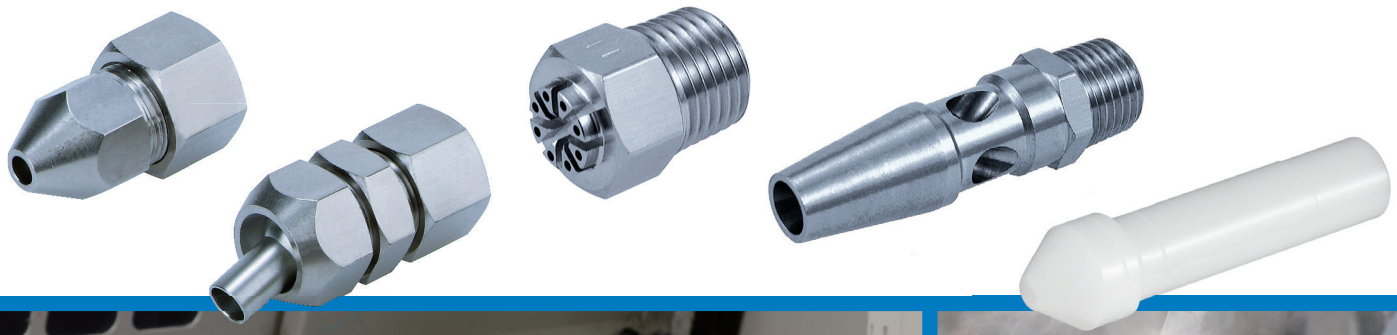
Blow Nozzles



CONTENTS

SMC
CAT.EUS50-43A-UK

Nozzle Selection Chart

What is the purpose of blowing?

Removal of foreign matter

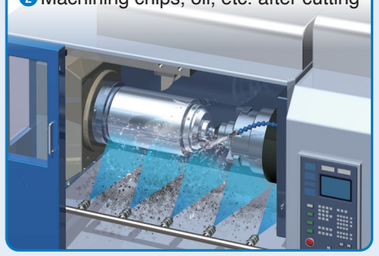
Yes

No

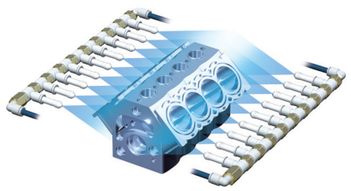
Foreign matter type

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

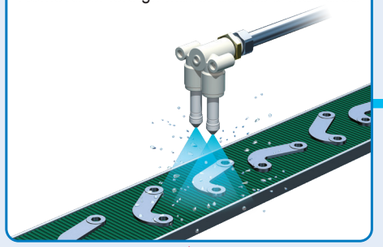
❷ Machining chips, oil, etc. after cutting



❸ Water droplets, etc. after cleaning



Removal of foreign matter across a wide area



Fine adjustment of blowing direction and nozzle position

No

Yes

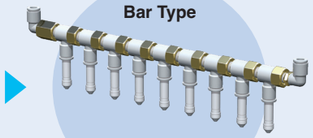
p. 4
Twin Nozzle

KQ2LU, KQ2U + KN-Q□A

p. 10
Pivoting Nozzle

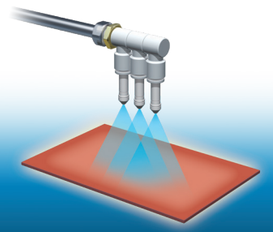
KNK Series

p. 4
Bar Type

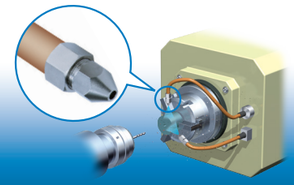


KQ2VF + KN-Q□A

Cooling of workpieces



Cooling during machining



No

Yes

Yes

p. 4
Twin Nozzle

KQ2LU, KQ2U + KN-Q□A

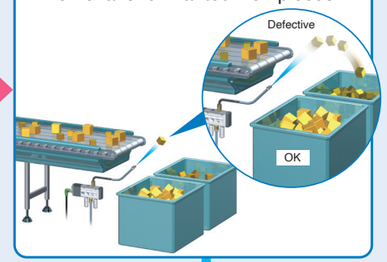
Triple Nozzle

KM13, KQ2VT + KN-Q□A

p. 8
Mono-porous Nozzle

KN Series

Removal of unwanted workpieces



p. 9
Nozzle for One-touch fitting

KN-Q□A

Others

Reduce noise when blowing

p. 10
Low Noise Nozzle

KNS Series

Use safety related products (Compliant with OSHA Standards)

* Operate at 0.5 MPa or less.

p. 10
High Efficiency Nozzle

KNH Series

⚠ 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.

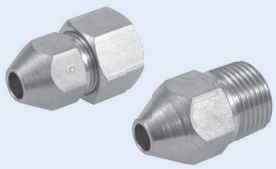
⚠ Caution The applications described here are for reference only. For actual usage in various other applications, please conduct thorough evaluation and validation testing in order to determine the feasibility under your actual usage conditions.

Nozzle Variations

High-pressure blow with minimal pressure loss

p. 8

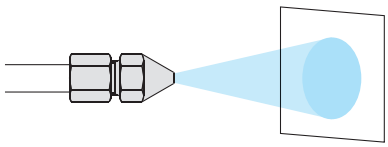
Mono-porous Nozzle
KN Series



- 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	Ø 1, Ø 1.5, Ø 2, Ø 2.5, Ø 3, Ø 3.5, Ø 4, Ø 6
	Ø 1, Ø 1.5, Ø 2, Ø 2.5, Ø 4, Ø 6, Ø 8

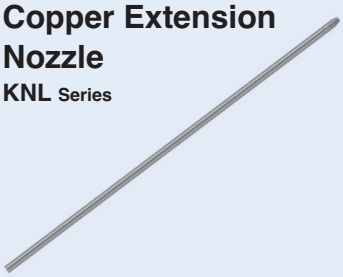
Blow example



Nozzle length: 300 mm, 600 mm

p. 9

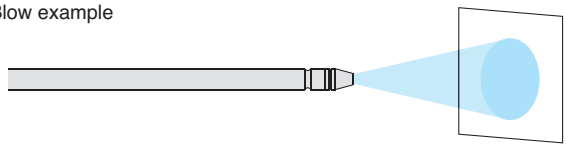
Copper Extension Nozzle
KNL Series



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

Nozzle diameter	Ø 1.5, Ø 2, Ø 2.5, Ø 3

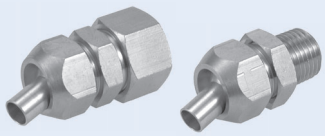
Blow example



Fine adjustment of blow

p. 10

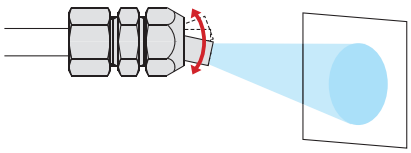
Pivoting Nozzle
KNK Series



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

Nozzle diameter	Ø 4, Ø 6

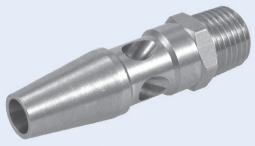
Blow example



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

p. 10

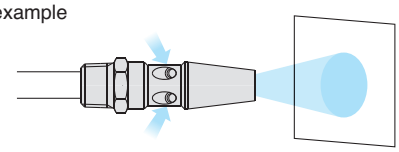
High Efficiency Nozzle
KNH Series

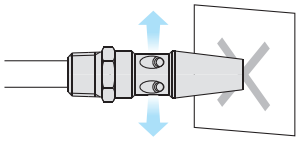


- Entrains the surrounding air increasing the blow flow rate through the nozzle
- Increases the blow flow to about double the supply air quantity
- This nozzle prevents any pressure buildup when the outlet is blocked for safety. (Compliant with OSHA Standards: Operate at 0.5 MPa or less.)

