injury or accident. For details about One-touch fittings that can connect products with metal rods, contact SMC.

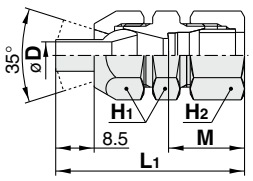
Pivoting nozzle with self-align fitting/KNK

[mm]



Air Coolant

Model	Nozzle dia. øD	Applicable tubing O.D.	Width across flats H1	Width across flats H2	L1	M	Weight [g]
KNK-10-400	ø4	ø10	17	17	41.7	17	44
KNK-10-600	ø6	ø10	17	17	41.7	17	44
KNK-12-400	ø4	ø12	17	19	41.2	17	44
KNK-12-600	ø6	ø12	17	19	41.2	17	44
KNK-16-400	ø4	ø16	17	24	41.8	17	64
KNK-16-600	ø6	ø16	17	24	41.8	17	64
KNK-20-400	ø4	ø20	17	27	43.8	17	77
KNK-20-600	ø6	ø20	17	27	43.8	17	77



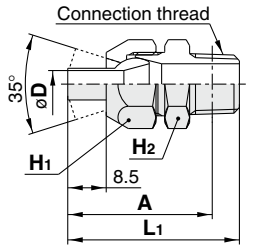
Pivoting nozzle with male thread/KNK

[mm]

Air Coolant

Model	Nozzle dia. øD	Connection thread	Width across flats H1	Width across flats H2	L1	A*1	Weight [g]
KNK-R02-400	ø4	R1/4	17	17	38	31.9	32
KNK-R02-600	ø6	R1/4	17	17	38	31.9	32
KNK-R03-400	ø4	R3/8	17	17	39	32.4	40
KNK-R03-600	ø6	R3/8	17	17	39	32.4	40
KNK-R04-400	ø4	R1/2	17	22	42.2	34.1	54
KNK-R04-600	ø6	R1/2	17	22	42.2	34.1	54

*1 Reference dimensions after R thread installation



High efficiency nozzle/KNH (OSHA compliant: Operate at 0.5 MPa or less.)

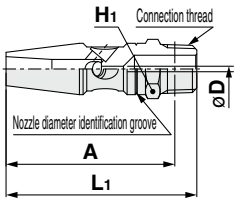
[mm]

Amplifies the air blow flow rate (When operated at 0.5 MPa: amplifies by 2 to 3 times)

Air

Model	Nozzle dia. øD	Connection thread	Width across flats H1	L1	A*1	Weight [g]	Nozzle diameter identification groove
KNH-R02-100	ø1	R1/4	14	52	46	38	—
KNH-R02-150	ø1.5	R1/4	14	52	46	38	1 pc.
KNH-R02-200	ø2	R1/4	14	52	46	38	2 pcs.

*1 Reference dimensions after R thread installation

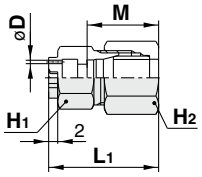


Low noise nozzle with self-align fitting/KNS

[mm]

Air

Model	Nozzle dia. øD	Applicable tubing O.D.	Width across flats H1	Width across flats H2	L1	M	Weight [g]
KNS-08-075-4	ø0.75 x 4	ø8	12	14	24.3	16	17
KNS-08-100-4	ø1 x 4	ø8	12	14	24.3	16	17
KNS-10-075-4	ø0.75 x 4	ø10	14	17	24	17	24
KNS-10-090-8	ø0.9 x 8	ø10	14	17	24	17	24
KNS-10-100-4	ø1 x 4	ø10	14	17	24	17	24



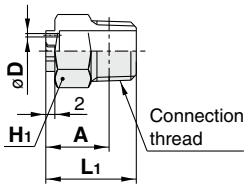
Low noise nozzle with male thread/KNS

[mm]

Air

Model	Nozzle dia. øD	Connection thread	Width across flats H1	L1	A*1	Weight [g]
KNS-R01-075-4	ø0.75 x 4	R1/8	12	18	14	9
KNS-R01-100-4	ø1 x 4	R1/8	12	18	14	9
KNS-R01-090-8	ø0.9 x 8	R1/8	12	18	14	9
KNS-R02-075-4	ø0.75 x 4	R1/4	14	20	14	13
KNS-R02-090-8	ø0.9 x 8	R1/4	14	20	14	13
KNS-R02-100-4	ø1 x 4	R1/4	14	20	14	13
KNS-R02-110-8	ø1.1 x 8	R1/4	14	20	14	13

*1 Reference dimensions after R thread installation



Made to Order

Made to Order

(For details, refer to pages 13 to 15.)

Description	
Blower Nozzle	p. 13
Bender Tube	p. 14
Stainless Steel Nozzles	p. 15

Sensing Heads

Specifications

Sensing head (KNP)

Applicable tubing O.D.	ø4
Fluid	Air
Max. operating pressure (at 20°C)	0.8 MPa
Ambient and fluid temperatures	–5 to 60°C (No freezing)

Principal Parts Material

KNP-1

Pressure spindle	Stainless steel 303
One-touch fitting	POM, NBR, Stainless steel 303, Stainless steel 304
Polyurethane tube (ø4, 1 m)	Polyurethane

KNP-2

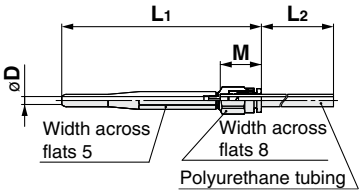
Pipe	Stainless steel 304
One-touch fitting	POM, NBR, Stainless steel 304
Polyurethane tube (ø4, 1 m)	Polyurethane

Standard sensing head/KNP

[mm]

Model	Nozzle dia. ø**D**	Applicable tubing O.D.	Width across flats **H1**	Width across flats **H2**	**M**	**L1**	**L2**	Weight [g]
KNP-1	ø2.5	ø4	5	8	13.3	64.6	986.7	7

∗ A 1 m polyurethane tube is included.

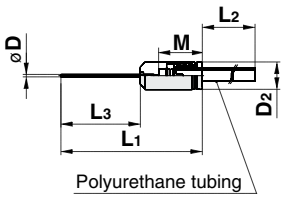


Needle sensing head/KNP

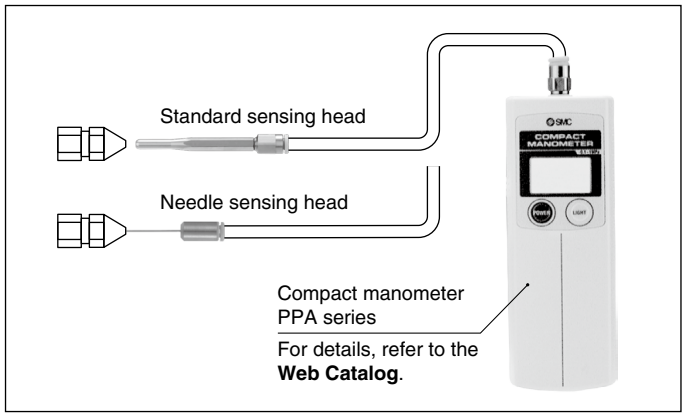
[mm]

Model	Nozzle dia. ø**D**	Applicable tubing O.D.	**D2**	**M**	**L1**	**L2**	**L3**	Weight [g]
KNP-2	ø0.7	ø4	ø8	12.7	41	987.3	23	4

∗ A 1 m polyurethane tube is included.



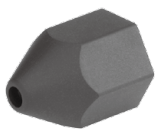
Use to measure workpiece impact pressure.



