

# Check Valve Series AK

RoHS

Large flow capacity

Low cracking pressure: 0.02 MPa

A wide variation of models



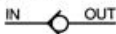
## Model

Model	Port size	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
AK2000-01	1/8	5	0.25	105
AK2000-02	1/4	5.5		100
AK4000-02	1/4	9.4		155
AK4000-03	3/8	17		150
AK4000-04	1/2	19		140
AK6000-06	3/4	40		345
AK6000-10	1	46		315

## Specifications

Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1 MPa
Minimum operating pressure	0.02 MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)

Symbol



## How to Order

AK 2 000 -   02

Standard size

2	1/4
4	1/2
6	1

Thread type

Nil	Rc
N	NPT
F	G

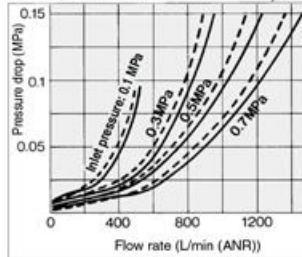
Port size

Port size	Applicable series
01	1/8 AK2000
02	1/4 AK2000, 4000
03	3/8 AK4000
04	1/2 AK4000
06	3/4 AK6000
10	1 AK6000

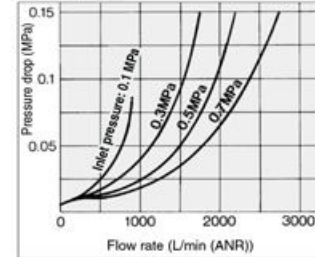
## Flow Characteristics

Note) The flow characteristics are representative values.

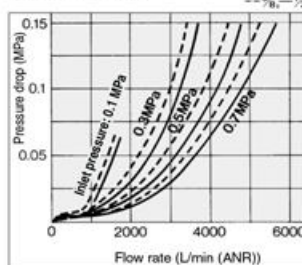
AK2000-01/02



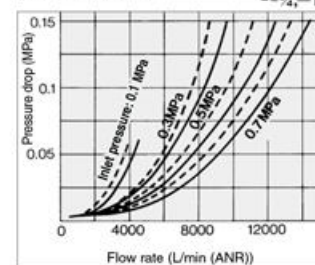
AK4000-02



AK4000-03/04



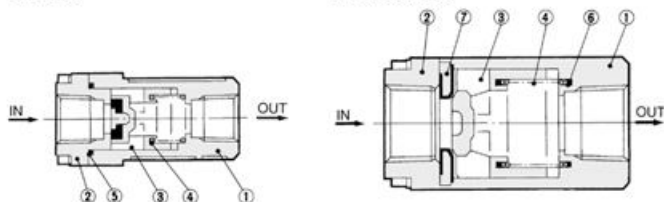
AK6000-06/10



## Construction

AK2000

AK4000/6000



## Component Parts

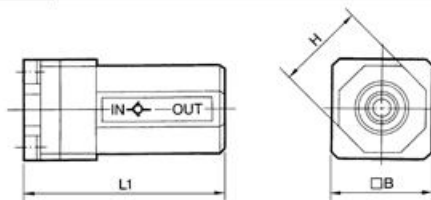
No.	Description	Material
1	Body	Aluminum die-casted
2	Cover	Aluminum die-casted (Note 1)

Note 1) AK2000: Zinc alloy

## Replacement Parts

No.	Description	Material	Part no.		
			AK2000	AK4000	AK6000
3	Valve	POM	19033	19014	19024
4	Spring	Stainless steel	19037	19015	19025
5	O-ring	NBR	KA00294 20 x 17 x 1.5	—	—
6	Ring	NBR	—	19016	19026
7	Seat ring	Brass, NBR	—	19013	19023

## Dimensions



Model	Port size	L1	□B	H
AK2000-01, 02	1/8, 1/4	50	25	22
AK4000-02, 03, 04	1/4, 3/8, 1/2	67	36	36
AK6000-06, 10	3/4, 1	95	50	50

## ⚠ Specific Product Precautions

Be sure to read before handling.  
Refer to front matter 56 for Safety Instructions and pages 468 to 471 for Flow Control Equipment Precautions.

