

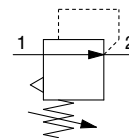
Regulator

AR20-B to AR60-B

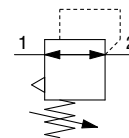
Regulator with Backflow Function

AR20K-B to AR60K-B

Symbol
Regulator



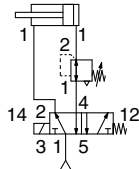
Regulator with
Backflow Function



- With the backflow function it incorporates a mechanism to exhaust the air pressure in the outlet side reliably and quickly.

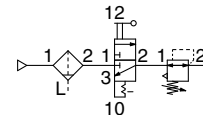
Example 1)

When the pressure in the rear and the front of the cylinder differs:



Example 2)

When the air supply is cut off and releasing the inlet pressure to the atmosphere, the residual pressure release of the outlet side can be ensured for a safety purpose.



How to Order

Refer to page 63 for size 10.

AR **30** **K** - **03** **BE** - **1** - **B**

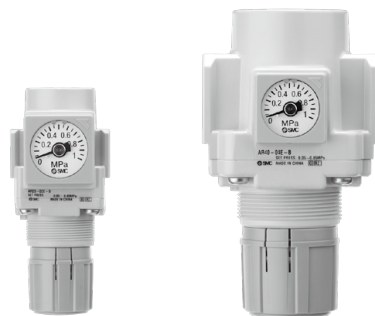
① ② ③ ④ ⑤ ⑥

- Option/Semi-standard: Select one each for a to g.
- Option/Semi-standard symbol: When more than one specification is required, indicate in alphanumeric order.
Example) AR30K-03BE-1NR-B

	Symbol	Description	①						
			Body size						
			20	25	30	40	50	60	
②	With backflow function	Nil	Without backflow function						
		K ^{Note 1)}	With backflow function						
		+							
③	Pipe thread type	Nil	Rc						
		N	NPT						
		F	G						
		+							
④	Port size	01	1/8						
		02	1/4						
		03	3/8						
		04	1/2						
		06	3/4						
		10	1						
		+							
⑤	a	Mounting	Nil	Without mounting option					
			B ^{Note 3)}	With bracket					
			H	With set nut (for panel mount)					
			+						
	b	Pressure gauge ^{Note 4)}	Nil	Without pressure gauge					
			E	Square embedded type pressure gauge (with limit indicator)					
			G	Round type pressure gauge (with limit indicator)					
			M	Round type pressure gauge (with color zone)					
		Digital pressure switch ^{Note 5)}	E1	Output: NPN output/Electrical entry: Wiring bottom entry					
			E2	Output: NPN output/Electrical entry: Wiring top entry					
			E3	Output: PNP output/Electrical entry: Wiring bottom entry					
	E4		Output: PNP output/Electrical entry: Wiring top entry						

Regulator *Series AR20-B to AR60-B*

Regulator with Backflow Function *Series AR20K-B to AR60K-B*



AR20-B, AR20K-B AR40-B, AR40K-B

AC
AF+AR+AL
AW+AL
AF+AR
AF+AFM+AR
AW+AFM
Attachment
AF
AFM / AFD
AR
AL
AW

	Symbol	Description	①						
			Body size						
			20	25	30	40	50	60	
⑥ Semi-standard	c Set pressure <small>Note 6)</small>	Nil	0.05 to 0.85 MPa setting	●	●	●	●	●	●
		1	0.02 to 0.2 MPa setting	●	●	●	●	●	●
	+								
	d Exhaust mechanism	Nil	Relieving type	●	●	●	●	●	●
		N	Non-relieving type	●	●	●	●	●	●
	+								
	e Flow direction	Nil	Flow direction: Left to right	●	●	●	●	●	●
		R	Flow direction: Right to left	●	●	●	●	●	●
	+								
	f Knob	Nil	Downward	●	●	●	●	●	●
		Y	Upward	●	●	●	●	●	●
	+								
g Pressure unit	Nil	Name plate and pressure gauge in imperial units: MPa	●	●	●	●	●	●	
	Z <small>Note 7)</small>	Name plate and pressure gauge in imperial units: psi	○ <small>Note 9)</small>	○ <small>Note 9)</small>	○ <small>Note 9)</small>	○ <small>Note 9)</small>	○ <small>Note 9)</small>	○ <small>Note 9)</small>	
	ZA <small>Note 8)</small>	Digital pressure switch: With unit conversion function	△ <small>Note 10)</small>	△ <small>Note 10)</small>	△ <small>Note 10)</small>	△ <small>Note 10)</small>	△ <small>Note 10)</small>	△ <small>Note 10)</small>	

