



# Modular Type Regulators *Series AR*

Regulator Series AR	Model	Port size	Option
 <p data-bbox="164 954 474 987">Page 41 through to 49</p>	AR10	M5 x 0.8	Bracket  Square embedded type pressure gauge (except for the AR10)
	AR20	1/8, 1/4	
	AR25	1/4, 3/8	
	AR30	1/4, 3/8	
	AR40	1/4, 3/8, 1/2	
	AR40-06	3/4	
	AR50	3/4, 1	
	AR60	1	
 <p data-bbox="164 1375 474 1408">Page 41 through to 49</p>	AR20K	1/8, 1/4	Digital pressure switch (except for the AR10)  Round type pressure gauge  Panel mount
	AR25K	1/4, 3/8	
	AR30K	1/4, 3/8	
	AR40K	1/4, 3/8, 1/2	
	AR40K-06	3/4	
	AR50K	3/4, 1	
	AR60K	1	

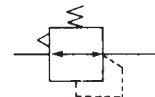
# Regulator

# AR10 to AR60

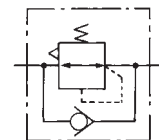
## Regulator with Backflow Mechanism

# AR20K to AR60K

JIS Symbol  
Regulator



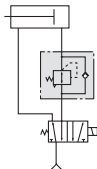
Symbol  
Regulator with  
Backflow Mechanism



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

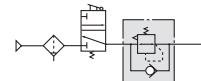
Example 1)

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

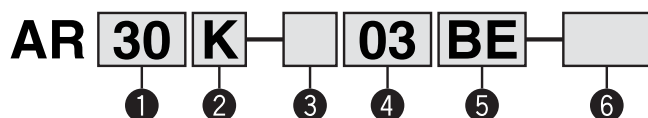


Example 2)

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



- Option / Semi-standard: Select one each for a to g.
- Option / Semi-standard symbol: Enter them alphanumerically.  
Example) AR30K-03BE-1NR

	Symbol	Description	①								
			Body size								
			10	20	25	30	40	50	60		
②	With backflow mechanism	Nil	Without backflow mechanism	●	●	●	●	●	●	●	
		K <small>Note 1)</small>	With backflow mechanism	—	●	●	●	●	●	●	
+											
③	Thread type	Nil	Metric thread (M5)	●	—	—	—	—	—	—	
			Rc	—	●	●	●	●	●	●	
		N	NPT	—	●	●	●	●	●	●	
		F	G	—	●	●	●	●	●	●	
+											
④	Port size	M5	M5	●	—	—	—	—	—	—	
		01	1/8	—	●	—	—	—	—	—	
		02	1/4	—	●	●	●	●	—	—	
		03	3/8	—	—	●	●	●	—	—	
		04	1/2	—	—	—	●	●	—	—	
		06	3/4	—	—	—	—	●	●	—	
		10	1	—	—	—	—	—	●	●	
+											
⑤ <small>Note 2)</small> Option	a	Mounting	Nil	Without mounting option	●	●	●	●	●	●	●
			B <small>Note 3)</small>	With bracket	●	●	●	●	●	●	●
			H	With set nut (for panel fitting)	●	●	●	●	●	—	—
	+										
	b	Pressure switch	Nil	Without pressure gauge	●	●	●	●	●	●	●
			E	Square embedded type pressure gauge (with limit indicator)	—	●	●	●	●	●	●
			G	Round type pressure switch (without limit indicator)	●	—	—	—	—	—	—
				Round type pressure switch (with limit indicator)	—	●	●	●	●	●	●
		Digital pressure switch	E1 <small>Note 4)</small>	Output: NPN output / Electrical entry: Wiring bottom entry	—	●	●	●	●	●	●
			E2 <small>Note 4)</small>	Output: NPN output / Electrical entry: Wiring top entry	—	●	●	●	●	●	●
	E3 <small>Note 4)</small>		Output: PNP output / Electrical entry: Wiring bottom entry	—	●	●	●	●	●	●	
	E4 <small>Note 4)</small>		Output: PNP output / Electrical entry: Wiring top entry	—	●	●	●	●	●	●	

# Regulator *Series AR10 to AR60*

## Regulator with Backflow Mechanism *Series AR20K to AR60K*



**AR20/AR20K      AR40/AR40K**

					①							
					Body size							
					10	20	25	30	40	50	60	
6	c	Set pressure	Nil	0.05 to 0.85 MPa set	●	●	●	●	●	●	●	
			1 <sup>Note 5)</sup>	0.02 to 0.2 MPa set	●	●	●	●	●	●	●	●
				+								
	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	Handle facing	Nil	Downward facing handle	●	●	●	●	●	●	●	●
			Y	Upward facing handle	●	●	●	●	●	●	●	●
				+								
	g	Pressure unit	Nil	Name plate and pressure gauge in imperial units: MPa	●	●	●	●	●	●	●	●
			Z <sup>Note 6)</sup>	Name plate and pressure gauge in imperial units (PSI, F)	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>	○ <sup>Note 8)</sup>
			ZA <sup>Note 7)</sup>	Digital pressure switch: With unit switching function	—	△ <sup>Note 9)</sup>	△ <sup>Note 9)</sup>	△ <sup>Note 9)</sup>	△ <sup>Note 9)</sup>	△ <sup>Note 9)</sup>	△ <sup>Note 9)</sup>	△ <sup>Note 9)</sup>

