

Diaphragm Valve Type AP (Pneumatic Type)

Features

- Near-Linear flow characteristics
- A new type of rubber having a high reliability in leakage prevention is used for the diaphragm and cushion.
- The original design achieves high sealing performance with low torque.
- Bayonet structure allowing quick diaphragm replacement
- Equipped with a bottom stand allowing easy and secure replacement.



Basic specifications

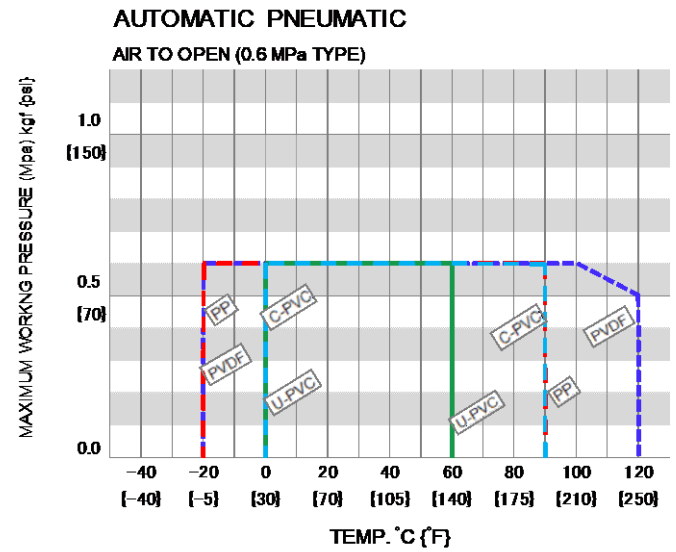
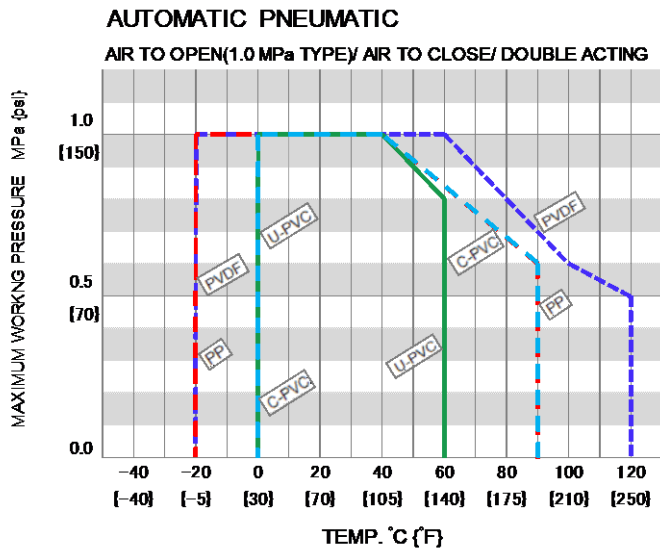
- Valve Type : Diaphragm Valve Type AP
- Size : 65 mm - 100 mm (2 1/2 inch – 4 inch)
- Body Material : U-PVC (Conforming to ASTM D1784 Cell Classification 12454A)
C-PVC (Conforming to ASTM D1784 Cell Classification 23567-A)
PP (Conforming to ASTM D4101 Cell Classification PP0110B67272)
PVDF / EL-PVDF (Conforming to ASTM D3222 Cell Classification Type II)
- Seal Material / Diaphragm : EPDM, PTFE, FKM etc.
- Connection / Flanged : JIS B2220 10K, DIN/EN1092-1 PN10, ANSI B16.5 CLASS150

Body Material	FLUID TEMPERATURE °C {°F}	Maximum Working Pressure (Normal temperature) MPa {psi}	Connection method
			Flanged
U-PVC	0 ~ 60 { 30~140 }	1.0 { 150 }	○
C-PVC	0 ~ 90 { 30~195 }	1.0 { 150 }	○
PP	-20 ~ 90 { -5~195 }	1.0 { 150 }	○
PVDF / EL-PVDF	-40 ~ 120 { -40~250 }	1.0 { 150 }	○

Note: The maximum working pressure is the value including the water hammer pressure. Be careful that the maximum working pressure is not exceeded during use.

* Concerning the allowable pressure for each temperature, material and actuator type, see the technical documents at the next page of this sheet.