- Note 1) Set the inlet pressure to at least 0.05 MPa higher than the set pressure.
 Note 2) Option B, G, H, M are not assembled and supplied loose at the time of shipment.
 Note 3) Assembly of a bracket and set nuts (applicable to the AR20(K)-B to AR40(K)-B). Including 2 mounting screws for the AR50(K)-B and AR60(K)-B
 Note 4) When the pressure gauge is attached, a 1.0 MPa pressure gauge will be fitted for standard (0.85 MPa) type. 0.4 MPa pressure gauge for 0.2 MPa type.
 Note 5) When choosing with H (panel mount), the installation space for lead wires will not be secured. In this case, select "wiring top entry" for the electrical entry. (Select "wiring bottom entry" when the semi-standard Y is chosen simultaneously.)
 Note 6) Pressure can be set higher than the specification pressure in some cases, but

- use pressure within the specification range.
 Note 7) For pipe thread type: NPT.
 This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)
 Cannot be used with M: Round pressure gauge (with color zone). Available by request for special.
 The digital pressure switch will be equipped with the unit conversion function, setting to psi initially.
 Note 8) For options: E1, E2, E3, E4. This product is for overseas use only according to the new Measurement Law. (The SI unit is provided for use in Japan.)
 Note 9) ○: For pipe thread type: NPT only
 Note 10) △: Select with options: E1, E2, E3, E4.

Standard Specifications

Model	AR20-B	AR25-B	AR30-B	AR40-B	AR40-06-B	AR50-B	AR60-B
Port size	1/8, 1/4	1/4, 3/8	1/4, 3/8	1/4, 3/8, 1/2	3/4	3/4, 1	1
Pressure gauge port size <small>Note 1)</small>	1/8						
Fluid	Air						
Ambient and fluid temperature <small>Note 2)</small>	-5 to 60°C (with no freezing)						
Proof pressure	1.5 MPa						
Maximum operating pressure	1.0 MPa						
Set pressure range	0.05 to 0.85 MPa						
Construction	Relieving type						
Weight (kg)	0.16	0.21	0.29	0.44	0.47	1.17	1.22

- Note 1) Pressure gauge connection threads are not available for F.R.L. unit with a square embedded type pressure gauge or with a digital pressure switch.
 Note 2) -5 to 50°C for the products with the digital pressure switch

Series AR20-B to AR60-B

Series AR20K-B to AR60K-B

Options/Part No.

Option		Model	AR20(K)-B	AR25(K)-B	AR30(K)-B	AR40(K)-B	AR40(K)-06-B	AR50(K)-B	AR60(K)-B
Bracket assembly <small>Note 1)</small>			AR23P-270AS	AR28P-270AS	AR33P-270AS	AR43P-270AS		AR52P-270AS	
Set nut			AR23P-260S	AR28P-260S	AR33P-260S	AR43P-260S		___ <small>Note 2)</small>	
Pressure gauge	Round type <small>Note 3)</small>	Standard	G36-10-□01			G46-10-□01			
		0.02 to 0.2 MPa setting	G36-4-□01			G46-4-□01			
	Round type <small>Note 3)</small> (with color zone)	Standard	G36-10-□01-L			G46-10-□01-L			
		0.02 to 0.2 MPa setting	G36-4-□01-L			G46-4-□01-L			
Square embedded type <small>Note 4)</small>	Standard		GC3-10AS [GC3P-010AS (Pressure gauge cover only)]						
	0.02 to 0.2 MPa setting		GC3-4AS [GC3P-010AS (Pressure gauge cover only)]						
Digital pressure switch <small>Note 5)</small>	NPN output: Wiring bottom entry		ISE35-N-25-MLA [ISE35-N-25-M (Switch body only)]						
	NPN output: Wiring top entry		ISE35-R-25-MLA [ISE35-R-25-M (Switch body only)]						
	PNP output: Wiring bottom entry		ISE35-N-65-MLA [ISE35-N-65-M (Switch body only)]						
	PNP output: Wiring top entry		ISE35-R-65-MLA [ISE35-R-65-M (Switch body only)]						

Note 1) Assembly of a bracket and set nuts. Including 2 mounting screws for the AR50(K)-B and AR60(K)-B

Note 2) Please consult with SMC regarding the set nuts for the AR50(K)-B and AR60(K)-B.

Note 3) □ in part numbers for a round pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT.

Please contact SMC regarding the pressure gauge supply for psi unit specifications.

Note 4) Including one O-ring and 2 mounting screws. []: Pressure gauge cover only

Note 5) In addition to the pressure switch body, lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached.

[]: Switch body only. (Regarding how to order the digital pressure switch, refer to the **WEB catalog** or the Best Pneumatics No.6.)

⚠ Specific Product Precautions

Be sure to read this before handling. Refer to the back cover for Safety Instructions, "Handling Precautions for SMC Products" and the Operation Manual for F.R.L. Precautions, <http://www.smcworld.com>

Selection

⚠ Warning

- Residual pressure disposal (outlet pressure removal) is not possible for the AR20-B to AR60-B even though the inlet pressure is exhausted. When the residual pressure disposal is performed, use the regulator with a backflow function (AR20K-B to AR60K-B).

Maintenance

⚠ Warning

- When using the regulator with backflow function between a solenoid valve and an actuator, check the pressure gauge periodically. Sudden pressure fluctuations may shorten the durability of the pressure gauge. A digital pressure gauge is recommended for such situation or as deemed necessary.