## Design/Selection

## ⚠ Caution

- Even when using with the specification range listed in the catalog, when the IN side of the check valve is throttled, it may fail to open all the way and may generate vibration.
- The minimum operating pressure is the pressure when the valve begins to open, and not the pressure when the valve is fully open.
- The check valve has a construction, in which it is closed by the differential pressure generated when the inlet pressure (IN side) or outlet pressure (OUT side) solenoid valve is switched. Be aware that the check valve does not close completely and the outlet pressure (OUT side) may drop when the inlet pressure (IN side) drops gently and the differential pressure becomes smaller than the minimum operating pressure or cracking pressure.

AS  
TMH  
ASD  
AS  
AS-FE  
KE  
AS-FG  
AS-FP  
AS-FM  
AS-D  
AS-T  
ASP  
ASN  
AQ  
ASV  
AK  
VCHC  
ASS  
ASR  
ASQ

# Bushing Type Check Valve with One-touch Fittings

## Series AKH/AKB

RoHS

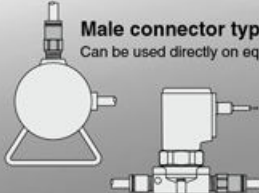
3 configurations provide design solutions based on the operating conditions.



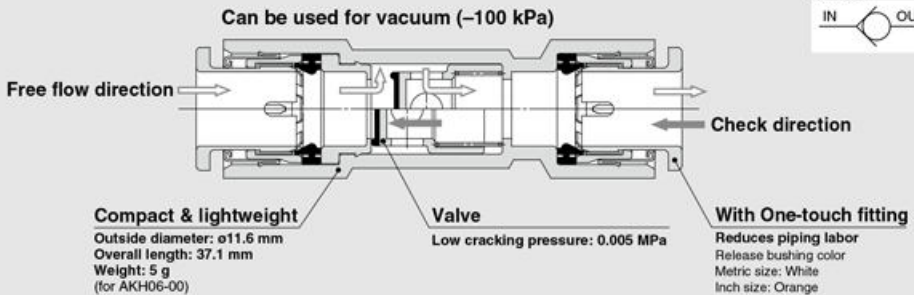
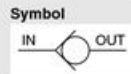
**Straight type**  
Easily installed in pipe lines.



**Male connector type**  
Can be used directly on equipment.



**Bushing type**  
Can be used in applications with splashing coolant and spatter, etc.



AS
TMH
ASD
AS
AS-FE KE
AS-FG
AS-FP
AS-FM
AS-D AS-T
ASP
ASN
AQ
ASV
<b>AK</b>
VCHC
ASS
ASR ASQ

# Bushing Type Check Valve with One-touch Fittings

## Series **AKH/AKB**

RoHS

### How to Order

**Straight type** AKH **04** - 00  
**Male connector type** AKH **04** **A** - **01** **S**

#### Applicable tubing O.D.

Metric 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

• With seal (Standard)  
 \* M5 and 10-32 UNF types are not required.

#### Thread type

Nil	Metric thread (M5)
	Unified thread (10-32 UNF)
	R
N	NPT

#### Port size

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

#### Check valve free flow direction

<b>A</b>	From male thread to One-touch fitting	
<b>B</b>	From One-touch fitting to male thread	

#### Applicable Tubing O.D./Port Size Combinations

##### Metric size

Model	Applicable tubing O.D.	R thread			
		M5	1/8	1/4	3/8 1/2
AKH04□	ø4	●	●		
AKH06□	ø6	●	●		
AKH08□	ø8		●	●	
AKH10□	ø10			●	●
AKH12□	ø12				●

##### Inch size

Model	Applicable tubing O.D.	NPT thread			
		10-32	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**

#### Body size

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

• With seal (Standard)

#### 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

<b>A</b>	From male to female thread	
<b>B</b>	From female to male thread	

#### Female/Male Threads Combinations

##### R thread

Model	Female thread Rc	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

<b>Fluid</b>	Air
<b>Proof pressure</b>	1.5 MPa
<b>Operating pressure range</b>	-100 kPa to 1 MPa
<b>Cracking pressure</b>	0.005 MPa <sup>Note 1)</sup>
<b>Ambient temperature and operating fluid temperature</b>	-5 to 60°C (No freezing)
<b>Applicable tubing material</b> <sup>Note 2)</sup>	Nylon, Soft nylon, Polyurethane

Note 1) The valve does not open fully at this pressure level.

Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.

(Refer to pages 411 and 412 for details.)

AS

TMH

ASD

AS

AS-FE  
KE

AS-FG

AS-FP

AS-FM

AS-D  
AS-T

ASP

ASN

AQ

ASV

AK

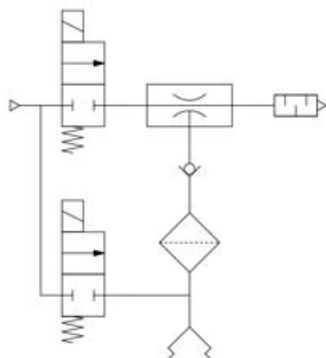
VCHC

ASS

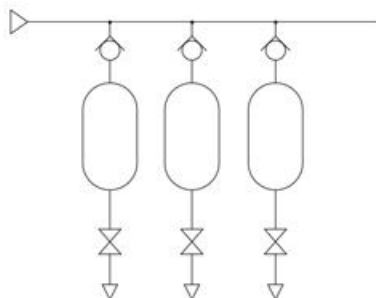
ASR  
ASQ

## Application Example for Bushing Type Check Valve with One-touch Fittings

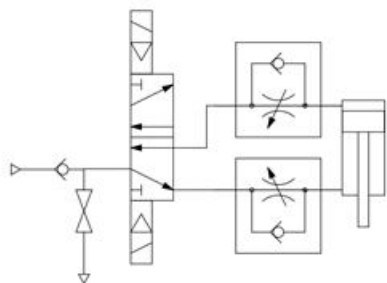
### Prevention of reverse flow to vacuum source \* (Simple vacuum holding)



### 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.

## ⚠ Specific Product Precautions

Be sure to read before handling.  
Refer to front matter 56 for Safety Instructions and pages 468 to 471 for Flow Control Equipment Precautions.

### Design/Selection

## ⚠ Caution

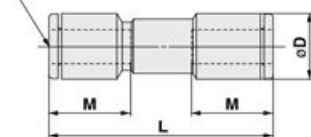
1. Even when using with the specification range listed in the catalog, when the IN side of the check valve is throttled, it may fail to open all the way and may generate vibration.
2. The cracking pressure is the pressure when the valve begins to open, and not the pressure when the valve is fully open.
3. The check valve has a construction, in which it is closed by the differential pressure generated when the inlet pressure (IN side) or outlet pressure (OUT side) solenoid valve is switched. Be aware that the check valve does not close completely and the outlet pressure (OUT side) may drop when the inlet pressure (IN side) drops gently and the differential pressure becomes smaller than the minimum operating pressure or cracking pressure.



## Dimensions

### Straight type: AKH

2 x Applicable tubing



#### Metric Size

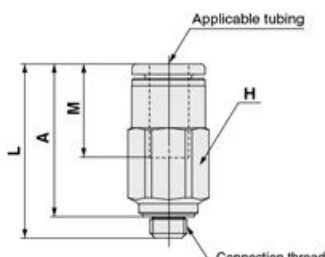
Applicable tubing O.D.	Model	øD	L	M	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
4	AKH04-00	9.3	33.5	12.7	0.56	0.35	3
6	AKH06-00	11.6	37.1	13.5	1.3		5
8	AKH08-00	15.2	53.3	18.5	2.8		10
10	AKH10-00	18.5	63.6	21	4.8	0.5	17
12	AKH12-00	21.7	70.2	22	6.8		25

#### Inch Size

Applicable tubing O.D.	Model	øD	L	M	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
5/32	AKH03-00	9.3	33.5	12.7	0.56	0.35	3
1/4	AKH07-00	12	39	13.6	1.3		6
5/16	AKH09-00	15.2	53.3	18.5	2.8		10
3/8	AKH11-00	18.5	63.6	21	4.8	0.5	17
1/2	AKH13-00	21.7	70.2	22	6.8		24