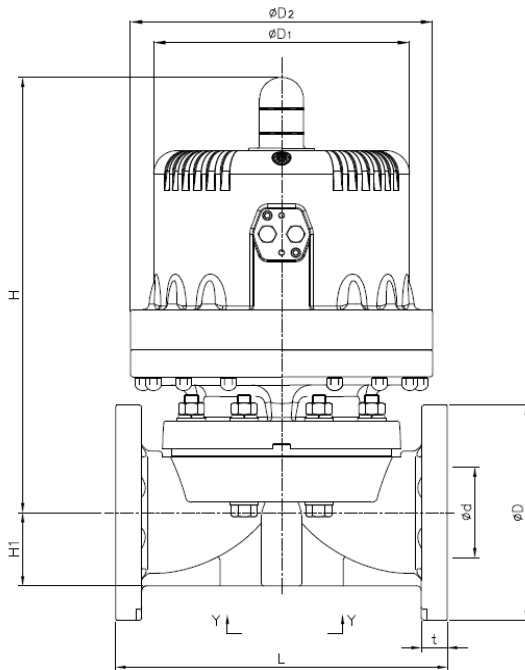
Working pressure vs. Temperature



Note : Make sure that the temperature and pressure are within the working range during operation.
(If the tolerance range is exceeded during use, the valve may be damaged.)

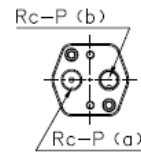
DATASHEET

Product dimension



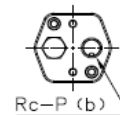
Face of air Supply

(FOR DOUBLE ACTING)



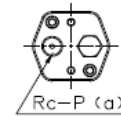
Valve open: (a) Exhaust (b) Supply
Valve close: (a) Supply (b) Exhaust

(FOR AIR TO OPEN)

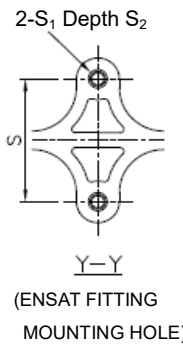


Valve open: (b) Supply
Valve close: (b) Exhaust

(FOR AIR TO CLOSE)



Valve open: (a) Exhaust
Valve close: (a) Supply



■ JIS (Unit: mm)

mm	inch	MAX.WORKING PRESSURE	d	JIS 10K				D ₁			D ₂			L	t		H			H ₁	S	S ₁	S ₂	P
				D	C	n	h	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE		U-PVC C-PVC	PP PVDF	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE					
65	2 1/2	0.6MPa, 1.0MPa	67	175	140	4	19	216	216	216	255	255	255	250	22	23	353	353	353	61	85	M8	15	1/4
80	3	0.6MPa	78	185	150	8	19	216	216	216	255	255	255	280	22	23	376	376	376	63	100	M12	22	1/4
		1.0MPa							232			271						389						
100	4	0.6MPa	100	210	175	8	19	232	232	276	271	271	315	340	22	24	428	428	451	78	120	M12	22	1/4
		1.0MPa							276			315						451						

■ DIN (Unit: mm)

mm	inch	MAX.WORKING PRESSURE	d	DIN PN10				D ₁			D ₂			L	t		H			H ₁	S	S ₁	S ₂	P
				D	C	n	h	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE		U-PVC C-PVC	PP PVDF	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE					
65	2 1/2	0.6MPa, 1.0MPa	67	185	145	4	18	216	216	216	255	255	255	290	22	22	353	353	353	61	85	M8	15	1/4
80	3	0.6MPa	78	200	160	8	18	216	216	216	255	255	255	310	24	24	376	376	376	63	100	M12	22	1/4
		1.0MPa							232			271						389						
100	4	0.6MPa	100	220	180	8	18	232	232	276	271	271	315	350	24	26	428	428	451	78	120	M12	22	1/4
		1.0MPa							276			315						451						

■ ANSI (Unit: inch)