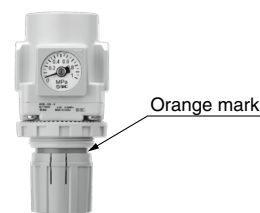
Mounting/Adjustment

⚠ Warning

- Set the regulator while verifying the displayed values of the inlet and outlet pressure gauges. Turning the regulator knob excessively can cause damage to the internal parts.
- Do not use tools on the pressure regulator knob as this may cause damage. It must be operated manually.

⚠ Caution

- Be sure to unlock the knob before adjusting the pressure and lock it after setting the pressure. Failure to follow this procedure can cause damage to the knob and the outlet pressure may fluctuate.
 - Pull the pressure regulator knob to unlock. (You can visually verify this with the "orange mark" that appears in the gap.)
 - Push the pressure regulator knob to lock. When the knob is not easily locked, turn it left and right a little and then push it (when the knob is locked, the "orange mark", i.e., the gap will disappear).



- A knob cover is available to prevent careless operation of the knob. Refer to page 97 for details.

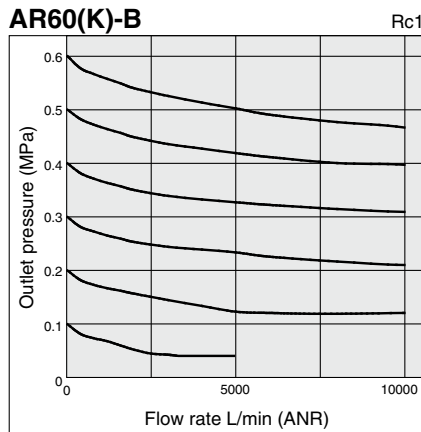
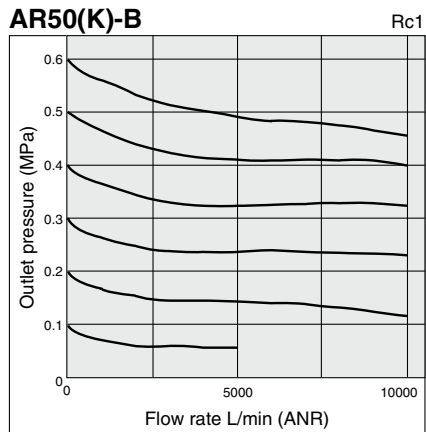
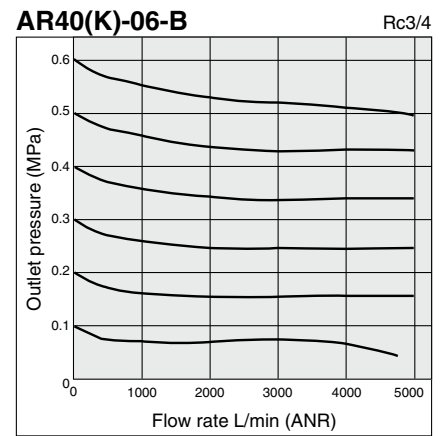
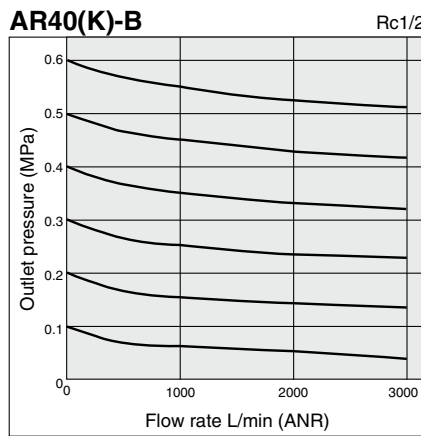
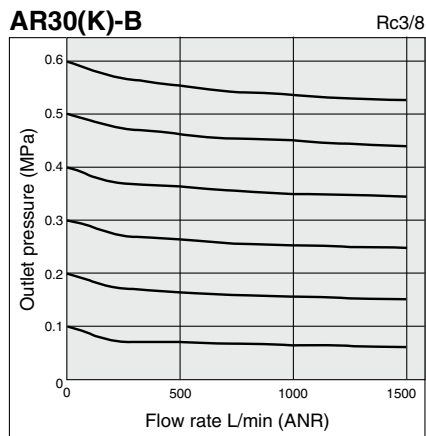
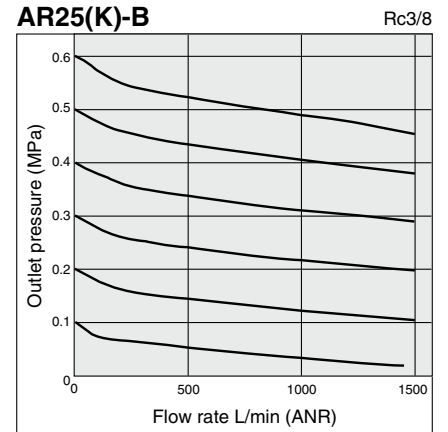
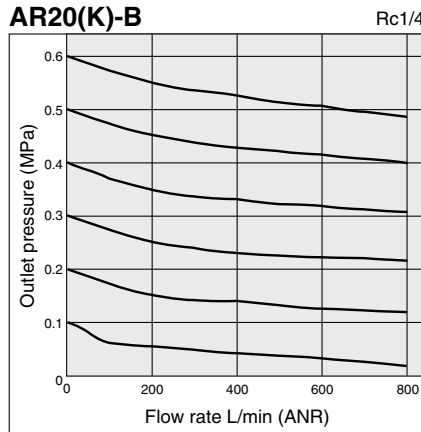
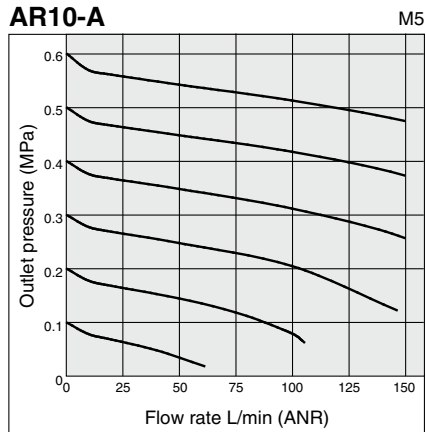
Regulator *Series AR10-A*