Nozzle diameter	Ø 1, Ø 1.5, Ø 2

Blow example



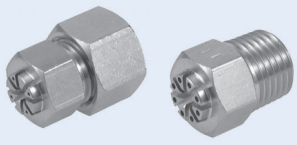


Compliant with OSHA Standards:
Air is discharged from the ports on the side of the product to prevent pressure building up when the outlet of the nozzle tip is blocked.

Noise reduction

p. 10

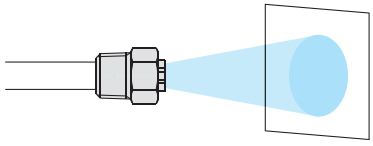
Low Noise Nozzle
KNS Series



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

Nozzle diameter	Ø 0.75 x 4, Ø 1 x 4, Ø 0.9 x 8
	Ø 0.75 x 4, Ø 1 x 4, Ø 0.9 x 8, Ø 1.1 x 8

Blow example



Nozzle Variations

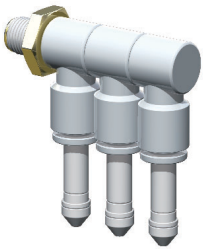
Adjustable layout to match application

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

- Nozzle that fit One-touch fittings can be used to setup different blow system layouts.
- Uses highly efficient single hole nozzle to ensure 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.

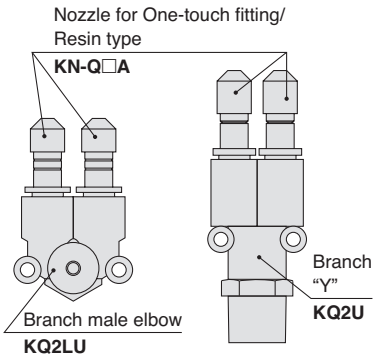
Nozzle diameter	Ø 1, Ø 1.5, Ø 2, Ø 2.5, Ø 3
Applicable One-touch fitting size	Ø 6, Ø 8, Ø 10, Ø 12

Mounting examples ∗ The nozzle size can be changed.



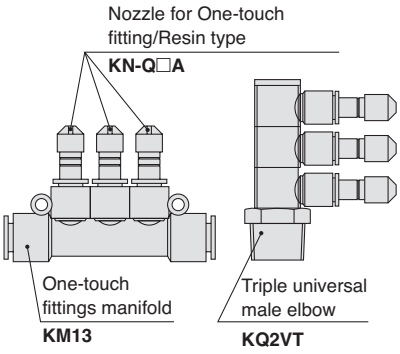
"Twin Nozzle"

Jet shape



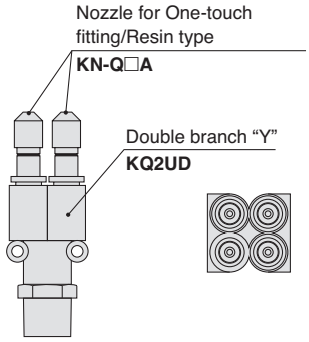
"Triple Nozzle"

Jet shape



"High-thrust Type"

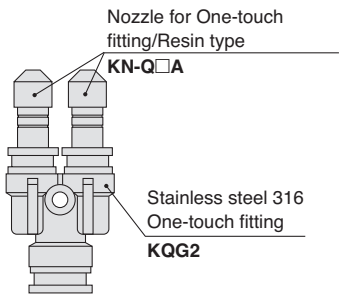
Jet shape



"Water-resistant Type"

Jet shape

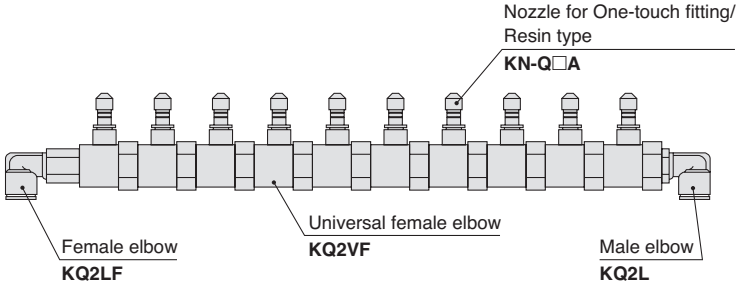
Fitting: Stainless steel 316, Nozzle: POM



∗ Stainless steel products are available for heat resistance and anti-corrosion properties. Please contact SMC for further details.

"Bar Type Nozzle"

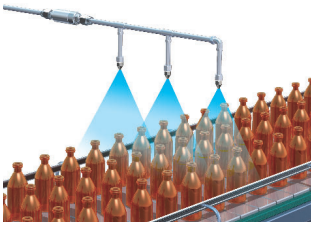
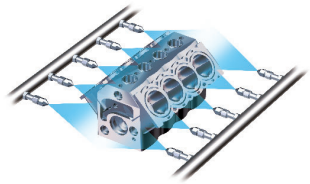
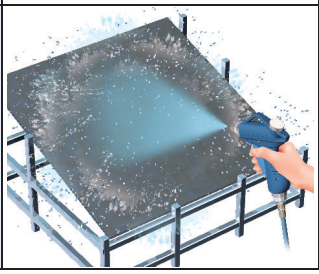
Jet shape

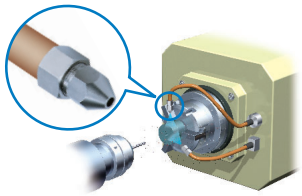


⚠Caution The use of fittings not manufactured by SMC is extremely dangerous since the nozzle for One-touch fitting may be released with no warning. Make sure to purchase the One-touch fitting KQ2 series by SMC and use it in combination with the nozzle. For details on fittings, refer to the **Web Catalogue**.

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. 9 
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. 8 to 10 
Water droplet removal		**KNK** p. 10 

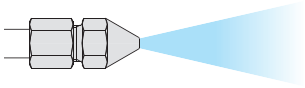
Work process	Application example	Main series
Cooling during machining		**KN** p. 8 
Blowing for deburring after machining		**KN** p. 8 

⚠ 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. 8, 9

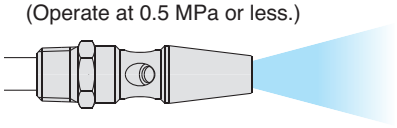
- Standard blow nozzle
- Highly effective with low pressure loss
- A wide variety of nozzle diameters are available for selection.
- Can be used with One-touch fittings, copper piping, and other applications in addition to mounting on male and female threads



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

High Efficiency Nozzle KNH Series p. 9

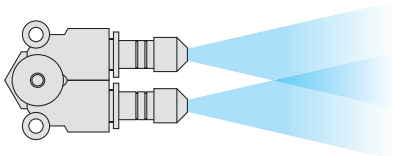
- Entrains the surrounding air and increases the blow flow rate
- Blow thrust improved by 10 %
- OSHA Standards compliant product (Operate at 0.5 MPa or less.)