### Male connector type: AKH

<For M5, UNF10-32>



#### Metric Size

Applicable tubing O.D.	Connection thread R	Model	H (Height with sonic file)	L	A*	M	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
4	M5 x 0.8	AKH04□-M5	8	24.3	21.2	12.7	0.56	0.35	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	0.56		8
	1/8	AKH06□-01S	10	26.9	22.9				1.3
8	1/4	AKH08□-02S	14	30	24	17	1.3	22	
	1/8	AKH08□-01S	14	31.7	27.7			16	
	1/4	AKH08□-02S	17	42	36	18.5	2.8	24	
	3/8	AKH08□-03S	17	42	35.5			43	
10	1/4	AKH10□-02S	17	54.3	48.3	21	4.8	0.5	45
	3/8	AKH10□-03S	17	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	6.8	62	
	1/2	AKH12□-04S	22	54.5	46.5			80	

\* Reference dimensions of R thread after installation.

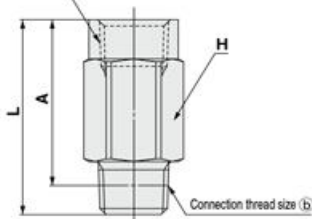
#### Inch Size

Applicable tubing O.D.	Connection thread NPT	Model	H (Height with sonic file)	L	A*	M	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
5/32	10-32 UNF	AKH03□-U10/32	8	24.3	21.2	12.7	0.56	0.35	5
	1/8	AKH03□-N01S	11.11	24.6	20.6				10
1/4	10-32 UNF	AKH07□-U10/32	11.11	25.8	22.2	13.6	0.56		11
	1/8	AKH07□-N01S	11.11	26.9	22.9				1.3
5/16	1/4	AKH07□-N02S	14.29	31	25	17	1.3	18	
	1/8	AKH09□-N01S	14.29	31.7	27.7			16	
	1/4	AKH09□-N02S	17.46	42	36	18.5	2.8	24	
	3/8	AKH09□-N03S	17.46	42	35.5			43	
3/8	1/4	AKH11□-N02S	17.46	54.2	48.3	21	4.8	0.5	47
	3/8	AKH11□-N03S	22.23	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	6.8	87	
	1/2	AKH13□-N04S	22.23	54.5	46.5			85	

\* Reference dimensions of NPT thread after installation.

### Bushing type: AKB

Connection thread size (a)



#### Metric Size

Connection thread size R		Model	H	L	A*	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
(a)	(b)							
1/8	1/8	AKB01□-01S	14	23.7	19.7	1.3	0.35	18
1/4	1/4	AKB02□-02S	17	39.8	33.8	2.8		44
3/8	3/8	AKB03□-03S	22	45.2	38.7	4.8	0.5	86
1/2	1/2	AKB04□-04S	24	56.2	48.2	6.8		113

\* Reference dimensions of R thread after installation.

#### Inch Size

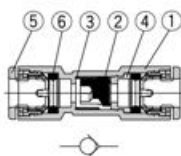
Connection thread size NPT		Model	H	L	A*	Sonic conductance dm <sup>3</sup> /(s·bar)	Critical pressure ratio	Weight (g)
(a)	(b)							
1/8	1/8	AKB01□-N01S	14.29	24.2	20.2	1.3	0.35	18
1/4	1/4	AKB02□-N02S	17.46	40	34	2.8		44
3/8	3/8	AKB03□-N03S	22.23	44.9	38.4	4.8	0.5	86
1/2	1/2	AKB04□-N04S	23.81	55.5	47.5	6.8		113

\* Reference dimensions of NPT thread after installation.

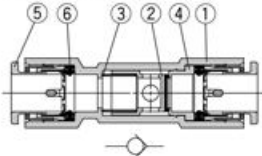
## Construction

### Straight type: AKH

ø4, ø6  
ø5/32, ø1/4



ø8, ø10, ø12  
ø5/16, ø3/8, ø1/2



### Component Parts

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 R1/8 ø5/32, ø1/4 ø5/16 x NPT1/8	ø8, ø10, ø12 ø5/16, ø3/8, ø1/2
Free flow One-touch fitting Male thread			
Free flow One-touch fitting Male thread			

### Bushing type: AKB

	R1/8 NPT1/8	R1/4, 3/8, 1/2 NPT1/4, 3/8, 1/2
Free flow Female thread Male thread		
Free flow Female thread Male thread		

### Component Parts

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	

### Component Parts

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	

# Check Valves For Air/Water

## Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and lead times.