Regulator *Series AR20-B to AR60-B*

Regulator with Backflow Function *Series AR20K-B to AR60K-B*

Flow-rate Characteristics (Representative values)

Condition: Inlet pressure 0.7 MPa



AC

AF+AR+AL

AW+AL

AF+AR

AF+AFM+AR

AW+AFM

Attachment

AF

AFM / AFD

AR

AL

AW

Series AR10-A

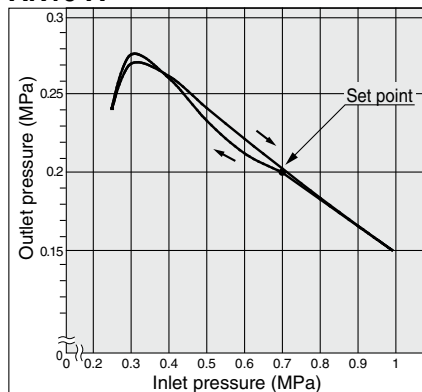
Series AR20-B to AR60-B

Series AR20K-B to AR60K-B

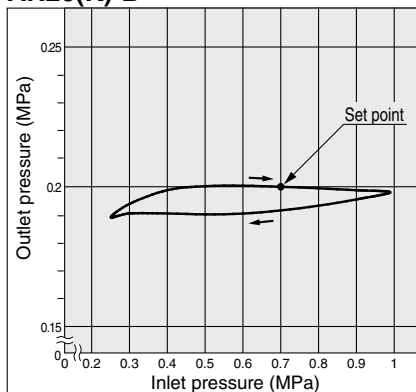
Pressure Characteristics (Representative values)

Conditions: Inlet pressure 0.7 MPa, Outlet pressure 0.2 MPa, Flow rate 20 L/min (ANR)