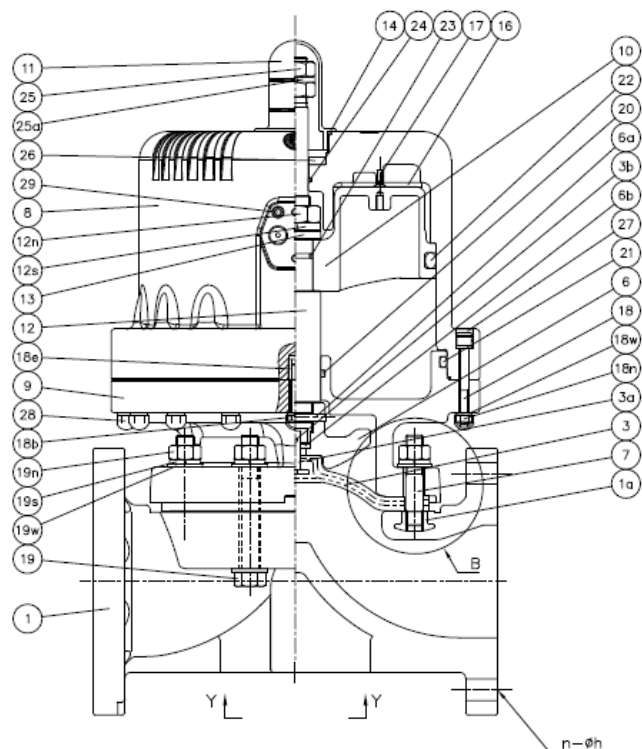
inch	mm	MAX.WORKING PRESSURE	d	ANSI Class 150				D ₁			D ₂			L		t		H			H ₁	S	S ₁	S ₂	P
				D	C	n	h	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE	GRINNEL STANDARD	AV STANDARD	U-PVC C-PVC	PP PVDF	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE					
2 1/2	65	85psi, 150psi	2.64	7.00	5.50	4	0.75	8.50	8.50	8.50	10.04	10.04	10.04	-	9.84	0.87	0.91	13.90	13.90	13.90	2.40	3.35	M8	0.59	1/4
3	80	85psi	3.07	7.50	6.00	4	0.75	8.50	8.50	8.50	10.04	10.04	10.04	10.37	11.02	0.87	0.91	14.80	14.80	14.80	2.48	3.94	M12	0.87	1/4
		150psi							9.13			10.67							15.31						
4	100	85psi	3.94	9.00	7.50	8	0.75	9.13	9.13	10.87	10.67	10.67	12.40	12.93	13.39	0.87	0.94	16.85	16.85	17.76	3.07	4.72	M12	0.87	1/4
		150psi							10.87			12.40							17.76						

ACTUATOR SELECTION CHART

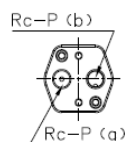
SIZE	ACTUATOR TYPE			
	DOUBLE ACTING	AIR TO OPEN		AIR TO CLOSE
		0.6MPa TYPE	1.0MPa TYPE	
65mm (2 1/2inch)	AP-1DA	AP-1AO-06	AP-1AO-10	AP-1AS
80mm (3inch)	AP-2DA	AP-2AO-06	—	AP-2AS
	—	—	AP-2AO-10	—
100mm (4inch)	AP-3DA	AP-3AO-06	—	—
	—	—	AP-3AO-10	AP-3AS

Parts list

AUTOMATIC [PNEUMATIC] DOUBLE ACTING

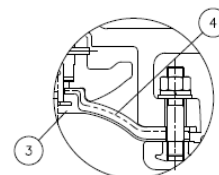


Face of air Supply

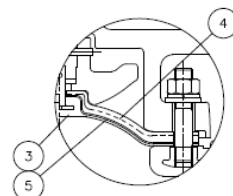


Valve open: (a) Exhaust (b) Supply

Valve close: (a) Supply (b) Exhaust

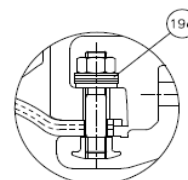
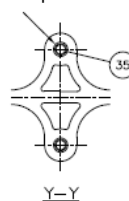


