CKD

Discontinue

New Products

New product

Air-Operated Valve for Chemical Liquids

AMD Part 3 Series

AIR-OPERATED VALVE FOR CHEMICAL LIQUIDS

CKD Corporation

CC-1098A 2

Discontinue

A 3-port Valve and a Manifold Added to All-in-one Models That Support Various Specifications!!

Different models supporting various fluids, pressure ranges, and temperature ranges are standardized and integrated.
A 3-port valve and a manifold are added to AMD Part 3, the all-in-one model answering the customer needs.

Air-operated valve for chemical liquid

AMDZ*3
AMD3*3
AMD4*3
AMD5*3

Part 3
AMD3**
●Integrated specification

Part 2
AMD2**
●Integrated fittings

Part 1
AMD**

RoHS

Discontinue

3-port valve and manifold added

■ 3-port valve
AMG series

■ Manifold
GAMD series

■ Supporting various fittings

Nippon Pillar Packing Co., Ltd.
Super 300 Type P Series

Flowell Co., Ltd.
F-LOCK 60 Series

Supporting various chemical liquids as standard

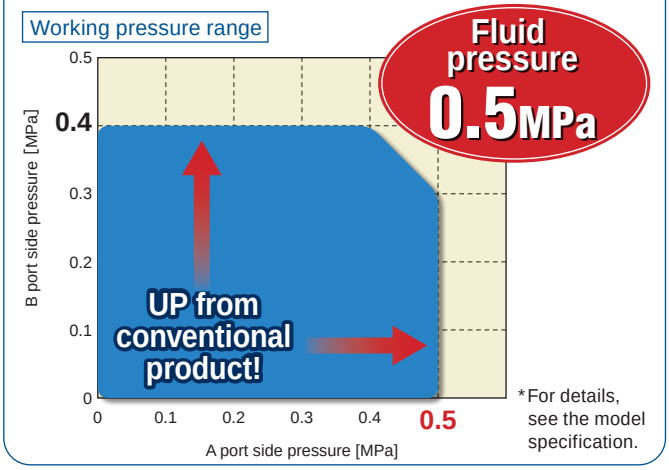
By adopting excellent chemical-resistant fluoroplastic "PVDF" for the actuator, wide range of chemical fluid, acid or alkaline, is available as standard specification.

Standard

Liquid	General/other	Fluorine, nitric acid	Aqueous ammonia
Conventional (Part 2)	Standard	P	M
AMD**3 (Part 3)	Standard		

Significantly wider range of working pressure

The new sealing structure has enhanced the working pressure range with the same size and the control pressure (0.35 to 0.5 MPa) as the conventional product (Part 2). (Normal temperature, NC specification)



*For details, see the model specification.

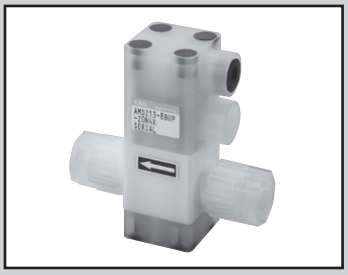
- New option with sensor (signal check of open and close status valve)
  * For Z size contact us.
- Significantly wider range of working fluid temperature for standard products

MAX 120°C

Size variation

Tube connection	1/4" 6 mm	3/8" 10 mm	1/2" 12 mm	3/4"	1" 25 mm	Page
AMDZ*3	●					1
AMD3*3		●	●			3
AMD4*3				●		7
AMD5*3					●	11
AMG* NEW	●	●	●	●	●	15
GAMD* NEW	●	●	●	●	●	23

Discontinue



Air-operated valve for chemical liquid

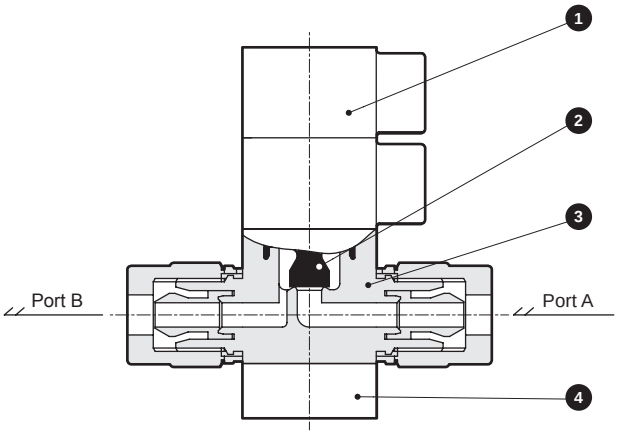
AMDZ*3 Series

Specifications

Descriptions			AMDZ*3	
Working fluid			Pure water, chemical liquids, air, N_2 gas (Note 1)	
Fluid temperature		°C	5 to 120 (Note 2, Note 3)	
Pressure resistance		MPa	1.0	
Working pressure (A→B)		MPa	See figure “Working pressure” below.	
Working pressure (B→A)		MPa	See figure “Working pressure” below.	
Valve seat leakage		cm^3/min	0 (under water pressure)	
Back pressure		MPa	See figure “Working pressure” below.	
Ambient temperature		°C	0 to 60	
Frequency			30 times/min or less	
Mounting orientation			Free	
Connection			OD ø6 tube connection (fitting integrated type) OD 1/4" tube connection (fitting integrated type)	
Orifice			ø4	ø3.5
Cv value		(Note 4)	0.25	0.22
Operation section	Operation pressure	MPa	NC • NO 0.4 to 0.5, double acting 0.3 to 0.4	
	Operation port		Rc1/8 (used operation port NC: port Y, NO: port X, double acting:ports X and Y)	

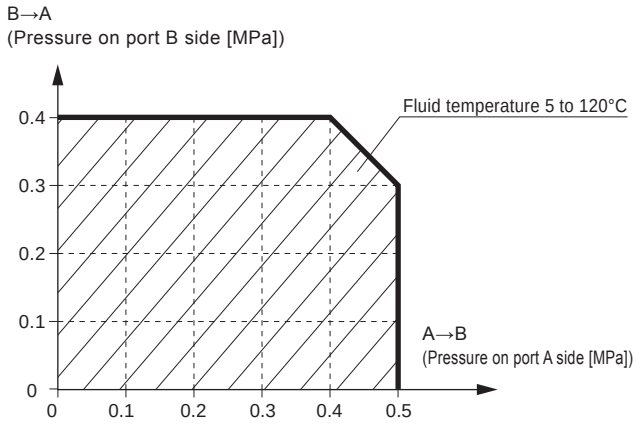
Note 1: Check compatibility between the material of each components and the working environment of the working fluid. (Refer to page 43 for the compatibility check list.)
Note 2: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hy drofluoric acid.
Note 3: 5°C to 100°C in the case of connection with an F-LOCK 60 series fitting
Note 4: The Cv value shown is at 23°C.

Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PTFE
4	Mounting plate	PVDF

Working pressure



How to order

AMDZ 1 3 - 6UP - Z0 N 4 X

- 1: Ⓐ Operation method
- 3: Ⓐ Operation method
- 6UP: Ⓑ Connection
- Z0: Ⓒ Actuator option
- N: Ⓓ Body option
- 4: Ⓔ Operation port direction
- X: Ⓕ Mounting

Ⓐ Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

Ⓑ Connection (Note 1)			
6UP	8BUP	6UR	8BUR
Super 300 type Pillar fitting P Series integrated type		F-LOCK 60 series Fitting integrated type	
ø6×ø4 Connection tube	1/4"×5/32" Connection tube	ø6×ø4 Connection tube	1/4"×5/32" Connection tube

Symbol	Descriptions / Orifice	ø4		ø3.5	
Ⓒ Actuator option					
Z0	ON • OFF Only	●	●	●	●
Ⓓ Body option		Body material			
N	Normal body	PTFE			
Ⓔ Operation port direction					
4	In the overhead view, ← indicates the fluid flow direction, ⇦ the operation port direction.	●	●	●	●
1		●	●	●	●
2		●	●	●	●
3		●	●	●	●
Ⓕ Mounting (Note 2)					
X	Bottom mounting	●	●	●	●

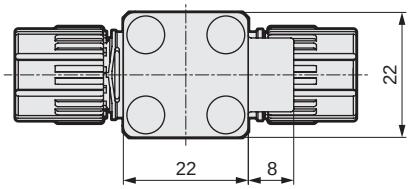
Note on model No. selection

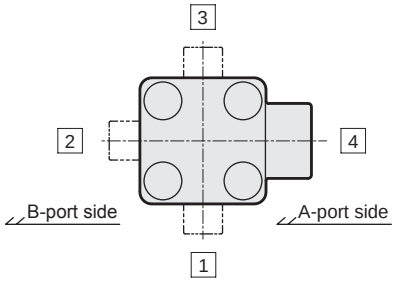
Note 1: F-LOCK 60 series fittings are built-to-order products.
Contact CKD for other connection methods.
Note 2: Contact CKD for flange installation.

Dimensions

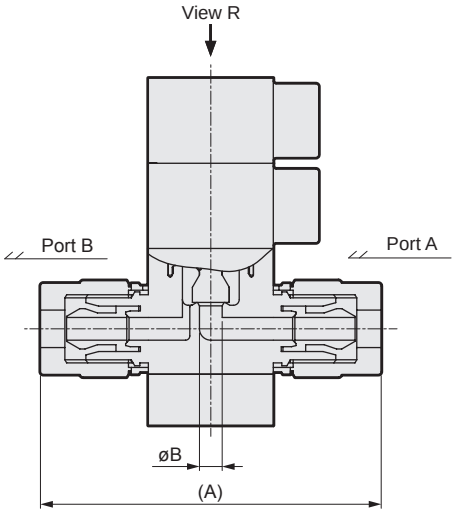
● Bottom mounting

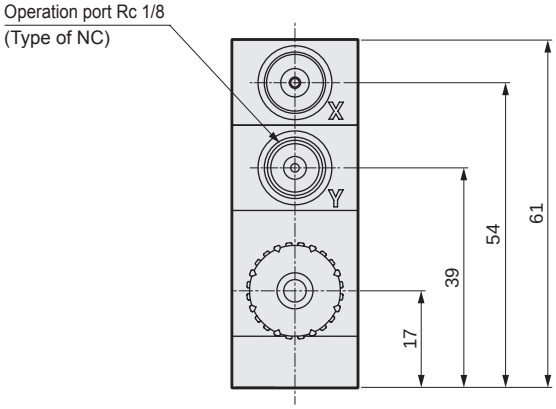
• AMDZ*3-*-Z0N*X

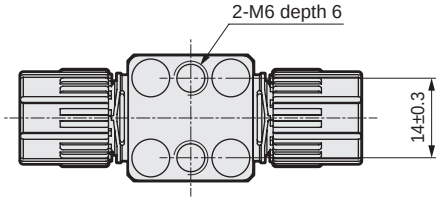




Operation port direction (view R)

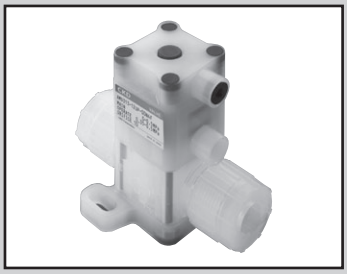






Connection	A	B
6UP	60	4
8BUP	60	4
6UR	82	3.5
8BUR	84	3.5

Discontinue



Air-operated valve for chemical liquid

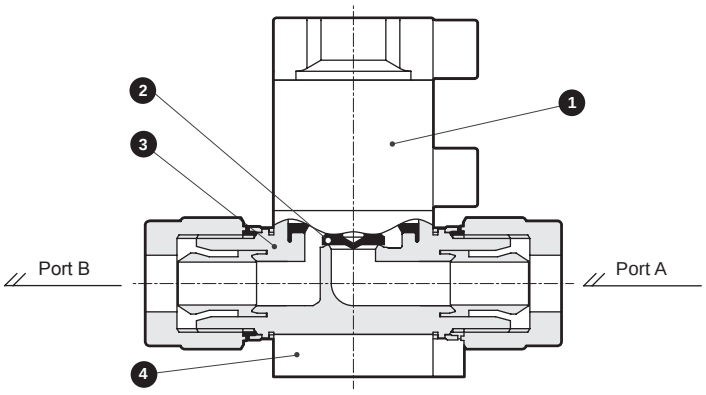
AMD3*3 Series

Specifications

Descriptions		AMD3*3					
Body option		N (Normal body)				B (Body with bypass)	
Working fluid		Chemical liquids, pure water, air, and N_2 gas (Note 1)					
Fluid temperature	°C	5 to 120 (NO, 5 to 100 for double acting) (Note 3, Note 4)				5 to 90	
Pressure resistance	MPa	1.0					
Working pressure (A→B)	MPa	See figure “Working pressure” below.					
Working pressure (B→A)	MPa	See figure “Working pressure” below.					
Valve seat leakage	cm^3/min	0 (under water pressure)					
Back pressure	MPa	See figure “Working pressure” below.					
Ambient temperature	°C	0 to 60 (0 to 50 with a sensor)					
Frequency		30 times/min or less					
Mounting orientation		Free					
Connection		OD ø10, ø12 tube connection (fitting integrated type) OD 3/8”, 1/2” tube connection (fitting integrated type)					
Orifice	(Note 5)	ø6	ø7	ø8	ø9	ø10	
Cv value	(Note 6)	0.7	1	1.25	1.6	1.8	
Bypass orifice diameter		-				ø2.3	
Operation section	Operation pressure MPa	NC: 0.35 to 0.5 NO: 0.35 to 0.4 Double acting: 0.3 to 0.35 (Note 7)					
	Operation port	Rc1/8 (used operation port NC: port Y, NO: port X, double acting: ports X and Y)					
Sensor		See page 31 and 32.					

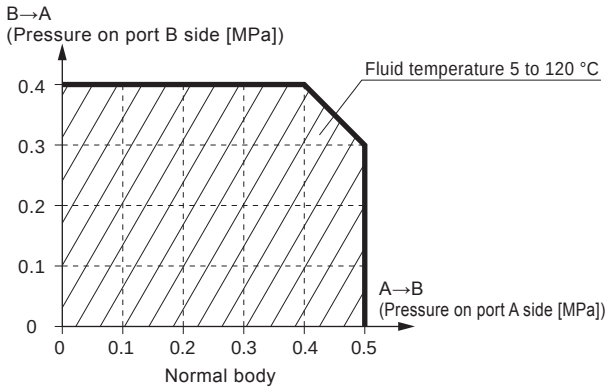
Note 1: Use the product after confirming the compatibility of the product material to the working fluid and environment. (See page 43 for the compatibility check list.)
A body with bypass cannot be used for hydrofluoric acid or chemical liquids that include hydrofluoric acid.
Note 2: Refer to page 33 and 34 for flow characteristics.
Note 3: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 4: 5°C to 100°C in the case of connection of an F-LOCK 60 series fitting
Note 5: Check the orifice diameter of any model in its how-to-order page.
Note 6: The Cv value shown is at 23°C.
Note 7: The NO specification is valid in 0.35 to 0.5 MPa, and the double acting specification is valid in 0.3 to 0.4 MPa, when the fluid temperature is within 5 to 60°C.

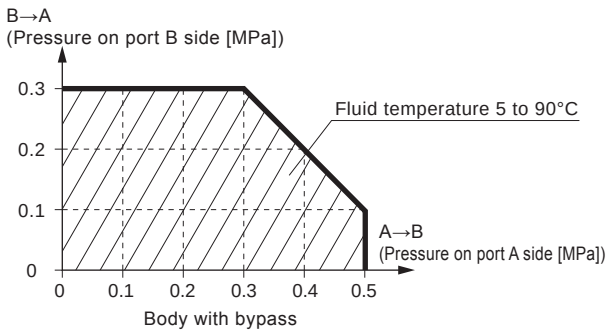
Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PFA, PTFE
4	Mounting plate	PVDF

Working pressure





Discontinue

How to order

AMD3 (1) **3** - (10UP) - (00) (N) (4) (F)

- Model number: AMD3 … 3
- A Operation method: 1
- B Connection: 10UP
- C Actuator option: 00
- D Body option: N
- E Operation port direction: 4
- F Mounting: F

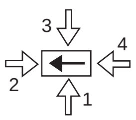
A Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

B Connection (Note 1)	10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR
	Super 300 type Pillar fitting P Series integrated type				F-LOCK 60 series Fitting integrated type			
	ø10×ø8 Connection tube	3/8"×1/4" Connection tube	ø12×ø10 Connection tube	1/2"×3/8" Connection tube	ø10×ø8 Connection tube	3/8"×1/4" Connection tube	ø12×ø10 Connection tube	1/2"×3/8" Connection tube
Orifice	ø8		ø10		ø7	ø6	ø9	

Symbol	Descriptions			10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR
C Actuator option											
00	ON/OFF only (with indicator)			●	●	●	●	●	●	●	●
10	With regulator			●	●	●	●	●	●	●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length								
A1	NPN	Operation port side	1 m	●	●	●	●	●	●	●	●
A3	NPN	Operation port side	3 m	●	●	●	●	●	●	●	●
B1	NPN	Opposite side of operation port	1 m	●	●	●	●	●	●	●	●
B3	NPN	Opposite side of operation port	3 m	●	●	●	●	●	●	●	●
C1	PNP	Operation port side	1 m	●	●	●	●	●	●	●	●
D1	PNP	Opposite side of operation port	1 m	●	●	●	●	●	●	●	●

D Body option		Body material			
N	Normal body	PFA	PFA	PTFE	PTFE
B	Body with bypass	PTFE	PFA	PTFE	PTFE

E Operation port direction (Note 2)		10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR
4		●	●	●	●	●	●	●	●
1		●	●	●	●	●	●	●	●
2		●	●	●	●	●	●	●	●
3		●	●	●	●	●	●	●	●



In the overhead view, ← indicates the fluid flow direction, ⇦ the operation port direction.

F Mounting (Note 2)		10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR
F	Flange mounting	●	●	●	●	●	●	●	●
X	Bottom mounting	●	●	●	●	●	●	●	●

⚠ Note on model No. selection

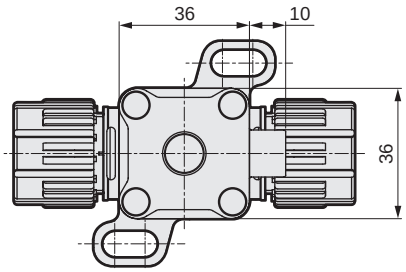
Note 1: In the case of an F-LOCK 60 series fitting and when the body material is PTFE, the product is built to order.
Contact CKD for other connection methods.

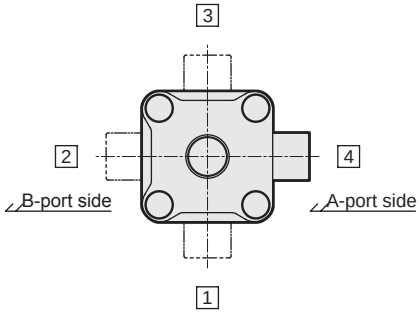
Note 2: Refer to “Dimensions” for the operation port direction, sensor cable direction, and mounting plate.