Note 1) The AR10 comes with a backflow mechanism as a standard feature. (K is not available.) When using the AR10 type as w/ backflow mechanism, back flow may not occur with the set pressure 0.15 MPa or less.  
 Note 2) Option B, G and H are not assembled and are supplied loose at the time of shipment.  
 Note 3) Assembly of a bracket and set nuts (the AR10, AR20(K) to AR40(K)) Including 2 mounting screws for the AR50(K) and AR60(K)  
 Note 4) 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 lead wire entry. (Select "wiring bottom entry" when the semi-standard Y is chosen simultaneously.)

Note 5) The only difference from the standard specifications is the adjusting spring for the regulator. It does not restrict the setting of 0.2 MPa or more. When the pressure gauge is attached, a 0.2 MPa pressure gauge will be fitted.  
 Note 6) For thread type: M5 and NPT. This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.) The digital pressure switch will be equipped with the unit switching function, setting to PSI initially.  
 Note 7) 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 8) ○: For thread type: M5 and NPT only  
 Note 9) △: Combination available for options: E1, E2, E3, E4.

### Standard Specifications

Model	AR10	AR20(K)	AR25(K)	AR30(K)	AR40(K)	AR40(K)-06	AR50(K)	AR60(K)	
<b>Port size</b>	M5 x 0.8	1/8, 1/4	1/4, 3/8	1/4, 3/8	1/4, 3/8, 1/2	3/4	3/4, 1	1	
<b>Pressure gauge port size</b> <sup>Note 1)</sup>	1/16 <sup>Note 2)</sup>	1/8			1/4				
<b>Fluid</b>	Air								
<b>Ambient and fluid temperature</b> <sup>Note 3)</sup>	-5 to 60 <sup>o</sup> TM (with no freezing)								
<b>Proof pressure</b>	1.5 MPa								
<b>Maximum operating pressure</b>	1.0 MPa								
<b>Set pressure range</b>	0.05 to 0.7 MPa	0.05 to 0.85 MPa							
<b>Relief pressure</b> <sup>Note 4)</sup>	Set pressure + 0.05 MPa <sup>Note 3)</sup> [at relief flow rate of 0.1 ℓ/min (ANR)]								
<b>Construction</b>	Relieving type								
<b>Weight (kg)</b>	0.06	0.26	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 (the AR20(K) to AR60(K)).  
 Note 2) Use a bushing (part no:131368) when connecting the R 1/8 pressure gauge to the R 1/16.  
 Note 3) -5 to 50C for the products with the digital pressure switch.  
 Note 4) Not applicable to the AC10.

# Series AR10 to AR60

# Series AR20K to AR60K

## Option / Part No.

Option		Model	AR10	AR20(K)	AR25(K)	AR30(K)	AR40(K)	AR40(K)-06	AR50(K)	AR60(K)	
<b>Bracket assembly</b> <small>Note 1)</small>			AR10P-270AS	AR20P-270AS	AR25P-270AS	AR30P-270AS	AR40P-270AS		AR50P-270AS <small>Note 2)</small>		
<b>Set nut</b>			AR10P-260S	AR20P-260S	AR25P-260S	AR30P-260S	AR40P-260S		— <small>Note 3)</small>	— <small>Note 3)</small>	
<b>Pressure gauge</b>	<small>Note 4)</small> Round type	<b>Standard</b>	G27-10-R1	G36-10-□01			G46-10-□02				
		<b>0.02 to 0.2 MPa set</b>	G27-10-R1 <small>Note 5)</small>	G36-2-□01			G46-2-□02				
	<small>Note 6)</small> Square embedded type	<b>Standard</b>	—	GC3-10AS [GC3P-010AS (Pressure gauge cover only)]							
		<b>0.02 to 0.2 MPa set</b>	—	GC3-2AS [GC3P-010AS (Pressure gauge cover only)]							
<b>Digital pressure switch</b>	<small>Note 7)</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

Note 2) Assembly of a bracket and 2 mounting screws

Note 3) Please consult with SMC regarding the set nuts for the AR50(K) and AR60(K).

Note 4) □ in part numbers for a round pressure gauge indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the connection thread NPT and pressure gauge supply for PSI unit specifications.

Note 5) Pressure gauge for general purpose

Note 6) Including one O-ring and 2 mounting screws. [ ]: Pressure gauge cover only

Note 7) Lead wire with connector (2 m), adaptor, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached. [ ]: Switch body only

Also, regarding how to order the digital switch, please refer to page 73.

## ⚠ Specific Product Precautions

**Be sure to read this before handling. Refer to “Precautions for Handling Pneumatic Devices” (M-03-E3A) for Safety Instructions and F.R.L. Unit Precautions.**

### Selection

#### ⚠ Warning

- Residual pressure disposal (outlet pressure removal) is not possible for the AR20 to 60 even though the inlet pressure is exhausted. When the residual pressure disposal is performed, use the regulator with a backflow mechanism (the AR20K to AR60K).