In case material of
diaphragm is PTFE



In case material of diaphragm is
PTFE with cushion cover

2-S₁ Depth S₂



"B" Part

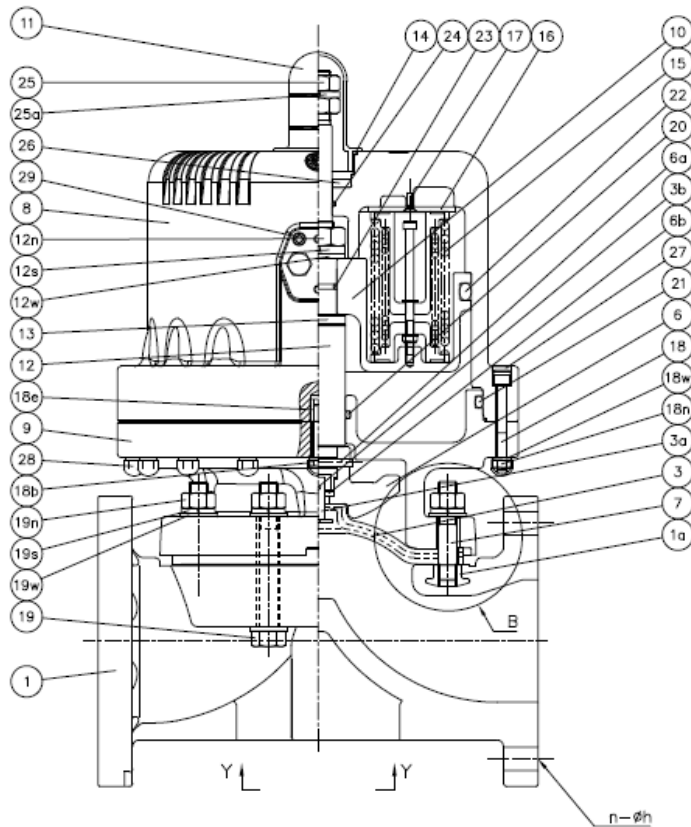
In case of PVDF Body

PART NO./NAME	QTY	MATERIAL	PART NO./NAME	QTY	MATERIAL	PART NO./NAME	QTY	MATERIAL
1 BODY	1	PVC, C-PVC, PP, PVDF	8 CYLINDER BODY	1	PPG	19c CONICAL SPRING WASHER (No.19)	8Sets	STAINLESS STEEL
1a INSERTED NUT	4	COPPER ALLOY	9 CYLINDER BONNET	1	PPG			Use for PVDF Body
		Use for PVC,C-PVC,PP Body	10 PISTON	1	PF+GF	19n NUT (No.19)	8	STAINLESS STEEL
		STAINLESS STEEL	11 GAUGE COVER	1	PC	19s SPRING WASHER (No.19)	8	STAINLESS STEEL
3 DIAPHRAGM	1	EPDM, PTFE, Others	12 STEM	1	STAINLESS STEEL	19w WASHER (No.19)	12	STAINLESS STEEL
3a INSERTED METAL OF DIAPHRAGM	1	STAINLESS STEEL	12n NUT (No.12)	1	STAINLESS STEEL	20 O-RING (No.20)	1	NBR
3b DIAPHRAGM PIN	1	STAINLESS STEEL	12s SPRING WASHER (No.12)	1	STAINLESS STEEL	21 O-RING (No.21)	1	NBR
4 CUSHION	1	EPDM	13 STEM WASHER	1	STAINLESS STEEL	22 O-RING (No.22)	1	NBR
		Use for PTFE Diaphragm	14 O-RING (No.14)	1	EPDM	23 O-RING (No.23)	1	NBR
5 CUSHION COVER	1	PVDF	16 SPRING BASE	1	PVC	24 O-RING (No.24)	1	NBR
		Use for PTFE Diaphragm	17 SCREW	4	STAINLESS STEEL	25 STOPPER	1Sets	STAINLESS STEEL
6 COMPRESSOR	1	PVDF	18 CAP BOLT (No.18)	-	STAINLESS STEEL	25a SPRING WASHER (No.25)	1	STAINLESS STEEL
6a COMPRESSOR PIN	1	STAINLESS STEEL	18b BOLT (No.18)	1	STAINLESS STEEL	26 STOPPER BASE	1	STAINLESS STEEL
6b METAL OF COMPRESSOR	1	STAINLESS STEEL	18e INSERTED NUT (No.18)	1	COPPER ALLOY	27 CAP	-	EPDM
7 STUD BOLT	4	STAINLESS STEEL	18n NUT (No.18)	-	STAINLESS STEEL	28 NUT CAP	-	PVC
			18w WASHER (No.18)	-	STAINLESS STEEL	29 INSERTED METAL OF CYLINDER BODY	2	STAINLESS STEEL
			19 BOLT (No.19)	4	STAINLESS STEEL	35 ENSAT FOR BODY	2	COPPER ALLOY

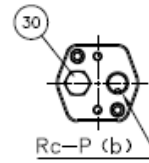
Diaphragms except EPDM and PTFE are available in FKM, VIFLON®C (FKM-C), VIFLON®F (FKM-F), CPE, CSM, NBR and IIR when required.
The shape and appearance of assembly differ a little with nominal size compared to this drawing.

DATASHEET

AUTOMATIC [PNEUMATIC] AIR TO OPEN

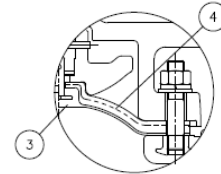
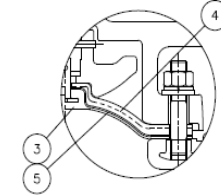
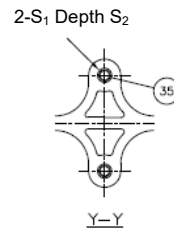