Dimensions

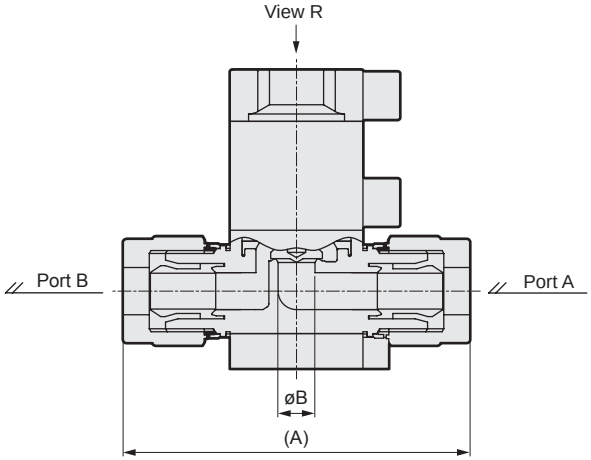
● 00 ON/OFF only (with indicator) + N normal body

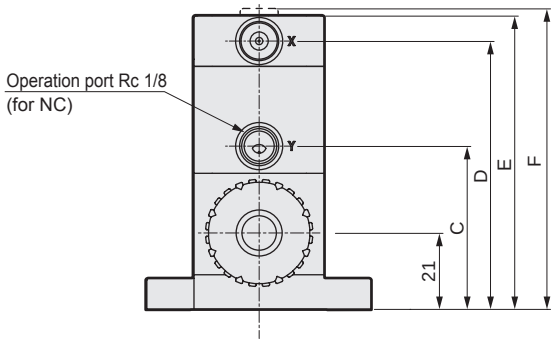
• AMD3*3- *1 -00N**





Operation port direction (view R)

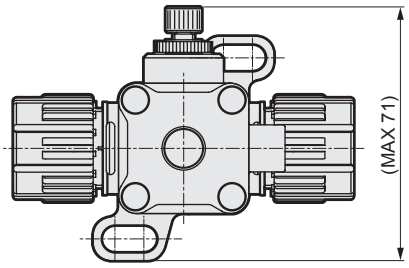


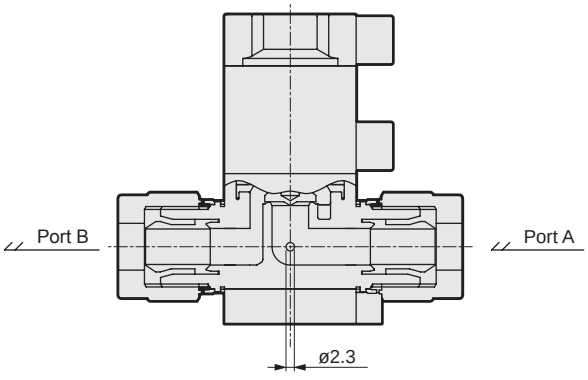


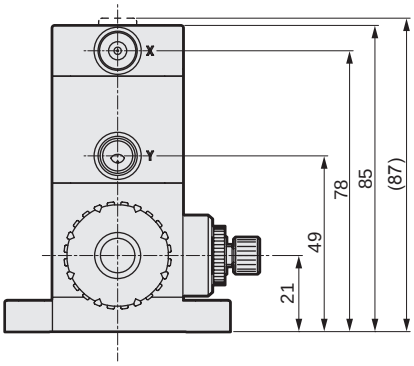
*1 Connection method	A	B	C	D	E	F
10UP	86	8	45	74	81	(83)
10BUP	86	8				
12UP	94	10				
15BUP	94	10				
10UR	110	7	49	78	85	(87)
10BUR	114	6				
12UR	110	9				
15BUR	114	9				

● 00 ON/OFF only (with indicator) + B body with bypass

• AMD3*3-*-00B**







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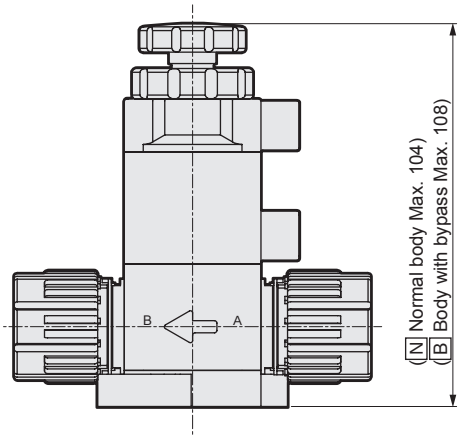
Dimensions

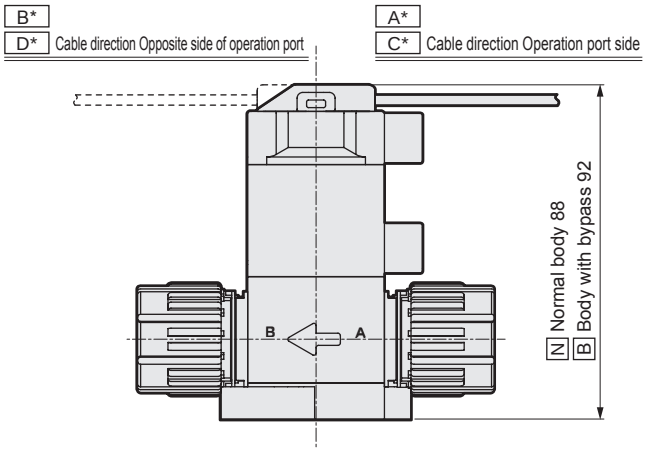
● 10 With regulator

• AMD3*3-*-10***



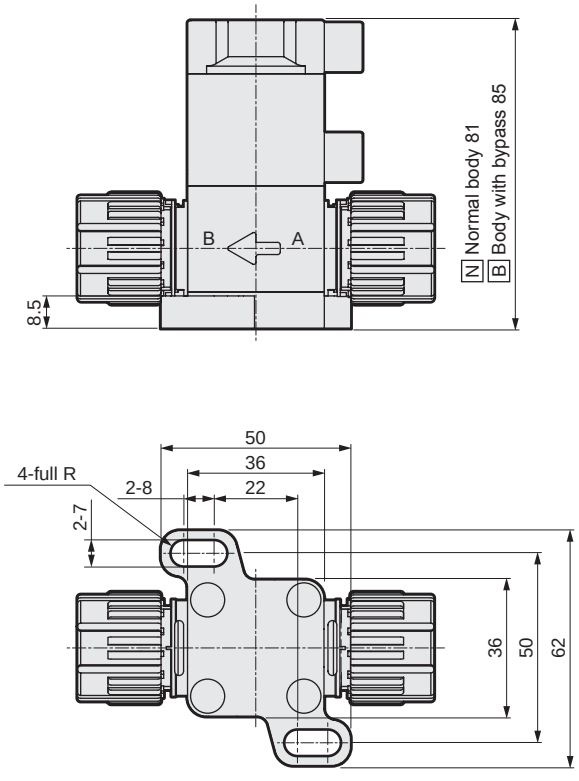
● A* B* C* D* With sensor

• AMD3*3-*-(A/B/C/D)****



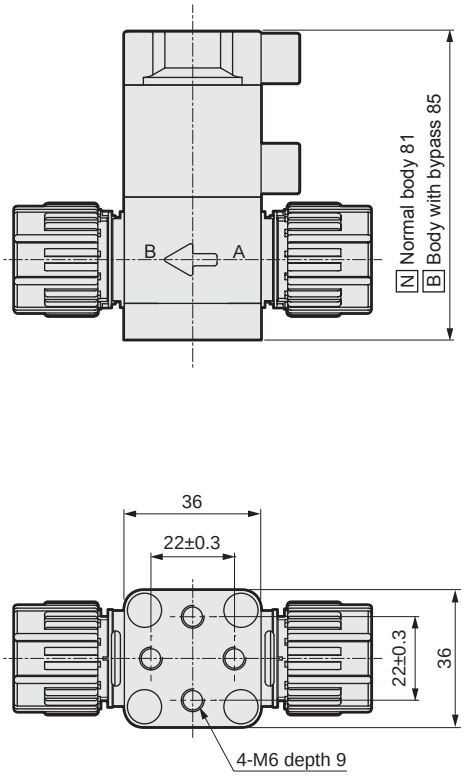
● F Flange mounting

• AMD3*3-*-***F



● X Bottom mounting

• AMD3*3-*-***X



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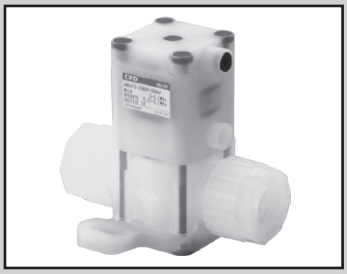


Air-operated valve for chemical liquid

AMD4*3 Series

RoHS CAD

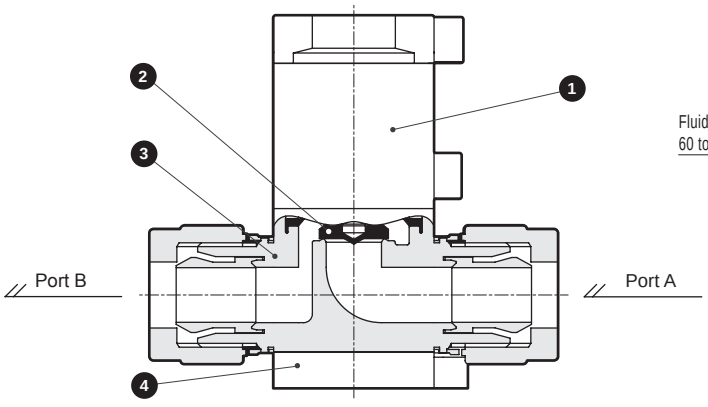
Subject to Export Trade Control Ordinances

Specifications

Descriptions		AMD4 *3	
Body option		**N (Normal body)**	**B (Body with bypass)**
Working fluid		Chemical liquids, pure water, air, and N_2 gas (Note 1)	
Fluid temperature	°C	5 to 120 (NO, 5 to 100 for double acting) (Note 3, Note 4)	5 to 90
Pressure resistance	MPa	1.0	
Working pressure (A→B)	MPa	See figure “Working pressure” below.	
Working pressure (B→A)	MPa	See figure “Working pressure” below.	
Valve seat leakage	cm^3/min	0 (under water pressure)	
Back pressure	MPa	See figure “Working pressure” below.	
Ambient temperature	°C	0 to 60 (0 to 50 with a sensor)	
Frequency		20 times/min or less	
Mounting orientation		Free	
Connection		OD 3/4” tube connection (fitting integrated type)	
Orifice	(Note 5)	ø15	ø16
Cv value	(Note 6)	4.5	5
Bypass orifice diameter		-	ø6
Operation section	Operation pressure MPa	NC: 0.35 to 0.5 NO: 0.35 to 0.4 Double acting: 0.3 to 0.35 (Note 7)	
	Operation port	Rc1/8 (used operation port NC: port Y, NO: port X, double acting:ports X and Y)	
Sensor		See page 31 and 32.	

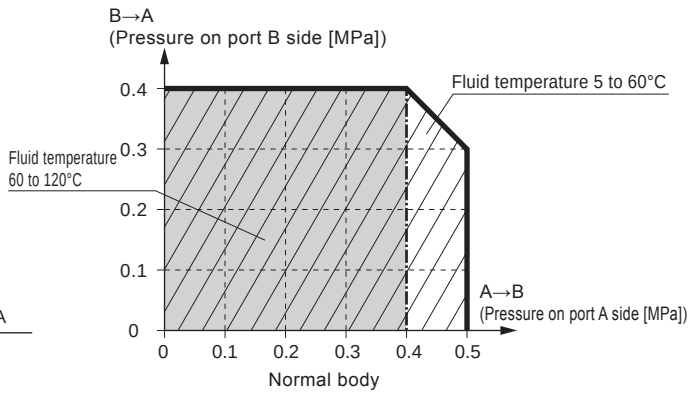
Note 1: Use the product after confirming the compatibility of the product material to the working fluid and environment. (See page 43 for the compatibility check list.)
A body with bypass cannot be used for hydrofluoric acid or chemical liquids that include hydrofluoric acid.
Note 2: Refer to page 33 and 34 for flow characteristics.
Note 3: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 4: 5°C to 100°C in the case of connection of an F-LOCK 60 series fitting
Note 5: Check the orifice diameter of any model in its how-to-order page.
Note 6: The Cv value shown is at 23°C.
Note 7: The NO specification is valid in 0.35 to 0.5 MPa, and the double acting specification is valid in 0.3 to 0.4 MPa, when the fluid temperature is within 5 to 60°C.

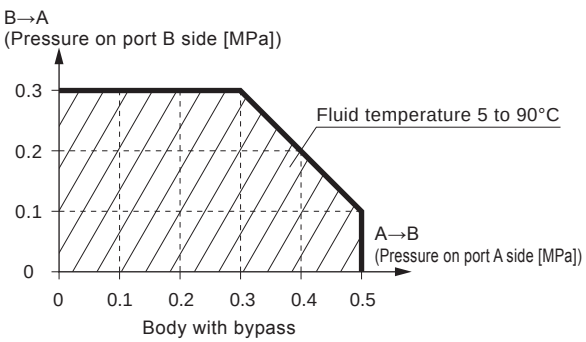
Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PFA, PTFE
4	Mounting plate	PVDF

Working pressure





How to order

AMD4 (1) 3 - (20BUP) - (00) (N) (4) (F)

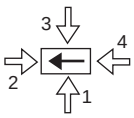
- Model number
- (A) Operation method
- (B) Connection
- (C) Actuator option
- (D) Body option
- (E) Operation port direction
- (F) Mounting

(A) Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

(B) Connection (Note 1)	
20BUP	20BUR
Super 300 type Pillar fitting P Series integrated type	F-LOCK 60 series Fitting integrated type
3/4"×5/8" Connection tube	3/4"×5/8" Connection tube

Symbol	Descriptions / Orifice			ø16	ø15
(C) Actuator option					
00	ON/OFF only (with indicator)			●	●
10	With regulator			●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length		
A1	NPN	Operation port side	1 m	●	●
A3	NPN	Operation port side	3 m	●	●
B1	NPN	Opposite side of operation port	1 m	●	●
B3	NPN	Opposite side of operation port	3 m	●	●
C1	PNP	Operation port side	1 m	●	●
D1	PNP	Opposite side of operation port	1 m	●	●

(D) Body option		Body material	
N	Normal body	PFA	PTFE
B	Body with bypass	PFA	PTFE

(E) Operation port direction (Note 2)			
4	 In the overhead view, ← indicates the fluid flow direction, ⇦ the operation port direction.	●	●
1		●	●
2		●	●
3		●	●

(F) Mounting (Note 2)			
F	Flange mounting	●	●
X	Bottom mounting	●	●

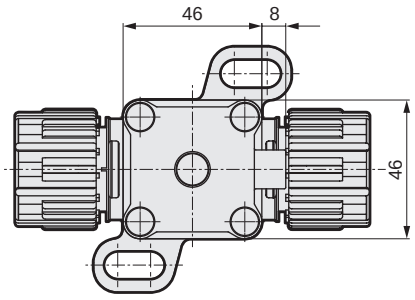
Note on model No. selection

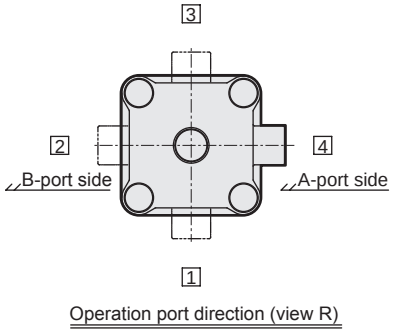
Note 1: F-LOCK 60 series fittings are built-to-order products.
Contact CKD for other connection methods.
Note 2: Refer to “Dimensions” for the operation port direction, sensor cable direction, and mounting plate.

Dimensions

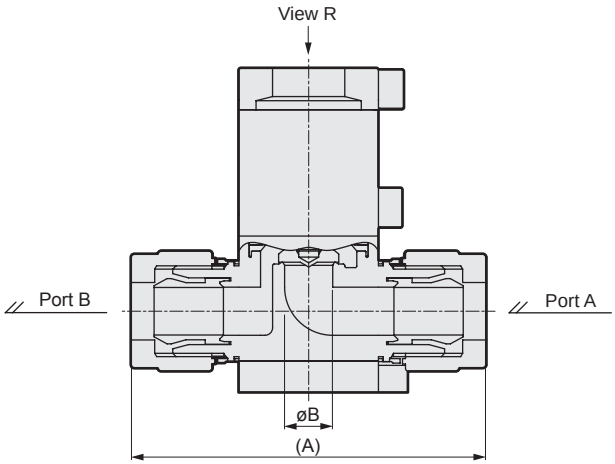
● 00 ON/OFF only (with indicator) + N normal body

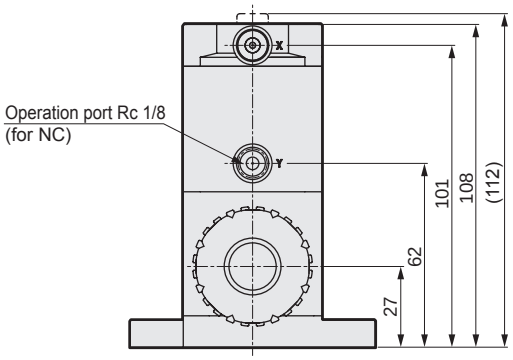
• AMD4*3- *1 -00N**





Operation port direction (view R)

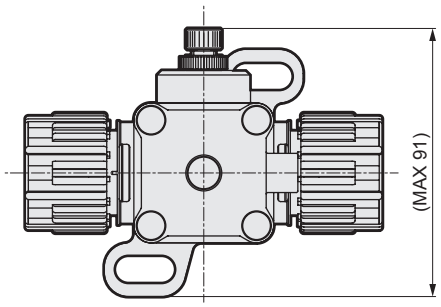


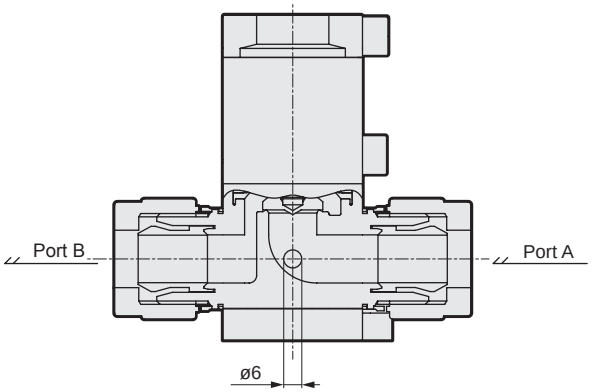


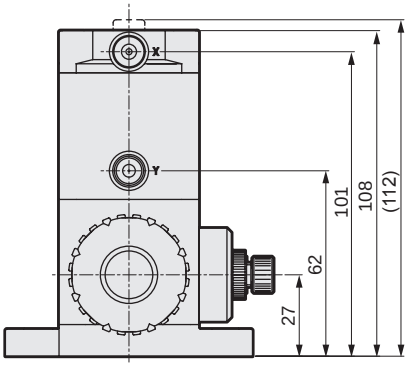
*1 Connection method	A	B
20BUP	118	16
20BUR	134	15