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)



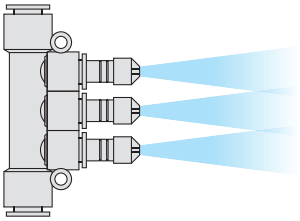
Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 100 mm		Blowing off of water droplets Removal of defective workpieces Drying Removal of foreign matter Blowing water droplets off engine blocks Workpiece alignment

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!

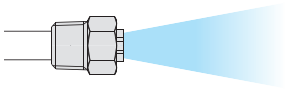


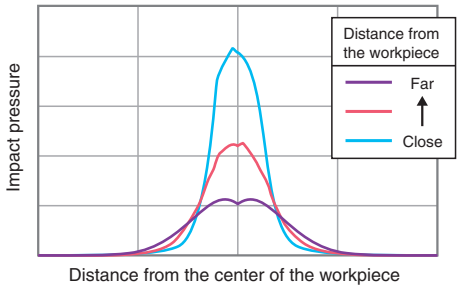
Jet shape	Pressure distribution diagram (Image)	Main applications
Distance from the workpiece: 100 mm		Blowing off the water of a wide area Drying Removal of foreign matter Cooling

Low Noise Nozzle with Self-align Fitting KNS Series

p. 10

- 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.		Ø 4, Ø 6, Ø 8, Ø 10, Ø 12, Ø 16, Ø 20
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

KNL

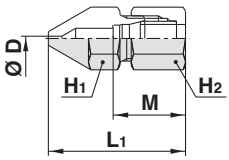
Pipe	C1220T-0
Nozzle	C3604

Nozzle with self-align fitting/KN

[mm]

Air Coolant

Model	Nozzle dia. Ø D	Applicable tubing O.D.	Width across flats H_1	Width across flats H_2	L_1	M	Weight [g]
KN-04-100	Ø 1	Ø 4	10	10	27	15	13
KN-04-150	Ø 1.5	Ø 4	10	10	27.7	15	14
KN-06-100	Ø 1	Ø 6	12	12	30.1	16	19
KN-06-150	Ø 1.5	Ø 6	12	12	30.8	16	20
KN-06-200	Ø 2	Ø 6	12	12	31.5	16	22
KN-08-150	Ø 1.5	Ø 8	14	14	33.8	16	28
KN-08-200	Ø 2	Ø 8	14	14	34.6	16	30
KN-10-250	Ø 2.5	Ø 10	14	17	35.6	17	35
KN-10-300	Ø 3	Ø 10	14	17	36.3	17	36
KN-10-350	Ø 3.5	Ø 10	14	17	37.1	17	37
KN-10-400	Ø 4	Ø 10	14	17	29.5	17	30
KN-10-600	Ø 6	Ø 10	14	17	27.7	17	28
KN-12-350	Ø 3.5	Ø 12	17	19	40.4	17	54
KN-12-400	Ø 4	Ø 12	17	19	41.3	17	55
KN-12-600	Ø 6	Ø 12	17	19	31.2	17	40
KN-16-400	Ø 4	Ø 16	22	24	40.1	17	77
KN-16-600	Ø 6	Ø 16	22	24	38.4	17	79
KN-20-400	Ø 4	Ø 20	26	27	45.6	17	117
KN-20-600	Ø 6	Ø 20	26	27	43.9	17	112



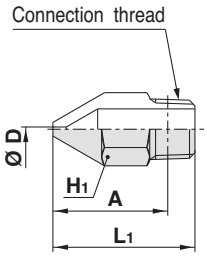
Nozzle with male thread/KN

[mm]

Air Coolant

Model	Nozzle dia. Ø D	Connection thread	Width across flats H_1	L_1	A*1	Weight [g]
KN-R01-100	Ø 1	R1/8	10	21.4	17.4	8
KN-R01-150	Ø 1.5	R1/8	10	21	17	8
KN-R02-100	Ø 1	R1/4	14	31.4	25.4	19
KN-R02-150	Ø 1.5	R1/4	14	31	25	20
KN-R02-200	Ø 2	R1/4	14	30.5	24.5	21
KN-R02-250	Ø 2.5	R1/4	14	30.1	24.1	21
KN-R02-600	Ø 6	R1/4	14	27.1	21.1	22
KN-R03-400	Ø 4	R3/8	17	31.8	25.4	36
KN-R03-600	Ø 6	R3/8	17	30.1	23.7	37
KN-R04-400	Ø 4	R1/2	22	41.8	33.6	75
KN-R04-600	Ø 6	R1/2	22	40.1	31.8	76
KN-R06-600	Ø 6	R3/4	27	49.6	40.1	149
KN-R06-800	Ø 8	R3/4	27	47.8	38	152
KN-R10-800	Ø 8	R1	36	62.8	52.4	328

*1 Reference dimensions after R thread installation



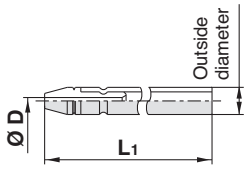
Nozzles for Blowing *KN Series*

Copper extension nozzle/KNL

[mm]

Air Coolant

Model	Nozzle dia. Ø D	Outside diameter	L_1	Weight [g]
KNL3-06-150	Ø 1.5	Ø 6	300	43
KNL3-06-200	Ø 2	Ø 6	300	43
KNL3-08-200	Ø 2	Ø 8	300	61
KNL3-08-250	Ø 2.5	Ø 8	300	61
KNL3-10-250	Ø 2.5	Ø 10	300	94
KNL3-10-300	Ø 3	Ø 10	300	94
KNL6-06-150	Ø 1.5	Ø 6	600	84
KNL6-06-200	Ø 2	Ø 6	600	84
KNL6-08-200	Ø 2	Ø 8	600	117
KNL6-08-250	Ø 2.5	Ø 8	600	117
KNL6-10-250	Ø 2.5	Ø 10	600	183
KNL6-10-300	Ø 3	Ø 10	600	183

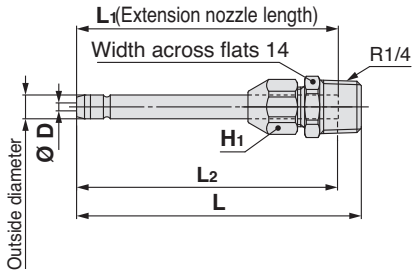


Copper extension nozzle set/VMG

[mm]

