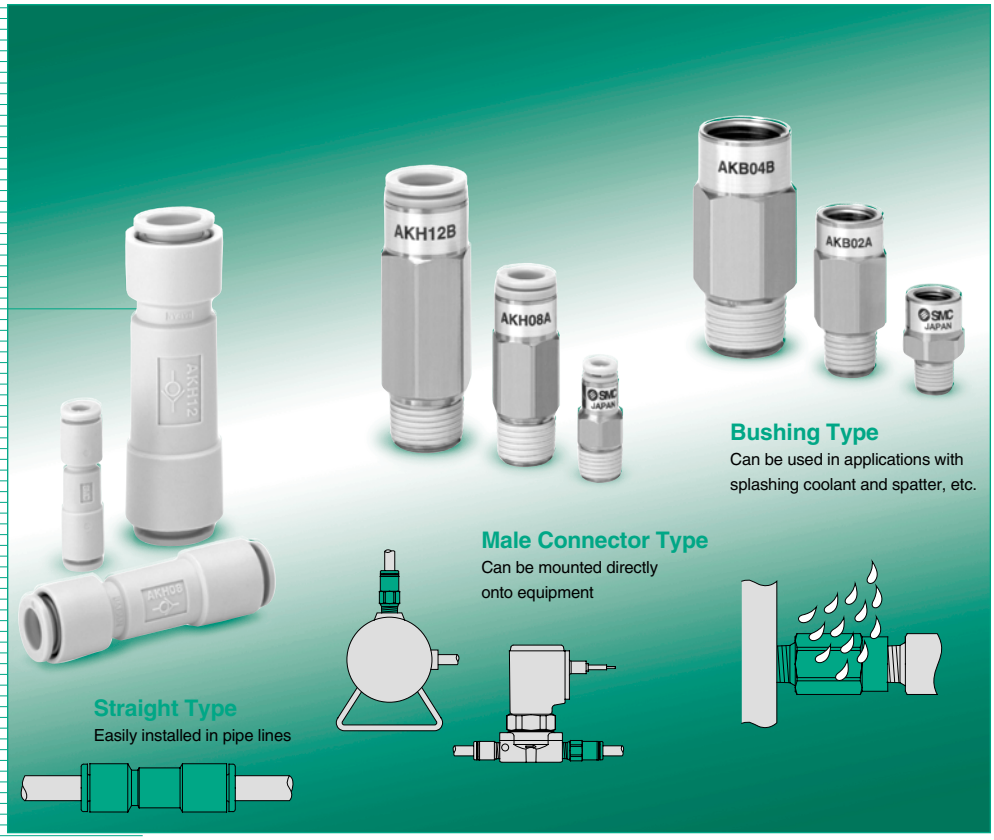
SMC®

AKH/AKB Series

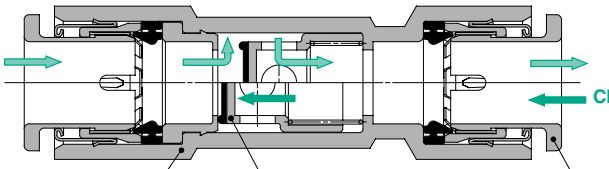
Check Valve with One-touch Fitting



Symbol

IN — OUT

Can be used for vacuum (–100kPa)



Compact & Light weight
Outside diameter: ø11.6mm
Overall length: 37.1mm
Weight: 5g
(for AKH06-00)

Valve
Low cracking pressure: 0.005MPa
Large effective area: 3 to 34mm²

With One-touch fitting
Reduces piping labor
Release button color
Millimeter size: White
Inch size: Orange

How to Order

Straight Type **AKH 04 — 00**

Male Connector Type **AKH 04 A — □ 01 S**

With sealant (standard)
∗ Not applicable to types M5 & 10-32UNF are not required.

Applicable tube O.D.