- Body material: Brass/Stainless steel (Main parts: Stainless steel)
- Low cracking pressure: 0.01 MPa
- High temperature: 80°C
- Low temperature: -30°C
- Rubber material: NBR/FKM/CR



### Specifications/Models

Model	Port size	Specifications					Fluid	Operating temperature range (°C)	Minimum operating pressure (MPa)	Application	
		Body Brass	All stainless steel	Low cracking pressure 0.01 MPa	Main parts: Stainless steel	Rubber material					
INA-14-290	01: Rc 1/8	●			●	NBR	Air/Water	-5 to 60	0.02		
INA-14-47-□	02: Rc 1/4 03: Rc 3/8 04: Rc 1/2		●			NBR	Air/Water	-5 to 60	0.05	Anti-corrosion	
INA-14-85-□			●			FKM	Air/Water	-5 to 80	0.05	Anti-corrosion	
XTO-674-□			●			NBR	Air	-5 to 60	0.05	Basic type	
XTO-674-□A			●			●	NBR	Air/Water	-5 to 60	0.05	For water
XTO-674-□E			●		●		NBR	Air	-5 to 60	0.01	For vacuum, oscillation measures
XTO-674-□H			●				FKM	Air	-5 to 80	0.05	For high temperature
XTO-674-□L			●				CR	Air	-30 to 60	0.05	For low temperature
XTO-674-□AE			●		●	●	NBR	Air/Water	-5 to 60	0.01	
XTO-674-□AH			●			●	FKM	Air/Water	-5 to 80	0.05	
XTO-674-□AL			●			●	CR	Air	-30 to 60	0.05	
XTO-674-□EH			●		●		FKM	Air	-5 to 80	0.01	
XTO-674-□EL			●		●		CR	Air	-30 to 60	0.01	
XTO-674-□AEH			●		●	●	FKM	Air/Water	-5 to 80	0.01	
XTO-674-□AEL			●		●	●	CR	Air	-30 to 60	0.01	



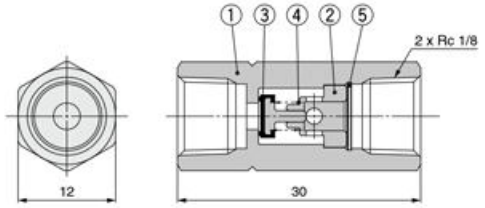


## INA-14-290 (Body material: Brass)

### Specifications

Fluid	Air/Water
Proof pressure	1.5 MPa
Operating pressure range	0.02 to 1 MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)
Port size	2 x Rc 1/8
Sonic conductance	1.25 dm <sup>3</sup> /(s-bar)
Critical pressure ratio	0.45

### Construction/Dimensions



Symbol



Weight: 20 g

### How to Order

# INA-14-290

### Component Parts

No.	Description	Material	Note
1	Body	Brass	Electroless nickel plating
2	Guide	Brass	Electroless nickel plating
3	Valve	Stainless steel 303, NBR	
4	Spring	Stainless steel 304	
5	Basic internal retaining ring	Stainless steel 304	

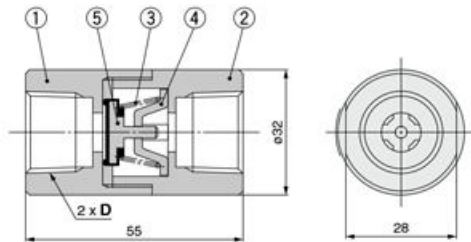
## INA-14-□ (All stainless steel)



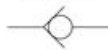
### Specifications

Model		INA-14-47	INA-14-85
Fluid		Air/Water	
Operating pressure range		0.05 to 1 MPa	
Proof pressure		1.5 MPa	
Ambient and fluid temperature		-5 to 60°C (No freezing)	-5 to 80°C (No freezing)
Valve seal material		NBR	FKM
Port size		Rc 1/4, Rc 3/8, Rc 1/2	
Sonic conductance	Rc 1/4	9.5 dm <sup>3</sup> /(s-bar)	
	Rc 3/8, Rc 1/2	10.5 dm <sup>3</sup> /(s-bar)	
Critical pressure ratio		0.45	