Air Coolant

Model	Nozzle dia. D	Outside diameter	L_1	L_2*1	L*1	Width across flats H_1
VMG1-06-150-100	Ø 1.5	Ø 6	100	100	106	12
VMG1-06-200-100	Ø 2					
VMG1-06-150-150	Ø 1.5		150	150	156	
VMG1-06-200-150	Ø 2					
VMG1-06-150-300	Ø 1.5		300	300	306	
VMG1-06-200-300	Ø 2					
VMG1-06-150-600	Ø 1.5		600	600	606	
VMG1-06-200-600	Ø 2					
VMG1-08-250-100	Ø 2.5	Ø 8	100	100	106	14
VMG1-08-300-100	Ø 3					
VMG1-08-350-100	Ø 3.5					
VMG1-08-250-150	Ø 2.5		150	150	156	
VMG1-08-300-150	Ø 3					
VMG1-08-350-150	Ø 3.5					
VMG1-08-250-300	Ø 2.5		300	300	306	
VMG1-08-300-300	Ø 3					
VMG1-08-350-300	Ø 3.5					
VMG1-08-250-600	Ø 2.5		600	600	606	
VMG1-08-300-600	Ø 3					
VMG1-08-350-600	Ø 3.5					



*1 Reference dimensions after installation

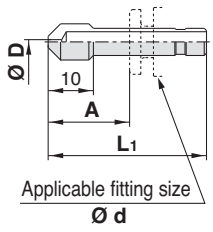
* Copper extension nozzle and self-align fitting are included in the same package but do not come assembled. Refer to "How to attach extension nozzle" in the VMG series operation manual for assembly procedures.

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

[mm]

Air

Model	Nozzle dia. Ø D	Applicable fitting size Ø d	L_1	A*1	Weight [g]
KN-Q06A-100	Ø 1	Ø 6	35	21.8	1
KN-Q06A-150	Ø 1.5	Ø 6	35	21.8	1
KN-Q06A-200	Ø 2	Ø 6	35	21.8	1
KN-Q08A-150	Ø 1.5	Ø 8	39	24.8	2
KN-Q08A-200	Ø 2	Ø 8	39	24.8	2
KN-Q10A-200	Ø 2	Ø 10	43	27.4	3
KN-Q10A-250	Ø 2.5	Ø 10	43	27.4	3
KN-Q12A-250	Ø 2.5	Ø 12	45.5	28.5	4
KN-Q12A-300	Ø 3	Ø 12	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)

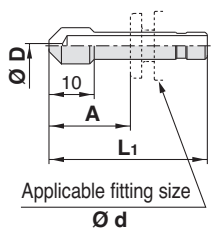
When connecting the nozzle to the One-touch fitting, insert it securely until it cannot move any further. After setting the nozzle deep into the fitting, be sure to pull on the nozzle to confirm that it is firm and does not budge. If the nozzle is not secured all the way at the back of the fitting or 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	L_1	A	Weight [g]
KN-Q06-100	Ø 1	Ø 6	35	18	5
KN-Q06-150	Ø 1.5	Ø 6	35	18	5
KN-Q06-200	Ø 2	Ø 6	35	18	5
KN-Q08-150	Ø 1.5	Ø 8	39	20.5	9
KN-Q08-200	Ø 2	Ø 8	39	20.5	9
KN-Q10-200	Ø 2	Ø 10	43	22	16
KN-Q10-250	Ø 2.5	Ø 10	43	22	16
KN-Q12-250	Ø 2.5	Ø 12	45.5	24	23
KN-Q12-300	Ø 3	Ø 12	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.

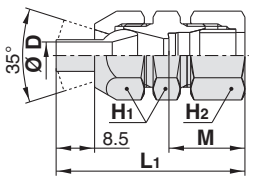
SMC

Pivoting nozzle with self-align fitting/KNK

[mm]

Air Coolant

Model	Nozzle dia. Ø D	Applicable tubing O.D.	Width across flats H1	Width across flats H2	L1	M	Weight [g]
KNK-10-400	Ø 4	Ø 10	17	17	41.7	17	44
KNK-10-600	Ø 6	Ø 10	17	17	41.7	17	44
KNK-12-400	Ø 4	Ø 12	17	19	41.2	17	44
KNK-12-600	Ø 6	Ø 12	17	19	41.2	17	44
KNK-16-400	Ø 4	Ø 16	17	24	41.8	17	64
KNK-16-600	Ø 6	Ø 16	17	24	41.8	17	64
KNK-20-400	Ø 4	Ø 20	17	27	43.8	17	77
KNK-20-600	Ø 6	Ø 20	17	27	43.8	17	77



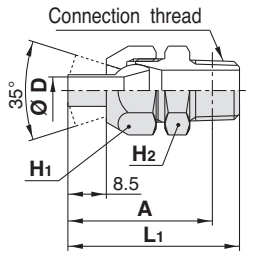
Pivoting nozzle with male thread/KNK

[mm]

Air Coolant

Model	Nozzle dia. Ø D	Connection thread	Width across flats H1	Width across flats H2	L1	A*1	Weight [g]
KNK-R02-400	Ø 4	R1/4	17	17	38	31.9	32
KNK-R02-600	Ø 6	R1/4	17	17	38	31.9	32
KNK-R03-400	Ø 4	R3/8	17	17	39	32.4	40
KNK-R03-600	Ø 6	R3/8	17	17	39	32.4	40
KNK-R04-400	Ø 4	R1/2	17	22	42.2	34.1	54
KNK-R04-600	Ø 6	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.)

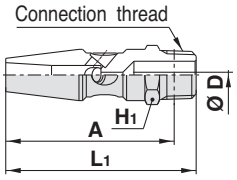
[mm]

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

Air

Model	Nozzle dia. Ø D	Connection thread	Width across flats H1	L1	A*1	Weight [g]
KNH-R02-100	Ø 1	R1/4	14	52	46	38
KNH-R02-150	Ø 1.5	R1/4	14	52	46	38
KNH-R02-200	Ø 2	R1/4	14	52	46	38

*1 Reference dimensions after R thread installation

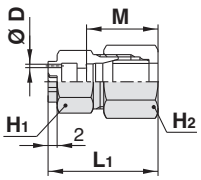


Low noise nozzle with self-align fitting/KNS

[mm]

Air

Model	Nozzle dia. Ø D	Applicable tubing O.D.	Width across flats H1	Width across flats H2	L1	M	Weight [g]
KNS-08-075-4	Ø 0.75 x 4	Ø 8	12	14	24.3	16	17
KNS-08-100-4	Ø 1 x 4	Ø 8	12	14	24.3	16	17
KNS-10-075-4	Ø 0.75 x 4	Ø 10	14	17	24	17	24
KNS-10-090-8	Ø 0.9 x 8	Ø 10	14	17	24	17	24
KNS-10-100-4	Ø 1 x 4	Ø 10	14	17	24	17	24



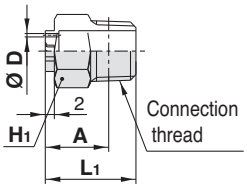
Low noise nozzle with male thread/KNS

[mm]