Millimeter size		Inch size	
04	ø4	03	ø5/32
06	ø6	07	ø1/4
08	ø8	09	ø5/16
10	ø10	11	ø3/8
12	ø12	13	ø1/2

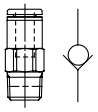
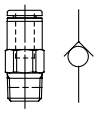
Thread type

Nil	Metric system thread (M5)
	Unified thread (10-32UNF)
	Rc(PT)
N	NPT

Port size

M5	M5 x 0.8
U10/32	10-32UNF
01	1/8
02	1/4
03	3/8
04	1/2

Check valve free flow direction

A	From male thread to one-touch fitting	
B	From one-touch fitting to male thread	

Applicable Tube O.D. /Port Size Combinations

Millimeter size

Model	Applicable tube O.D.	Port size Rc(PT)				
		M5	1/8	1/4	3/8	1/2
AKH04□	ø4	●	●			
AKH06□	ø6	●	●	●		
AKH08□	ø8		●	●	●	
AKH10□	ø10			●	●	●
AKH12□	ø12				●	●

Inch size

Model	Applicable tube O.D.	Port size NPT				
		10-32 UNF	1/8	1/4	3/8	1/2
AKH03□	ø5/32"	●	●			
AKH07□	ø1/4"	●	●	●		
AKH09□	ø5/16"		●	●	●	
AKH11□	ø3/8"			●	●	●
AKH13□	ø1/2"				●	●

Bushing Type **AKB 01 A — □ 01 S**

With sealant (standard)

Body size

01	1/8
02	1/4
03	3/8
04	1/2

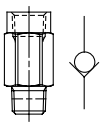
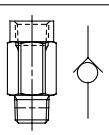
Thread type

Nil	R
N	NPT

Port size

01	1/8
02	1/4
03	3/8
04	1/2

Check valve free flow direction

A	From male thread to female thread	
B	From female thread to male thread	

Female Thread/Male Thread Combinations

R(PT) thread

Model	Female thread Rc(PT)	Male thread R			
		1/8	1/4	3/8	1/2
AKB01□	1/8	●			
AKB02□	1/4		●		
AKB03□	3/8			●	
AKB04□	1/2				●

NPT thread

Model	Female thread NPT	Male thread NPT			
		1/8	1/4	3/8	1/2
AKB01□	1/8	●			
AKB02□	1/4		●		
AKB03□	3/8			●	
AKB04□	1/2				●

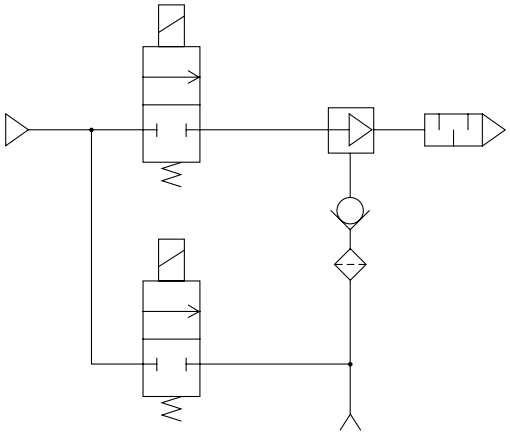
Specifications

Fluid	Air
Proof pressure	1.5MPa (217.5psi)
Operating pressure range	– 100kPa to 1MPa (-14.5 to 145psi)
Cracking pressure	0.005MPa (0.7psi)
Ambient and fluid temperature	– 5 to 60°C (23 to 140°F) (with no freezing)
Applicable tube material Note 1)	Nylon, Soft nylon, Polyurethane

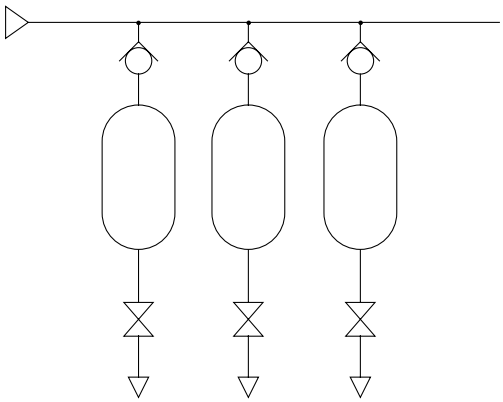
Note 1) Use caution at the maximum operating pressure with soft nylon and polyurethane.
(Refer to CAT.E501-Ⓑ "Air Fittings and Tubing" for details.)

Application Examples for Check Valve with One-Touch Fitting

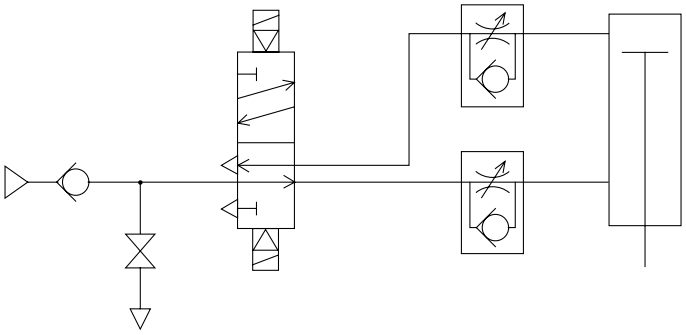
Prevention of reverse flow to vacuum source ＊ (simple vacuum holding)