Face of air Supply

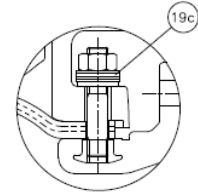


Valve open: (b) Supply

Valve close: (b) Exhaust

In case material of
diaphragm is PTFEIn case material of diaphragm is
PTFE with cushion cover2-S₁ Depth S₂

Y-Y



" B" Part

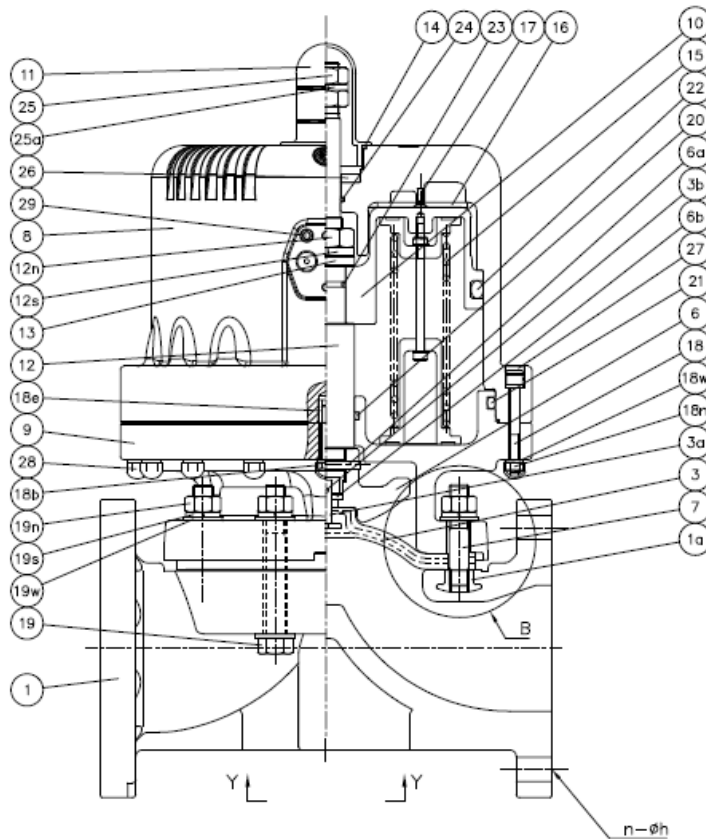
In case of PVDF Body

PART NO./NAME	QTY	MATERIAL	PART NO./NAME	QTY	MATERIAL	PART NO./NAME	QTY	MATERIAL
1 BODY	1	PVC, C-PVC, PP, PVDF	10 PISTON	1	PF+GF	19n NUT (No.19)	8	STAINLESS STEEL
1a INSERTED NUT	4	COPPER ALLOY Use for PVC,C-PVC,PP Body STAINLESS STEEL Use for PVDF Body	11 GAUGE COVER	1	PC	19s SPRING WASHER (No.19)	8	STAINLESS STEEL
3 DIAPHRAGM	1	EPDM, PTFE, Others	12 STEM	1	STAINLESS STEEL	19w WASHER (No.19)	12	STAINLESS STEEL
3a INSERTED METAL OF DIAPHRAGM	1	STAINLESS STEEL	12n NUT (No.12)	1	STAINLESS STEEL	20 O-RING (No.20)	1	NBR
3b DIAPHRAGM PIN	1	STAINLESS STEEL	12s SPRING WASHER (No.12)	1	STAINLESS STEEL	21 O-RING (No.21)	1	NBR
4 CUSHION	1	EPDM Use for PTFE Diaphragm	13 STEM WASHER	1	STAINLESS STEEL	22 O-RING (No.22)	1	NBR
5 CUSHION COVER	1	PVDF Use for PTFE Diaphragm	14 O-RING (No.14)	1	EPDM	23 O-RING (No.23)	1	NBR
6 COMPRESSOR	1	PVDF	15 SPRING UNIT	-	SWOSC-B etc.	24 O-RING (No.24)	1	NBR
6a COMPRESSOR PIN	1	STAINLESS STEEL	16 SPRING BASE	1	PVC	25 STOPPER	1Sets	STAINLESS STEEL
6b METAL OF COMPRESSOR	1	STAINLESS STEEL	17 SCREW	4	STAINLESS STEEL	25a SPRING WASHER (No.25)	1	STAINLESS STEEL
7 STUD BOLT	4	STAINLESS STEEL	18 CAP BOLT (No.18)	-	STAINLESS STEEL	26 STOPPER BASE	1	STAINLESS STEEL
8 CYLINDER BODY	1	PPG	18b BOLT (No.18)	1	STAINLESS STEEL	27 CAP	-	EPDM 0.6MPa: Red 1.0MPa: Blue
9 CYLINDER BONNET	1	PPG	18e INSERTED NUT (No.18)	1	COPPER ALLOY	28 NUT CAP	-	PVC
			18n NUT (No.18)	-	STAINLESS STEEL	29 INSERTED METAL OF CYLINDER BODY	2	STAINLESS STEEL
			18w WASHER (No.18)	-	STAINLESS STEEL	30 NIPPLE	1	PPG
			19 BOLT (No.19)	4	STAINLESS STEEL	35 ENSAT FOR BODY	2	COPPER ALLOY
			19c CONICAL SPRING WASHER (No.19)	8Sets	STAINLESS STEEL Use for PVDF Body			