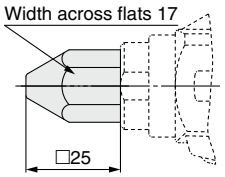
Nozzle Covers

Cover for male thread nozzle

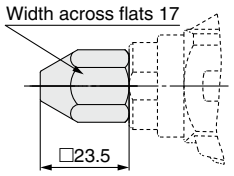
[mm]



Nozzle cover model	Material	Applicable blow gun model	
		Model	Nozzle type
P5670129-01	HNBR	VMG1□□-□-01 to 04	Male thread nozzle ø1 to ø2.5
P5670129-01F	Fluororubber		
P5670129-02	HNBR	VMG1□□-□-05 to 07	Male thread nozzle ø3 to ø4
P5670129-02F	Fluororubber		



VMG1□-□□-1 to 04

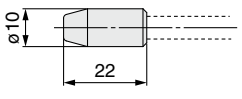


VMG1□-□□-05 to 07

Cover for copper extension nozzle

[mm]

Nozzle cover model	Material	Applicable blow gun model	
		Model	Nozzle type
P5670129-11	HNBR	VMG1□□-□-31 to 38	ø6 copper extension nozzle
P5670129-11F	Fluororubber		



VMG1□-□□-31 to 38

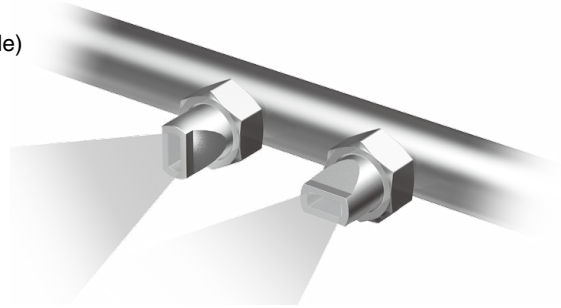
Made to Order

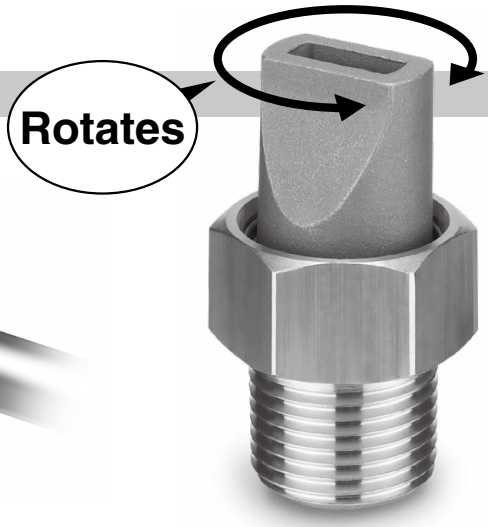
Contact our sales office for delivery dates and prices as this is a special model.

Made to Order

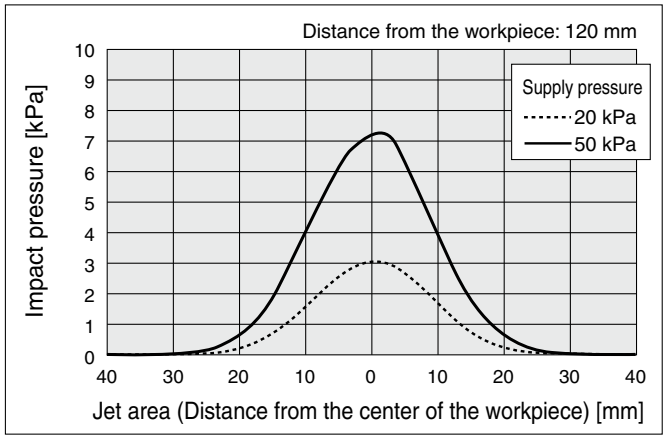
1 Blower Nozzle KN-R03-400-X1484

- The spray direction can be adjusted after the nozzle has been mounted.
- Spray: Fan shape
- Material: Stainless steel (Nozzle)
  Brass (Socket: R3/8)



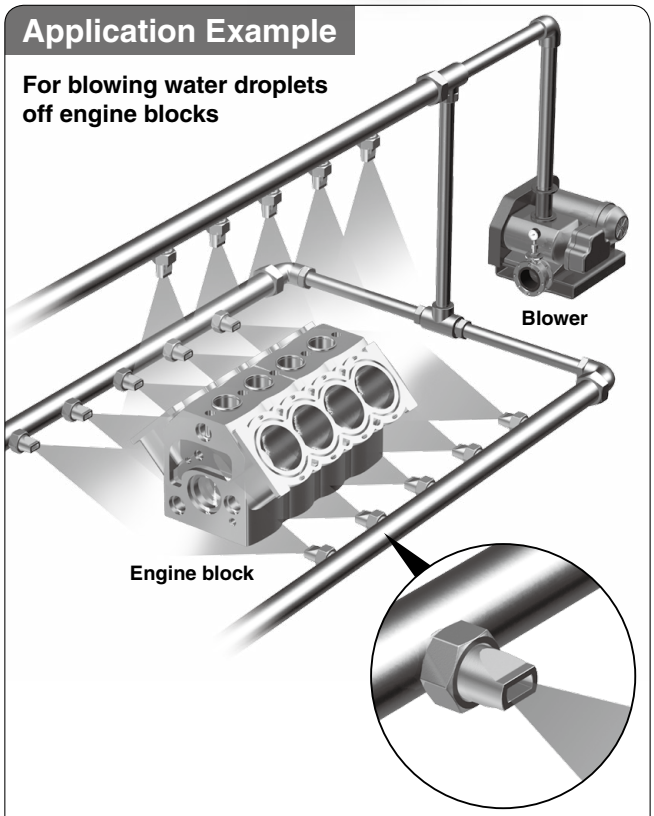


Nozzle Impact Pressure Distribution Diagram



Application Example

For blowing water droplets off engine blocks



Specifications

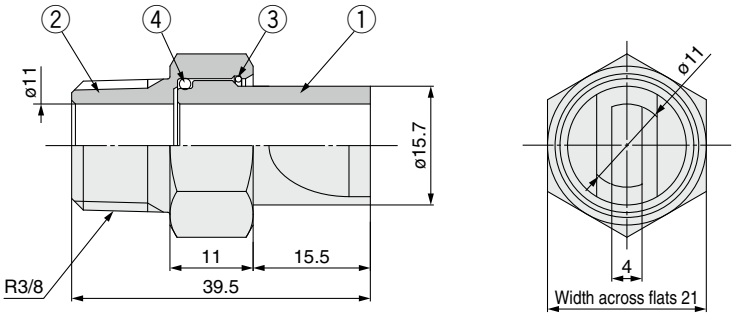
Fluid	Air
Operating pressure range	1 MPa or less*1
Fluid temperature	–10 to 60°C
Nozzle port size	4 x 11
Connection thread	R3/8
Weight	45 g
Air source	Blower*1
Spray	Fan shape

*1 Compressor air can be used.

Dimensions

[mm]

KN-R03-400-X1484



No.	Description	Material
1	**Nozzle (4 x 11)**	Stainless steel
2	**Socket (R3/8)**	Brass
3	**Stopper**	Stainless steel
4	**O-ring**	NBR

SMC

Made to Order

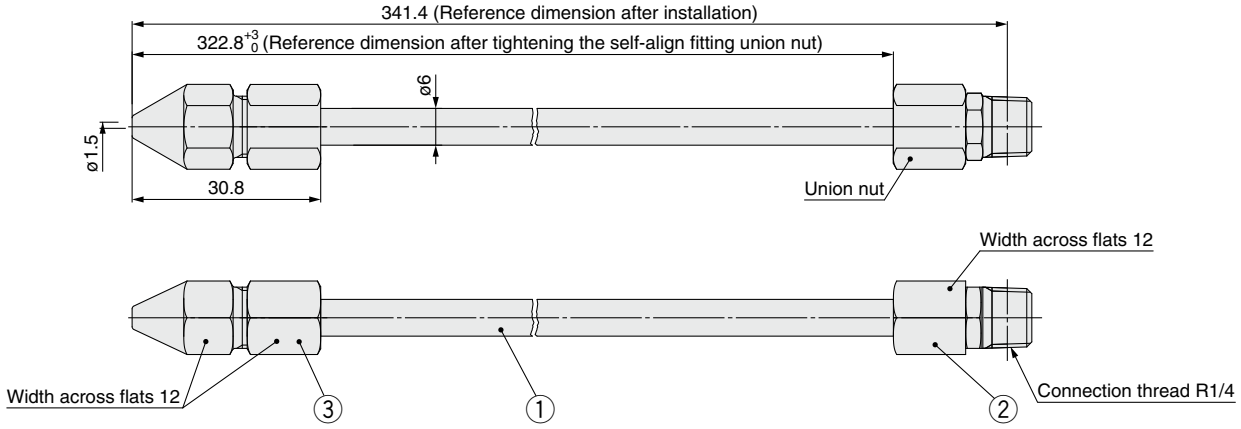
Contact our sales office for delivery dates and prices as this is a special model.

2 Bender Tube KN-06-150-X1567

- A metal bender tube and a single-hole nozzle combined in one unit, which allows the shape to be changed manually
- The nozzle diameter can be selected to adjust the impact pressure on the workpiece.
- Can be cut with a tube cutter (TK series made by SMC)

Dimensions

KN-06-150-X1567



Made to Order

Contact our sales office for delivery dates and prices as this is a special model.