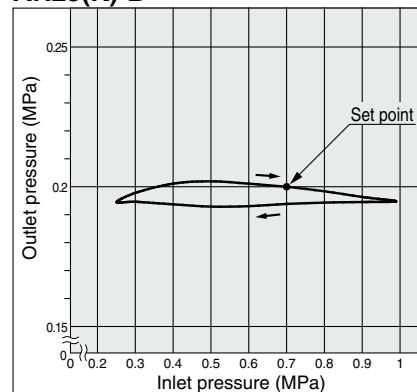
AR10-A



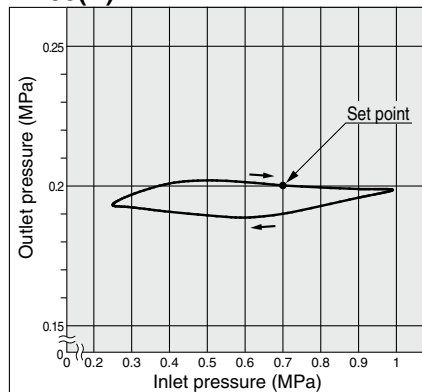
AR20(K)-B



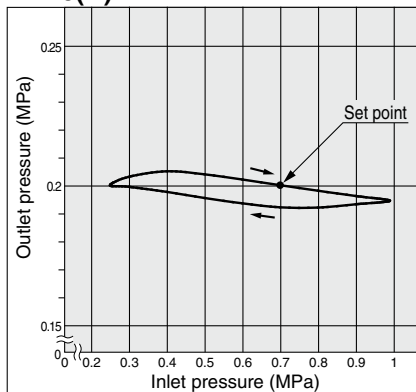
AR25(K)-B



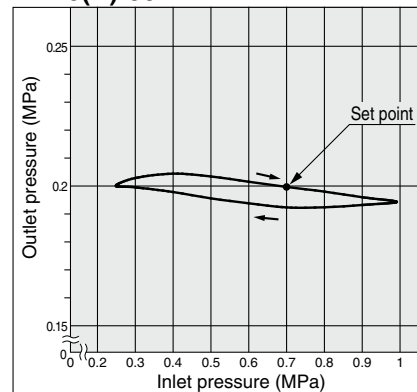
AR30(K)-B



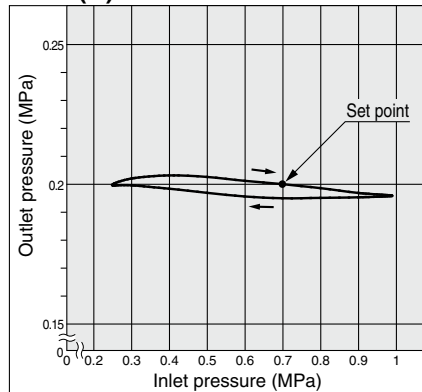
AR40(K)-B



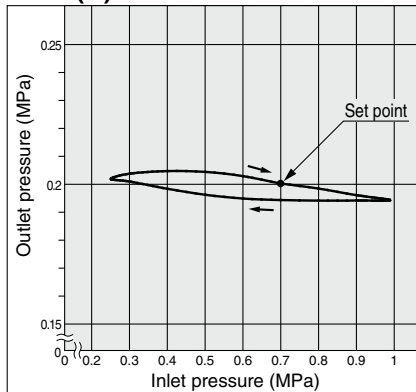
AR40(K)-06-B



AR50(K)-B



AR60(K)-B



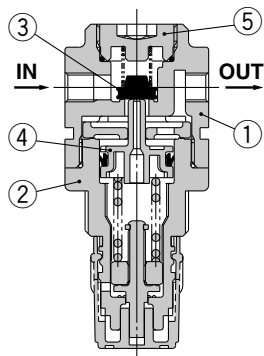
Regulator *Series AR10-A*

Regulator *Series AR20-B to AR60-B*

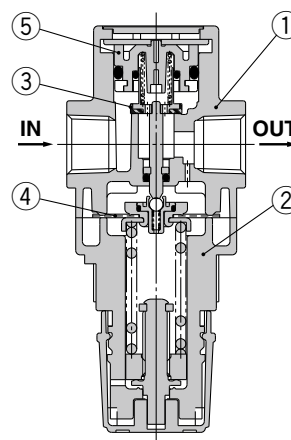
Regulator with Backflow Function *Series AR20K-B to AR60K-B*

Construction

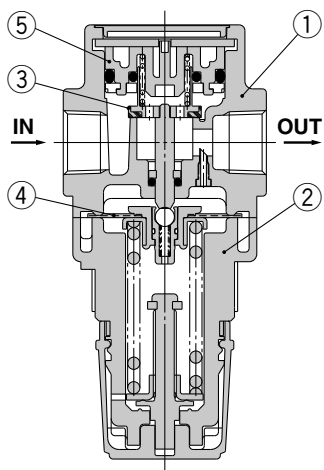
AR10-A



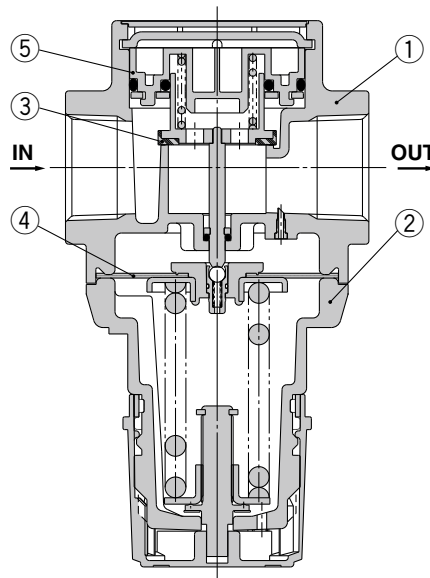
AR20(K)-B/AR25(K)-B



AR30(K)-B/AR40(K)-B



AR50(K)-B/AR60(K)-B



Component Parts

No.	Description	Material	Model	Color
1	Body	Zinc die-cast	AR10-A	White
		Aluminum die-cast	AR20(K)-B to AR60(K)-B	
2	Bonnet	Polyacetal	AR10-A	White
			AR20(K)-B to AR40(K)-B	
		Aluminum die-cast	AR50(K)-B/AR60(K)-B	

Replacement Parts

[AR10-A]

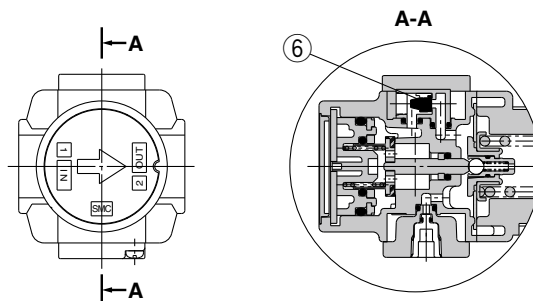
No.	Description	Material	Part no.
3	Valve	HNBR	AR10P-090S
4	Piston assembly	Polyacetal	AR10P-150AS
5	Valve guide assembly	Polyacetal	131329