Tank pressure reverse flow prevention



Drop prevention ＊

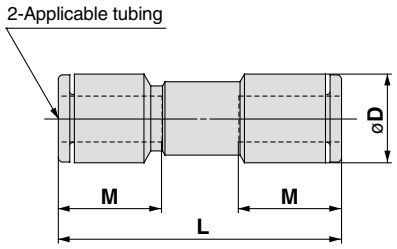


＊ A certain amount of leakage is allowed in the specifications of this product. Please note that it is not suitable for holding over an extended period of time.

Dimensions (mm)

1in=25.4mm

Straight Type: AKH



Millimeter Size

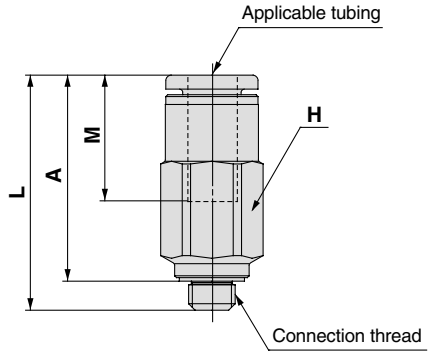
Applicable tube O.D.	Model	øD	L	M	Effective area (mm²)	Weight g
4	**AKH04-00**	9.3	33.5	12.7	2.8	3
6	**AKH06-00**	11.6	37.1	13.5	6.5	5
8	**AKH08-00**	15.2	53.3	18.5	14	10
10	**AKH10-00**	18.5	63.6	21	24	17
12	**AKH12-00**	21.7	70.2	22	34	25

Inch Size

Applicable tube O.D.	Model	øD	L	M	Effective area (mm²)	Weight g
5/32	**AKH03-00**	9.3	33.5	12.7	2.8	3
1/4	**AKH07-00**	12	39	13.6	6.5	6
5/16	**AKH09-00**	15.2	53.3	18.5	14	10
3/8	**AKH11-00**	18.5	63.6	21	24	17
1/2	**AKH13-00**	21.7	70.2	22	34	24

Male Connector Type: AKH

<For M5, UNF10-32>

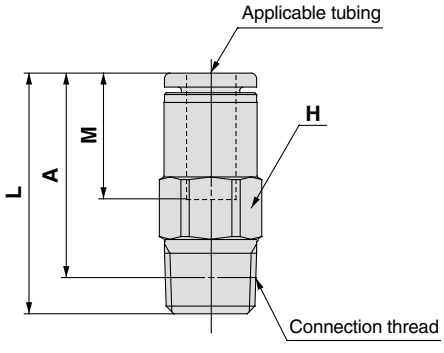


Millimeter Size

Applicable tube O.D.	Connection thread R	Model	H (Width across flats)	L	A *	M	Effective area (mm²)	Weight g
4	M5 x 0.8	**AKH04□-M5**	8	24.3	21.2	12.7	2.8	5
	1/8	**AKH04□-01S**	10	24.6	20.6			10
6	M5 x 0.8	**AKH06□-M5**	10	25.8	22.2	13.5	2.8	8
	1/8	**AKH06□-01S**		26.9	22.9		6.5	
	1/4	**AKH06□-02S**	14	30	24	17	6.5	22
8	1/8	**AKH08□-01S**	14	31.7	27.7	18.5	6.5	16
	1/4	**AKH08□-02S**	42	36			14	24
	3/8	**AKH08□-03S**	17	35.5				43
10	1/4	**AKH10□-02S**	17	54.3	48.3	21	24	45
	3/8	**AKH10□-03S**		47.3	40.8			39
	1/2	**AKH10□-04S**	22	49.3	41.3			80
12	3/8	**AKH12□-03S**	19	60.5	54	22	34	62
	1/2	**AKH12□-04S**	22	54.5	46.5			80

* Reference dimension after screwing into R threads.