Made to Order

3 Stainless Steel Nozzles

- Use stainless steel nozzles for excellent anti-corrosion and chemical resistance properties
- Can be used in environments where contact with water or chemicals occurs

With male thread

Connection thread	R1/8
Nozzle dia.	ø1.5

Material: Stainless steel 303

KN-R01-150-X13

Connection thread	R1/4
Nozzle dia.	ø2.5

Material: Stainless steel 303

KN-R02-250-X13

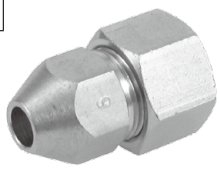
Material: Stainless steel 304

KN-R02-250-X49

With self-align fitting

Applicable tubing O.D.	ø6
Nozzle diameter	ø2.0

Material: Stainless steel 303



KN06-200-DPI00713

High efficiency

Connection thread	R1/4
Nozzle dia.	ø2.0

Material: Stainless steel 303

KNH-R02-200-X13

Material: Stainless steel 304

KNH-R02-200-X49

High noise reduction

Connection thread	R1/4
Nozzle dia.	ø1.1 x 8

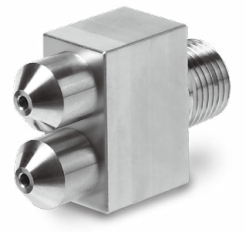
Material: Stainless steel 303

KNS-R02-110-8-X13

2-port/3-port nozzle

Connection thread	R1/8
Nozzle dia.	ø1.5 x 2

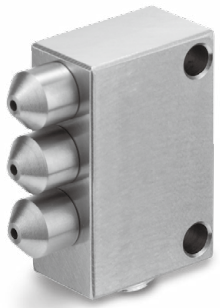
Material: Stainless steel 304



KN-DPW00079

Connection thread	Rc1/8
Nozzle dia.	ø1.5 x 3

Material: Stainless steel 304



KN-DPZ00022

Please contact SMC for information on size options.

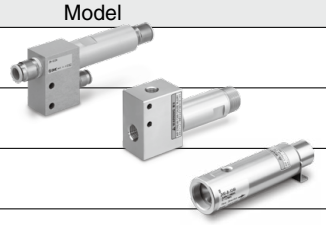
Related Products

Vacuum Flow

ZH-X226/X338/X249

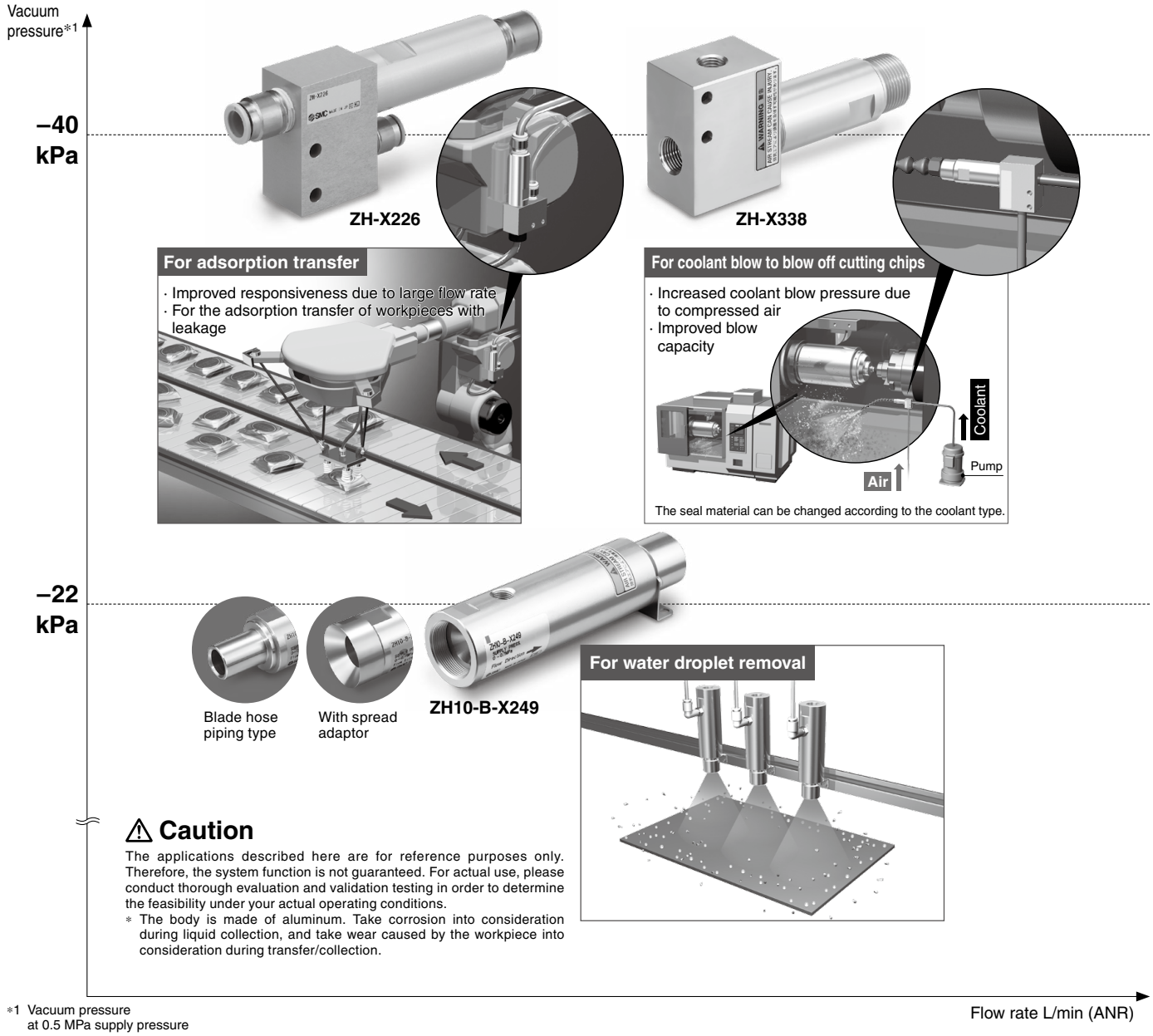
High-flow blow Max. 1550 L/min (ANR) and vacuum Max. 880 L/min (ANR) can be performed by supplying compressed air.

L/min (ANR)

Model	Suction flow rate	Discharge flow rate	Air consumption
ZH-X226 	**405**	**700**	**297**
ZH-X338	**880**	**1550**	**570**
ZH10-B-X249	**820**	**1160**	**340**

At 0.5 MPa supply pressure

Series Map



⚠ Caution

The applications described here are for reference purposes only. Therefore, the system function is not guaranteed. For actual use, please conduct thorough evaluation and validation testing in order to determine the feasibility under your actual operating conditions.

* The body is made of aluminum. Take corrosion into consideration during liquid collection, and take wear caused by the workpiece into consideration during transfer/collection.

*1 Vacuum pressure at 0.5 MPa supply pressure

Related Product

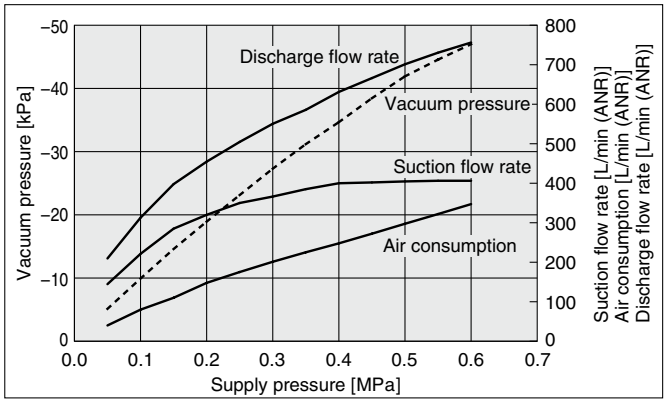
Vacuum Flow
ZH-X226

Model/Specifications

Model	ZH-X226
Body material	Aluminum alloy
Seal material	NBR
Passage diameter	ø8
C [dm³/(s·bar)] (Effective area [mm²])∗1	0.83 (4.13)
Fluid	Air
Supply pressure range	0 to 0.7 MPa
Ambient and fluid temperatures [°C]	–5 to 80 (No freezing or condensation)
Weight [g]	240