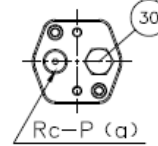
Diaphragms except EPDM and PTFE are available in FKM, VIFLON®C (FKM-C), VIFLON®F (FKM-F), CPE, CSM, NBR and IIR when required.
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DATASHEET

AUTOMATIC [PNEUMATIC] AIR TO CLOSE

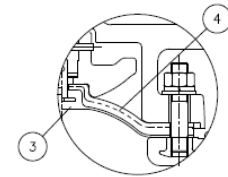
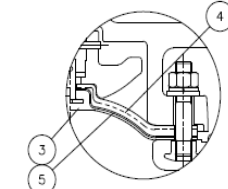
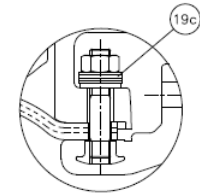
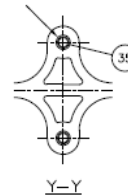


Face of air Supply



Valve open: (a) Exhaust

Valve close: (a) Supply

In case material of
diaphragm is PTFEIn case material of diaphragm is
PTFE with cushion cover2-S₁ Depth S₂

"B" Part

In case of PVDF Body

PART NO./NAME	QTY	MATERIAL	PART NO./NAME	QTY	MATERIAL	PART NO./NAME	QTY	MATERIAL
1 BODY	1	PVC, C-PVC, PP, PVDF	10 PISTON	1	PF+GF	19n NUT (No.19)	8	STAINLESS STEEL
1a INSERTED NUT	4	COPPER ALLOY Use for PVC,C-PVC,PP Body STAINLESS STEEL Use for PVDF Body	11 GAUGE COVER	1	PC	19s SPRING WASHER (No.19)	8	STAINLESS STEEL
3 DIAPHRAGM	1	EPDM, PTFE, Others	12 STEM	1	STAINLESS STEEL	19w WASHER (No.19)	12	STAINLESS STEEL
3a INSERTED METAL OF DIAPHRAGM	1	STAINLESS STEEL	12n NUT (No.12)	1	STAINLESS STEEL	20 O-RING (No.20)	1	NBR
3b DIAPHRAGM PIN	1	STAINLESS STEEL	12s SPRING WASHER (No.12)	1	STAINLESS STEEL	21 O-RING (No.21)	1	NBR
4 CUSHION	1	EPDM Use for PTFE Diaphragm	13 STEM WASHER	1	STAINLESS STEEL	22 O-RING (No.22)	1	NBR
5 CUSHION COVER	1	PVDF Use for PTFE Diaphragm	14 O-RING (No.14)	1	EPDM	23 O-RING (No.23)	1	NBR
6 COMPRESSOR	1	PVDF	15 SPRING UNIT	-	SWOSC-B etc.	24 O-RING (No.24)	1	NBR
6a COMPRESSOR PIN	1	STAINLESS STEEL	16 SPRING BASE	1	PVC	25 STOPPER	1Sets	STAINLESS STEEL
6b METAL OF COMPRESSOR	1	STAINLESS STEEL	17 SCREW	4	STAINLESS STEEL	25a SPRING WASHER (No.25)	1	STAINLESS STEEL
7 STUD BOLT	4	STAINLESS STEEL	18 CAP BOLT (No.18)	-	STAINLESS STEEL	26 STOPPER BASE	1	STAINLESS STEEL
8 CYLINDER BODY	1	PPG	18b BOLT (No.18)	1	STAINLESS STEEL	27 CAP	-	EPDM
9 CYLINDER BONNET	1	PPG	18e INSERTED NUT (No.18)	1	COPPER ALLOY	28 NUT CAP	-	PVC
			18n NUT (No.18)	-	STAINLESS STEEL	29 INSERTED METAL OF CYLINDER BODY	2	STAINLESS STEEL
			18w WASHER (No.18)	-	STAINLESS STEEL	30 NIPPLE	1	PPG
			19 BOLT (No.19)	4	STAINLESS STEEL	35 ENSAT FOR BODY	2	COPPER ALLOY
			19c CONICAL SPRING WASHER (No.19)	8Sets	STAINLESS STEEL Use for PVDF Body			

Diaphragms except EPDM and PTFE are available in FKM, VIFLON[®]C (FKM-C), VIFLON[®]F (FKM-F), CPE, CSM, NBR and IIR when required.
The shape and appearance of assembly differ a little with nominal size compared to this drawing.