● 00 ON/OFF only (with indicator) + B body with bypass

• AMD4*3-*-00B**



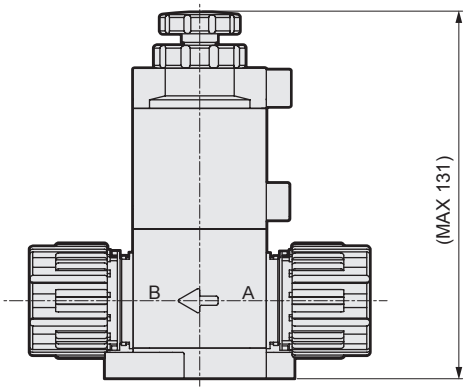




Dimensions

● 10 With regulator

• AMD4*3-*-10***

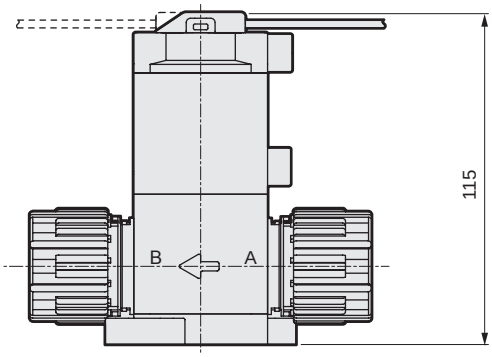


● A* B* C* D* With sensor

• AMD4*3-*-A/B/C/D****

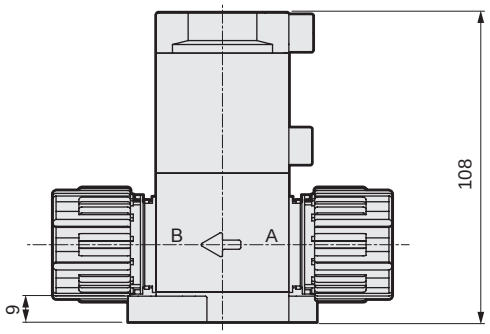
B* D* Cable direction Opposite side of operation port

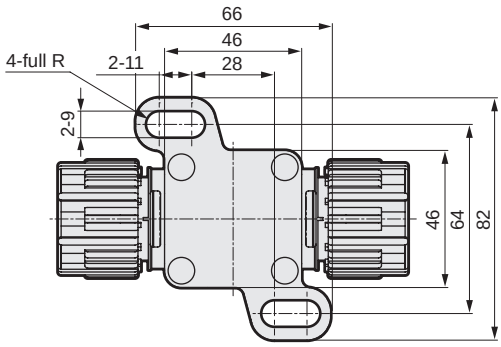
A* C* Cable direction Operation port side



● F Flange mounting

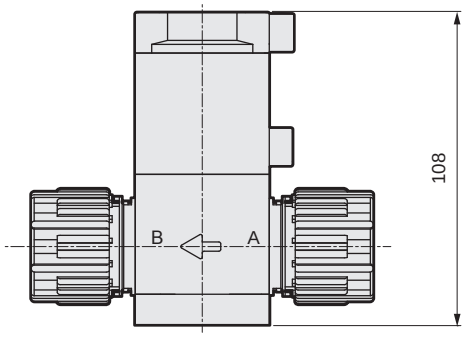
• AMD4*3-*-***F

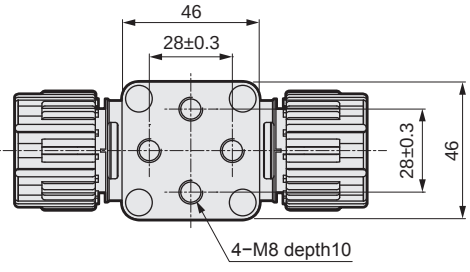




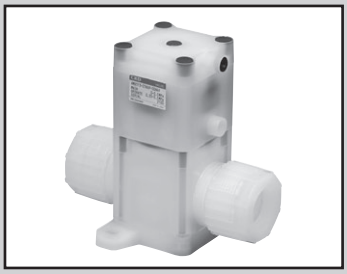
● X Bottom mounting

• AMD4*3-*-***X





Discontinue



Air-operated valve for chemical liquid

AMD5*3 Series

RoHS CAD

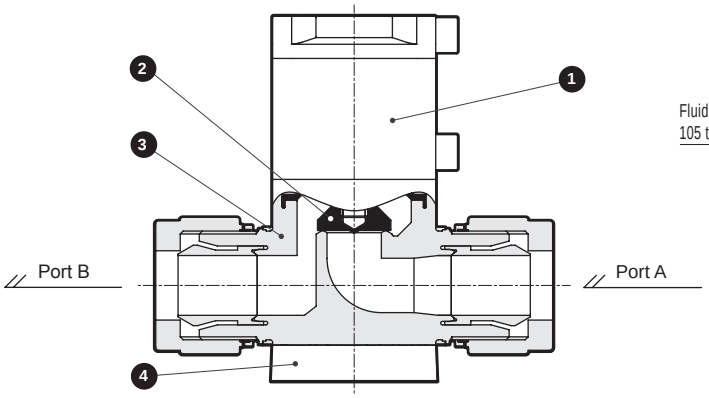
Subject to Export Trade Control Ordinances

Specifications

Descriptions		AMD5 *3	
Body option		**N (Normal body)**	**B (Body with bypass)**
Working fluid		Chemical liquids, pure water, air, and N_2 gas (Note 1)	
Fluid temperature	°C	5 to 120 (NO, 5 to 105 for double acting) (Note 3, Note 4)	5 to 90
Pressure resistance	MPa	1.0	
Working pressure (A→B)	MPa	See figure “Working pressure” below.	
Working pressure (B→A)	MPa	See figure “Working pressure” below.	
Valve seat leakage	cm^3/min	0 (under water pressure)	
Back pressure	MPa	See figure “Working pressure” below.	
Ambient temperature	°C	0 to 60 (0 to 50 with a sensor)	
Frequency		20 times/min or less	
Mounting orientation		Free	
Connection		OD ø25 tube connection (fitting integrated type) OD 1” tube connection (fitting integrated type)	
Orifice		ø20	
Cv value	(Note 5)	8	
Bypass orifice diameter		-	ø6
Operation section	Operation pressure MPa	NC: 0.35 to 0.5 NO: 0.35 to 0.4 Double acting: 0.3 to 0.35 (Note 6)	
	Operation port	Rc1/8 (used operation port NC: port Y, NO: port X, double acting:ports X and Y)	
Sensor		See page 31 and 32.	

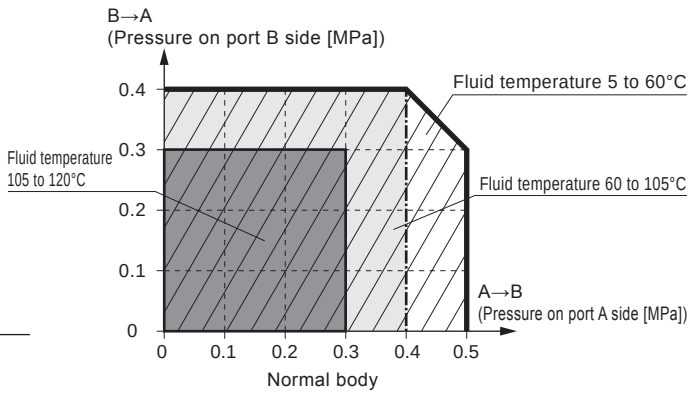
Note 1: Use the product after confirming the compatibility of the product material to the working fluid and environment. (See page 43 for the compatibility check list.)
A body with bypass cannot be used for hydrofluoric acid or chemical liquids that include hydrofluoric acid.
Note 2: Refer to page 33 and 34 for flow characteristics.
Note 3: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 4: 5°C to 100°C in the case of connection of an F-LOCK 60 series fitting
Note 5: The Cv value shown is the one at 23°C.
Note 6: The NO specification is valid in 0.35 to 0.5 MPa, and the double acting specification is valid in 0.3 to 0.4 MPa, when the fluid temperature is within 5 to 60°C.

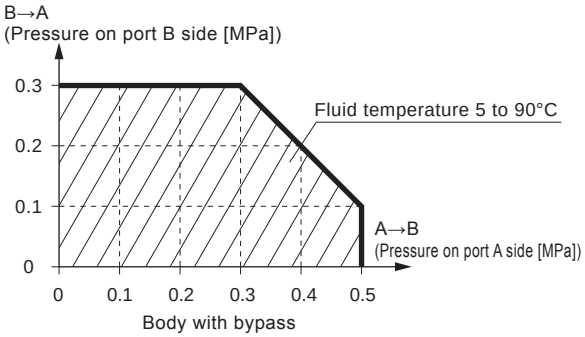
Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PFA, PTFE
4	Mounting plate	PVDF

Working pressure





How to order

AMD5 (1) 3 - (25BUP) - (00)(N)(4)(F)

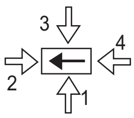
- Model number: AMD5
- A Operation method: 1
- B Connection: 25BUP
- C Actuator option: 00
- D Body option: N
- E Operation port direction: 4
- F Mounting: F

A Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

B Connection (Note 1)	25UP	25BUP	25UR	25BUR
	Super 300 type Pillar fitting P Series integrated type		F-LOCK 60 series Fitting integrated type	
	ø25 x ø22 Tube connection	1"×7/8" Connection tube	ø25 x ø22 Tube connection	1"×7/8" Connection tube
Symbol / Descriptions / Orifice	ø20			

C Actuator option				25UP	25BUP	25UR	25BUR
00	ON/OFF only (with indicator)			●	●	●	●
10	With regulator			●	●	●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length				
A1	NPN	Operation port side	1 m	●	●	●	●
A3	NPN	Operation port side	3 m	●	●	●	●
B1	NPN	Opposite side of operation port	1 m	●	●	●	●
B3	NPN	Opposite side of operation port	3 m	●	●	●	●
C1	PNP	Operation port side	1 m	●	●	●	●
D1	PNP	Opposite side of operation port	1 m	●	●	●	●

D Body option		Body material	
N	Normal body	PFA	PTFE
B	Body with bypass	PTFE	PTFE

E Operation port direction (Note 2)		25UP	25BUP	25UR	25BUR
4	 In the overhead view, ← indicates the fluid flow direction, ⇦ the operation port direction.	●	●	●	●
1		●	●	●	●
2		●	●	●	●
3		●	●	●	●

F Mounting (Note 2)		25UP	25BUP	25UR	25BUR
F	Flange mounting	●	●	●	●
X	Bottom mounting	●	●	●	●

Note on model No. selection

Note 1: In the case of an F-LOCK 60 series fitting and when the body material is PTFE, the product is built to order.
Contact CKD for other connection methods.

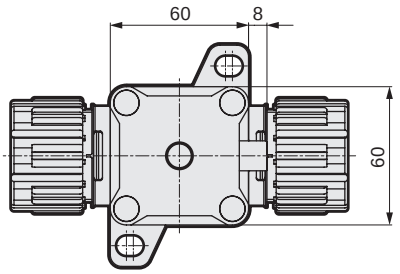
Note 2: Refer to “Dimensions” for the operation port direction, sensor cable direction, and mounting plate.

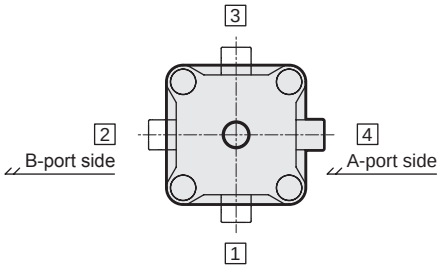
Discontinue

Dimensions

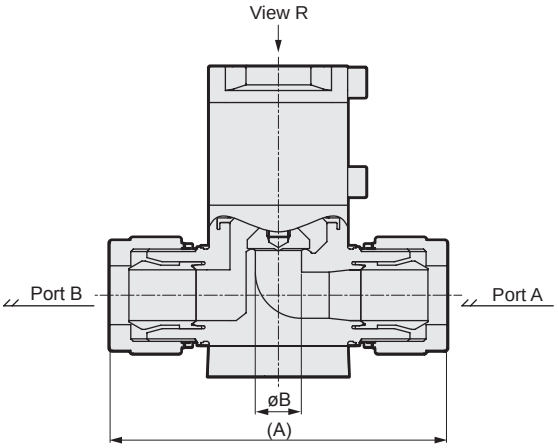
● 00 ON/OFF only (with indicator) + N normal body

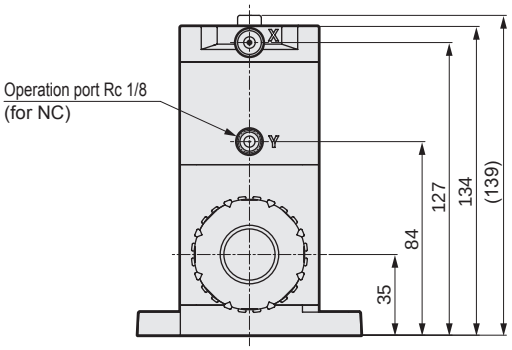
• AMD5*3- *1 -00N**





Operation port direction (view R)

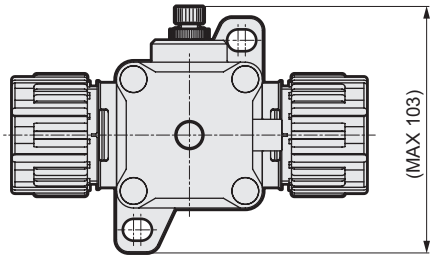


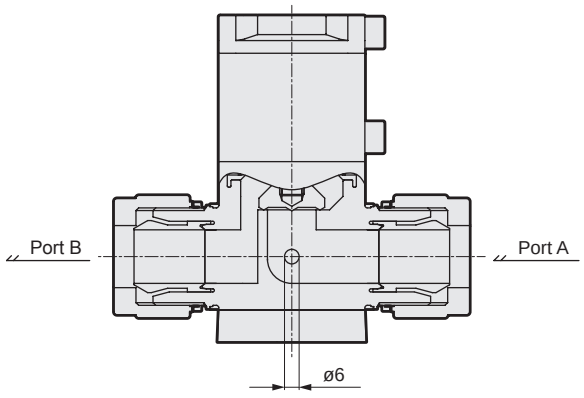


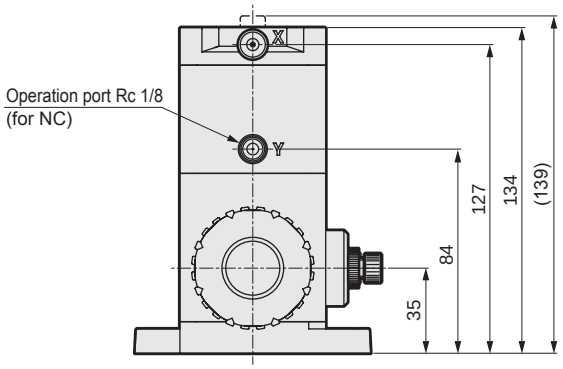
*1 Connection method	A	B
25UP	146	20
25BUP	146	20
25UR	159	20
25BUR	162	20

● 00 ON/OFF only (with indicator) + B body with bypass

• AMD5*3-*-00B**



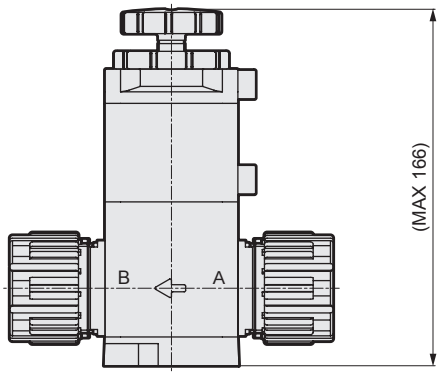




Dimensions

● 10 With regulator

• AMD5*3-*-10***

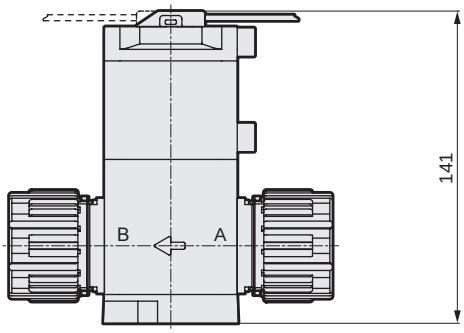


● A* With sensor
B*
C*
D*

• AMD5*3-*-A/B/C/D****

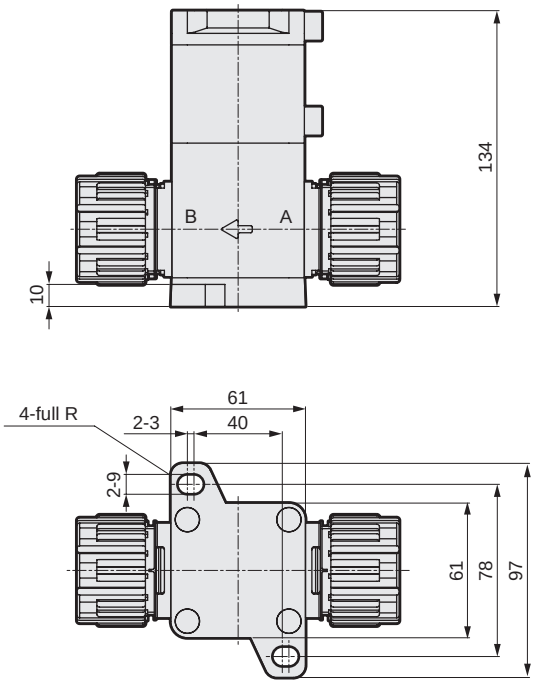
B*
D* Cable direction Opposite side of operation port

A*
C* Cable direction Operation port side



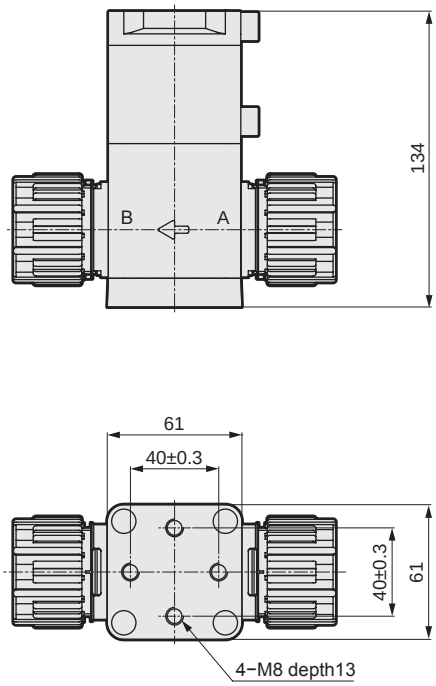
● F Flange mounting

• AMD5*3-*-***F

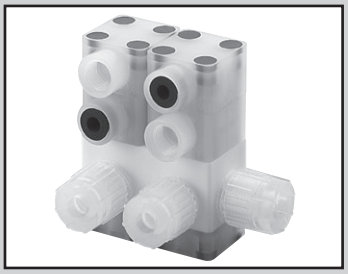


● X Bottom mounting

• AMD5*3-*-***X



Discontinue



Air-operated valve for chemical liquid (3-port valve)

AMGZ03 Series

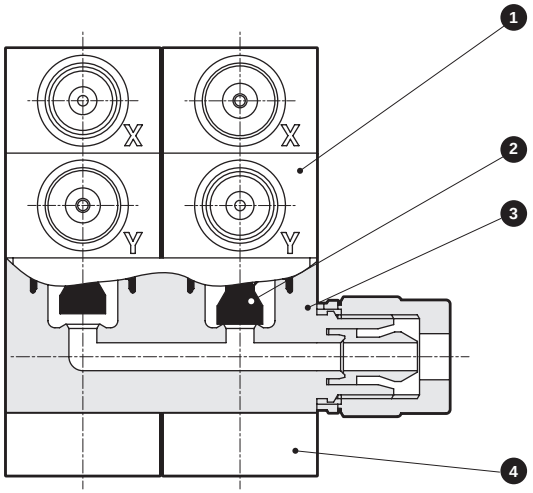
RoHS CAD Custom order

Specifications

Descriptions			AMGZ03	
Working fluid			Pure water, chemical liquids, air, N_2 gas (Note 1)	
Fluid temperature		°C	5 to 120 (Note 2, Note 3)	
Pressure resistance		MPa	1.0	
Working pressure (A→B)		MPa	See figure “Working pressure” below.	
Working pressure (B→A)		MPa	See figure “Working pressure” below.	
Valve seat leakage		cm^3/min	0 (under water pressure)	
Back pressure		MPa	See figure “Working pressure” below.	
Ambient temperature		°C	0 to 60	
Frequency			30 times/min or less	
Mounting orientation			Free	
Connection			OD ø6 tube connection (fitting integrated type) OD 1/4" tube connection (fitting integrated type)	
Orifice			ø4	ø3.5
Operation section	Operation pressure	MPa	NC/NO: 0.4 to 0.5	
	Operation port		Rc1/8	