### Construction/Dimensions



Symbol



### How to Order

# INA-14-47-02

Series

47	Seal material: NBR
85	Seal material: FKM

Port size

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

Part no.		D	Weight (g)
INA-14-47-02	INA-14-85-02	Rc 1/4	260
INA-14-47-03	INA-14-85-03	Rc 3/8	240
INA-14-47-04	INA-14-85-04	Rc 1/2	210

### Component Parts

No.	Description	Material
1	Body A	Stainless steel 303
2	Body B	Stainless steel 303
3	Check valve spring	Stainless steel 304
4	Stopper	Stainless steel 304
5	INA-14-47 type	Stainless steel 303, NBR
	INA-14-85 type	Stainless steel 303, FKM

AS  
TMH  
ASD  
AS  
AS-FE  
KE  
AS-FG  
AS-FP  
AS-FM  
AS-D  
AS-T  
ASP  
ASN  
AQ  
ASV  
AK  
VCHC  
ASS  
ASR  
ASQ



### Specifications

Model		XTO-674-□	XTO-674-□A	XTO-674-□E	XTO-674-□H	XTO-674-□L
Fluid		Air	Air/Water		Air	
Proof pressure		1.5 MPa				
Operating pressure range		0.05 to 1 MPa		0.01 to 1 MPa	0.05 to 1 MPa	
Ambient and fluid temperature		-5 to 60°C (No freezing)			-5 to 80°C (No freezing)	-30 to 60°C (No freezing)
Port size		Rc 1/4, Rc 3/8, Rc 1/2				
Sonic conductance		Rc 1/4		9.5 dm³/(s-bar)		
		Rc 3/8, Rc 1/2		10.5 dm³/(s-bar)		
Critical pressure ratio		0.45				

Note) Refer to "Specifications/Models" on page 640 for combinations of each option.

### How to Order

## XTO-674-02□

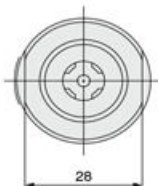
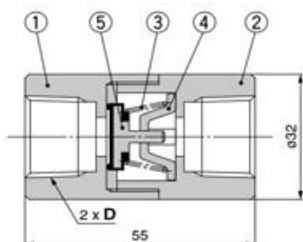
Port size	
02	Rc 1/4
03	Rc 3/8
04	Rc 1/2

Symbol	Specifications	Operating temperature range	Minimum operating pressure
<b>NII</b>	Basic type	-5 to 60°C	0.05 MPa
<b>A</b>	Main parts: Stainless steel (For water)	-5 to 60°C	0.05 MPa
<b>E</b>	Low cracking pressure	-5 to 60°C	0.01 MPa
<b>H</b>	High temperature	-5 to 80°C	0.05 MPa
<b>L</b>	Low temperature	-30 to 60°C	0.05 MPa

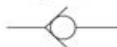
Note 1) A combination of H and L is not possible.

Note 2) Refer to "Specifications/Models" on page 640 for combinations of each option.

### Construction/Dimensions



#### Symbol



Part no.	D	Weight (g)
XTO-674-02□	Rc 1/4	280
XTO-674-03□	Rc 3/8	255
XTO-674-04□	Rc 1/2	225

### Component Parts

No.	Description Option symbol	Material											
		Basic type	A	E	H	L	AE	AH	AL	EH	EL	AEH	AEL
1	Body A	Brass											
2	Body B	Brass											
3	Check valve spring	Stainless steel 304											
4	Stopper	Stainless steel 304											
5	Valve	Steel	Stainless steel 304	Steel	Stainless steel 304			Steel	Stainless steel 303		Stainless steel 304	Stainless steel 303	
	Bracket		Stainless steel 303		Stainless steel 303				Stainless steel 303				
	Rubber lining		NBR		FKM	CR	NBR	FKM	CR	FKM	CR	FKM	CR



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