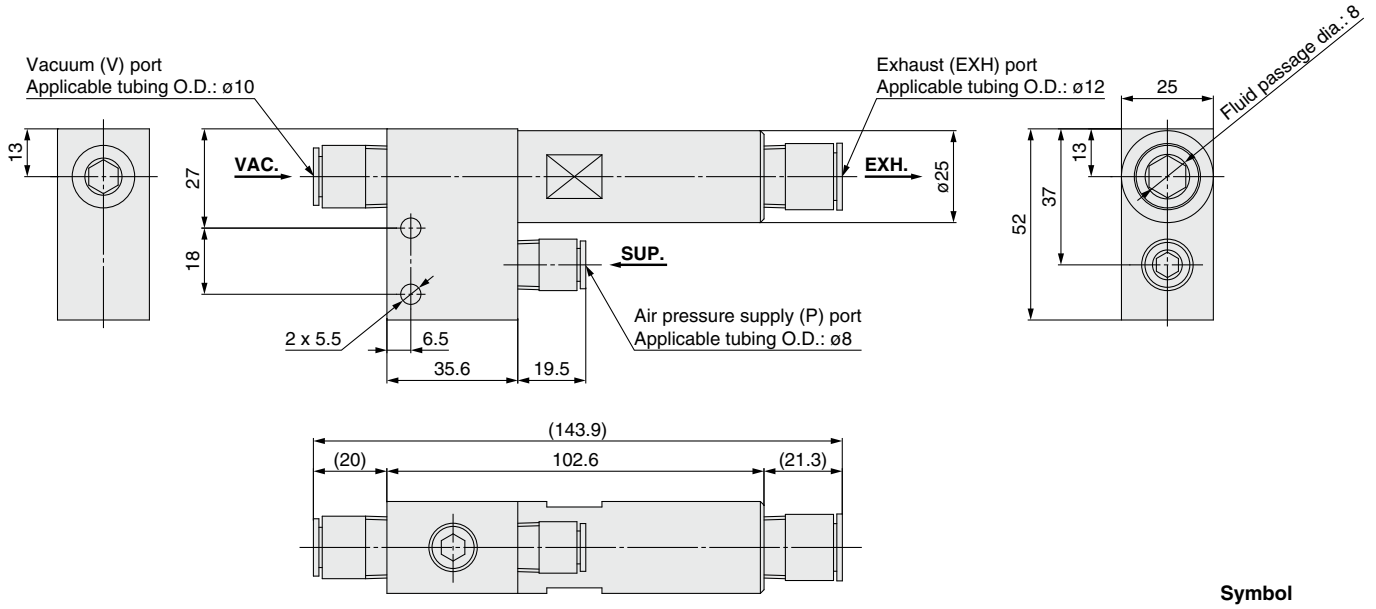
∗1 The C value and the effective area are theoretical values.

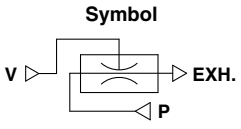
Exhaust Characteristics



This data was acquired under SMC's measurement conditions. Therefore, the characteristics are not guaranteed. In addition, the data shows representative values and the performance may change depending on the piping conditions, etc. Be sure to conduct tests on the actual equipment to test for compatibility with the intended application.

Dimensions





⚠ Specific Product Precautions

Be sure to read this before handling the products. For safety instructions and vacuum equipment precautions, refer to the Web Catalog: https://www.smcworld.com

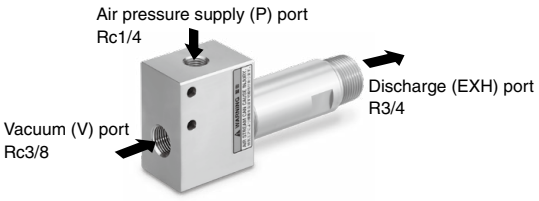
Operating Precautions

⚠ Warning

1. **Because suctioned matter is ejected together with the exhaust, do not direct an exhaust port at a person or other equipment.**
2. **Do not use in an atmosphere which contains corrosive gases, chemicals, organic solvents, sea water, water steam, or where there is direct contact with any of these.**

Related Product

Vacuum Flow
ZH-X338



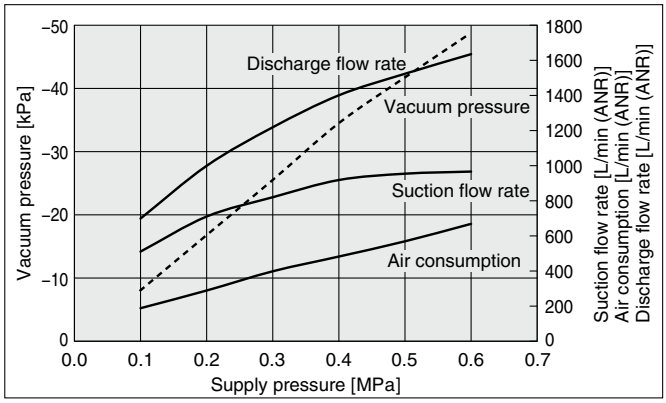
Model/Specifications

Model	ZH-X338
Body material	Aluminum alloy
Seal material	NBR
Passage diameter	ø12
C [dm³/(s·bar)] (Effective area [mm²])∗1	1.58 (7.92)
Fluid	Air
Supply pressure range	0 to 0.7 MPa
Ambient and fluid temperatures [°C]	–5 to 80 (No freezing or condensation)
Weight [g]	328

∗1 The C value and the effective area are theoretical values.

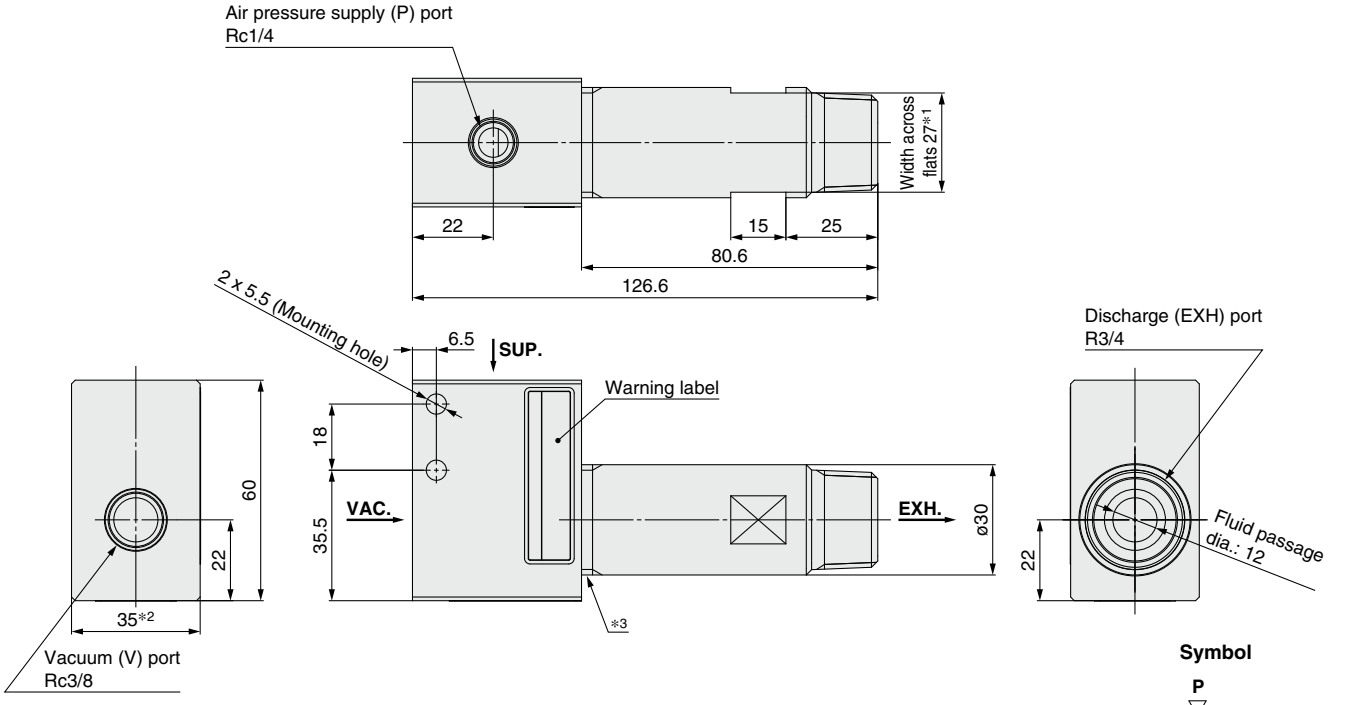
∗ Refer to page 17 for specific product precautions.

Exhaust Characteristics



This data was acquired under SMC's measurement conditions. Therefore, the characteristics are not guaranteed. In addition, the data shows representative values and the performance may change depending on the piping conditions, etc. Be sure to conduct tests on the actual equipment to test for compatibility with the intended application.