Air

Model	Nozzle dia. Ø D	Connection thread	Width across flats H1	L1	A*1	Weight [g]
KNS-R01-075-4	Ø 0.75 x 4	R1/8	12	18	14	9
KNS-R01-100-4	Ø 1 x 4	R1/8	12	18	14	9
KNS-R01-090-8	Ø 0.9 x 8	R1/8	12	18	14	9
KNS-R02-075-4	Ø 0.75 x 4	R1/4	14	20	14	13
KNS-R02-090-8	Ø 0.9 x 8	R1/4	14	20	14	13
KNS-R02-100-4	Ø 1 x 4	R1/4	14	20	14	13
KNS-R02-110-8	Ø 1.1 x 8	R1/4	14	20	14	13

*1 Reference dimensions after R thread installation



Sensing Heads

Specifications

Sensing head (KNP)

Applicable tubing O.D.	Ø 4
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 (Ø 4, 1 m)	Polyurethane

KNP-2

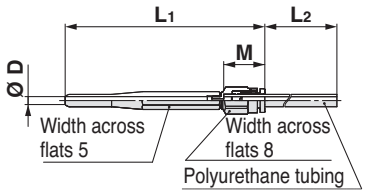
Pipe	Stainless steel 304
One-touch fitting	POM, NBR, Stainless steel 304
Polyurethane tube (Ø 4, 1 m)	Polyurethane

Standard sensing head/KNP

[mm]

Model	Nozzle dia. Ø **D**	Applicable tubing O.D.	Width across flats		**M**	L_1	L_2	Weight [g]
			H_1	H_2				
KNP-1	Ø 2.5	Ø 4	5	8	13.3	64.6	986.7	7

∗ A 1 m polyurethane tube is included.

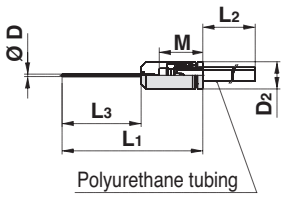


Needle sensing head/KNP

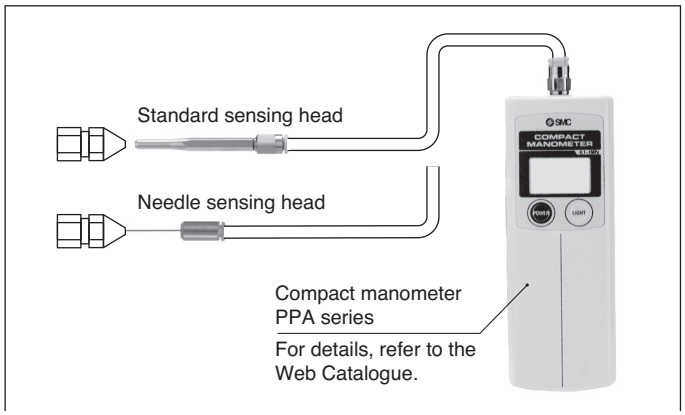
[mm]

Model	Nozzle dia. Ø **D**	Applicable tubing O.D.	D_2	**M**	L_1	L_2	L_3	Weight [g]
KNP-2	Ø 0.7	Ø 4	Ø 8	12.7	41	987.3	23	4

∗ A 1 m polyurethane tube is included.



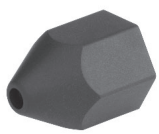
Use to measure workpiece impact pressure



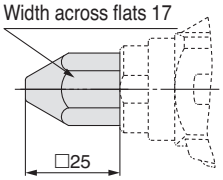
Nozzle Covers

Cover for male thread nozzle

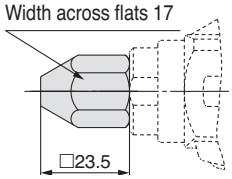
[mm]



Nozzle cover model	Material	Applicable blow gun model	
		Model	Nozzle type
P5670129-01	HNBR	VMG1□□-□-01 to 04	Male thread nozzle Ø 1 to Ø 2.5
P5670129-01F	Fluororubber		
P5670129-02	HNBR	VMG1□□-□-05 to 07	Male thread nozzle Ø 3 to Ø 4
P5670129-02F	Fluororubber		



VMG1□-□□-1 to 04

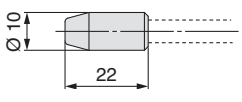


VMG1□-□□-05 to 07

Cover for copper extension nozzle

[mm]

Nozzle cover model	Material	Applicable blow gun model	
		Model	Nozzle type
P5670129-11	HNBR	VMG1□□-□-31 to 38	Ø 6 copper extension nozzle
P5670129-11F	Fluororubber		



VMG1□-□□-31 to 38

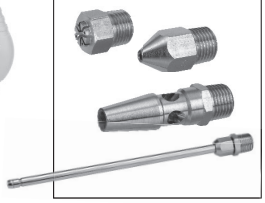
Equipment for Blowing

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: Ø 2.5)
- 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)

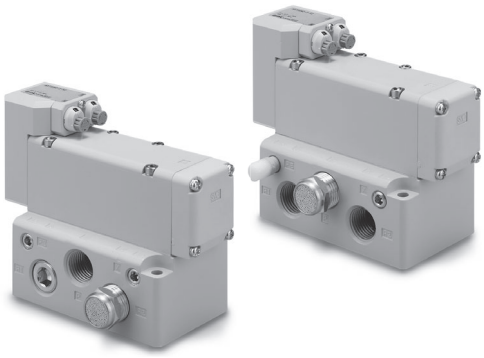
Available nozzles

KN series



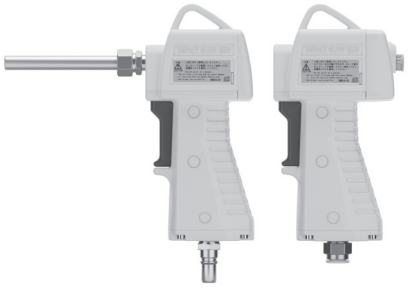
Pulse Blow Valve
AXTS040□-□□-X2

- 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.



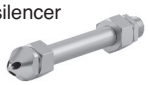
Air Saving Impact Blow Gun
IBG

- 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 with a silencer

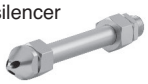


Impact Blow Valve
IBV1□-X5/X7(-Q)

- 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.

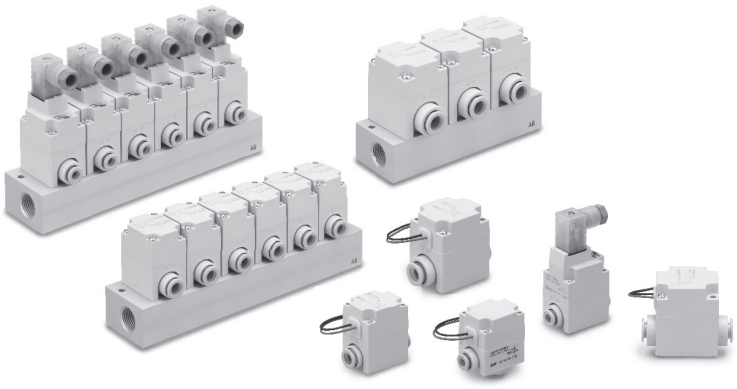
Available nozzles

Long nozzle 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.