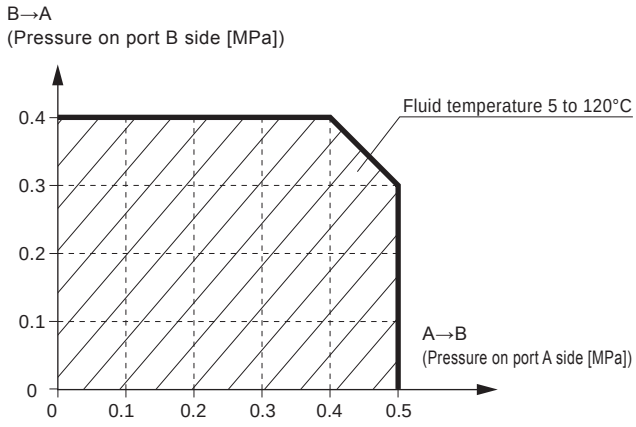
Note 1: Check compatibility between the material of each components and the working environment of the working fluid. (Refer to page 43 for the compatibility check list.)
Note 2: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 3: 5°C to 100°C in the case of connection of an F-LOCK 60 series fitting

Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PTFE
4	Mounting plate	PVDF

Working pressure



How to order

AMGZ03 - 6UP - Z0 L

- AMGZ03: Model number
- 6UP: Ⓐ Connection
- Z0: Ⓑ Actuator option
- L: Ⓒ Port A position

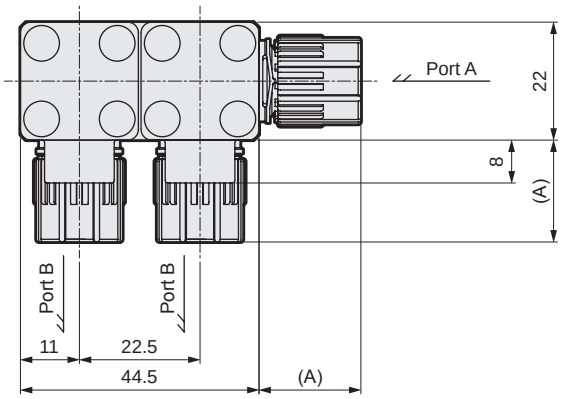
Symbol	Description \ Orifice	Ⓐ Connection (Note 1)			
		6UP	8BUP	6UR	8BUR
		Super 300 type Pillar fitting P Series integrated type		F-LOCK 60 series Fitting integrated type	
		ø6×ø4 Connection tube	1/4"×5/32" Connection tube	ø6×ø4 Connection tube	1/4"×5/32" Connection tube
		ø4		ø3.5	
	Body material	PTFE			
Ⓑ Actuator option					
Z0	ON • OFF Only	●	●	●	●
Ⓒ Port A position					
L	Left	●	●	●	●
R	Right	●	●	●	●

Note on model No. selection

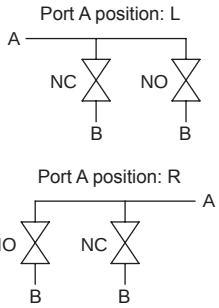
Note: Contact CKD for other connection methods.

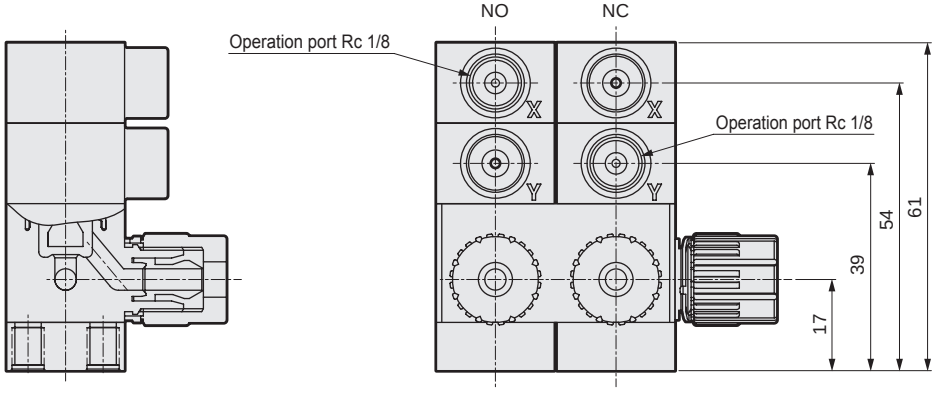
Dimensions

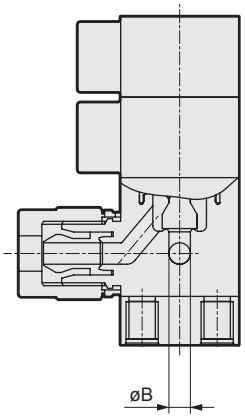
● AMGZ03- *1 -Z0R

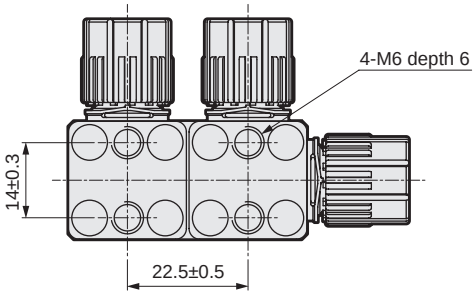


*: The position of NC and NO is different depending on the Port A position.
The valve near the Port A is NC and the other is NO.



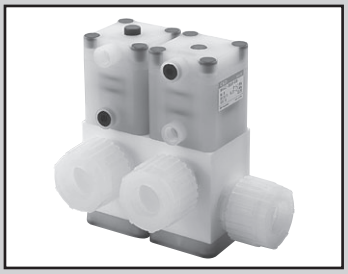






Connection method *1	A	B
6UP	19	4
8BUP	19	4
6UR	30	3.5
8BUR	31	3.5

Discontinue



Air-operated valve for chemical liquid (3-port valve)

AMG$^{3}_{4}_{5}$03 Series

Custom order

Subject to Export Trade Control Ordinances

Applicable to: AMG403 and AMG503

- Orifice: AMG303 ø6 to ø10
  Orifice: AMG403 ø15 to ø16
  Orifice: AMG503 ø20

RoHS CAD

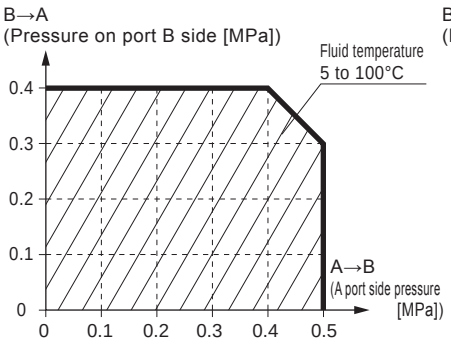
Specifications

Descriptions		AMG303	AMG403	AMG503
Working fluid		Chemical liquids, pure water, air, and N_2 gas (Note 1)		
Fluid temperature	°C	5 to 100 (Note 2)		
Pressure resistance	MPa	1.0		
Working pressure (A→B)	MPa	See figure “Working pressure” below.		
Working pressure (B→A)	MPa	See figure “Working pressure” below.		
Valve seat leakage	cm^3/min	0 (under water pressure)		
Back pressure	MPa	See figure “Working pressure” below.		
Ambient temperature	°C	0 to 60 (0 to 50 with a sensor)		
Frequency		30 times/min or less	20 times/min or less	
Mounting orientation		Free		
Connection		OD ø10, ø12 tube connection (Fitting integrated type) OD 3/8”, 1/2” tube connection (Fitting integrated type)	OD 3/4” tube connection (Fitting integrated type)	OD ø25 tube connection (Fitting integrated type) OD 1” tube connection (Fitting integrated type)
Orifice	(Note 3)	ø6 to ø10	ø15 to ø16	ø20
Operation section	Operation pressure MPa	0.35 to 0.4 (0.35 to 0.5 when the fluid temperature is 60°C or less)		
	Operation port	Rc1/8		
Sensor		See page 31 and 32.		

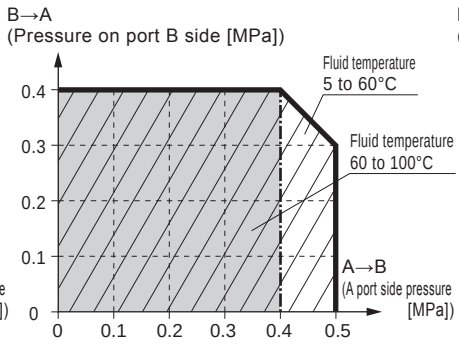
Note 1: Use the product after confirming the compatibility of the product material to the working fluid and environment. (See page 43 for the compatibility check list.)
A body with bypass cannot be used for hydrofluoric acid or chemical liquids that include hydrofluoric acid.
Note 2: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 3: Check the orifice diameter of any model in its how-to-order page.

Working pressure

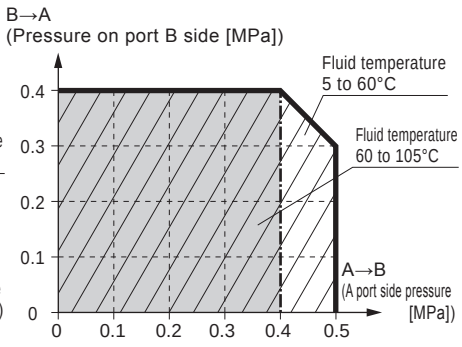
● AMG303



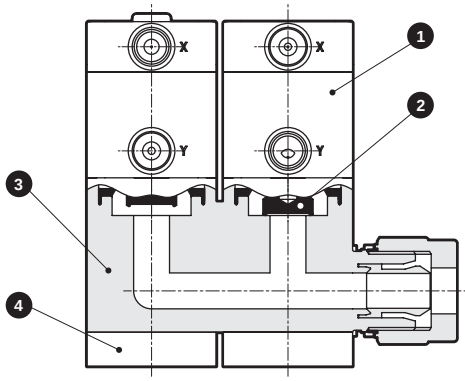
● AMG403



● AMG503

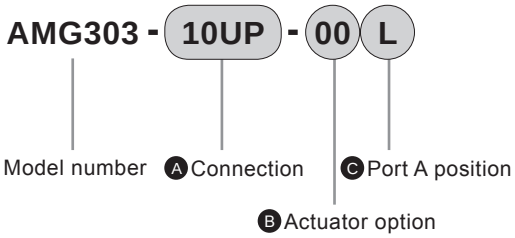


Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PTFE
4	Mounting plate	PVDF

How to order



Symbol	Descriptions \ Orifice				A Connection (Note 1)							
					10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR
					Super 300 type Pillar fitting P Series integrated type				F-LOCK 60 series Fitting integrated type			
					ø10×ø8 Connection tube	3/8"×1/4" Connection tube	ø12×ø10 Connection tube	1/2"×3/8" Connection tube	ø10×ø8 Connection tube	3/8"×1/4" Connection tube	ø12×ø10 Connection tube	1/2"×3/8" Connection tube
	Orifice				ø8		ø10		ø7	ø6	ø9	
	Body material				PTFE							
B Actuator option												
00	ON/OFF only (with indicator)				●	●	●	●	●	●	●	●
10	With regulator				●	●	●	●	●	●	●	●
With sensor	Transistor	Cable direction (Note 2)		Cable length								
A1	NPN	Operation port side		1 m	●	●	●	●	●	●	●	●
A3				3 m	●	●	●	●	●	●	●	●
B1		Opposite side of operation port		1 m	●	●	●	●	●	●	●	●
B3				3 m	●	●	●	●	●	●	●	●
C1	PNP	Operation port side		1 m	●	●	●	●	●	●	●	●
D1		Opposite side of operation port		1 m	●	●	●	●	●	●	●	●
C Port A position (Note 2)												
L	Left				●	●	●	●	●	●	●	●
R	Right				●	●	●	●	●	●	●	●

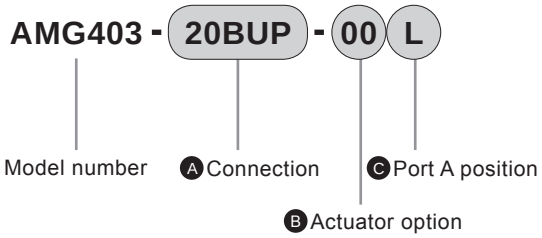
Note on model No. selection

Note 1: Contact CKD for other connection methods.
Note 2: See “Dimensions” for the sensor cable direction and the A port position.

Discontinue

AMG403 Series

How to order

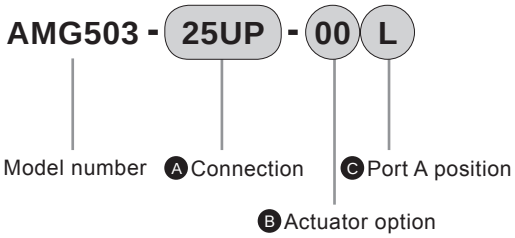


				A Connection (Note 1)	
				20BUP	20BUR
				Super 300 type Pillar fitting P Series integrated type	F-LOCK 60 series Fitting integrated type
				3/4"×5/8" Connection tube	3/4"×5/8" Connection tube
Symbol	Descriptions \ Orifice			ø16	ø15
Body material				PTFE	
B Actuator option					
00	ON/OFF only (with indicator)			●	●
10	With regulator			●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length		
A1	NPN	Operation port side	1 m	●	●
A3			3 m	●	●
B1		Opposite side of operation port	1 m	●	●
B3			3 m	●	●
C1	PNP	Operation port side	1 m	●	●
D1		Opposite side of operation port	1 m	●	●
C Port A position (Note 2)					
L	Left			●	●
R	Right			●	●

Note on model No. selection

Note 1: Contact CKD for other connection methods.
Note 2: See “Dimensions” for the sensor cable direction and the A port position.

How to order



				Ⓐ Connection (Note 1)			
				25UP	25BUP	25UR	25BUR
				Super 300 type Pillar fitting P Series integrated type		F-LOCK 60 series Fitting integrated type	
				ø25 x ø22 Tube connection	1"×7/8" Connection tube	ø25 x ø22 Tube connection	1"×7/8" Connection tube
Symbol	Descriptions \ Orifice			ø20			
	Body material			PTFE			
Ⓑ Actuator option							
00	ON/OFF only (with indicator)			●	●	●	●
10	With regulator			●	●	●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length				
A1	NPN	Operation port side	1 m	●	●	●	●
A3			3 m	●	●	●	●
B1		Opposite side of operation port	1 m	●	●	●	●
B3			3 m	●	●	●	●
C1	PNP	Operation port side	1 m	●	●	●	●
D1		Opposite side of operation port	1 m	●	●	●	●
Ⓒ Port A position (Note 2)							
L	Left			●	●	●	●
R	Right			●	●	●	●

Note on model No. selection

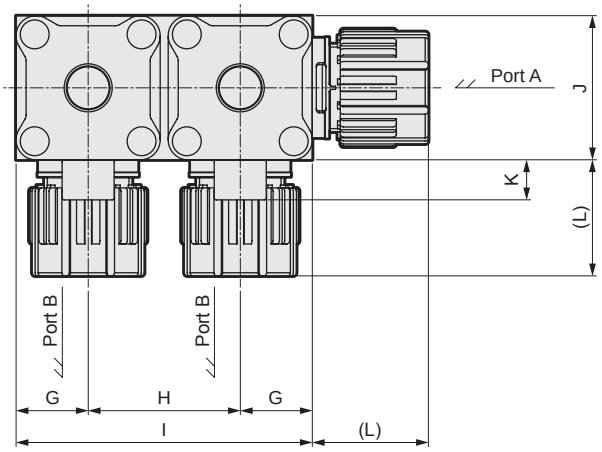
Note 1: Contact CKD for other connection methods.
Note 2: See “Dimensions” for the sensor cable direction and the A port position.

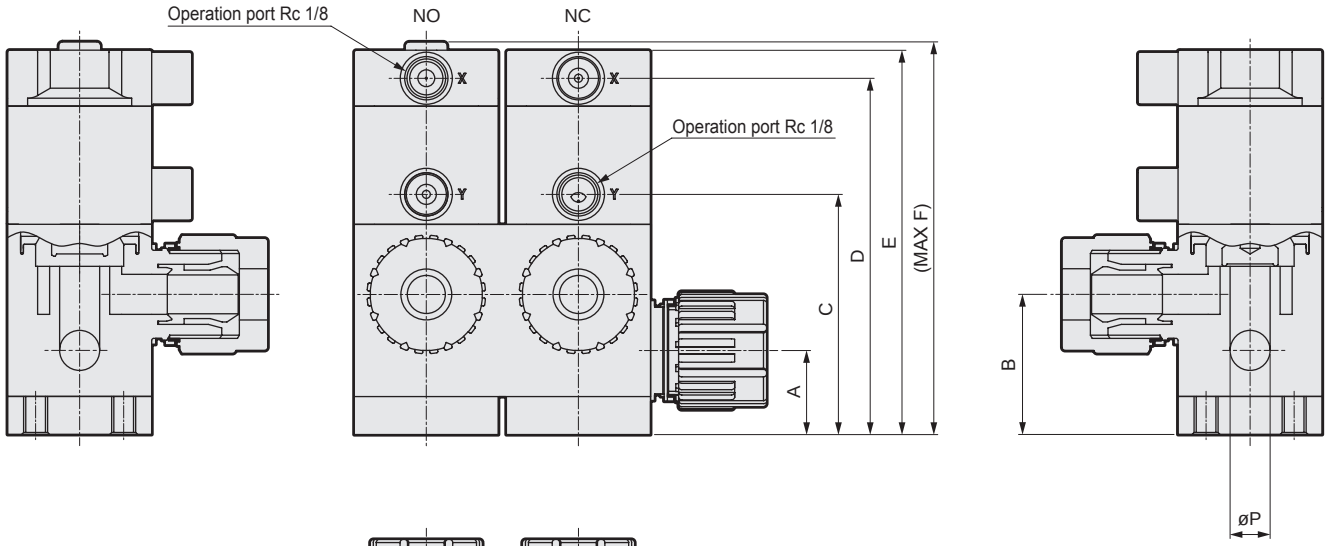
Dimensions

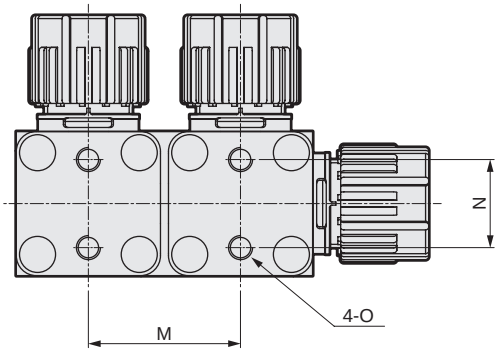
● 00 ON/OFF only (with indicator)

- AMG303- *1
- AMG403- *1
- AMG503- *1

*: The position of NC and NO is different depending on the Port A position.
The valve near the Port A is NC and the other is NO.