<For R, NPT>



Inch Size

Applicable tube O.D.	Connection thread NPT	Model	H (Width across flats)	L	A *	M	Effective area (mm²)	Weight g
5/32	10-32 UNF	**AKH03□-U10/32**	8	24.3	21.2	12.7	2.8	5
	1/8	**AKH03□-N01S**	11.11	24.6	20.6			10
1/4	10-32 UNF	**AKH07□-U10/32**	11.11	25.8	22.7	13.6	2.8	10
	1/8	**AKH07□-N01S**		26.9	22.9		6.5	11
	1/4	**AKH07□-N02S**	14.29	31	25	17	6.5	18
5/16	1/8	**AKH09□-N01S**	14.29	31.7	27.7	18.5	6.5	16
	1/4	**AKH09□-N02S**	42	36			14	24
	3/8	**AKH09□-N03S**	17.46	35.5				43
3/8	1/4	**AKH11□-N02S**	17.46	54.2	48.3	21	24	47
	3/8	**AKH11□-N03S**		47.2	40.7			40
	1/2	**AKH11□-N04S**	22.23	49.2	41.2			79
1/2	3/8	**AKH13□-N03S**	22.23	60.5	54	22	34	87
	1/2	**AKH13□-N04S**		54.5	46.5			85

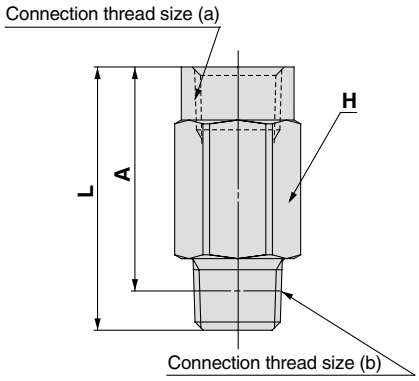
* Reference dimension after screwing into NPT threads.

Note: 1in = 25.4mm
18mm² = 1Cv
1g = 0.0353oz

Dimensions (mm)

1in=25.4mm

Bushing Type: AKB



Millimeter Size

Connection thread size R		Model	H	L	A *	Effective area (mm^2)	Weight g
(a)	(b)						
1/8	1/8	**AKB01□-01S**	14	23.7	19.7	6.5	18
1/4	1/4	**AKB02□-02S**	17	39.8	33.8	14	44
3/8	3/8	**AKB03□-03S**	22	45.2	38.7	24	86
1/2	1/2	**AKB04□-04S**	24	56.2	48.2	34	113

* Reference dimension after screwing into R threads.

Inch Size

Connection thread size NPT		Model	H	L	A *	Effective area (mm^2)	Weight g
(a)	(b)						
1/8	1/8	**AKB01□-N01S**	14.29	24.2	20.2	6.5	18
1/4	1/4	**AKB02□-N02S**	17.46	40	34	14	44
3/8	3/8	**AKB03□-N03S**	22.23	44.9	38.4	24	86
1/2	1/2	**AKB04□-N04S**	23.81	55.5	47.5	34	113

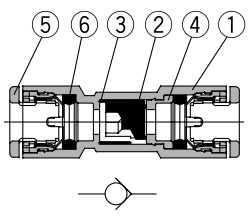
* Reference dimension after screwing into NPT threads.

Note: 1in = 25.4mm
$8mm^2$ = 1Cv
1g = 0.0353oz

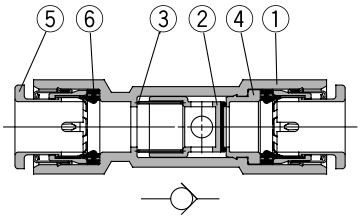
Construction

Straight type: AKH

ø4, ø6
ø5/32, ø1/4



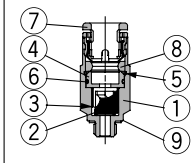
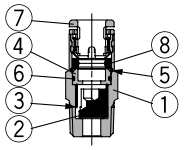
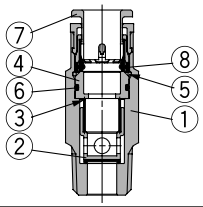
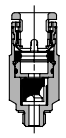
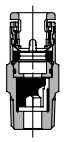
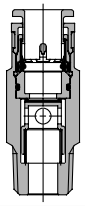
ø8, ø10, ø12
ø5/16, ø3/8, ø1/2



Parts list

No.	Description	Material	Note
1	**Body**	PBT	
2	**Valve**	NBR, Aluminum alloy	
3	**Spring**	Stainless steel	
4	**Spacer**	Brass	Electroless nickel plated
5	**Cassette**	–	
6	**Seal**	NBR	

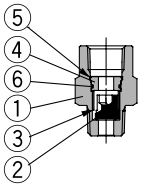
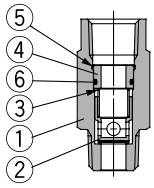
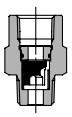
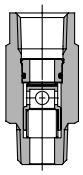
Male Connector Type: AKH