LLB4

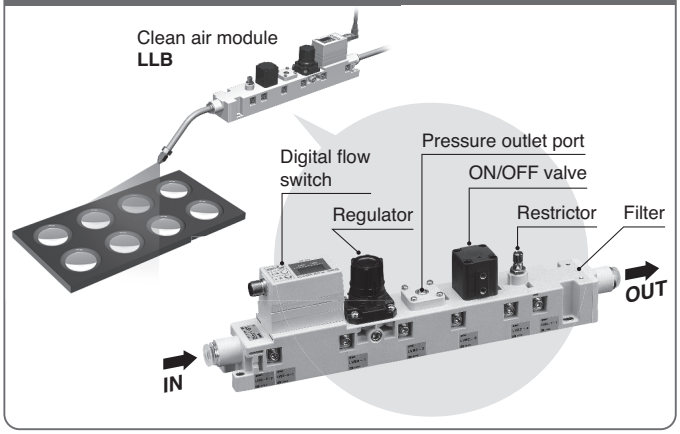
LLB3

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

Made to order

LLB1-X100

N_2 blow for the removal of lens dust



Bacteria Removal Filter/ Hollow Fiber Element
SFDA

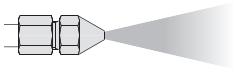
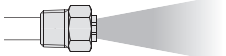
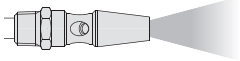
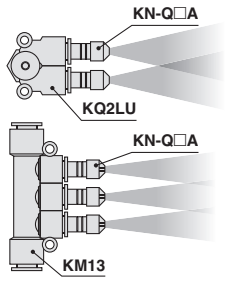
- Bacteria capture performance: LRV ≥ 9
  Uses FDA/Food Sanitation Law compliant materials*1
  *1 Parts in contact with fluid: Resin/Rubber
- Grease-free
- Contributes to the hygiene control of HACCP, etc., and FSSC22000 certification acquisition!
- Nominal filtration rating: 0.01 μm (Filtering efficiency: 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

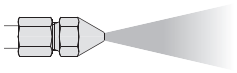
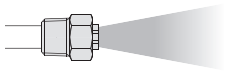
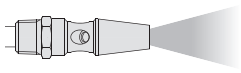
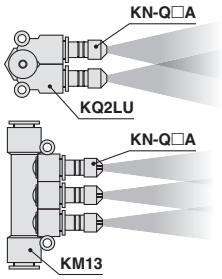
	Mono-porous nozzle (KN series)			Low noise nozzle (KNS series)			High efficiency nozzle (KNH series)			Twin/Triple nozzle (KQ2LU, KM13 + KN-Q□A series)		
												
Thrust [N]	Nozzle diameter	Noise dB(A)	Flow consumption l/min (ANR)	Nozzle diameter x Number of nozzles	Noise dB(A)	Flow consumption l/min (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	Ø 1	65	27									
0.3							Ø 1	76.2	103 [25]			
0.4										Ø 1 x 2	66.5	46
0.5	Ø 1.5	74	58	Ø 0.75 x 4	64	52						
0.6							Ø 1.5	81	169 [54]			
0.7										Ø 1 x 3	70	76
0.8				Ø 1.0 x 4	70	96						
0.9										Ø 1 x 4	69	93
1.0	Ø 2	81.8	105				Ø 2	88.6	220 [111]	Ø 1.5 x 2	77	112
1.3				Ø 0.9 x 8	71	133						
1.5	Ø 2.5	87.2	172							Ø 1.5 x 3	75.4	163
1.6												
1.9										Ø 2 x 2	83.4	205
2.0				Ø 1.1 x 8	77	237						
2.2												
2.3	Ø 3	91.7	220									
2.7										Ø 2.5 x 2	87.1	298
3.0												
3.1	Ø 3.5	95.6	337									
4.0	Ø 4	98.7	430							Ø 3 x 2	90.1	443
5.6												
9.0	Ø 6	104	1030									
16.3	Ø 8	109	1605									

Pressure right before the nozzle: 0.4 MPa

⋮												
0.5	Ø 1	74.6	43				Ø 1	82	153 [41]			
0.8										Ø 1 x 2	75.3	78
0.9				Ø 0.75 x 4	72.6	87						
1.0	Ø 1.5	83	97									
1.1							Ø 1.5	90	231 [82]			
1.3										Ø 1 x 3	78.5	125
1.7				Ø 1.0 x 4	78.6	152				Ø 1 x 4	77.3	153
1.8												
1.9	Ø 2	91.4	176				Ø 2	91	308 [180]			
2.0										Ø 1.5 x 2	86	189
2.6				Ø 0.9 x 8	81.2	208						
2.7												
2.9	Ø 2.5	96.7	289							Ø 1.5 x 3	83.2	272
3.5												
3.6										Ø 2 x 2	93.5	338
4.0				Ø 1.1 x 8	87.6	391						
4.3												
4.4	Ø 3	101	363									
5.2										Ø 2.5 x 2	96.1	497
5.9	Ø 3.5	106	542									
6.4												
7.7	Ø 4	106	722							Ø 3 x 2	100	724
11.6												
17.6	Ø 6	110	1730									
30.9	Ø 8	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	Ø 1	79	60				Ø 1	84	202 [57]			
1.2										Ø 1 x 2	80	108
1.4				Ø 0.75 x 4	78	121						
1.5	Ø 1.5	86	135									
1.6							Ø 1.5	92	326 [125]			
1.9										Ø 1 x 3	83	177
2.3												
2.5				Ø 1.0 x 4	84	224				Ø 1 x 4	83	220
2.8							Ø 2	97	400 [253]			
2.9	Ø 2	95	243									
3.0										Ø 1.5 x 2	91	265
3.9				Ø 0.9 x 8	86	330						
4.1												
4.2										Ø 1.5 x 3	87	381
4.4	Ø 2.5	101	400									
5.3										Ø 2 x 2	98	475
5.4												
5.5												
5.9				Ø 1.1 x 8	93.1	554						
6.5	Ø 3	105	552									
7.6										Ø 2.5 x 2	100	694
8.7	Ø 3.5	109	771									
9.8												
11.1										Ø 3 x 2	103	1025
11.5	Ø 4	109	995									
17.5												
26.1	Ø 6	112	2430									
46.3	Ø 8	115	4320									

Recommended Circuit Configuration for Blowing

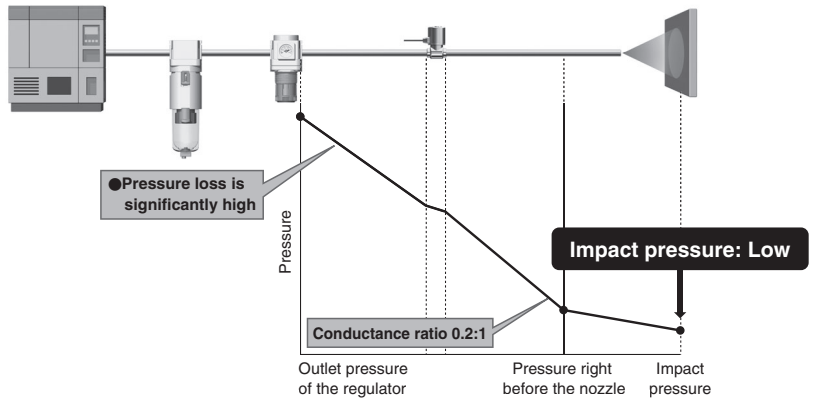
Optimization of an air blow system

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.