[AR20(K)-B to AR60(K)-B]

No.	Description	Material	Part no.					
			AR20(K)-B	AR25(K)-B	AR30(K)-B	AR40(K)-B	AR40(K)-06-B	AR50(K)-B
3	Valve	Brass, HNBR	AR20P-410S	AR25P-410S	AR30P-410S	AR40P-410S	AR50P-410S	AR60P-410S
4	Diaphragm assembly	Weatherable NBR	AR20P-150AS	AR20P-150AS	AR30P-150AS	AR40P-150AS		
5	Valve guide assembly	Polyacetal	AR20P-050AS	AR20P-050AS	AR30P-050AS	AR40P-050AS	AR50P-050AS	AR60P-050AS
6	Check valve assembly ^{Note)}	—	AR23KP-020AS					

Note) Check valve assembly is applicable for a regulator with backflow function (AR20K-B to AR60K-B) only.
 Assembly of a check valve cover, check valve body assembly and 2 mounting screws

AR20K-B to AR60K-B
 (Regulator with Backflow Function)



AC
AF+AR+AL
AW+AL
AF+AR
AF+AFM+AR
AW+AFM
Attachment
AF
AFM / AFD
AR
AL
AW

Series AR10-A

Series AR20K-B to AR60K-B

Working Principle (Regulator with Backflow Function)

AR10-A

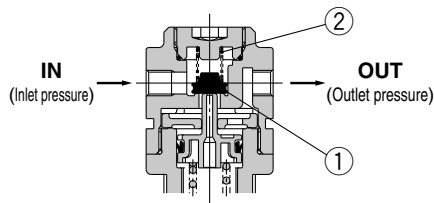


Figure 1

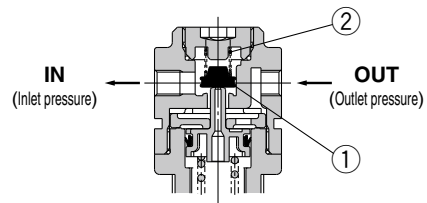


Figure 2

When the inlet pressure is higher than the regulating pressure, the check valve operates as a normal regulator (Figure 1). When the inlet pressure is shut off and exhausted, any inlet pressure applied to the valve ① will be lost. The force for seating the valve ① is the valve spring force ② only. When the valve ① is opened using the outlet force, the outlet pressure will be exhausted at the inlet side (Figure 2). When the set pressure is 0.15 MPa or less, the valve ① may not open due to the valve spring ② force.

AR20K-B to AR60K-B

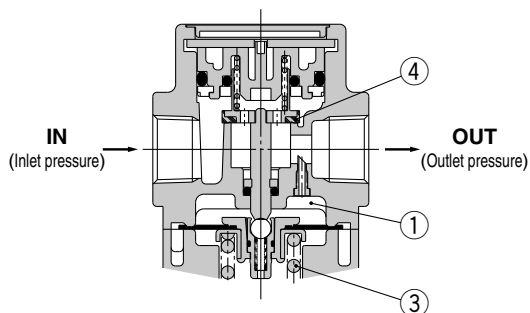
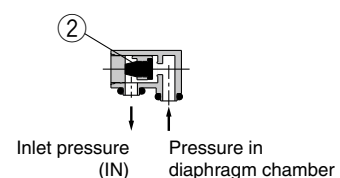
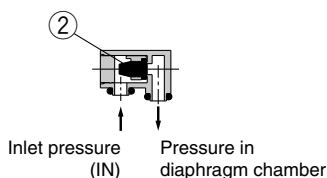
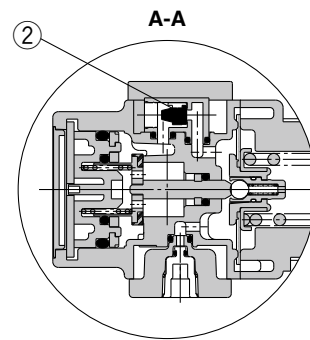
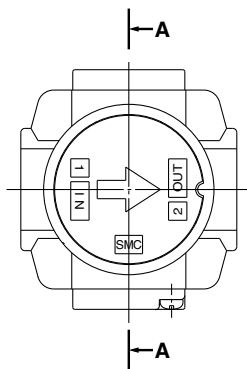


Figure 1 Normal

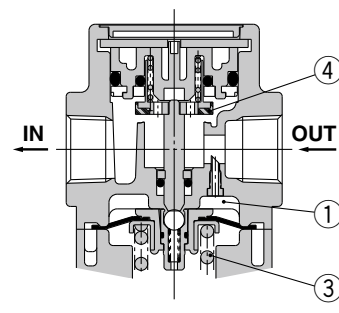


Figure 2 Backflow

When the inlet pressure is higher than the regulating pressure, the check valve ② closes and operates as a normal regulator (Figure 1). When the inlet pressure is shut off and released, the check valve ② opens and the pressure in the diaphragm chamber ① is released into the inlet side (Figure 2). This lowers the pressure in the diaphragm chamber ① and the force generated by the pressure regulator spring ③ lifts the diaphragm. The valve ④ opens through the stem, and the outlet pressure is released to the inlet side (Figure 2).