Technical Data of Actuator

Light weight and compact size due to plastic actuator.
Air piping is compatible with NAMUR standard.
All-plastic body ensures excellent corrosion resistance.



BASIC SPECIFICATIONS

DOUBLE ACTING	ACTUATOR TYPE			UNIT
	AP-1DA	AP-2DA	AP-3DA	
	VALVE SIZE			
	65mm (2 1/2inch)	80mm (3inch)	100mm (4inch)	
OPERATING PRESSURE	0.4 - 0.5			MPa
AIR CONSUMPTION	22.1	23.7	30.4	NL ^{*1)} /OPEN & CLOSE (at 0.4MPa)
	26.5	28.4	36.5	NL ^{*1)} /OPEN & CLOSE (at 0.5MPa)
AIR SUPPLY BORE	Rc1/4			
AMBIENT TEMPERATURE	- 10 ~ 50 { 14 ~ 122 }			℃ { °F }

AIR TO OPEN (0.6MPa SPEC.)	ACTUATOR TYPE			UNIT
	AP-1AO-06	AP-2AO-06	AP-3AO-06	
	VALVE SIZE			
	65mm (2 1/2inch)	80mm (3inch)	100mm (4inch)	
OPERATING PRESSURE	0.4 - 0.5			MPa
AIR CONSUMPTION	7.4	7.7	10.6	NL ^{*1)} /OPEN & CLOSE (at 0.4MPa)
	8.9	9.2	12.7	NL ^{*1)} /OPEN & CLOSE (at 0.5MPa)
AIR SUPPLY BORE	Rc1/4			
AMBIENT TEMPERATURE	- 10 ~ 50 { 14 ~ 122 }			℃ { °F }

AIR TO OPEN (1.0MPa SPEC.)	ACTUATOR TYPE			UNIT
	AP-1AO-10	AP-2AO-10	AP-3AO-10	
	VALVE SIZE			
	65mm (2 1/2inch)	80mm (3inch)	100mm (4inch)	
OPERATING PRESSURE	0.4 - 0.5			MPa
AIR CONSUMPTION	7.4	9.3	15.1	NL ^{*1)} /OPEN & CLOSE (at 0.4MPa)
	8.9	11.2	18.1	NL ^{*1)} /OPEN & CLOSE (at 0.5MPa)
AIR SUPPLY BORE	Rc1/4			
AMBIENT TEMPERATURE	- 10 ~ 50 { 14 ~ 122 }			℃ { °F }

AIR TO CLOSE	ACTUATOR TYPE			UNIT
	AP-1AS	AP-2AS	AP-3AS	
	VALVE SIZE			
	65mm (2 1/2inch)	80mm (3inch)	100mm (4inch)	
OPERATING PRESSURE	0.4 - 0.5			MPa
AIR CONSUMPTION	7.0	8.3	17.2	NL ^{*1)} /OPEN & CLOSE (at 0.4MPa)
	8.4	10.0	20.6	NL ^{*1)} /OPEN & CLOSE (at 0.5MPa)
AIR SUPPLY BORE	Rc1/4			
AMBIENT TEMPERATURE	- 10 ~ 50 { 14 ~ 122 }			℃ { °F }