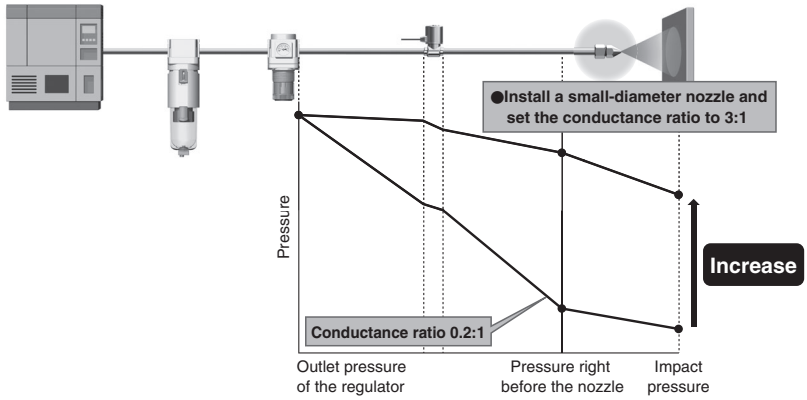
The conductance ratio recommended by SMC is 3:1 considering the energy-saving efficiency and installation cost.

∗ Conductance: Index of air flow ability

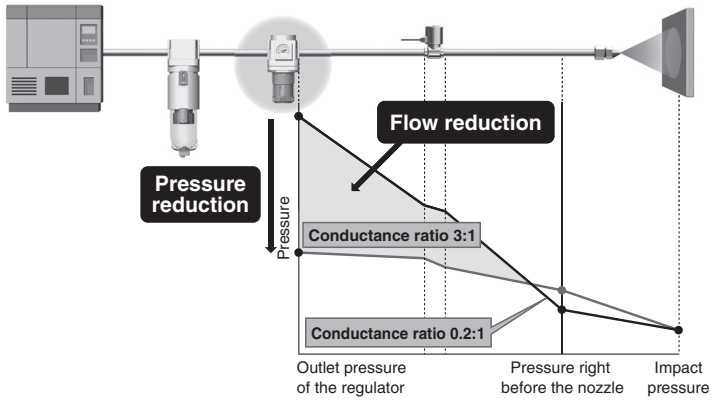
Optimization process



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.

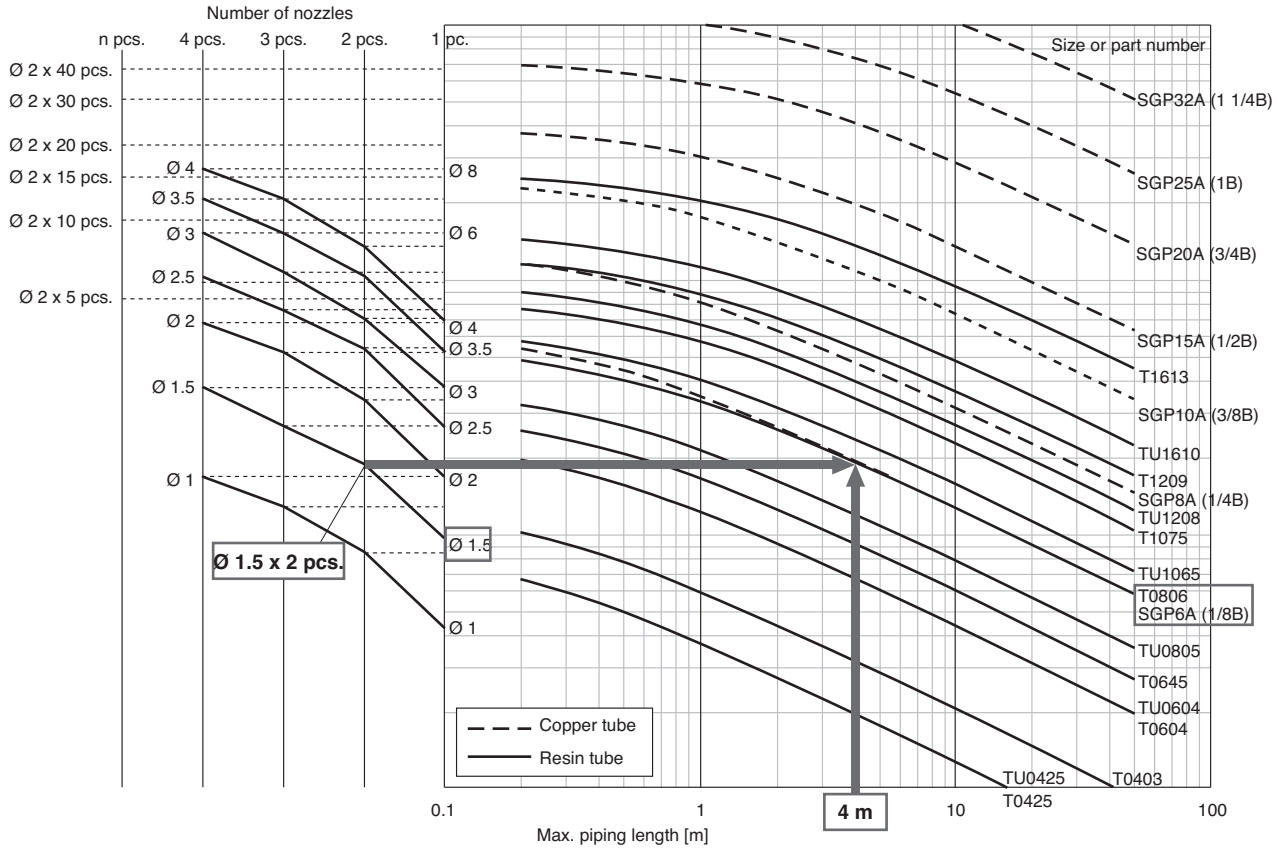


Lower supply pressure and significant reduction of the flow rate can be achieved by reducing the supply pressure to a level that provides the required impact pressure.