	M5 type U10/32	ø4, ø6 ø8 x R 1/8 ø5/32, ø1/4 ø5/16 x NPT 1/8	ø8, ø10, ø12 ø5/16, ø3/8, ø1/2
Free flow Fitting ↑ Male thread			
Free flow Fitting ↓ Male thread			

Parts list

No.	Description	Material	Note
1	**Body**	Brass	Electroless nickel plated
2	**Valve**	NBR, Aluminum alloy	
3	**Spring**	Stainless steel	
4	**Spacer**	Brass	Electroless nickel plated
5	**Stopper**	Stainless steel	
6	**O-ring**	NBR	
7	**Cassette**	–	
8	**Seal**	NBR	
9	**Gasket**	Stainless steel + NBR	

Bushing Type: AKB

	R 1/8 NPT 1/8	R 1/4, 3/8, 1/2 NPT 1/4, 3/8, 1/2
Free flow Female thread ↑ Male thread		
Free flow Female thread ↓ Male thread		

Auto Switch
D-B7/B8
D-G7/K7

Parts list

No.	Description	Material	Note
1	**Body**	Brass	Electroless nickel plated
2	**Valve**	NBR, Aluminum alloy	
3	**Spring**	Stainless steel	
4	**Spacer**	Brass	Electroless nickel plated
5	**Stopper**	Stainless steel	
6	**O-ring**	NBR	

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of **"Caution", "Warning" or "Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.

⚠ Warning : Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.

Note 2) JIS B 8370: General Rules for Pneumatic Systems

⚠ Warning

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

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

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

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back-pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Safety Instructions

Selection

⚠ Warning

1. Confirm the specifications.

The products appearing in this catalog are designed for use only in compressed air systems (including vacuum). Do not use outside the specified ranges of pressure, temperature, etc., as this may cause damage or faulty operation. (Refer to specifications.)

Consult with SMC if fluids other than compressed air (including vacuum) are to be used.

Mounting

⚠ Warning

1. Read the instruction manual carefully.

The product should be mounted and operated with a good understanding of its contents. Also, keep the manual where it can be easily referred to at any time.

2. Ensure space for maintenance.

Ensure the necessary space for maintenance activities.

3. Strictly observe the fastening of screws and fastening torque.

When mounting, fasten screws with the recommended torque.

Piping

⚠ Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. Wrapping of sealing tape

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping.

Further, when sealing tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Air Supply

⚠ Warning

1. Types of fluid

This product is designed for use with compressed air. Consult with SMC if a different fluid is to be used.

2. When there is a large amount of drainage

Pressurized air containing a large amount of drainage may cause the malfunction of pneumatic equipment. An air dryer or Drain Catch should be installed upstream from filters.

3. Drainage removal

If the air filter drains are not flushed regularly, the drainage will flow downstream and this may lead to the malfunction of pneumatic equipment.

In cases where the management of drain flushing will be difficult, the use of filters with automatic drains is recommended.

For details on the qualities of compressed air mentioned above, refer to SMC's "Compressed Air Cleaning Systems" catalog.

4. Types of air

Do not use compressed air containing chemicals, synthetic oil which includes organic solvents, salt, corrosive gases, etc., as this may cause damage or faulty malfunction.

Safety Instructions

Operating Environment

⚠ Warning

1. Do not operate in locations having an atmosphere of corrosive gases, chemicals, sea water, fresh water or water vapor, or where there will be contact with the same.

2. In locations which receive direct sunlight, the sunlight should be blocked .

3. Do not operate in locations where vibration or impact occurs.

4. Do not operate in a location near a heat source where radiated heat will be received.

Maintenance

⚠ Warning

1. Maintenance should be performed in accordance with procedures in the instruction manual.

Improper handling may cause damage or malfunction of equipment or machinery.

2. Maintenance operations

Improper handling of compressed air is dangerous. Therefore, in addition to observing the product specifications, replacement of elements and other maintenance activities should be performed by personnel having sufficient knowledge and experience pertaining to pneumatic equipment.

3. Drain flushing

Drainage should be flushed from air filter and other drains on a regular basis. (Refer to specifications.)

4. Pre-maintenance inspection

When removing this product, turn off the electric power, and be certain to shut off the supply pressure and exhaust the compressed air in the system. Proceed only after confirming that all pressure has been released to the atmosphere.

5. Post maintenance inspection

After installation, repair or reconstruction, reconnect compressed air and electric power, and then perform inspections for proper operation and air leakage. If the sound of air leakage can be heard, or if the equipment does not operate properly, stop operation and confirm that it is mounted correctly.