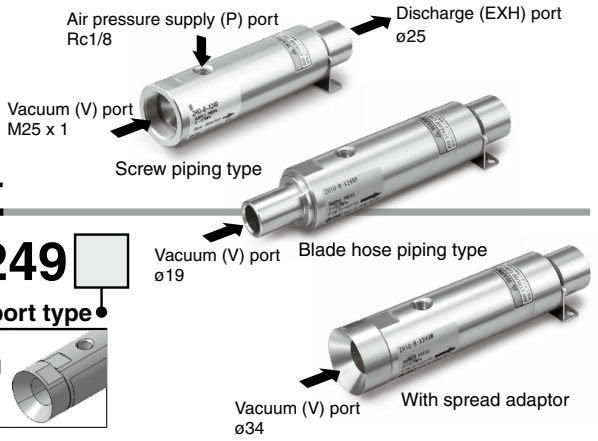
Dimensions



∗1 When connecting (or removing) piping, etc., to the exhaust (EXH) port, be sure to hold the width across flats.
∗2 When connecting (or removing) piping, etc., to the air pressure supply (P) port or the vacuum (V) port, be sure to hold the sides of the body.
∗3 If torque is applied to this thread part, the performance of the product may be affected.

Related Product

Vacuum Flow
ZH10-B-X249



How to Order

ZH10 − B − X249 □

Suction port type

Nil	Screw piping type	**P**	Blade hose piping type	**W**	With spread adaptor

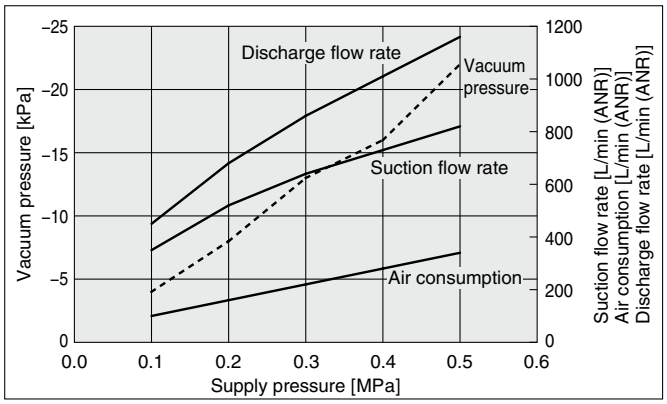
Specifications

Model	ZH10-B-X249	ZH10-B-X249P	ZH10-B-X249W
Body material	Aluminum alloy		
Seal material	NBR		
Passage diameter	ø11.5		
C [dm³/(s·bar)] (Effective area [mm²])∗1	0.94 (4.72)		
Fluid	Air		
Supply pressure range	0 to 0.7 MPa		
Ambient and fluid temperatures [°C]	−5 to 80 (No freezing or condensation)		
Weight [g]	250	267	278

∗1 The C value and the effective area are theoretical values.

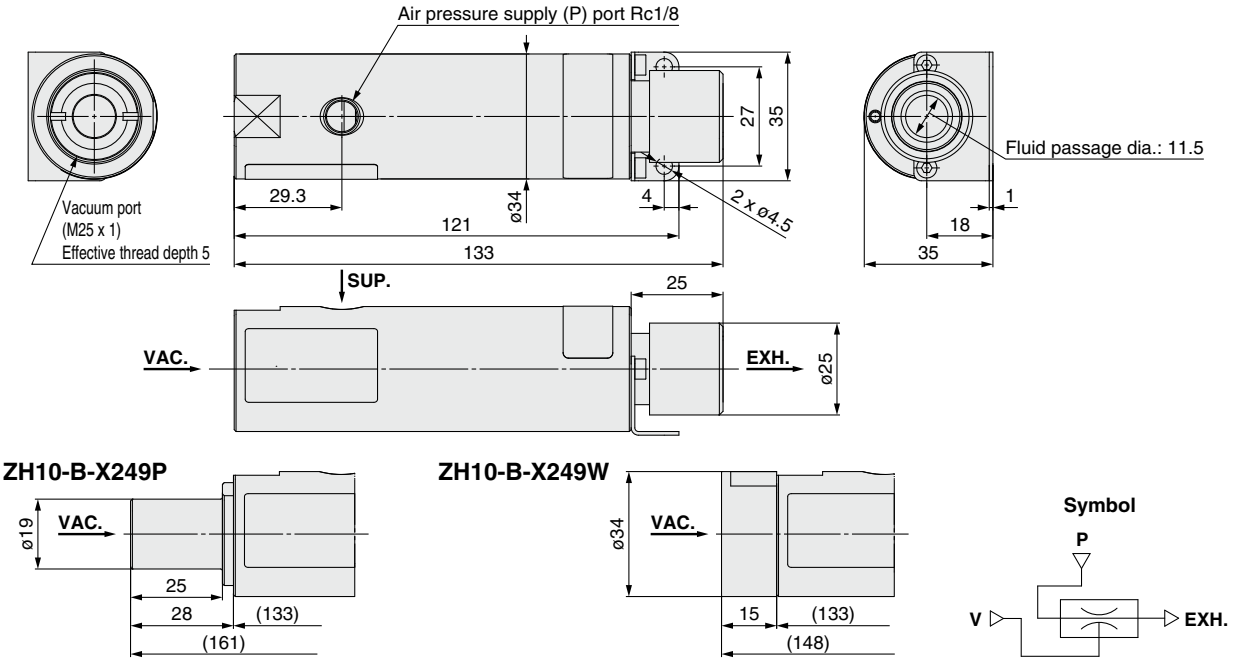
∗ Refer to page 17 for specific product precautions.

Exhaust Characteristics



This data was acquired under SMC's measurement conditions. Therefore, the characteristics are not guaranteed. In addition, the data shows representative values and the performance may change depending on the piping conditions, etc. Be sure to conduct tests on the actual equipment to test for compatibility with the intended application.

Dimensions



ZH10-B-X249P

ZH10-B-X249W

Symbol

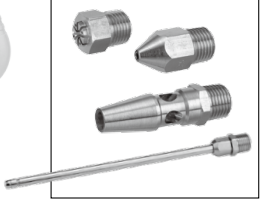
Equipment for Blowing

Blow Gun
VMG

- A 20% reduction in power consumption can be achieved with the SMC “Blow gun” + “S coupler” + “Coil tube.”
- Pressure loss: 1% or less (Nozzle diameter: ø2.5)
- Available nozzles:
  Male thread nozzle, High efficiency nozzle with male thread, Low noise nozzle with male thread, Copper extension nozzle
- With flow rate adjustment function (-X54)

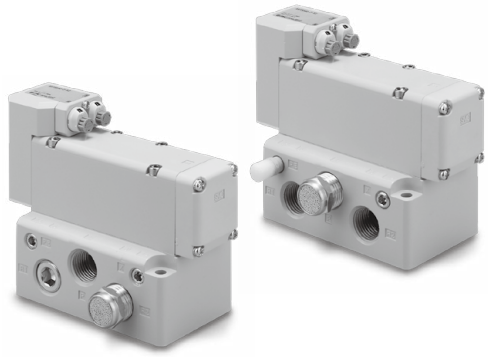
Available nozzles

KN series



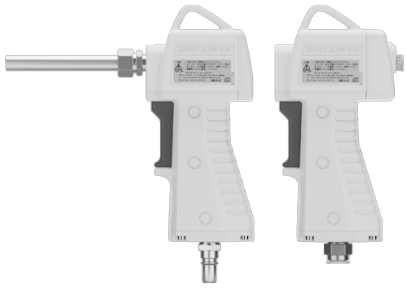
Pulse Blow Valve
AXTS040□-□□-X2

- The peak pressure of repeatedly colliding air permits efficient blowing.
- Air consumption: Reduced by 50% or more
- Pulse blow can be used by simply supplying air.



Air Saving Impact Blow Gun
IBG

- Increased impact force due to higher peak pressure
- Drastic reduction in air consumption and labor time
- Application: It is capable of eliminating, in a short period of time, the dust, etc., that is difficult to remove with the existing blow gun.



Available nozzles

Long nozzle

Long nozzle with a silencer

Impact Blow Valve
IBV1□-X5/X7(-Q)

- Increased impact force due to higher peak pressure
- Drastic reduction in air consumption and labor time
- High peak pressure: 3 times or more (Compared with the existing model)
- Air consumption: 93% reduction
- Compact design allows for installation in narrow spaces.