Discontinue

Dimensions

Model number	A	B	C	D	E	F	G	H	I	J	K	Q	R
AMG303	21	35	60	89	96	98	18	38	74	36	10	119	103
AMG403	27	46	78	118	125	128	23	48	94	46	8	148	132
AMG503	35	60	99	142	149	154	30	62	122	60	8	181	156

Model number	M	N	O
AMG303	38±0.3	22±0.3	M6 depth 9
AMG403	48±0.4	28±0.3	M8 depth 10
AMG503	62±0.4	40±0.3	M8 depth 13

AMG303 (10 mm, 3/8")

*1 (Connection method)	L	P
10UP	25	8
10BUP	25	8
10UR	37	7
10BUR	39	6

AMG303 (12 mm, 1/2")

*1 (Connection method)	L	P
12UP	29	10
15BUP	29	10
12UR	37	9
15BUR	39	9

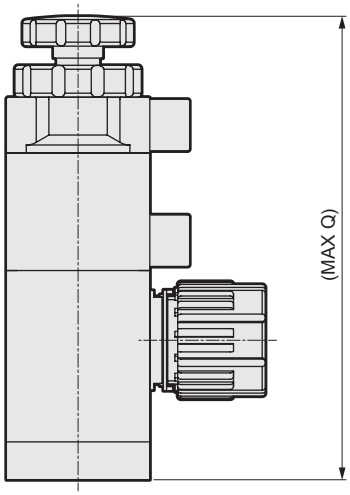
AMG403

*1 (Connection method)	L	P
20BUP	36	16
20BUR	44	15

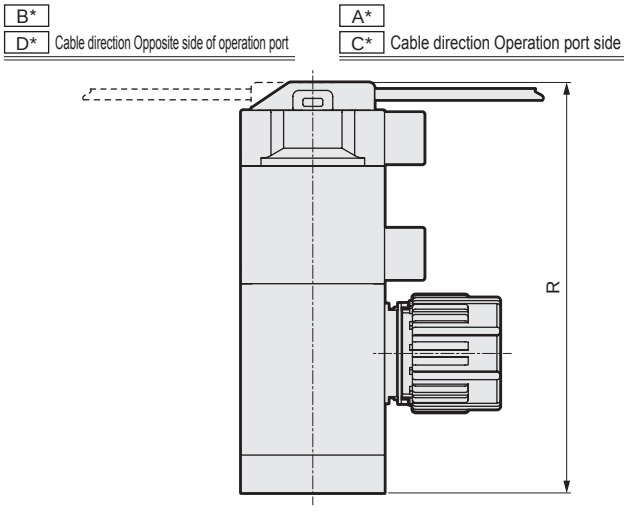
AMG503

*1 (Connection method)	L	P
25UP	43	20
25BUP	43	20
25UR	49.5	20
25BUR	51	20

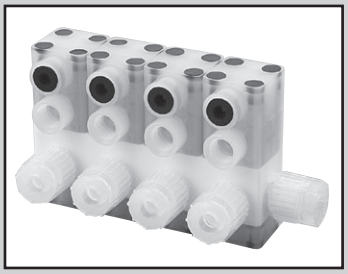
● 10 With regulator
• AMG*03-*-10*



● A* B* C* D* With sensor
• AMG*03-*-A B C D**



Discontinue



Air-operated valve for chemical liquid (manifold, branch valve)

GAMDZ*3 Series

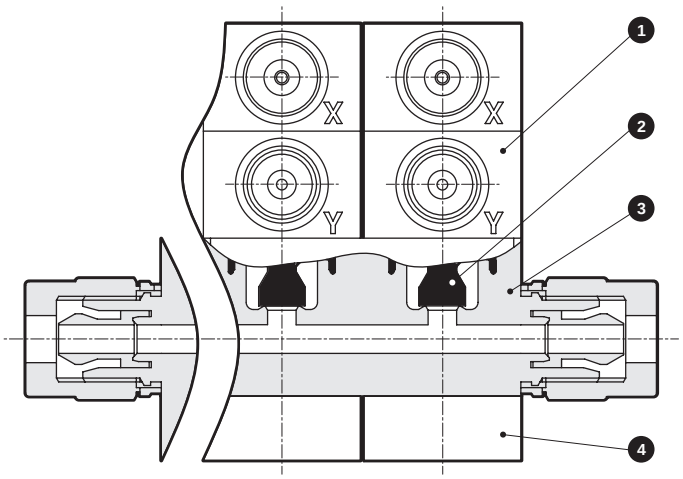
RoHS CAD Custom order

Specifications

Descriptions			GAMDZ*3	
Working fluid			Pure water, chemical liquids, air, N_2 gas (Note 1)	
Fluid temperature		°C	5 to 120 (Note 2, Note 3)	
Pressure resistance		MPa	1.0	
Working pressure (A→B)		MPa	See figure “Working pressure” below.	
Working pressure (B→A)		MPa	See figure “Working pressure” below.	
Valve seat leakage		cm^3/min	0 (under water pressure)	
Back pressure		MPa	See figure “Working pressure” below.	
Ambient temperature		°C	0 to 60	
Frequency			30 times/min or less	
Mounting orientation			Free	
Connection			OD ø6 tube connection (fitting integrated type) OD 1/4” tube connection (fitting integrated type)	
Orifice			ø4	ø3.5
Operation section	Operation pressure	MPa	NC • NO 0.4 to 0.5, double acting 0.3 to 0.4	
	Operation port		Rc1/8 (used operation port NC: port Y, NO: port X, double acting:ports X and Y)	

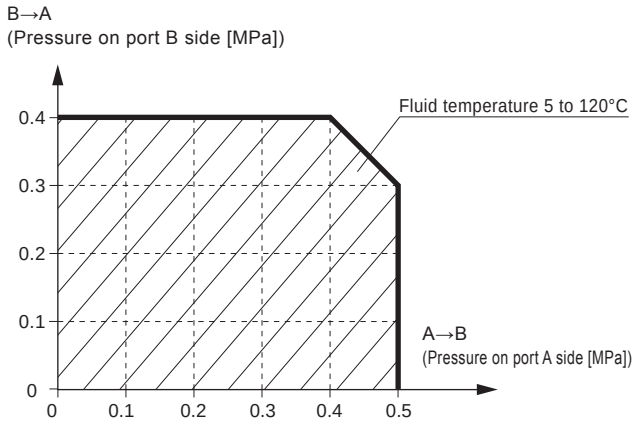
Note 1: Confirm the compatibility of the material of the product components with the working fluid and the environment atmosphere. (Refer to page 43 for the compatibility check list.)
Note 2: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 3: 5°C to 100°C in the case of connection by an F-LOCK 60 series fitting

Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PTFE
4	Mounting plate	PVDF

Working pressure



How to order

GAMDZ **1** **3** - **6UP** - **Z0** **3** **W**

- 1: Ⓐ Operation method
- 3: Ⓑ Connection
- 6UP: Ⓑ Connection
- Z0: Ⓒ Actuator option
- 3: Ⓓ Concatenation
- W: Ⓔ Port A position

Ⓐ Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

Symbol	Description \ Orifice	Ⓑ Connection (Note 1)			
		6UP	8BUP	6UR	8BUR
		Super 300 type Pillar fitting P Series integrated type		F-LOCK 60 series Fitting integrated type	
		ø6×ø 4 Connection tube	1/4"×5/32" Connection tube	ø6×ø4 Connection tube	1/4"×5/32" Connection tube
		ø4		ø3.5	
	Body material	PTFE			
Ⓒ Actuator option					
Z0	ON • OFF Only	●	●	●	●
Ⓓ Concatenation					
1	1 concatenation	●	●	●	●
to	to				
5	5 concatenation				
Ⓔ Port A position					
L	Left	●	●	●	●
R	Right	●	●	●	●
W	Both sides	●	●	●	●

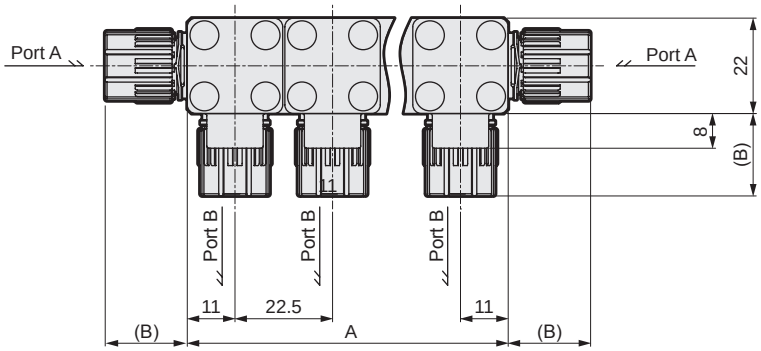
Note on model No. selection

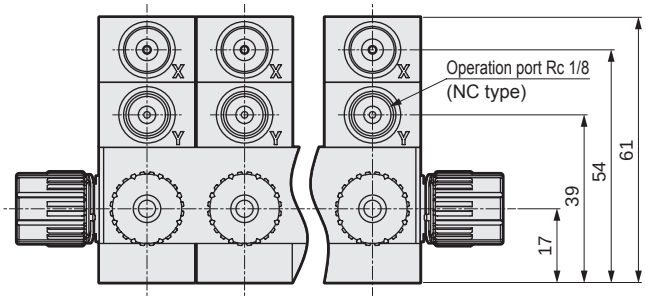
Note 1: Contact CKD for other connection methods.

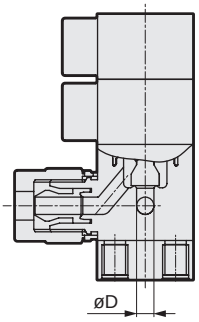
Dimensions

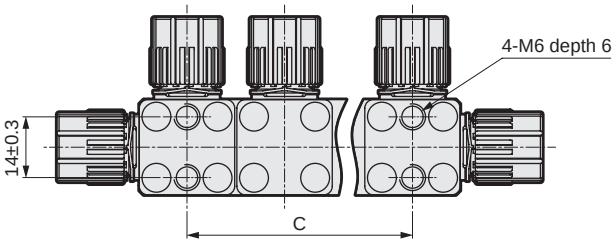
● Only the ON-OFF type

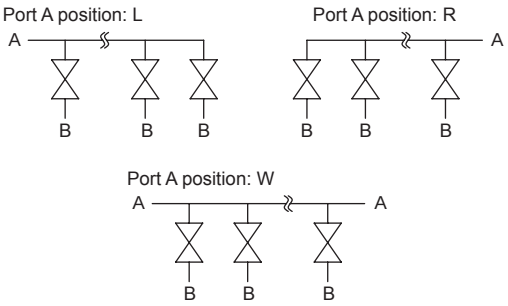
• GAMDZ*3- *1







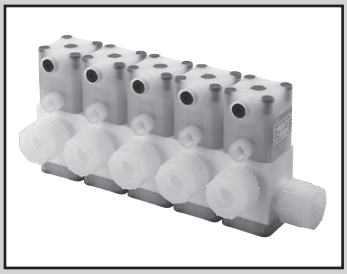




Concatenation	A	C
1 concatenation	22	-
2 concatenation	44.5	22.5±0.5
3 concatenation	67	45±0.7
4 concatenation	89.5	67.5±1.0
5 concatenation	112	90±1.0

Connection method *1	B	D
6UP	19	4
8BUP	19	4
6UR	30	3.5
8BUR	31	3.5

Discontinue



Air-operated valve for chemical liquid (manifold, branch valve)

GAMD$^{3}_{4}_{5}$*3 Series

Custom order

Subject to Export Trade Control Ordinances

* Applicable to: GAMD4*3 and GAMD5*3

- Orifice: GAMD3*3 ø6 to ø10
  Orifice: GAMD4*3 ø15 to ø16
  Orifice: GAMD5*3 ø20
  Concatenation: 1 to 5

RoHS CAD

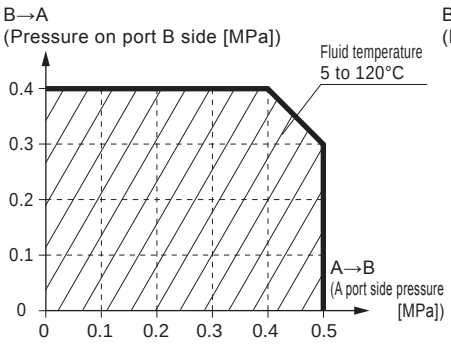
Specifications

Descriptions		GAMD3*3	GAMD4*3	GAMD5*3
Working fluid		Chemical liquids, pure water, air, and N_2 gas (Note 1)		
Fluid temperature	°C	5 to 120 (NO, 5 to 100 for double acting) (Note 3, Note 4)		
Pressure resistance	MPa	1.0		
Working pressure (A→B)	MPa	See figure “Working pressure” below.		
Working pressure (B→A)	MPa	See figure “Working pressure” below.		
Valve seat leakage	cm^3/min	0 (under water pressure)		
Back pressure	MPa	See figure “Working pressure” below.		
Ambient temperature	°C	0 to 60 (0 to 50 with a sensor)		
Frequency		30 times/min or less	20 times/min or less	
Mounting orientation		Free		
Connection		OD ø10, ø12 tube connection (Fitting integrated type) OD 3/8”, 1/2” tube connection (Fitting integrated type)	OD 3/4” tube connection (Fitting integrated type)	OD ø25 tube connection (Fitting integrated type) OD1” tube connection (Fitting integrated type)
Orifice	(Note 5)	ø6 to ø10	ø15 to ø16	ø20
Operation section	Operation pressure MPa	NC: 0.35 to 0.5 NO: 0.35 to 0.4 Double acting: 0.3 to 0.35 (Note 7)		
	Operation port	Rc1/8 (used operation port NC: port Y, NO: port X, double acting:ports X and Y)		
Sensor		See page 31 and 32.		

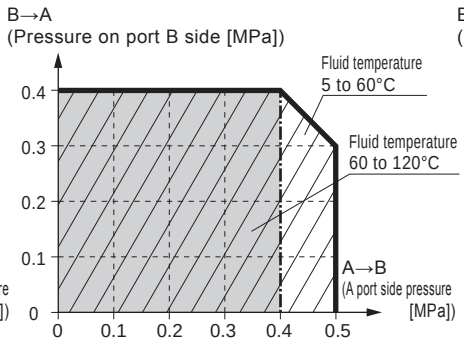
Note 1: Use the product after confirming the compatibility of the product material to the working fluid and environment. (See page 43 for the compatibility check list.)
Note 2: Refer to page 33 and 34 for flow characteristics.
Note 3: Keep the temperature of 5 to 80°C for hydrofluoric acid and chemical liquids that include hydrofluoric acid.
Note 4: 5°C to 100°C in the case of connection of an F-LOCK 60 series fitting
Note 5: Check the orifice diameter of any model in its how-to-order page.
Note 7: The NO specification is valid in 0.35 to 0.5 MPa, and the double acting specification is valid in 0.3 to 0.4 MPa, when the fluid temperature is within 5 to 60°C.

Working pressure

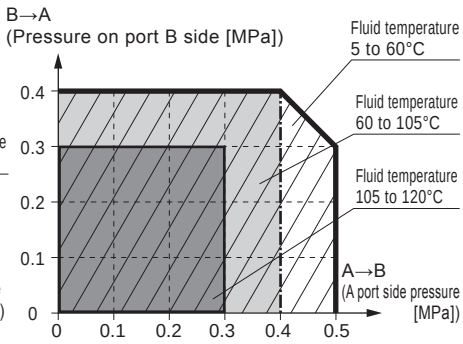
● GAMD3*3



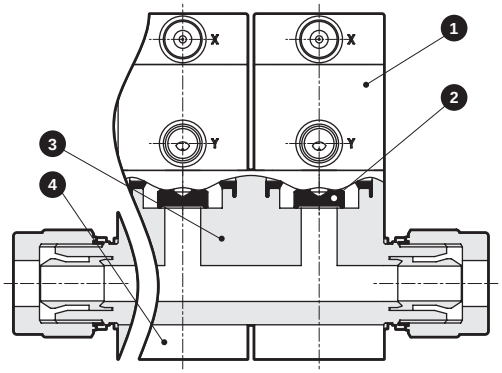
● GAMD4*3



● GAMD5*3



Internal structure and parts list



No.	Parts name	Material
1	Actuator	PVDF etc.
2	Diaphragm	PTFE
3	Body	PTFE
4	Mounting plate	PVDF

How to order

GAMD3 (1) 3 - (10UP) - (00) (5) (W)

- 1 — Model number
- Ⓑ 10UP — Connection
- Ⓒ 00 — Actuator option
- Ⓓ 5 — Concatenation
- Ⓔ W — Port A position

Ⓐ Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

Ⓑ Connection (Note 1)	10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR
	Super 300 type Pillar fitting P Series integrated type				F-LOCK 60 series Fitting integrated type			
	ø10×ø8 Connection tube	3/8"×1/4" Connection tube	ø12×ø10 Connection tube	1/2"×3/8" Connection tube	ø10×ø8 Connection tube	3/8"×1/4" Connection tube	ø12×ø10 Connection tube	1/2"×3/8" Connection tube
Symbol / Descriptions / Orifice	ø8		ø10		ø7	ø6	ø9	
Body material	PTFE							
Ⓑ Actuator option								
00 ON/OFF only (with indicator)	●	●	●	●	●	●	●	●
10 With regulator	●	●	●	●	●	●	●	●
With sensor / Transistor / Cable direction (Note 2) / Cable length								
A1 NPN, Operation port side, 1 m	●	●	●	●	●	●	●	●
A3 NPN, Operation port side, 3 m	●	●	●	●	●	●	●	●
B1 NPN, Opposite side of operation port, 1 m	●	●	●	●	●	●	●	●
B3 NPN, Opposite side of operation port, 3 m	●	●	●	●	●	●	●	●
C1 PNP, Operation port side, 1 m	●	●	●	●	●	●	●	●
D1 PNP, Opposite side of operation port, 1 m	●	●	●	●	●	●	●	●
Ⓓ Concatenation (Note 2)								
1 1 concatenation	●	●	●	●	●	●	●	●
to to								
5 5 concatenation								
Ⓔ Port A position (Note 2)								
L Left	●	●	●	●	●	●	●	●
R Right	●	●	●	●	●	●	●	●
W Both sides	●	●	●	●	●	●	●	●

Note on model No. selection

Note 1: Contact CKD for other connection methods.
Note 2: See “Dimensions” for the sensor cable direction, concatenation, and the A port position.

Discontinue

GAMD4*3 Series

How to order

GAMD4 (1) 3 - (20BUP) - (00) (5) (W)

- Model number
- (B) Connection
- (C) Actuator option
- (D) Concatenation
- (E) Port A position

(A) Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

Symbol	Descriptions \ Orifice			(B) Connection (Note 1) 20BUP: Super 300 type, Pillar fitting, P Series integrated type; 3/4"×5/8" Connection tube	(B) Connection (Note 1) 20BUR: F-LOCK 60 series, Fitting integrated type; 3/4"×5/8" Connection tube
	Body material			PTFE	
(C) Actuator option					
00	ON/OFF only (with indicator)			●	●
10	With regulator			●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length		
A1	NPN	Operation port side	1 m	●	●
A3			3 m	●	●
B1		Opposite side of operation port	1 m	●	●
B3			3 m	●	●
C1	PNP	Operation port side	1 m	●	●
D1		Opposite side of operation port	1 m	●	●
(D) Concatenation (Note 2)					
1	1 concatenation			●	●
to	to				
5	5 concatenation				
(E) Port A position (Note 2)					
L	Left			●	●
R	Right			●	●
W	Both sides			●	●

Note on model No. selection

Note 1: Contact CKD for other connection methods.
Note 2: See "Dimensions" for the sensor cable direction, concatenation, and the A port position.