AC

AF+AR+AL

AW+AL

AF+AR

AF+AFM+AR

AW+AFM

Attachment

AF

AFM / AFD

AR

AL

AW

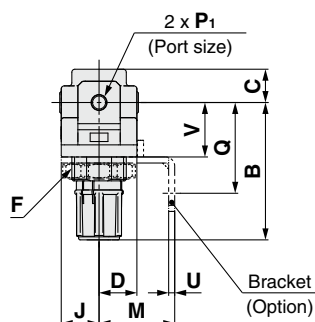
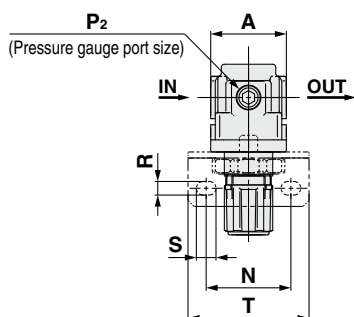
Series AR10-A

Series AR20-B to AR60-B

Series AR20K-B to AR60K-B

Dimensions

AR10-A



Panel fitting dimensions

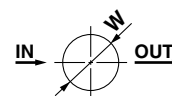
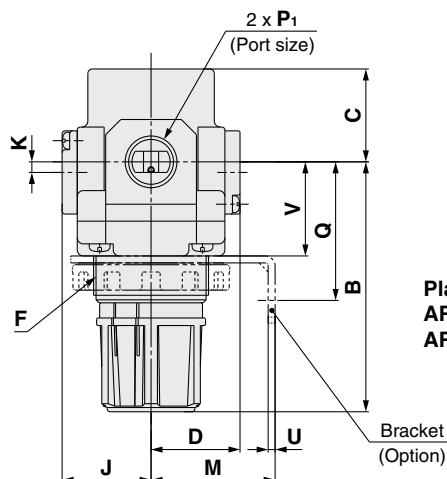
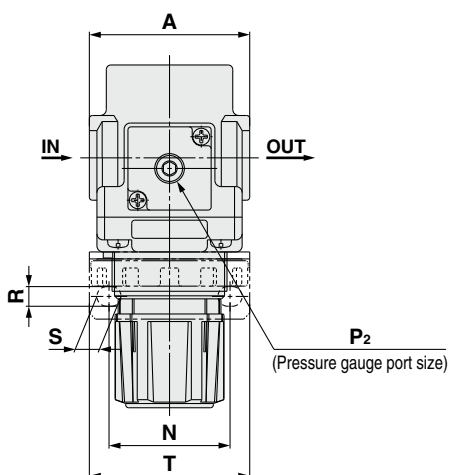


Plate thickness
AR10-A: Max. 3.5

AR20(K)-B to AR40(K)-06-B



Panel fitting dimensions

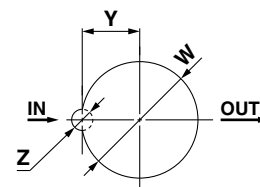
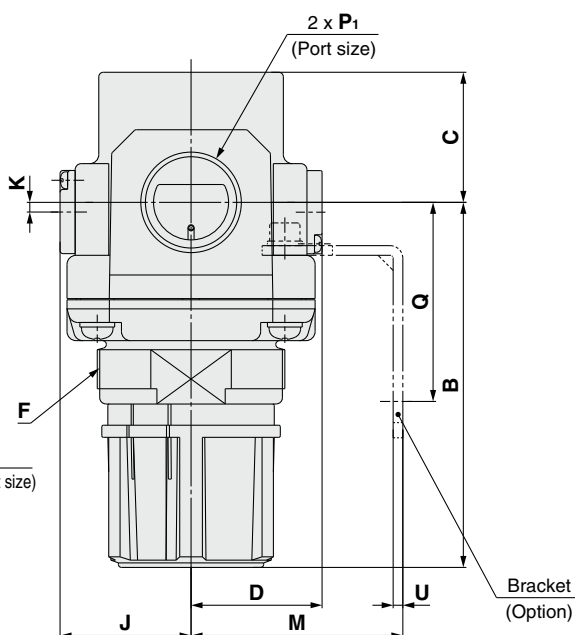
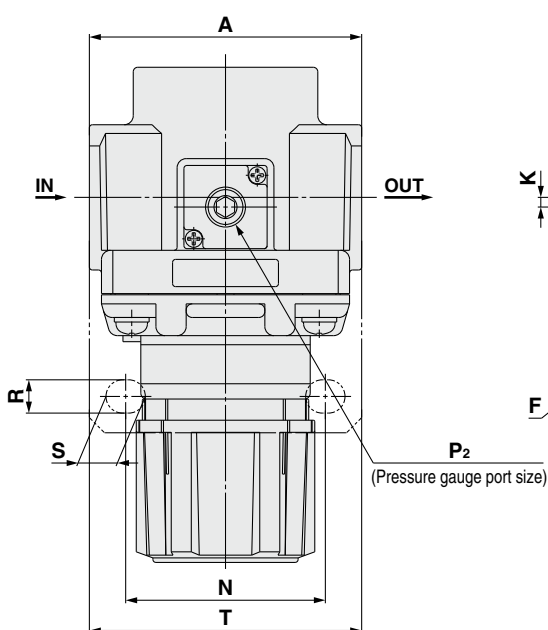