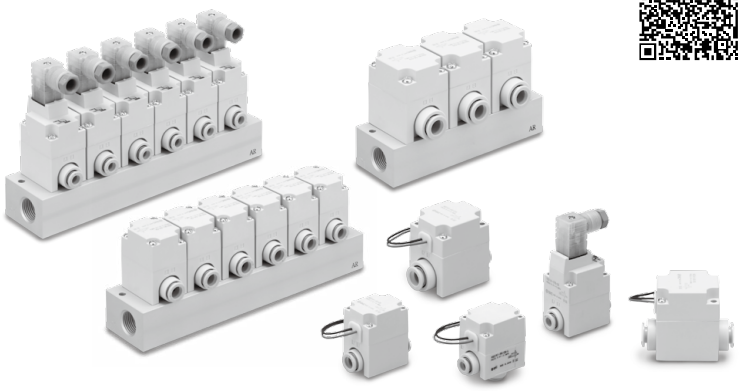
Available nozzles

Long nozzle

Long nozzle with a silencer

Pilot Operated 2-Port Solenoid Valve for Dry Air
VQ20/30

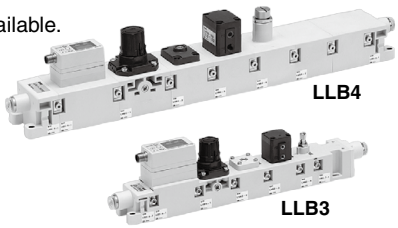
- Applications: Air-blow, Blow-off of workpieces, etc.
- High-frequency operation is possible: High-speed response 7 ms or less (VQ20), 20 ms or less (VQ30)
- Easy piping with One-touch fittings
- The dust-tight, water-jet-proof enclosure (IP65) is compatible with the DIN terminal type.
- Manifold type no.: VV2Q22, VV2Q32



For Clean Blow

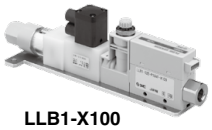
Clean Air Module
LLB

- Modularized clean equipment (Reduced piping labor, Space saving) Makes clean air easily available
- Nominal filtration rating: 0.01 μm (Filtration efficiency: 99.99%)
- Wetted parts: Grease-free, Silicone-free
- Assembled in a clean room, Shipped and packed in double packaging
- 24 combinations are available.

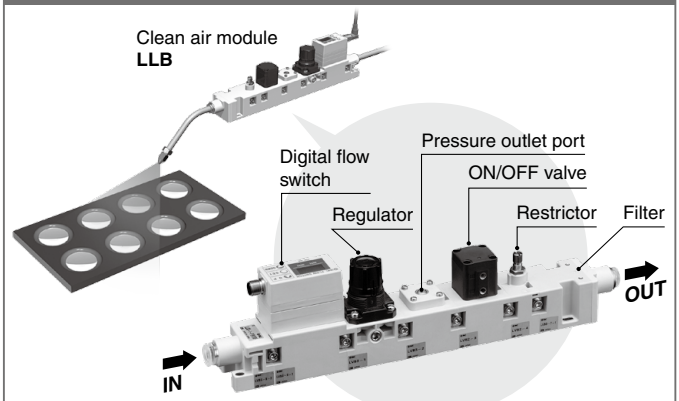


- Can perform the clean air blow of small workpieces with a flow rate of up to 100 L/min

Made to order



N_2 blow for the removal of lens dust



Bacteria Removal Filter/ Hollow Fiber Element
SFDA

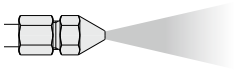
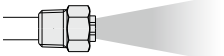
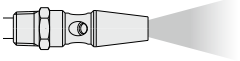
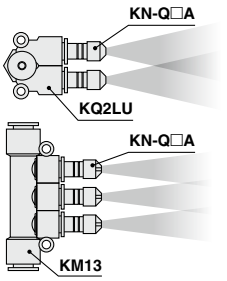
- Bacteria capture performance: LRV ≥ 9
  Uses FDA/Food Sanitation Law compliant materials*1
  *1 Parts in contact with fluid: Resin/Rubber
- Grease-free
- Contributes to the hygiene control of HACCP, etc., and FSSC22000 certification acquisition!
- Nominal filtration rating: 0.01 μm (Filtering efficiency: 99.99%)
- Initial pressure drop: 0.03 MPa (Inlet pressure 0.7 MPa, at max. flow rate)
  Flow rate: 500 L/min (ANR)

Clean One-touch Fittings for Blowing
KP

- One-touch fittings for clean room blowing systems
- Completely oil-free (Fluoro-coated rubber portions)
- Wetted parts are non-metallic.
- Parts washed and assembled in a clean room, Packed in double packaging
- Can be used in a vacuum (–100 kPa)

Technical Data
Comparison Table (Thrust, Noise, Flow consumption, Air flow)

Pressure right before the nozzle: 0.2 MPa

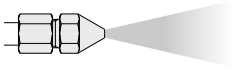
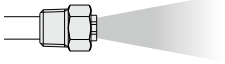
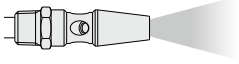
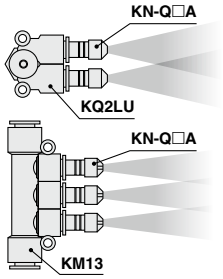
	Mono-porous nozzle (KN series)			Low noise nozzle (KNS series)			High efficiency nozzle (KNH series)			Twin/Triple nozzle (KQ2LU, KM13 + KN-Q□A series)		
												
Thrust [N]	Nozzle diameter	Noise dB(A)	Flow consumption L/min (ANR)	Nozzle diameter x Number of nozzles	Noise dB(A)	Flow consumption L/min (ANR)	Nozzle diameter	Noise dB(A)	Air flow [Flow consumption L/min (ANR)]	Nozzle diameter x Number of nozzles	Noise dB(A)	Flow consumption L/min (ANR)
0.2	ø1	65	27									
0.3							ø1	76.2	103 [25]			
0.4										ø1 x 2	66.5	46
0.5	ø1.5	74	58	ø0.75 x 4	64	52						
0.6							ø1.5	81	169 [54]			
0.7										ø1 x 3	70	76
0.8				ø1.0 x 4	70	96						
0.9										ø1 x 4	69	93
1.0	ø2	81.8	105				ø2	88.6	220 [111]	ø1.5 x 2	77	112
1.3				ø0.9 x 8	71	133						
1.5	ø2.5	87.2	172							ø1.5 x 3	75.4	163
1.6												
1.9										ø2 x 2	83.4	205
2.0				ø1.1 x 8	77	237						
2.2												
2.3	ø3	91.7	220									
2.7										ø2.5 x 2	87.1	298
3.0												
3.1	ø3.5	95.6	337									
4.0	ø4	98.7	430							ø3 x 2	90.1	443
5.6												
9.0	ø6	104	1030									
16.3	ø8	109	1605									

Pressure right before the nozzle: 0.4 MPa

⋮												
0.5	ø1	74.6	43				ø1	82	153 [41]			
0.8										ø1 x 2	75.3	78
0.9				ø0.75 x 4	72.6	87						
1.0	ø1.5	83	97									
1.1							ø1.5	90	231 [82]			
1.3										ø1 x 3	78.5	125
1.7				ø1.0 x 4	78.6	152				ø1 x 4	77.3	153
1.8												
1.9	ø2	91.4	176				ø2	91	308 [180]			
2.0										ø1.5 x 2	86	189
2.6				ø0.9 x 8	81.2	208						
2.7												
2.9	ø2.5	96.7	289							ø1.5 x 3	83.2	272
3.5												
3.6										ø2 x 2	93.5	338
4.0				ø1.1 x 8	87.6	391						
4.3												
4.4	ø3	101	363									
5.2										ø2.5 x 2	96.1	497
5.9	ø3.5	106	542									
6.4												
7.7	ø4	106	722							ø3 x 2	100	724
11.6												
17.6	ø6	110	1730									
30.9	ø8	112	3030									

Comparison Table (Thrust, Noise, Flow consumption, Air flow)

Pressure right before the nozzle: 0.6 MPa

	Mono-porous nozzle (KN series)			Low noise nozzle (KNS series)			High efficiency nozzle (KNH series)			Twin/Triple nozzle (KQ2LU, KM13 + KN-Q□A series)		
												
Thrust [N]	Nozzle diameter	Noise dB(A)	Flow consumption L/min (ANR)	Nozzle diameter x Number of nozzles	Noise dB(A)	Flow consumption L/min (ANR)	Nozzle diameter	Noise dB(A)	Air flow [Flow consumption L/min (ANR)]	Nozzle diameter x Number of nozzles	Noise dB(A)	Flow consumption L/min (ANR)
⋮												
0.7	ø1	79	60				ø1	84	202 [57]			
1.2										ø1 x 2	80	108
1.4				ø0.75 x 4	78	121						
1.5	ø1.5	86	135									
1.6							ø1.5	92	326 [125]			
1.9										ø1 x 3	83	177
2.3												
2.5				ø1.0 x 4	84	224				ø1 x 4	83	220
2.8							ø2	97	400 [253]			
2.9	ø2	95	243									
3.0										ø1.5 x 2	91	265
3.9				ø0.9 x 8	86	330						
4.1												
4.2										ø1.5 x 3	87	381
4.4	ø2.5	101	400									
5.3										ø2 x 2	98	475
5.4												
5.5												
5.9				ø1.1 x 8	93.1	554						
6.5	ø3	105	552									
7.6										ø2.5 x 2	100	694
8.7	ø3.5	109	771									
9.8												
11.1										ø3 x 2	103	1025
11.5	ø4	109	995									
17.5												
26.1	ø6	112	2430									
46.3	ø8	115	4320									