*1) NL = Normal Liters

OPTION COMBINATION

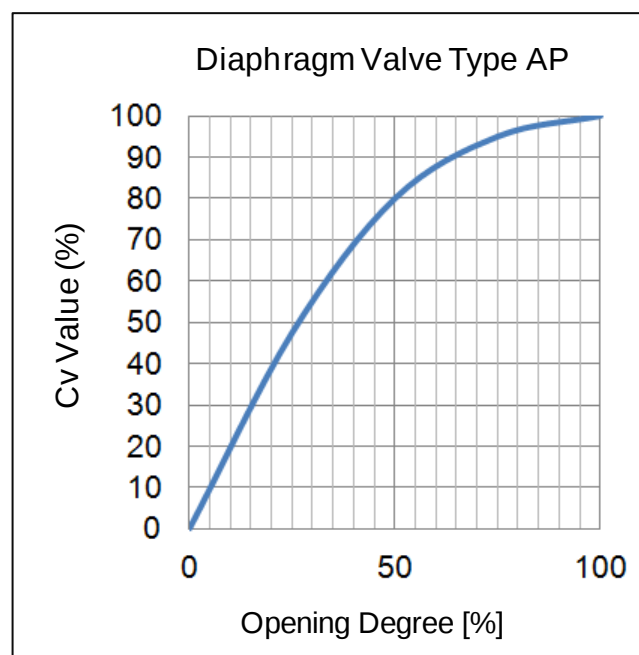
COMBINATION NO.	1	2	3	4	5	6	7	8	9	10	11	12
SOLENOID VALVE *1	○				○	○		○				
FILTER REGULATOR					○			○				
SPEED CONTROLLER	◎	○		◎	◎	◎	○	◎		○		
LIMIT SWITCH BOX			○			○	○	○				
LIMIT SWITCH			○			○	○	○				
BYPASS VALVE (SPEED CONTROLLER)												
POSITIONER (E/P,P/P)	◎			○	◎	◎		◎	○	○		
MANUAL OVERRIDE											○	
FULL OPENING ADJUSTMENT												○
INSERTED METAL (WITH ENSAT)	STANDARD											

*1 : Equipped with a built-in speed controller and bypass valve.

◎ : indicates solenoid valve-dedicated type.

OPTION LIST	MANUFACTURER	BASIC SPECIFICATIONS
SOLENOID VALVE NAMUR	KONAN	▪ WATER PROOF, EXPLOSION PROOF ▪ POWER SOURCE AC100V, AC110V, AC200V, AC220V, DC24V
FILTER REGULATOR	KONAN	
SPEED CONTROLLER	KONAN	* Since a solenoid valve has a built-in exhaust valve, when a solenoid valve is mounted, no speed controller is necessary.
LIMIT SWITCH BOX	Rotech	▪ WATER PROOF
LIMIT SWITCH	AZBIL (formerly YAMATAKE)	▪ WATER PROOF, EXPLOSION PROOF ▪ OPEN: 1pc, CLOSE: 1pc, OPEN/CLOSE: 2pcs
POSITIONER	YTC	▪ E/P: INPUT SIGNAL CURRENT DC 4-20 mA ▪ P/P: INPUT SIGNAL AIR PRESSURE 0.02 - 0.1 MPa
MANUAL OVERRIDE	ASAHI YUKIZAI	
FULL OPENING ADJUSTME	ASAHI YUKIZAI	

Cv value for each opening degree



FULL-OPEN Cv VALUE

mm	65	80	100
inch	2 1/2	3	4
FULL-OPEN Cv VALUE	85	115	185

Product weight

TYPE AP [AUTOMATIC PNEUMATIC TYPE AP]

Unit : kg

mm	inch	AIR TO OPEN								AIR TO CLOSE				DOUBLE ACTING			
		0.6MPa TYPE				1.0MPa TYPE											
		U-PVC	C-PVC	PP	PVDF	U-PVC	C-PVC	PP	PVDF	U-PVC	C-PVC	PP	PVDF	U-PVC	C-PVC	PP	PVDF
65	2 1/2	13.1	13.1	12.1	13.6	13.7	13.7	12.7	14.2	12.0	12.0	11.0	12.5	11.4	11.4	10.4	11.9
80	3	15.3	15.3	13.8	15.8	18.1	18.1	16.6	18.6	13.6	13.6	12.1	14.1	12.5	12.5	11.0	13.0
100	4	21.2	21.2	18.7	21.7	28.4	28.4	25.9	28.9	22.7	22.7	20.2	23.2	17.3	17.3	14.8	17.8

Product model code list

ACTUATION	TYPE	ACTUATOR TYPE	ACTION /POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	14	P	*	*	*	F	*	***
A AUTOMATIC VALVE	14 TYPE 14	AP TYPE AP	F DOUBLE ACTING (1.0MPa TYPE) G AIR TO OPEN (0.6MPa TYPE) H AIR TO OPEN (1.0MPa TYPE) S AIR TO CLOSE (1.0MPa TYPE)	U U-PVC C C-PVC P PP F PVDF	E EPDM V FKM F Viton-F C Viton-C T PTFE	F FLANGED	1 JIS10K D DIN A ANSI (GRINNELL STANDARD) J ANSI (AV STANDARD)	065 65mm 1 100 100mm

Installation, Operation and Maintenance Manual

For details of Installation, Operation and Maintenance, please contact our nearest distribution agent or sales office.