How to order

GAMD5 (1) 3 - (25UP) - (00) (4) (W)

- 1 — Model number
- Ⓐ Operation method
- Ⓑ Connection
- Ⓒ Actuator option
- Ⓓ Concatenation
- Ⓔ Port A position

Ⓐ Operation method	
1	NC (Normally closed)
2	NO (Normally open)
3	Double acting

Symbol	Descriptions \ Orifice			Ⓑ Connection (Note 1)			
				25UP	25BUP	25UR	25BUR
				Super 300 type Pillar fitting P Series integrated type		F-LOCK 60 series Fitting integrated type	
				ø25 x ø22 Tube connection	1"×7/8" Connection tube	ø25 x ø22 Tube connection	1"×7/8" Connection tube
				ø20			
	Body material			PTFE			
Ⓒ Actuator option							
00	ON/OFF only (with indicator)			●	●	●	●
10	With regulator			●	●	●	●
With sensor	Transistor	Cable direction (Note 2)	Cable length				
A1	NPN	Operation port side	1 m	●	●	●	●
A3			3 m	●	●	●	●
B1		Opposite side of operation port	1 m	●	●	●	●
B3			3 m	●	●	●	●
C1	PNP	Operation port side	1 m	●	●	●	●
D1		Opposite side of operation port	1 m	●	●	●	●
Ⓓ Concatenation (Note 2)							
1	1 concatenation			●	●	●	●
to	to						
4	4 concatenation						
Ⓔ Port A position (Note 2)							
L	Left			●	●	●	●
R	Right			●	●	●	●
W	Both sides			●	●	●	●

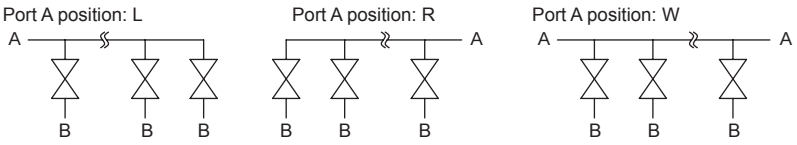
Note on model No. selection

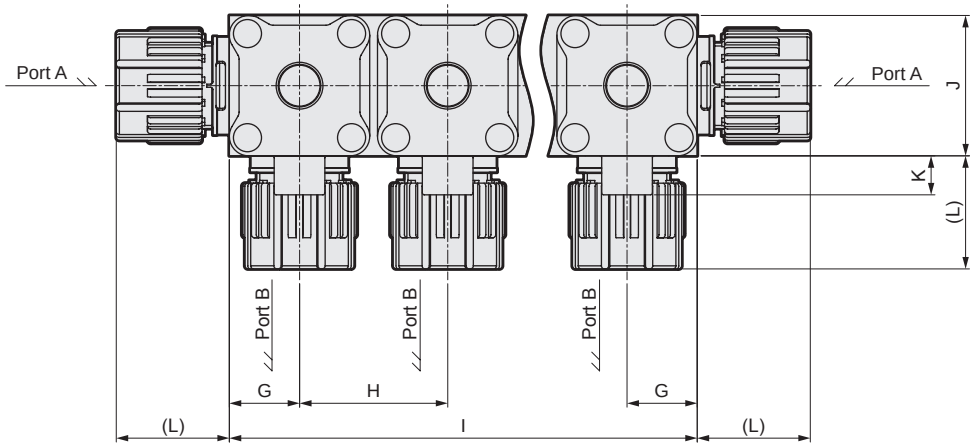
Note 1: Contact CKD for other connection methods.
Note 2: See “Dimensions” for the sensor cable direction, concatenation, and the A port position.

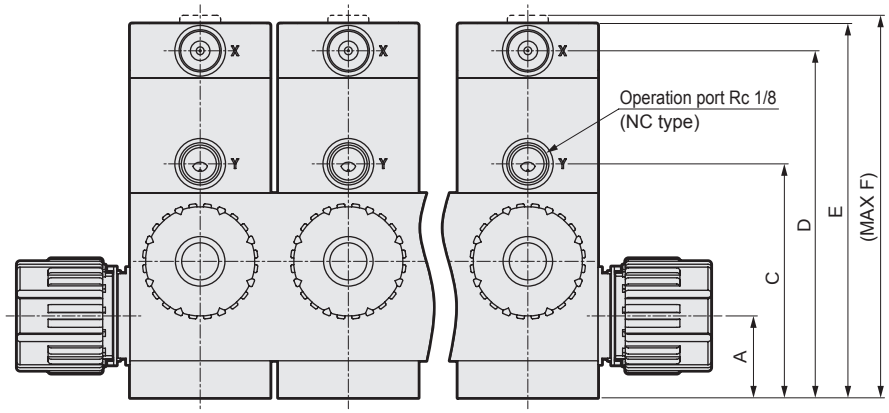
Dimensions

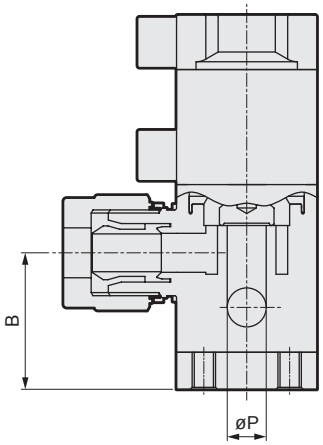
● 00 ON/OFF only type (with indicator)

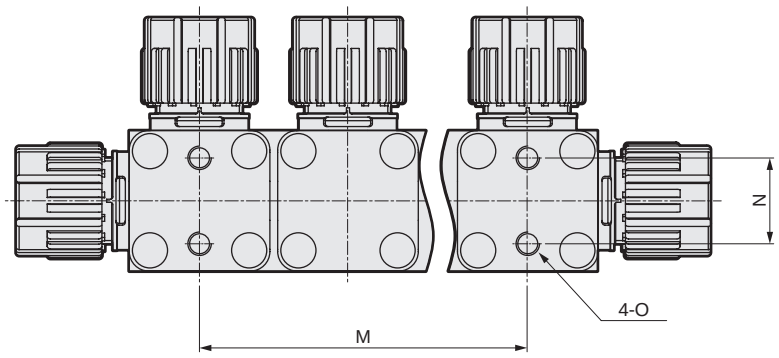
- GAMD3*3- *1
- GAMD4*3- *1
- GAMD5*3- *1











Dimensions

Model number	A	B	C	D	E	F	G	H	J	K	Q	R
GAMD3*3	21	35	60	89	96	98	18	38	36	10	119	103
GAMD4*3	27	46	78	118	125	128	23	48	46	8	148	132
GAMD5*3	35	60	99	142	149	154	30	62	60	8	181	156

Concatenation	Model number	I	M	N	O
1	GAMD3*3	36	-	22±0.3	M6 depth 9
	GAMD4*3	46	-	28±0.3	M8 depth 10
	GAMD5*3	60	-	40±0.3	M8 depth 13
2	GAMD3*3	74	38±0.3	22±0.3	M6 depth 9
	GAMD4*3	94	48±0.4	28±0.3	M8 depth 10
	GAMD5*3	122	62±0.4	40±0.3	M8 depth 13
3	GAMD3*3	112	76±0.4	22±0.3	M6 depth 9
	GAMD4*3	142	96±0.5	28±0.3	M8 depth 10
	GAMD5*3	184	124±0.5	40±0.3	M8 depth 13
4	GAMD3*3	150	114±0.5	22±0.3	M6 depth 9
	GAMD4*3	190	144±0.5	28±0.3	M8 depth 10
	GAMD5*3	246	186±0.7	40±0.3	M8 depth 13
5	GAMD3*3	188	152±0.7	22±0.3	M6 depth 9
	GAMD4*3	238	192±0.7	28±0.3	M8 depth 10

GAMD3*3 (10 mm, 3/8")

*1 (Connection method)	L	P
10UP	25	8
10BUP	25	8
10UR	37	7
10BUR	39	6

GAMD3*3 (12 mm, 1/2")

*1 (Connection method)	L	P
12UP	29	10
15BUP	29	10
12UR	37	9
15BUR	39	9

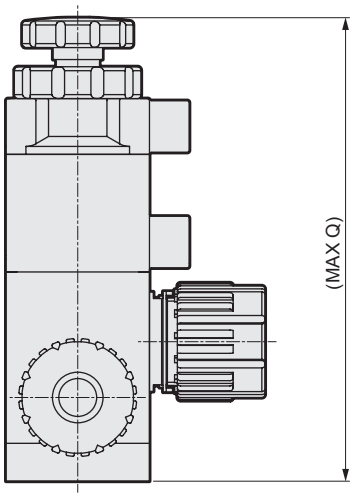
GAMD4*3

*1 (Connection method)	L	P
20BUP	36	16
20BUR	44	15

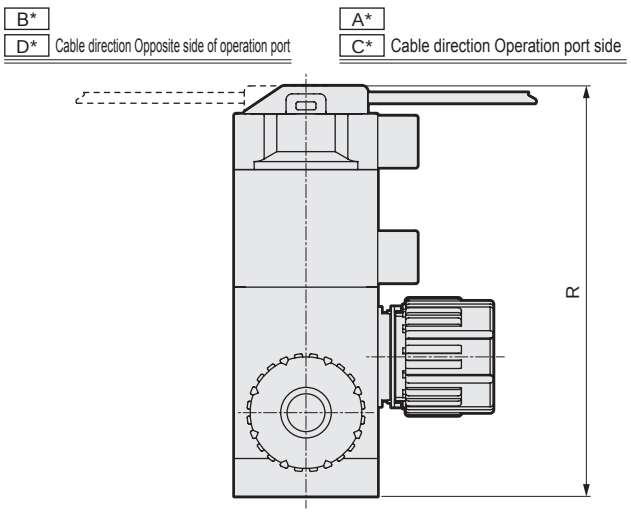
GAMD5*3

*1 (Connection method)	L	P
25UP	43	20
25BUP	43	20
25UR	49.5	20
25BUR	51	20

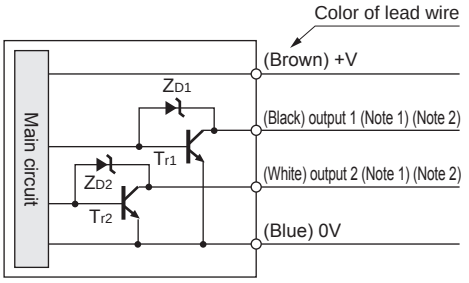
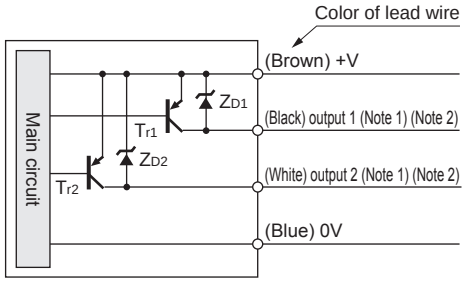
● 10 With regulator
• GAMD**3-*-10**



● A* B* C* D* With sensor
• GAMD**3-*-A B C D***

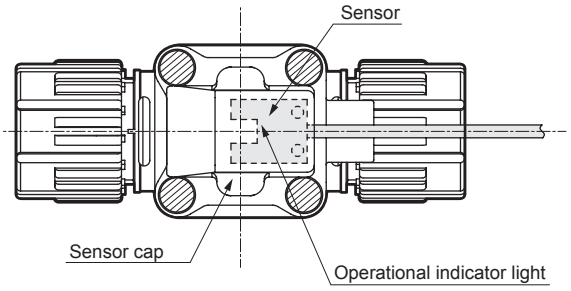


<Sensor part specifications>

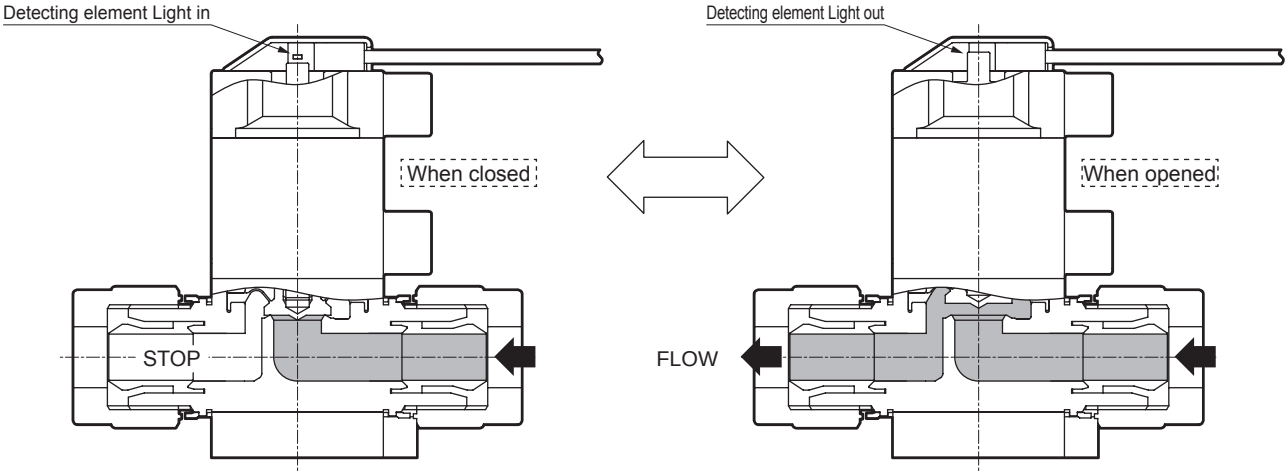
Actuator Option symbol	A1, B1	A3, B3	C1, D1
Sensor	Micro photo sensor PM-24 series (Panasonic Electric Works SUNX)		
Switch output	NPN transistor open collector • Load current: 50 mA or less • Load voltage: 30 VDC or less (output around -0 V) • Internal voltage drop: 0.7 V or less		PNP transistor open collector • Load current: 50 mA or less • Load voltage: 30 VDC or less (output around -+ V) • Internal voltage drop: 0.7 V or less
Indicator light	Red LED		
Power voltage	5 to 24 VDC ±10%, ripple P-P 10% or less		
Current consumption	15 mA or less		
Ambient temperature	Refer to the product specifications		
Ambient humidity	35 to 85% RH, when saving: 35 to 85% RH (no dew condensation or freeze)		
Ambient illuminance	Fluorescent light: 1000 Lx or less illuminance on the light reception surface		
Withstanding voltage	1000 VAC for one minute applied to all charged sections and between cases		
Insulation resistance	50 MΩ or over with 250 MVDC for all charged sections and between cases		
Material	Case: PBT, slit cover: polycarbonate		
Cable type	0.09 mm^2 4-conductor cabtire cable (Note 3, Note 4)		
Cable length (Note 12)	1 m	3 m	1 m
I/O circuit diagram	 Notations ... ZD1, ZD2: Surge voltage absorption zener diode Tr1, Tr2: NPN output transistor		 Notations ... ZD1, ZD2: Surge voltage absorption zener diode Tr1, Tr2: PNP output transistor

Note 1: The product is not equipped with a power supply reverse connection prevention circuit. Be sure to make accurate connections. The output is not equipped with a short circuit protection circuit.
Do not make direct connection to a power supply or capacious load. Incorrect wiring may cause damage.
Note 2: Make sure that unused output wires are insulated.
Note 3: It cannot be used at a movable portion.
Note 4: Cables can be extended, but doing so lowers the voltage. Make sure that the supply voltage at the end of the sensor cable is in the rated range.
Note 5: Do not use this product in flammable atmosphere. The sensor is not explosion proof.
Never make such use, since doing so could result in explosion or damage.
Note 6: The sensor is not dust proof or drip proof.
It cannot be used in an atmosphere with steam or dust, corrosive gas, or direct contact with chemicals.
Note 7: No special anti-ambient-light measures are taken. Make sure that light is not shed on the light receiving section of the sensor .
Note 8: Avoid a transient state (50 ms) when turning power ON.
Note 9: Contact CKD if the sensor needs to be replaced.
Note 10: Do not apply tension on the cable. Doing so may break the cable or cause malfunction.
Note 11: Do not remove the sensor or sensor cap.
Note 12: Contact CKD if you need a cable longer than 1 m or 3 m.

Valve and sensor operation



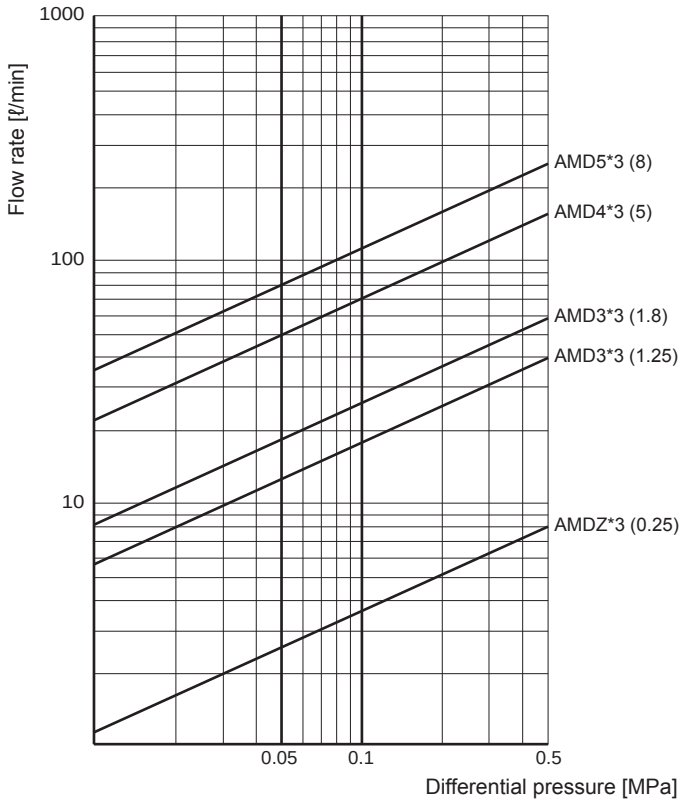
Valve operation			When closed	When opened
Sensor	Detecting element		Light in	Light out
	Operational indicator light		Lighting	Turning off the light
	Output 1	Lead wire color: black	Output ON	Output OFF
	Output 2	Lead wire color: white	Output OFF	Output ON



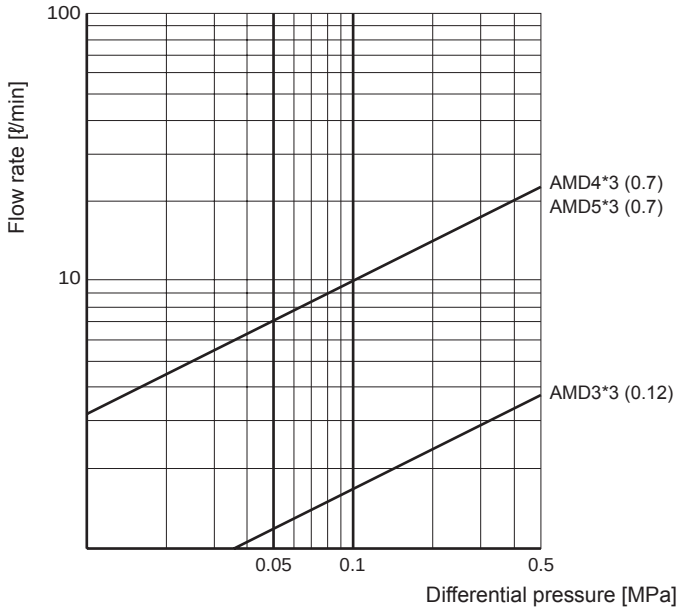
Flow characteristics

AMDZ*3 to AMD5*3

● Flow characteristics (water)
Differential pressure - flow rate in ( ): Cv value