6. Disassembly and alteration prohibited

Do not disassemble the unit or make any alterations to it.

Safety Instructions

Selection

⚠ Warning

1. Cannot be used as a check valve when zero leakage is required.

A certain amount of leakage is allowed in the product's specifications.

⚠ Caution

1. Do not use in a location where connection threads or tube connecting sections will slide or turn.

2. Use tubing within its minimum bend radius.

Using at less than the minimum bend radius can cause breaking or flattening of the tubing.

3. Do not use for gas, gas fuels and refrigerants, etc., which are combustible, explosive or poisonous.

4. Confirm whether PTFE can be used.

PTFE (tetrafluoroethylene resin) powder is contained in the sealing materials. Confirm that this will not cause operating problems.

Operating Environment

⚠ Warning

1. Do not use in locations where static electric charges will be a problem.

This can cause malfunction or failure of the system.

2. Except for the bushing type: AKB, do not use in locations where spatter is generated.

There is a danger of fire occuring if spatter sticks to synthetic resin parts.

3. Except for the bushing type: AKB, do not use in environments where there will be direct contact with liquids such as cutting oil, lubricating oil or coolant oil.

Contact SMC regarding operation in this kind of environment.

Maintenance

⚠ Caution

1. Check for the following during regular maintenance, and replace components as necessary.

a) Scratches, gouges, abrasion, corrosion

b) Air leakage

c) Twisting, flattening or distortion of tubing

d) Hardening, deterioration or softness of tubing

2. Do not repair or patch the replaced tubing or fittings for reuse.

Mounting

⚠ Caution

1. Confirm the model and size, etc. before mounting.

Also, confirm that the product has no scratches, gouges or cracks, etc.

2. Confirm the flow direction of a check valve when mounting.

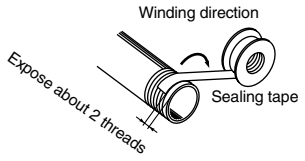
Confirm the free flow direction with the JIS symbol which is displayed on the body.

3. When connecting tubing, make allowances for changes in the length of the tubing, etc. due to pressure.

4. Do not allow tubing and fittings to be subjected to distortion, twisting, pulling or moment loads, etc. This can cause damage to fittings, and crushing, bursting or disconnection of tubing, etc.

5. Do not allow tubing to be worn, twisted or scratched. This can cause crushing, bursting or disconnection of the tubing, etc.

6. When connecting piping and fittings, etc., be careful that chips from the pipe threads and sealing material do not get inside. Also, when sealing tape is used, leave about 2 thread ridges uncovered at the end of the pipe.



7. When connecting taper pipe threads, tighten the wrench flats on the body with a suitable wrench.

Damage can be caused if any other area is used.

Safety Instructions

Precautions on Other Tube Brands

⚠ Caution

1. When using other than SMC brand tubes, confirm that the following specifications are satisfied with respect to the outside diameter tolerance of the tube.

1) Nylon tube within ±0.1mm
2) Soft nylon tube within ±0.1mm
3) Polyurethane tube within +0.15mm
within – 0.2mm

Do not use tubes which do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.

Precautions for One-Touch Fittings

⚠ Caution

Attaching and Detaching Tubes to One-Touch Fittings

1. Attaching of tube

①Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. The tube might be cut diagonally or flattened, making installation impossible or causing problems such as disconnection of the tube after installation or air leakage. Allow some extra length in the tube.

②Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.

③After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.

2. Detaching of tube

①Push in the release bushing sufficiently, and push the collar equally at the same time.

②Pull out the tube while holding down the release bushing so that it does not come out. If the release bushing is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to pull it out.

③When the removed tube is to be used again, using the chewed portion of the tube as it is can cause problems such as air leakage or difficulty in removing the tube.

Tightening Torque

⚠ Caution

1. The proper torque for connecting pipe fittings is shown in the table below. As a rule, this is equivalent to 2 or 3 turns with a tool after tightening by hand.

Be careful of damage due to over tightening. When using miniature pipe fittings, tighten by an additional 1/4 turn after hand tightening. Further, in cases such as a universal elbow or universal tee which have gaskets in 2 locations, the additional tightening is doubled to 1/2 turn.

Male thread	Proper tightening torque (N·m)
M5 10/32-UNF	1/6 turn after hand tightening
1/8	7 to 9
1/4	12 to 14
3/8	22 to 24
1/2	28 to 30

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