Energy Saving Program

- Allows you to perform various calculations necessary to improve the pneumatic energy saving
- Twenty different functions including air blow characteristics, pneumatics piping network, and combination of conductance
- Supports designing, current status analysis, and simulations for improvement

Recommended Circuit Configuration for Blowing

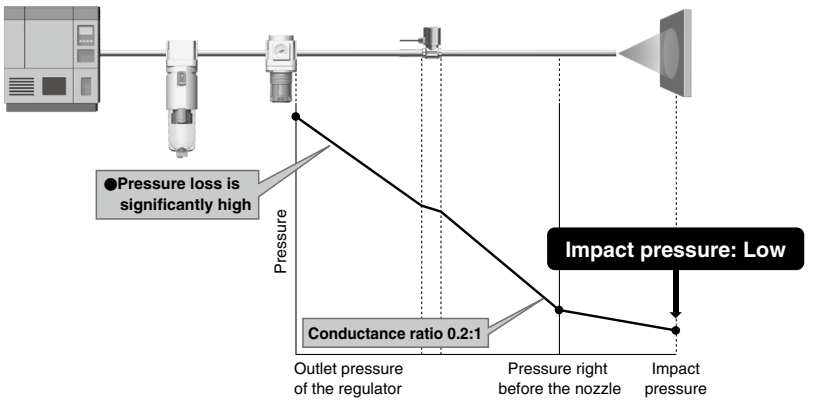
Optimization of an air blow system

For the optimization of an air blow system, it is important to make the ratio of the conductance of the components upstream and the conductance of the nozzle tip to the recommended value. By achieving this ratio, the system will allow high-pressure blow and flow rate reduction with a low pressure loss.

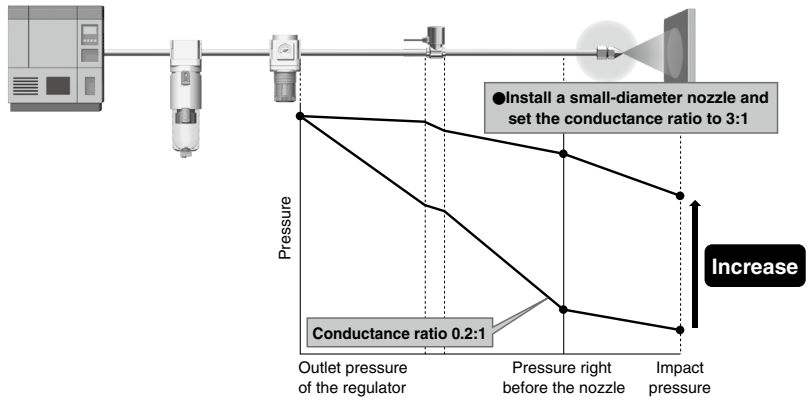
The conductance ratio recommended by SMC is 3:1 considering the energy-saving efficiency and installation cost.

∗ Conductance: Index of air flow ability

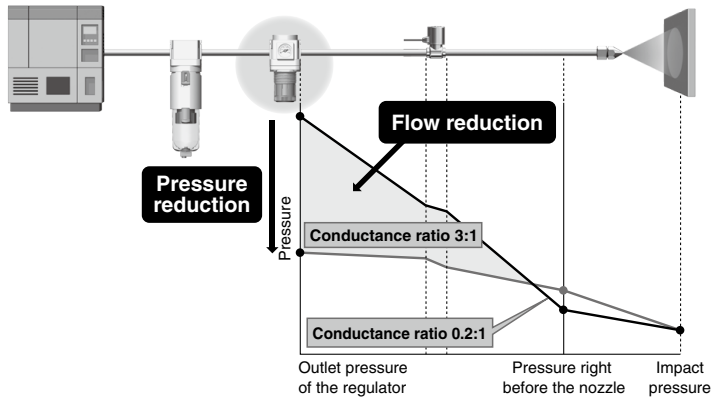
Optimization process



Using a components with a wide opening like a pipe or a multi-hole nozzle increases the pressure loss and decreases the impact pressure making it difficult to achieve an optimum conductance ratio.



The pressure loss decreases, and the impact pressure significantly increases when the tip is changed to a nozzle because it improves the conductance ratio.

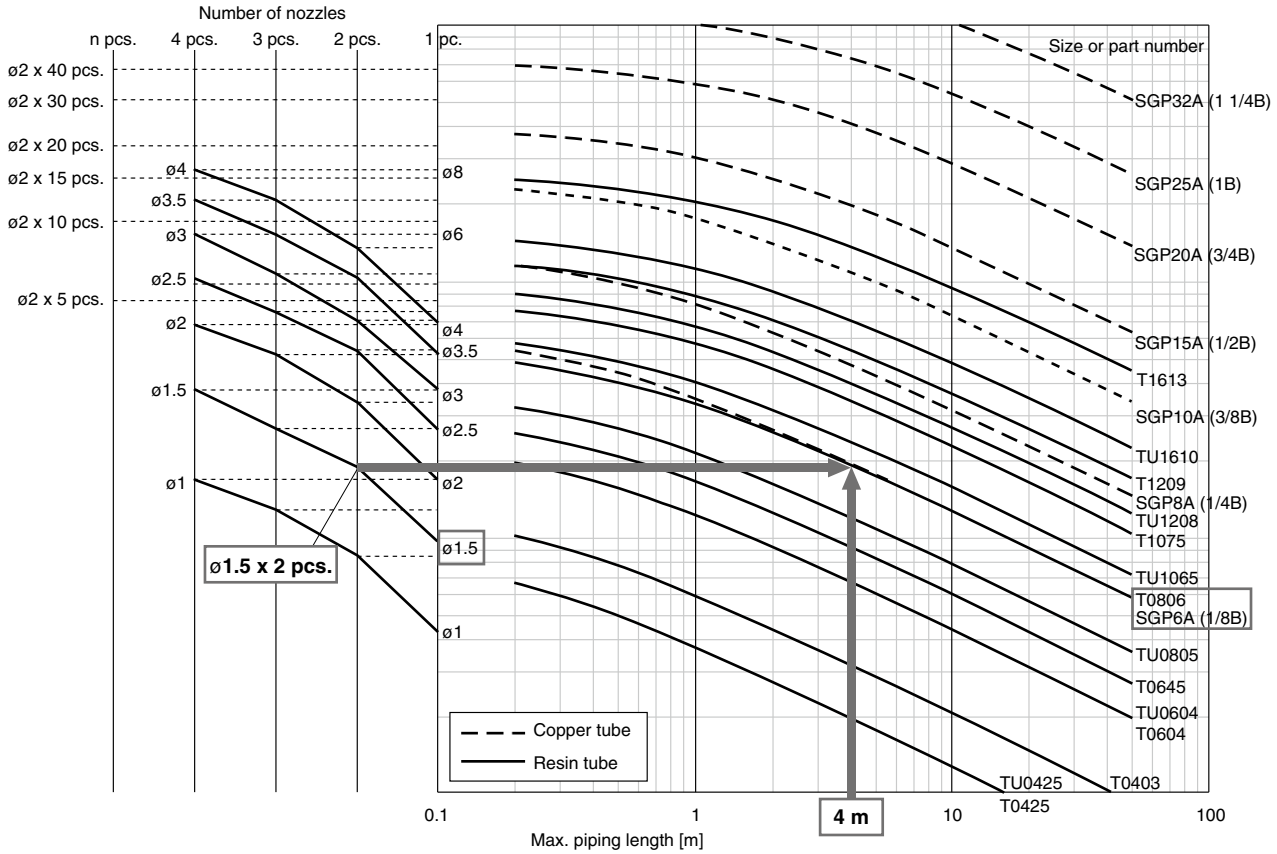


Lower supply pressure and significant reduction of the flow rate can be achieved by reducing the supply pressure to a level that provides the required impact pressure.