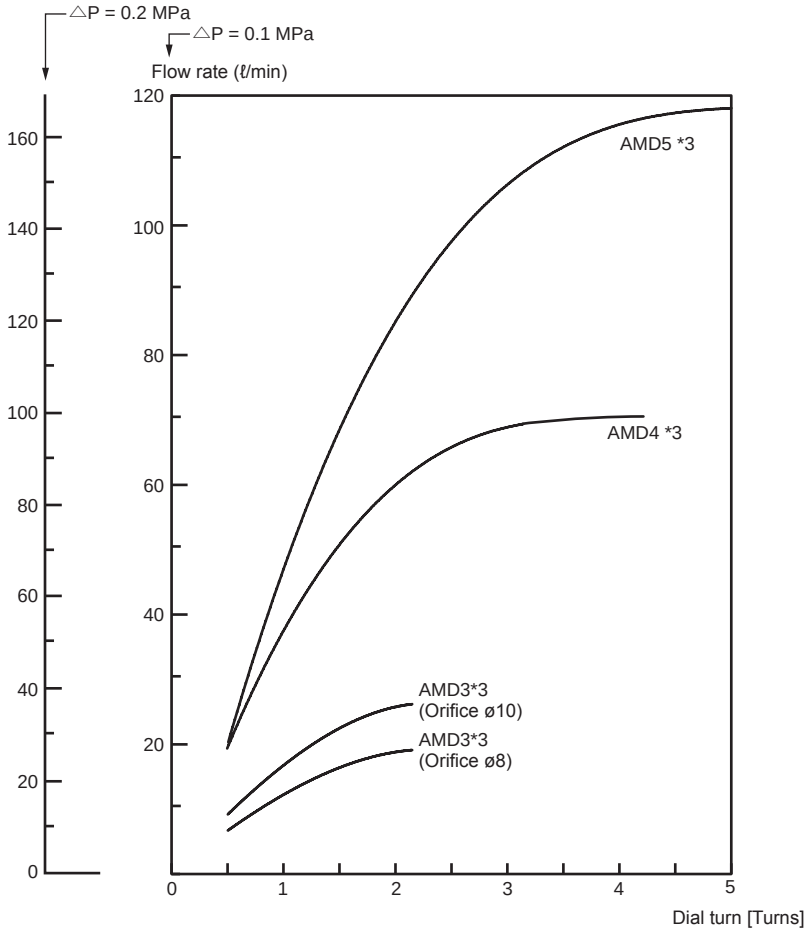


● Bypass part flow characteristics (water)
Differential pressure - flow rate in ( ): Cv value



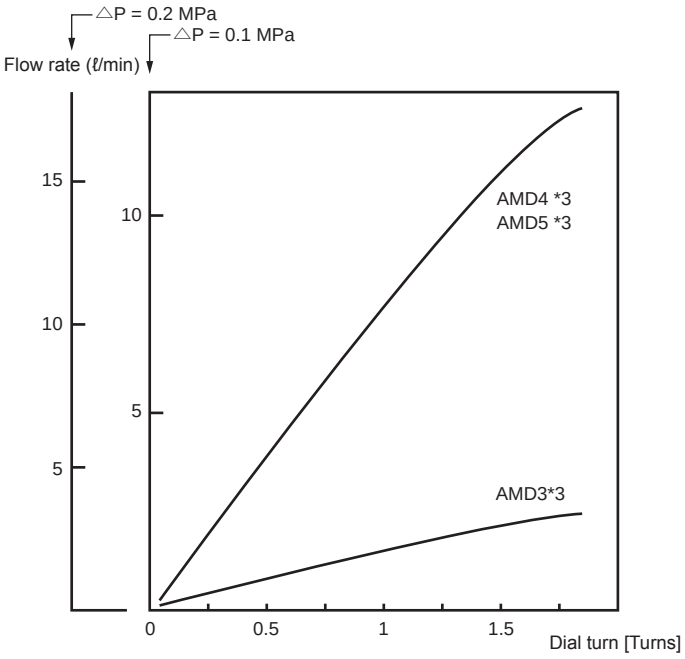
Flow characteristics

● With regulator (water)
Number of rotations - flow



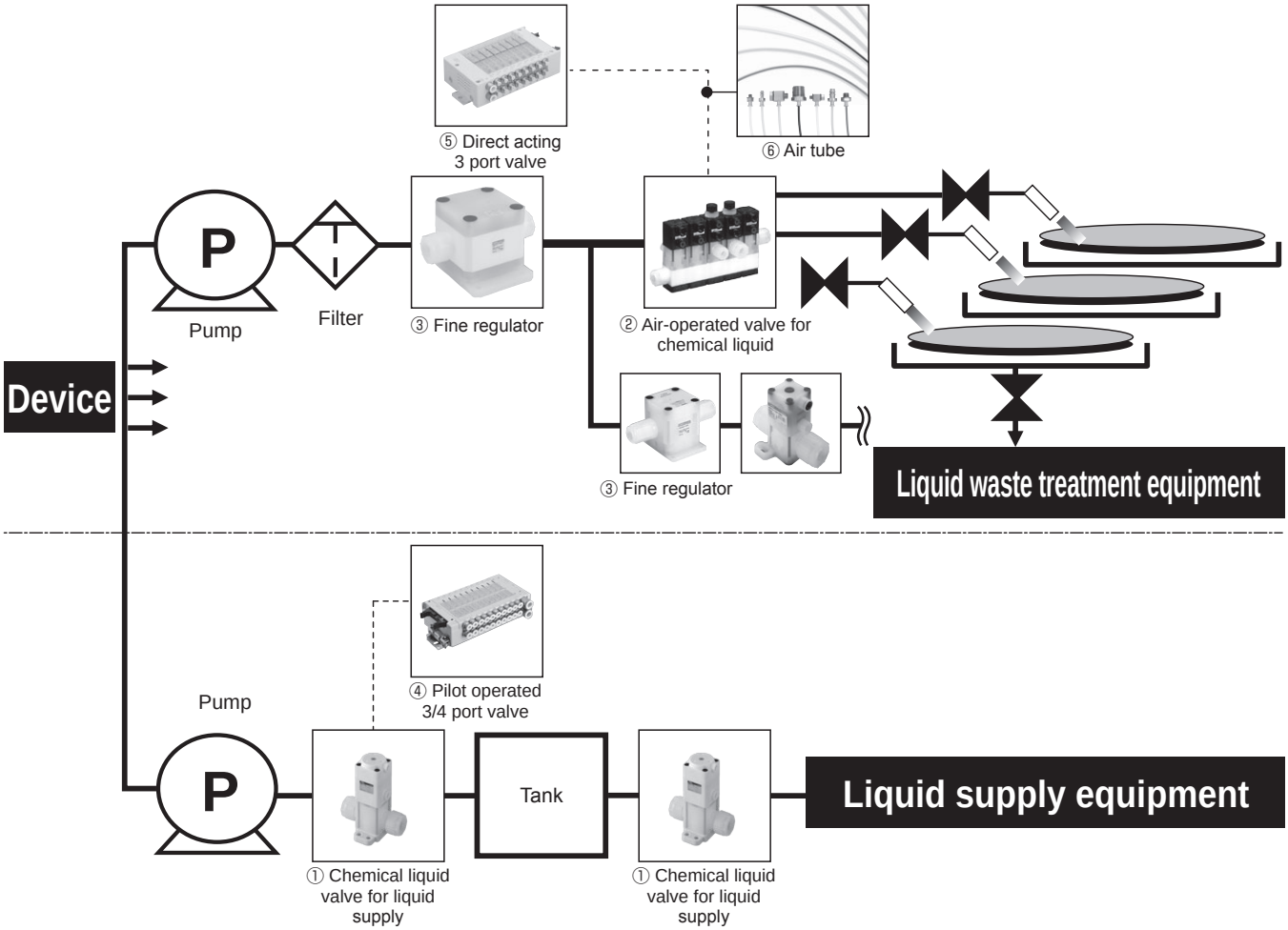
Note 1: Set the adjustment dial 1/2 round or more open from the complete closed position. Using the product with less opening may cause vibration or fluctuation in flow depending on the working conditions.

● With bypass (water)
Number of rotations - flow



Discontinue

Applications



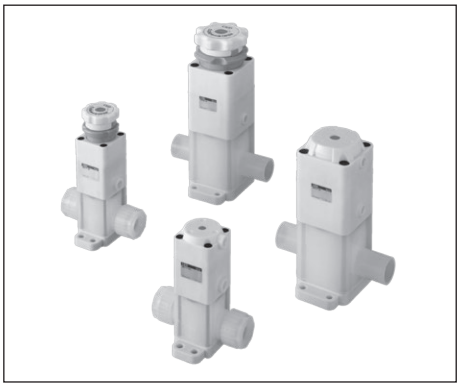
Related products

① High pressure valve for chemical liquid supply AMD*1H/MMD*0H series

Meets the requirement of high pressure and large flow rate on the end Fab.
Total solution of liquid supply!!

- Endures the high pressure and high back pressure of 0.7 MPa.
- Air operated valves and manual valves are lined up.
- Pipes extended for weld fitting are lined up.
- Operation is easily checked (with indicator).
- Excessive tightening prevention and safety locking mechanism (manual valve)

Catalog No.CB-031A

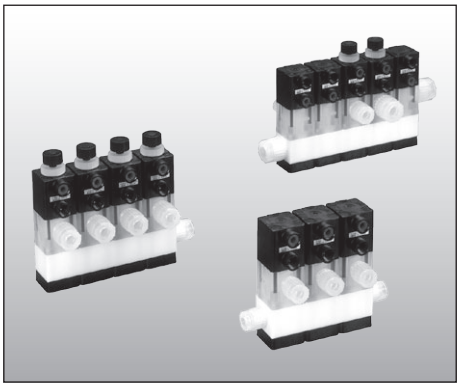


② Air operated valve for chemical liquid manifold GAMD0*2A series

Compact manifold valve for semi-conductor cleaner

- Compact large-flow manifold valves of 30 different sizes supporting ø10 tubes.
- High-pressure resistance enduring fluid pressure of 0.5 MPa and back pressure of 0.3 MPa.
- Wetted parts are made by PFA and PTFE, which is best for branching corrosive fluid.
- The standard models cover 2 to 5 valves in a row.
- Connection can be made to tubes of ø6, ø8, ø10, 1/4”, and 3/8”.

Catalog No.CC-854A

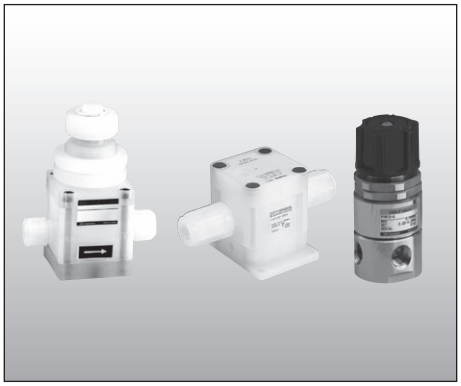


Discontinue

Related products

③ Fine regulator PYM10, PMM20, PMP202, 402 series

Catalog No.CB-031A

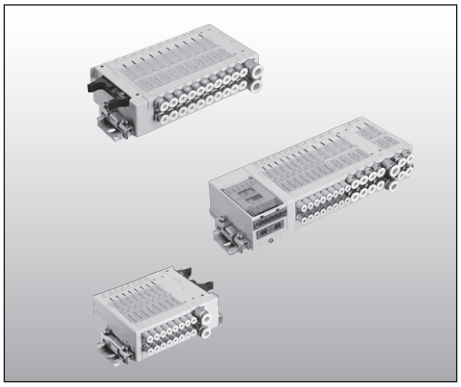


Regulator for controlling the pressure of chemical liquids in equipment that uses high purity chemicals (including pure water) for production of semiconductors, LCD, and the like.

- Filter integrated type, which has resistance to foreign materials
- Good flow and pressure characteristics; easy to install.
- Outstanding corrosion resistance
  Fluorine resin (PFA/PTFE) and SUS316 are used for wetted parts, achieving good corrosion resistance.
- Excellent pressure and flow characteristics
  Use of fluorine resin diaphragm realized better pressure and flow characteristics compared to metal diaphragm.
- Integrated filter provides protection against foreign materials in the fluid.
- Panel mounting eases the installation task. Bottom installation is also possible.
- Pilot regulator
  Regulator designed to provide stable pressure through pilot air control

④ 3/4 port pilot operated valve MN3E/MN4E series

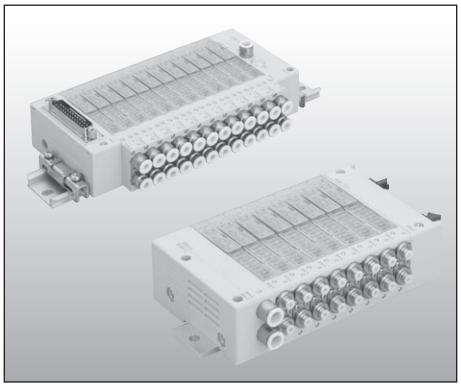
Catalog No.CB-023SA



- Environment preservation
  The compactness and power saving characteristics of the product realizes its light weight, smaller amount of materials used, and thrifty energy consumption. CKD is among the first to reduce environmentally affecting chemical substances. Lead-free solder and our other materials conform to JIG-101A Level A.
- Compactness and space saving
  In addition to MN3/4E0 series whose valve block width is 10 mm, MN3/4E00 is now available with their valve block width 7 mm and manifold pitch 7 mm. The smaller manifold of 7 mm pitch contributes to the compactness and high integration of the equipment.
- High performance
  - 12 ms responsiveness of balanced A and B ports. (CKD data value using type with two built-in 3 port valves)
  - Complicated wiring task is not required.
    Connection allows wiring work to be completed during assembly.
- Safety
  - Malfunction-free: A check valve, manual override protector to prevent incorrect operation, and an intake filter to prevent the entry of foreign matter are provided as standard. An ultimate pursuit of safety prevents valve malfunctioning.

⑤ Dual 3-port solenoid valve integrated manifold MN3Q Series

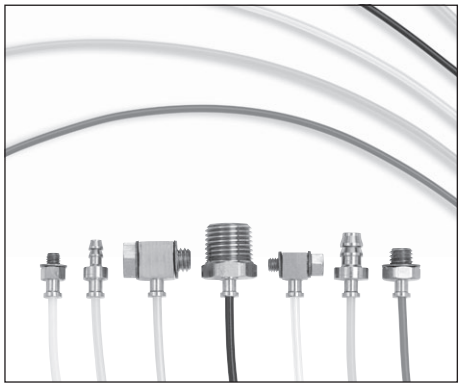
Catalog No.CC-1066A



- Small size
  Manifold height reduced to 34 mm. Installable in a narrow place.
- Mounting
  Mounting method can be selected either DIN rail mounting or direct mounting.
- Piping
  The supply/exhaust port removing position can be selected freely, increasing flexibility of piping.

⑥ Fiber tube

Catalog No.CB-024SA



- Extremely fine fiber tube as thin and flexible as lead wire.
- Outer diameter: ø1.8, minimum bending radius: 4 mm
- Volume resistivity is approximately 1 x 10^8 Ω • cm or less
- Best suited for piping of slow speed cylinders
- Various tube colors and fittings are available.

Discontinue

Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

Warning

1 This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. Do not attempt to modify or additionally machine the product.
This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)

❶ Use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medicinal devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency shutoff circuits, press machine, brake circuits, or for safeguard.

❷ Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO 4414, JIS B 8370 (Pneumatic system rules)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of the entire system related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power of the facility. Discharge any compressed air from the system, and pay attention to possible leakage of water and electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as “DANGER”, “WARNING” and “CAUTION” in this section.

⚠DANGER:	When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.
⚠WARNING:	When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.
⚠CAUTION:	When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Discontinue

Disclaimer

1 Term of warranty

“Warranty Period” is 18 months from the first delivery to the customer.

2 Scope of warranty

In case any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgement.

Note that the following faults are excluded from the warranty term:
(1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by other than the delivered product
(3) Use other than original design purposes.
(4) Third-party repair/modification
(5) Failure caused by reason that is unforeseeable with technology put into practical use at the time of delivery
(6) Failure attributable to force majeure.

In no event shall CKD be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

3 Compatibility confirmation

In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.

Precautions in Export

1 Security Trade Control

Products in this catalog and their related technology may require approval before export or provision. To contribute to world peace and safety, there may be cases in which approval under the Foreign Exchange and Foreign Trade Control Law is required depending on the country to which the product or related technology is being exported or provided.
The scope of products and related technologies requiring approval are listed in “Export Trade Control Ordinance Appendix Table 1” or “Foreign Exchange and Foreign Trade Control Law Appendix Table”.
Export Trade Control Ordinance Appendix Table 1 and Foreign Exchange Order Appendix Table contain the following two types of information:

- List Provisions indicating items 1 to 15 for each section
- Catchall Provisions that do not specify specifications by item, but restrict by applications (Item 16)

Application for Approval:
The application is received by the Ministry of Economy, Trade, and Industry, Security Trade Control Review Section or local bureaus of the Ministry of Economy, Trade, and Industry.

2 Products and related technologies in this catalog

Products and related technologies in this catalog includes those subject to List Control of the Foreign Exchange and Foreign Trade Control Law.
For products and related technologies that are subject to List Control of the Foreign Exchange and Foreign Trade Control Law are indicated so in the pages of those products.
Please obtain an export permit of the Foreign Exchange and Foreign Trade Control Law when you export or provide a product or related technology subject to List Control.
Also, when exporting or providing products or related technologies in this catalog, ensure that they are not used for arms or weapons.

3 Contact

Contact your local CKD Sales Office for information on the Security Trade Control of products and related technologies in this technology.

High purity chemical gas/liquid control systems

Safety precautions

Always read before starting use

Design & Selection

1. Confirmation of specifications

WARNING

■ This product can not be used as an emergency shut off valve.
Valves in this catalog are not designed to ensure safety such as emergency shutoff. When using in such a system, provide other measures to ensure safety.

■ Incorrect selection and handling of devices could result in product problems and user system problems. The user is responsible for confirming the compatibility of the product specification and their system before selecting and handling the product.

■ Working fluid
The compatibility check list on page 27 provides basic information on compatibility. Refer to it to check whether the material of each component is compatible with the working fluid and working environment. For a fluid not listed on the check list or a newly introduced fluid (including those with high concentration), consult CKD before using it.

■ Temperature of fluid
Use the product in the specified fluid temperature range.

■ Working pressure range
Use the product within the working pressure range specified in the catalog.

■ Working environment
(1) Check compatibility between the material of each components and the working environment before using the product. (Do not use it in a corrosive environment or flammable environment.)
(2) Make sure that fluids do not adhere to the product body.
(3) Use the product within the ambient temperature range.
(4) Do not use the product in a place with vibration or shock, a heat source neighborhood, or outdoors.

2. Design

WARNING

■ For a fluid that may cause personal injury, place the valve at a location that people cannot access.