Plate thickness
AR20(K)-B to AR30(K)-B: Max. 3.5
AR40(K)-B : Max. 5

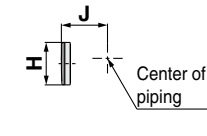
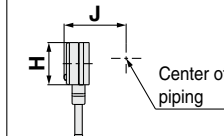
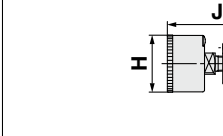
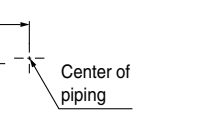
AR50(K)-B/AR60(K)-B



Regulator *Series AR10-A*

Regulator *Series AR20-B to AR60-B*

Regulator with Backflow Function *Series AR20K-B to AR60K-B*

Option	Square embedded type pressure gauge	Digital pressure switch	Round type pressure gauge	Round type pressure gauge (with color zone)
Dimensions				

Model	Standard specifications									Optional specifications							
	P1	P2	A	B ^{Note 1)}	C	D	F	J	K	Square type pressure gauge		Digital pressure switch		Round type pressure gauge		Round type pressure gauge (with color zone)	
AR10-A	M5 x 0.8	1/16	25	47.4	11	12.5	M18 x 1	12.5	—	—	—	—	—	—	—	—	—
AR20(K)-B	1/8, 1/4	1/8	40	67.4	26.5	28.5	M28 x 1	28.5	2 ^{Note 2)}	□28	29.5	□27.8	40	∅37.5	65	∅37.5	66
AR25(K)-B	1/4, 3/8	1/8	53	71.9	28	27.5	M32 x 1.5	27.5	0	□28	28.5	□27.8	39	∅37.5	64	∅37.5	65
AR30(K)-B	1/4, 3/8	1/8	53	85.6	30.7	29.4	M38 x 1.5	29.4	3.5	□28	30.4	□27.8	40.9	∅37.5	65.9	∅37.5	66.9
AR40(K)-B	1/4, 3/8, 1/2	1/8	70	91.7	35.8	33.8	M42 x 1.5	33.8	3.5	□28	34.8	□27.8	45.3	∅42.5	71.3	∅42.5	71.3
AR40(K)-06-B	3/4	1/8	75	93.2	35.8	33.8	M42 x 1.5	33.8	3	□28	34.8	□27.8	45.3	∅42.5	71.3	∅42.5	71.3
AR50(K)-B	3/4, 1	1/8	90	125.2	43	43.3	M62 x 1.5	43.3	3.2	□28	44.3	□27.8	54.8	∅42.5	80.8	∅42.5	80.8
AR60(K)-B	1	1/8	95	129.6	46	43.3	M62 x 1.5	43.3	3.2	□28	44.3	□27.8	54.8	∅42.5	80.8	∅42.5	80.8

Model	Optional specifications											
	Bracket mount							Panel mount				
	M	N	Q	R	S	T	U	V	W	Y	Z	
AR10-A	25	28	30	4.5	6.5	40	2	18	18.5	—	—	
AR20(K)-B	30	34	43.9	5.4	15.4	55	2.3	24.7	28.5	14	6	
AR25(K)-B	30	34	43.9	5.4	15.4	55	2.3	25.7	32.5	16	6	
AR30(K)-B	41	40	45.8	6.5	8	53	2.3	31.1	38.5	19	7	
AR40(K)-B	50	54	54	8.5	10.5	70	2.3	35.5	42.5	21	7	
AR40(K)-06-B	50	54	55.5	8.5	10.5	70	2.3	37	42.5	21	7	
AR50(K)-B	70	66	65.8	11	13	90	3.2	—	—	—	—	
AR60(K)-B	70	66	65.8	11	13	90	3.2	—	—	—	—	

Note 1) The dimension of B is the length when the filter regulator knob is unlocked.

Note 2) For the AR20 (K) -B only, the position of the pressure gauge is above the center of the piping.

AC
 AF+AR+AL
 AW+AL
 AF+AR
 AF+AFM+AR
 AW+AFM
 Attachment
 AF
 AFM / AFD
 AR
 AL
 AW