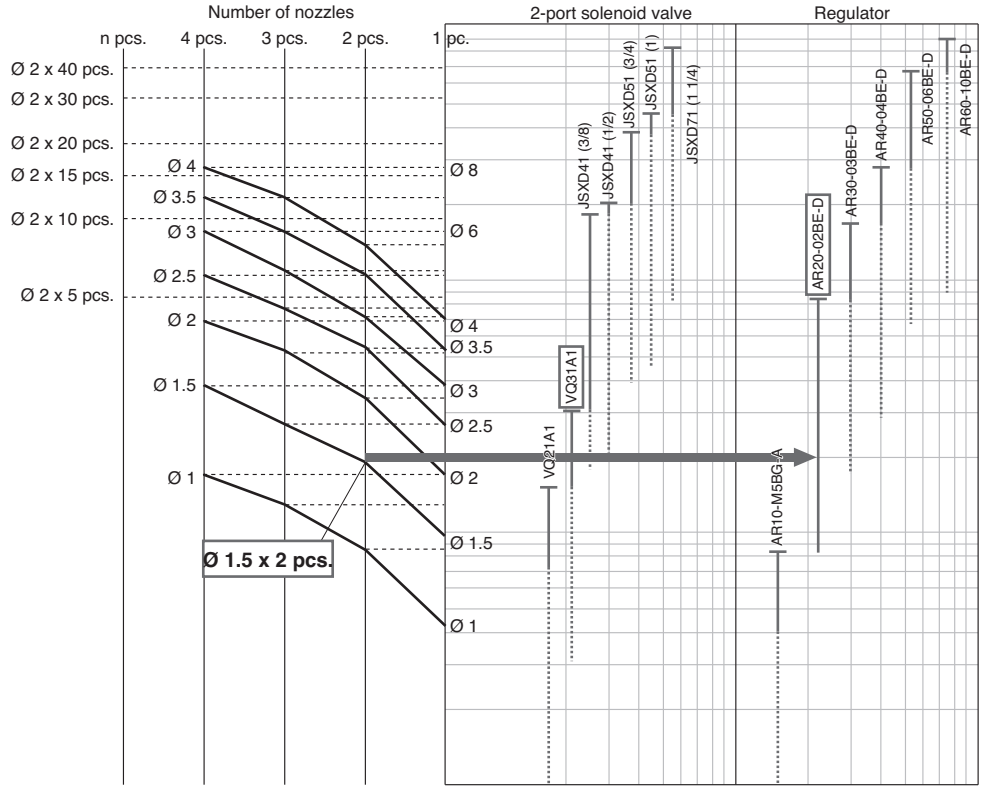
Optimization process complete

Recommended Circuit Configuration for Blowing

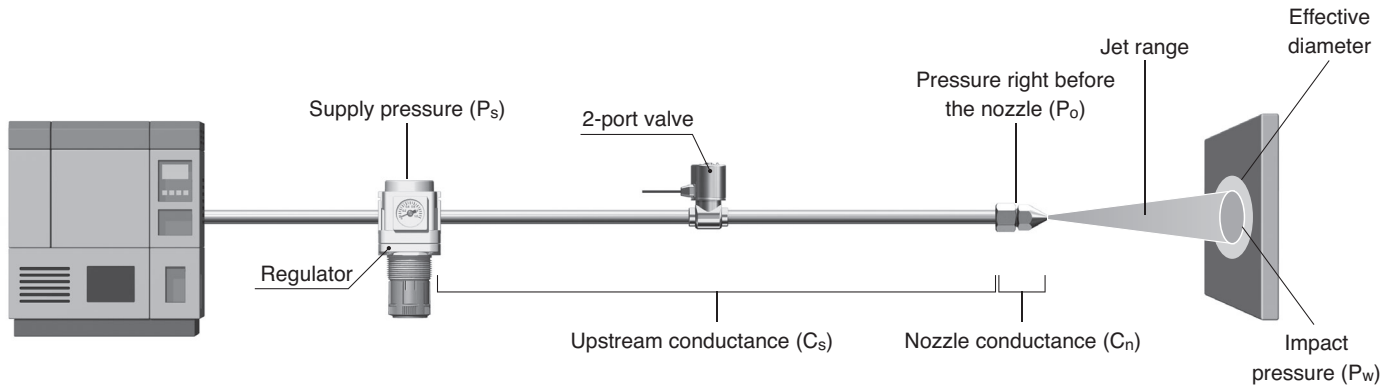
Piping lengths for conductance optimization



Optimization for 2-port valve with regulator model

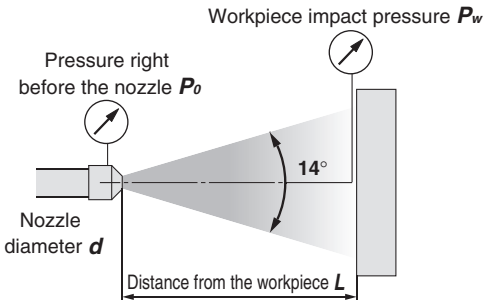


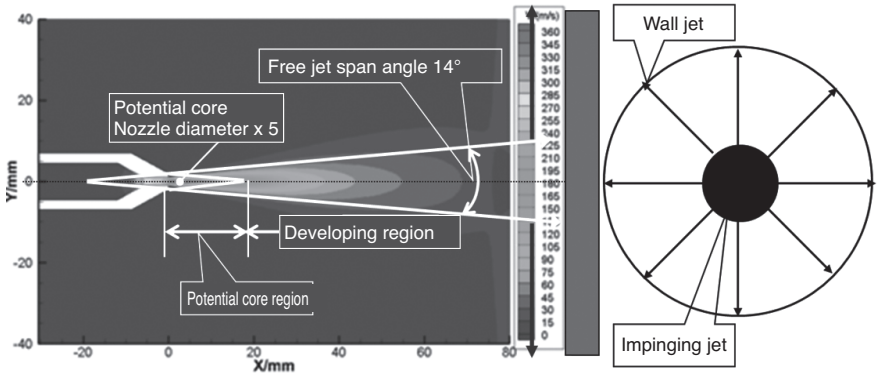
Glossary of Terms



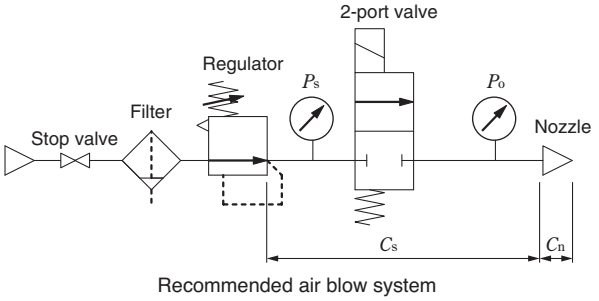
Term	Description
Pressure right before the nozzle (P_0)	The pressure right before the air is blown out from the nozzle. Pressure in the nozzle
Workpiece impact pressure (Pw)	Pressure when the air blown out of the nozzle collides with the workpiece
Conductance ratio	The ratio of conductance of the nozzle (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

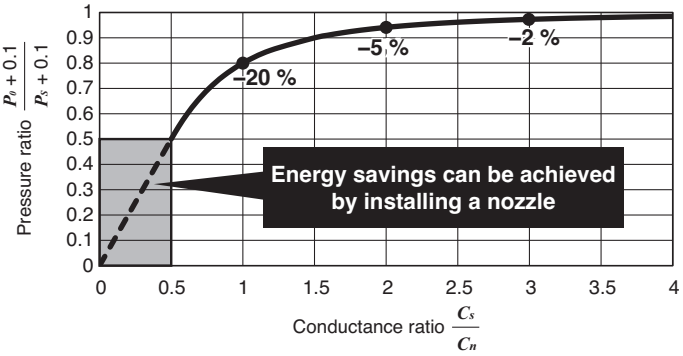




Air Blow System and Conductance



Recommended air blow system



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.

⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
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 catalogue 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. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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 catalogue 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.

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