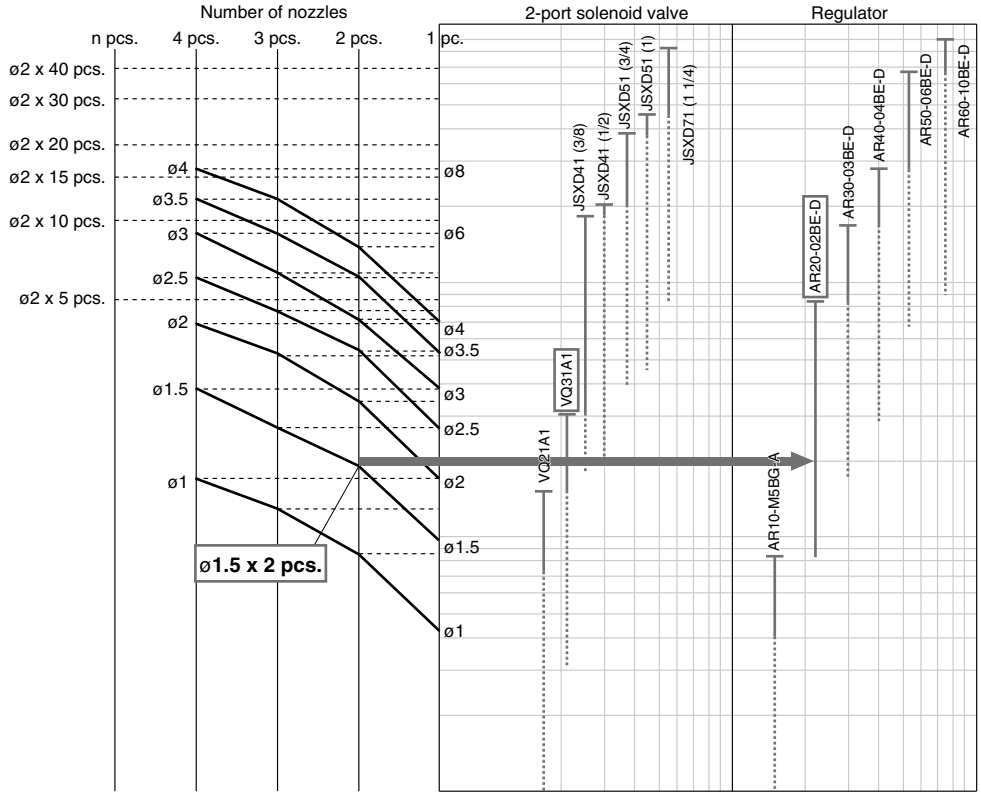
Optimization process complete

Recommended Circuit Configuration for Blowing

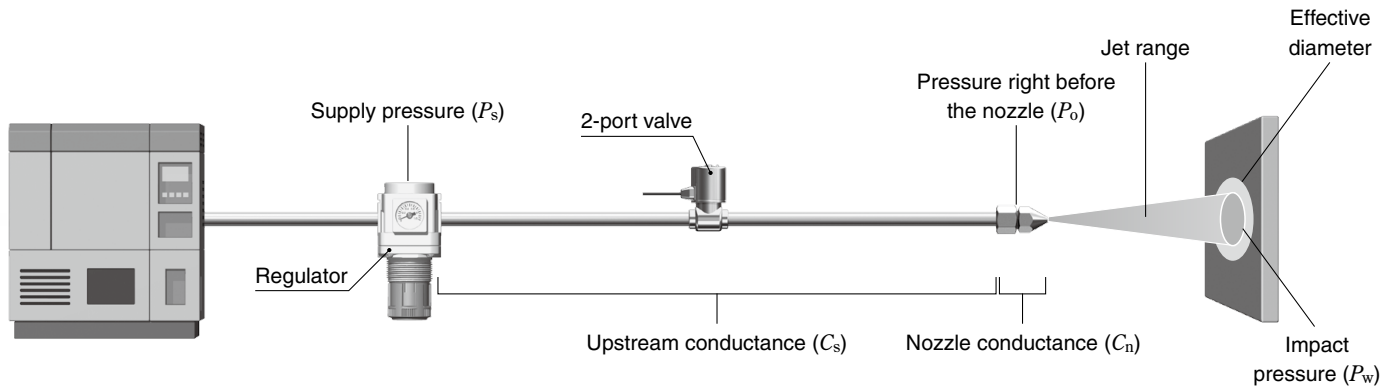
Piping lengths for conductance optimization



Optimization for 2-port valve with regulator model

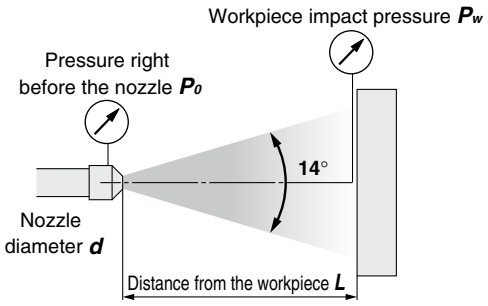


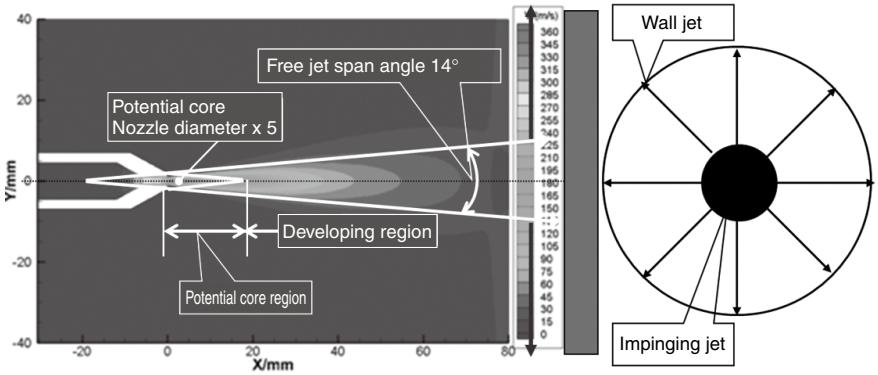
Glossary of Terms



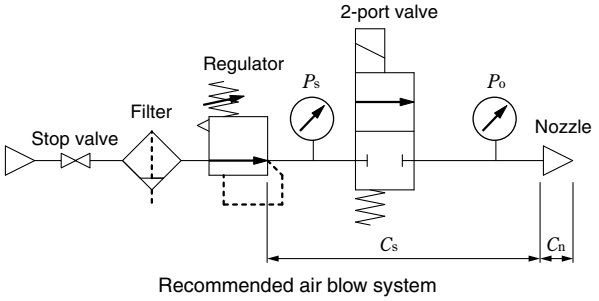
Term	Description
Pressure right before the nozzle (P_0)	The pressure right before the air is blown out from the nozzle. Pressure in the nozzle
Workpiece impact pressure (Pw)	Pressure when the air blown out of the nozzle collides with the workpiece
Conductance ratio	The ratio of conductance of the nozzle (Cn) and the upstream components (Cs) Setting the upstream side to 2 to 3 times the nozzle is recommended.
Pressure loss	Pressure loss of the supply pressure (difference between Ps and P_0) caused by the piping route. Lower pressure loss results in the better efficiency.
Jet range	Effective energy range inside the air that widens conically at the angle of 14 degrees from the nozzle opening
Effective diameter	The range in which the blowing effect is achieved in an area wider than the jet area
Potential core region	The range is equal to the nozzle diameter x 5. In this range, it interferes with the expansion thrust of the compressed air and the energy of the air blow cannot be used effectively.
Developing region	The range after the potential core region where the air blow thrust can be used effectively

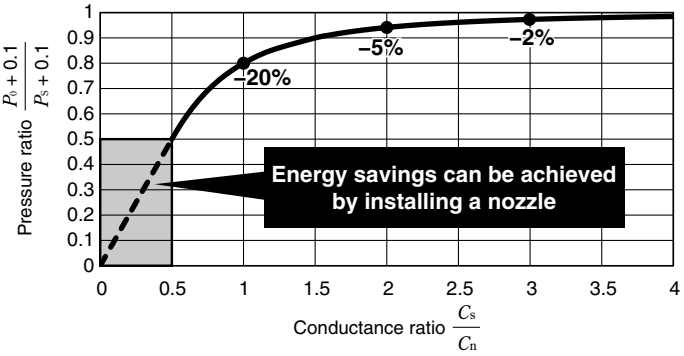
∗ Conductance: Index of air flow ability





Air Blow System and Conductance





P_s : Supply pressure
P_o : Pressure right before the nozzle
} Pressure ratio $\frac{P_o + 0.1}{P_s + 0.1}$

C_s : Upstream conductance
C_n : Nozzle conductance
} Conductance ratio $\frac{C_s}{C_n}$

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

⚠ Safety Instructions	Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

SMC Corporation

https://www.smcworld.com