■ Liquid ring
Opening and closing movement of the valve makes the diaphragm go up and down, changing the inner volume of the valve. Therefore, since the fluid is incompressible (liquid), operation with the fluid sealed within the valve (liquid ring) generates an abnormal pressure on the valve. In such cases, install a relief valve on the primary or secondary side of the valve to avoid a liquid ring circuit.

■ Securing maintenance space
Secure sufficient space for maintenance and inspection.

3. Sensor-equipped option

WARNING

■ Application, load current, voltage, temperature, impact, environment, etc., exceeding the specifications will result in damage or operation faults. Use the device as instructed in specifications.

■ Do not use this product in flammable atmosphere.
The sensor-equipped option is not explosion proof. Never make such use, since doing so could result in explosions or damage.

■ The sensor-equipped option is not dust proof or drip proof. It cannot be used in an atmosphere with steam or dust, corrosive gas, or direct contact with chemicals.

■ Be careful when using for an interlock circuit.
When using the sensor-equipped option for an interlock signal requiring high reliability, provide mechanical protection or use a double interlock, installing some other sensor as protection against faults.
Execute inspection regularly to check that the normal operation is done.

■ Check the contact capacity.
Do not apply a load that exceeds the maximum contact capacity of the sensor. Failure to observe this could cause faults.

■ Check the protective circuit.
- Provide a protective circuit when connecting an inductive load (relay or solenoid valve), as surge voltage is generated when the sensor turns OFF.
- Provide a protective circuit when connecting a capacious load (capacitor), as a rush current is generated when the sensor turns ON.
- A long wiring generates a rush current with its wiring capacitance. Provide a protective circuit since this may damage the sensor or shorten its life.

■ Do not use where surge is generated.
If there is a device (magnetic lifter, high-frequency induction furnace, motor, etc.) that generates a large surge near the sensor, circuit elements in the sensor could deteriorate or be damaged. Take measures against the surge-generating source.

CAUTION

■ Check internal voltage drops caused by serial connections.
- When connecting several sensors in series, the sensor voltage drop is the total voltage drop of all connected sensors. Check the specification of the current load of the sensor to determine the number of sensors connected so that the maximum current load is not exceeded.

Installation & Adjustment

1. Installation

⚠ WARNING

■ Incorrect installation and piping cause product problems and may cause problems in the user's system, resulting in death or serious injury. The user is responsible for ensuring that the system is operated by someone who understands safety precautions concerning the system, the fluid characteristics, compatibility of the fluid and the related products, and who has read the instruction manual thoroughly.

⚠ CAUTION

■ After installing, check for leaks from pipes, and check that the product is correctly installed.

2. Piping

⚠ WARNING

■ Always flush the piping before installing the valve. Dirt or foreign matter in fluid may prevent the valve from functioning correctly. If dirt or foreign matter may come inside, install a filter on the primary side of the valve in a way suiting the circuit used.

■ For a product with the arrow symbol, make sure that the flow direction of the fluid coincides with the arrow direction.

■ Do the piping not to apply tension, compression, bending, etc., caused by the pipe to the valve.

■ For NC and NO types, ports to which control pressure is not placed are released to the atmosphere. If direct intake and emission of air is not desirable due to the problem of working environment or dirt, release the set screw and do piping work so to make intake and emission of air at a proper location.

■ Use the driving solenoid valve connected to the drive section in accordance with the specification and the use purpose.

⚠ CAUTION

■ For fittings for PFA tubes, refer to the instruction manual provided by each fitting manufacturer and follow the description for its application.
Application of a fitting requires a specialized jig. Consult the fitting manufacturer about it.
Adjacent fittings of AMD and GAMD have very short clearance between them, so installation may be difficult with common tools. Contact CKD if tools provided by the fitting manufacturer cannot be used. (Super 300 type pillar fitting)

■ Check that stress, such as bending, tension, or compression, is not applied to the valve when connecting main pipes. Consider the position and method of supporting pipes in such a way that they do not apply the pipe weight on valves.

■ When installing a valve, do not support it only by the fitting, but fix the mounting plate and the equipment.

■ Piping on a control port may cause a crack of the port or damage on the screw. Keep the tightening force within 0.4 to 0.6 N • m.

3. Sensor-equipped option

⚠ CAUTION

■ Do not subject the product to undue vibration.
In handling the product, do not drop or hit it, or give excessive shock to it. Even if the body does not break, sensor components could break or malfunction.

■ Do not carry the valve by the sensor lead wire.
Do not carry the valve by the sensor lead wire because the wire could disconnect, and stress on the sensor could damage sensor components.

■ Do not wire with a power cable or high voltage cable.
Avoid wiring in parallel with or in the same conduit as a power cable or high voltage cable. The control circuit containing the sensor could malfunction because of noise.

■ Do not short-circuit the load.
If turned ON while the load is short-circuited, an overcurrent will flow, and the sensor will be damaged.

■ Be careful in lead wire connection.
Turn OFF power to the device in the electric circuit to be connected before starting wiring. Conducting work with power ON could result in accidents from electric shock or unpredictable operation.

■ Check that the power fluctuation range of the supplied power does not exceed the rated range.

■ If a switching regulator at store is used for power, ground a frame ground (F.G.) terminal of power.

■ When using components (such as switching regulator and inverter motor) causing noise around the sensor, ground a frame ground (F.G.) terminal of components.

Discontinue

High purity chemical gas/liquid control systems

Safety precautions

Always read before starting use

During Use & Maintenance

1. Before Use of Product

WARNING

■ Use within the maximum operation pressure and maximum working pressure range.

CAUTION

■ The compatibility check list on page 27 provides basic information on compatibility. Refer to it to check whether the material of each component is compatible with the working fluid and working environment. For a fluid not listed on the check list or a newly introduced fluid (including those with high concentration), consult CKD before using it.

- A fluid, such as slurry and UV hardener, that includes particles or that may become solid or gelatinous may affect the performance.
- When using fluids containing a surface acting agent or highly permeable fluids such as a peeling agent, the fluid could permeate the part.

Conduct regular inspections, and in the event of abnormality being found, take action such as replacement.

■ Gases such as N_2 and air may cause maximum of 1 cm^3/min valve seat leakage (by air pressure).

■ It should be noted that sudden changes of fluid temperature may have the valve seat distorted resulting in valve seat leakage.

■ For control air, use air or inert gas that has gone through a filter with filtration rating of 5 μm or over.

■ The product is provided after precision cleaning and with clean packing expecting it to be installed in a clean room. Please be careful in handling it.

■ Do not overturn the knob for flow control or by-pass control.

■ Do not step the valve, nor put the heavy things on it.

■ If the product has not been used for a long period, carry out trial operation.

■ There occurs turbulent flow on the secondary side of the valve.
When a device such as a flow meter that requires the flow to be laminar should be installed on the secondary side of the valve, keep some distance from the valve where the device is not affected by the turbulent flow.

■ This product must not be disassembled by the user. It is dangerous since some products have high load springs.

■ Make sure that fluids do not adhere to the product body.

■ If the product has the regulator, set the adjustment dial at a position of the specified number of rotations or more to the open direction from the complete closed position. Using the product with less opening may cause vibration or fluctuation in flow depending on the working conditions. There may be flow fluctuation caused by fluid temperature fluctuation depending on the use condition.

■ Water-hammer or vibration may occur depending on the media pressure condition. Most cases will be improved by adjusting the open/close speed by the speed control valve. If the condition still does not improve, check the fluid pressure and piping conditions.

2. Maintenance Inspection

DANGER

■ When replacing a valve, evacuate the fluid inside enough with pure water or air beforehand so that remaining chemical liquids will not affect devices and people around.
Although the top of the diaphragm (on the cylinder side) is not a wet area, the area is chemical atmosphere due to gas permeation from the thin film section. Observe the following precautions when handling it for the sake of safety.

(1) The valve operation makes a little amount of permeated gas discharged from the bleed hole on the cylinder side surface. Make sure that people do not approach the neighborhood of the bleed hole when the valve is in operation.
(2) Crystal may adhere to the bleed hole or its neighborhood.
(3) Use a corrosion resistant glove when touching the valve; do not touch it barehanded.

■ A valve that has been used for chemical liquids may have chemical liquid atmosphere remaining between its actuator and diaphragm. This product must not be disassembled by the user.
Contact CKD or a distributor when disassembling is required.

■ To ensure optimum operation of the valve, conduct the following regular inspection once or twice a year.

(1) Checking leakage outside the valve
(2) Checking leakage from the fitting section
(3) Checking abnormality such as discoloration, deformation, and corrosion of a component.

During Use & Maintenance

⚠ WARNING

■ Read the instruction manual thoroughly before starting maintenance to ensure correct operation.

■ Always turn the power OFF and release any fluids or pressure before starting maintenance.

■ When conducting a maintenance or inspection work, read the material safety data sheet (MSDS) of the chemical liquids used, and wear the required protective clothing.

■ Long-term use of chemical liquids with high permeability such as hydrochloric acid, hydrofluoric acid, and nitric acid will have the permeated gas deteriorate not only wet areas but parts of other areas, which may result in an accident such as external leakage. For the sake of safety, be sure to conduct periodic inspection once or twice a year to check if there is any abnormality such as discoloration of a component, deformation, or corrosion.

⚠ CAUTION

■ Use a product of the same model number when replacing a product. There are some products that have the same exterior appearance and different specifications.

■ Store any unused product at a location where direct sunlight is not shed and the temperature is not high. When handling the product, do not give shock or flaw to it by throwing, dropping, or catching it.

3. Sensor-equipped option

⚠ WARNING

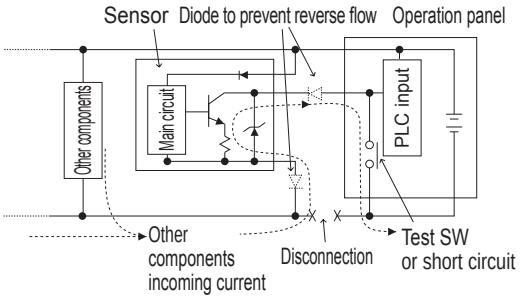
■ Do not apply overcurrent.

If overcurrent flows to the sensor because of a load short-circuit, etc., the sensor will be damaged but could ignite. Provide an overcurrent protection circuit, such as a fuse, for the output wire and power cable.

⚠ CAUTION

■ Pay attention to reverse currents caused by disconnected wires and wiring resistance.

● When other devices including sensors are connected to the same power supply as the sensor and the output/power cable are short-circuited, or the power supply is disconnected to check operation of the input device in the control panel, reverse current could flow to the output circuit of the sensor and cause damage.

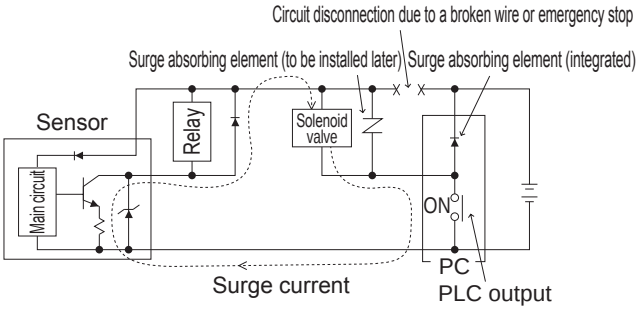


● Take countermeasures as followings to prevent damages caused by reverse current.

(1) Do not concentrate current to the power line, especially, (-) side power line, and use wire as fat as possible.
(2) Limit the number of devices connected to the same power source as the flow sensor.
(3) Insert a diode parallel tothe flow sensor'soutput line to prevent current backflow.
(4) Insert a diode parallel to the flow sensor power line's minus side to prevent current backflow.

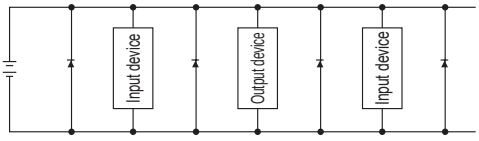
■ Pay attention to leading of surge current

● When sensor power is shared with an inductive load that generates a surge, such as a solenoid valve or relay, and the circuit is cut off while the inductive load is functioning, the surge current could enter the output circuit and cause damage depending on where the surge absorption element is installed



● Take the following measures to prevent damage from surge current that is led in:

(1) Separate the power supply for output including the inductive load, such as the solenoid valve and relay, and input, such as the sensor.
(2) If separate power supplies cannot be used, directly install a surge absorption element for all inductive loads. Note that the surge absorption element connected to the PLC, etc., protects only that device.
(3) Insert a diode parallel to the flow sensor's output line to prevent current backflow.
(4) Connect a surge absorption element to the following places on the power wiring as shown below as a measure against disconnections in unspecific areas.



When devices are connected to a connector, the output circuit could be damaged by the above if the connector is disconnected while power is ON. Turn power OFF before connecting or disconnecting the connector.

Discontinue

High purity chemical gas/liquid control systems

Safety precautions

Always read before starting use

Compatibility check list of the product and working fluid

* The check list has been created based on the past evaluations and experiences, but does not ensure a performance.
* When using this regulator for a substance other than pure water, the user is responsible for confirming the compatibility of the working fluid and product materials. A person familiar with chemicals should confirm the compatibility.

Fluid name		Compatibility
Pure water		●
Oxidized fluid	Sulfuric acid	●
	Hydrochloric acid	●
	Nitric acid	●
	Hydrofluoric acid	● (Note 2)
	Phosphoric acid	●
	Antimony fluoride	● (Note 2)
	Hydrogen peroxide	●
	Ozone	△
	Sulfuric acid + hydrogen peroxide water	● (Note 3)
	Sulfuric acid + ozone	△
Basic fluid	Sodium hydroxide	●
	Potassium hydroxide	●
	Aqueous ammonia	●
Organic fluid	Acetone	×
	Butyl acetate	×
	Isopropyl alcohol	●
Other / mixed fluid	Thinner	×
	Register	● (Note 1)
	Developer	● (Note 1)
	Slurry	● (Note 1)
	Plating	● (Note 1)
	Peel liquid	● (Note 1, Note 4)
Gas	Air, nitrogen gas	● (Note 5)

Judgment	●	Available (Check the details at the page of the product.)
	△	Contact CKD for details. (Can be supported for some cases.)
	×	Not available

Note 1: In most cases the fluid is a mixture of many chemical liquids so that we cannot grasp all ramifications. Check the compatibility between the material of each components and the working fluid thoroughly to judge whether the product can be used.
Note 2: For hydrofluoric acid or chemical liquids that include hydrofluoric acid, the temperature range is 5 to 80°C. A body with bypass cannot be used for hydrofluoric acid or chemical liquids that include hydrofluoric acid.
Note 3: Contact CKD when you use sulfuric acid + hydrogen peroxide water at a temperature of 100°C or over.
Note 4: Regular replacement is required for the case where an amine peel liquid is used at a temperature of 80°C or over. The replacement is required at lease once a year.
Note 5: In the case of gas, maximum of 1 cm^3/min valve seat leakage (by air pressure) may occur.

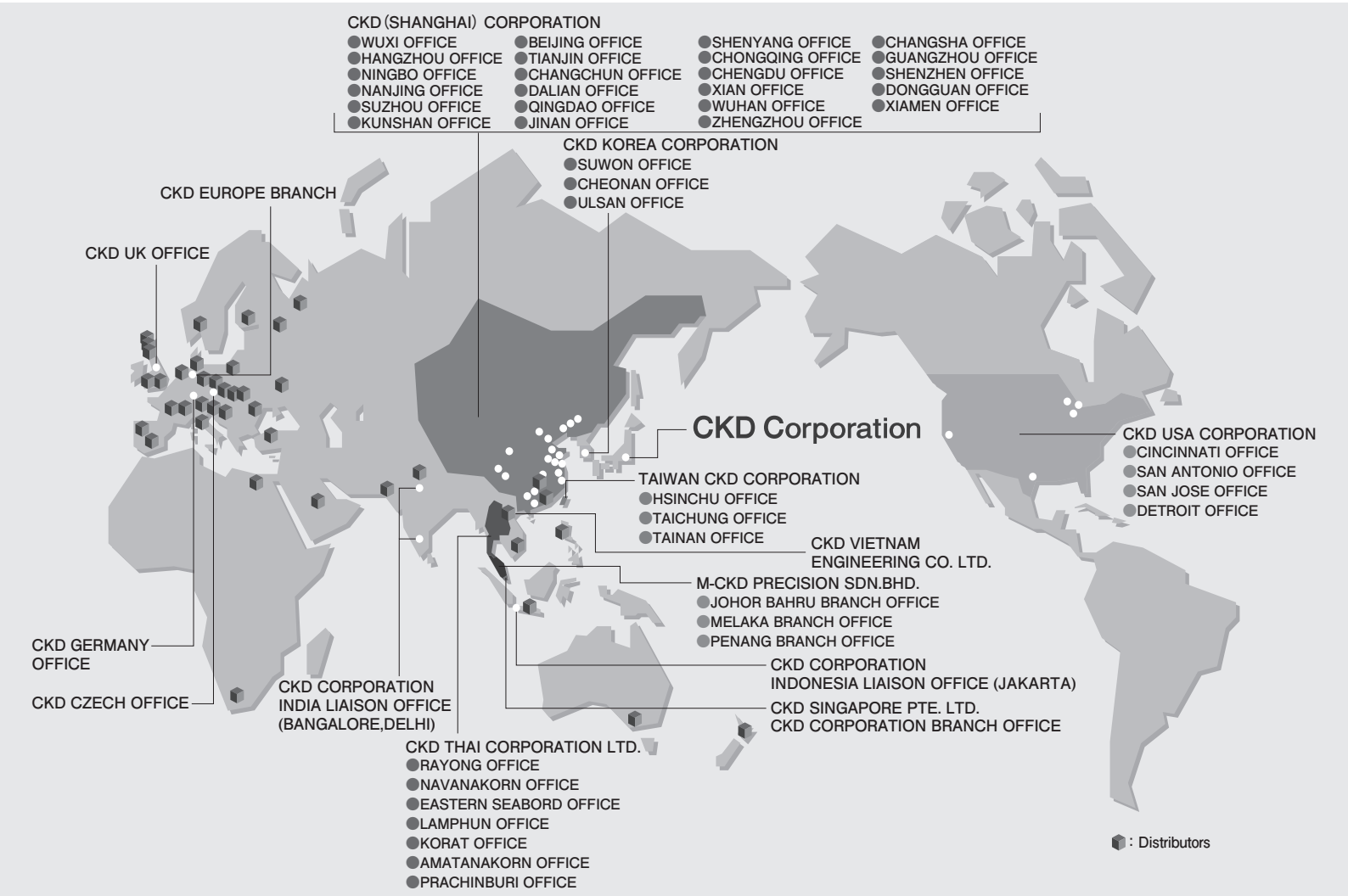
■ Safety and performance precautions

- When an organic solvent is used with fluorine resin pipes, take measures against fire caused by static electricity.
- A fluid, such as slurry and UV hardener, that includes particles or that may become solid or gelatinous may affect the performance.
- When using fluids containing a surface acting agent or highly permeable fluids such as a peeling agent, the fluid could permeate the part.
- Long-term use of chemical liquids with high permeability such as hydrochloric acid, hydrofluoric acid, and nitric acid will have the permeated gas deteriorate parts not even in wet areas.
- For the sake of safety, be sure to conduct periodic inspections1 or 2 times a year to check if there is any abnormality such as discoloration of a component, deformation, or corrosion.
- The sensor is not dust proof or explosion proof. It cannot be used in an atmosphere with steam or dust, corrosive gas, or direct contact with chemicals.

MEMO

Discontinue

WORLD NETWORK



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