### Maintenance

#### ⚠ Warning

- When using the regulator with backflow mechanism 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 and 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.
- The pressure gauge included with regulators for 0.02 to 0.2 MPa setting is for up to 0.2 MPa use only (except for the AR10). Exceeding 0.2 MPa of pressure can damage the gauge.
- 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).

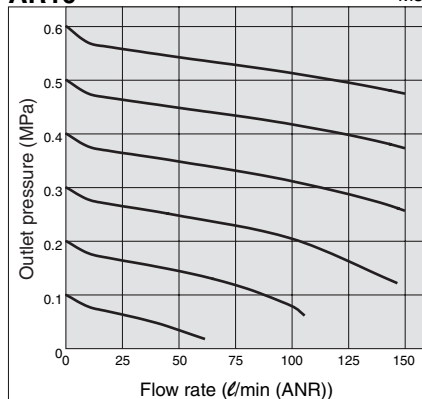


- A knob cover is available to prevent careless operation of the knob. Refer to “Features 1” for details.

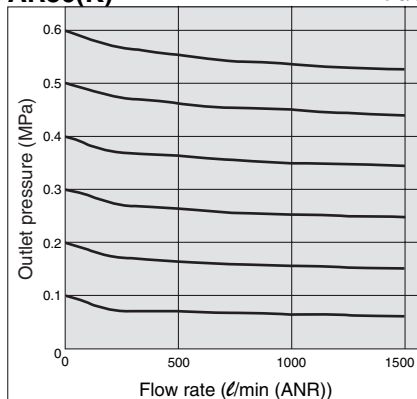
### Flow Characteristics (Representative values)

Condition: Inlet pressure 0.7 MPa

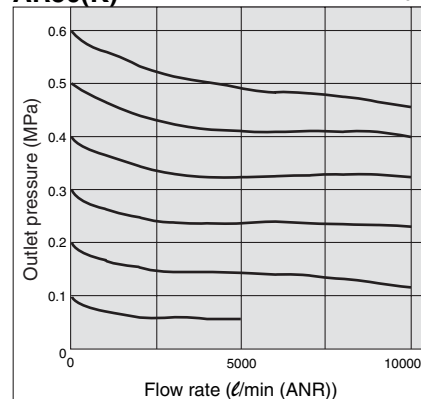
**AR10** M5



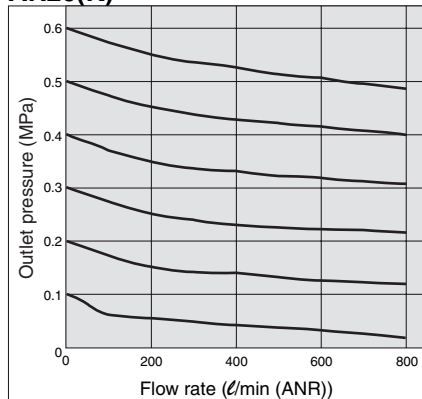
**AR30(K)** Rc 3/8



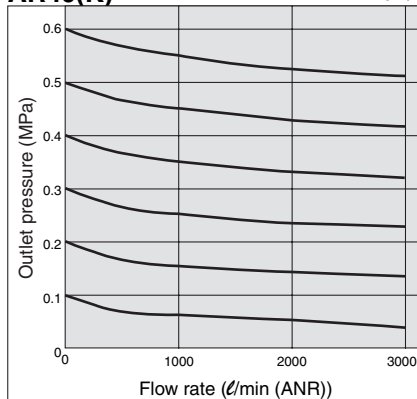
**AR50(K)** Rc 1



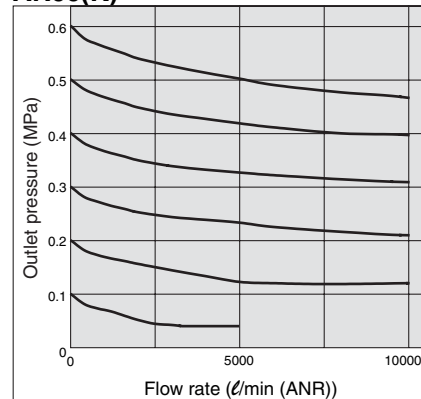
**AR20(K)** Rc 1/4



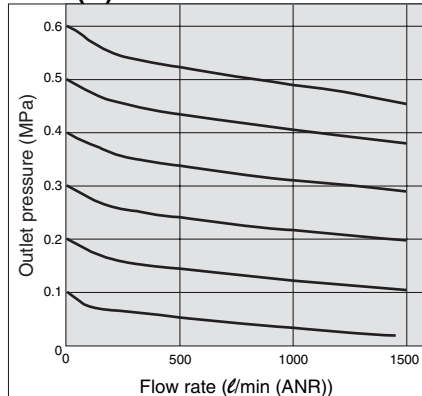
**AR40(K)** Rc 1/2



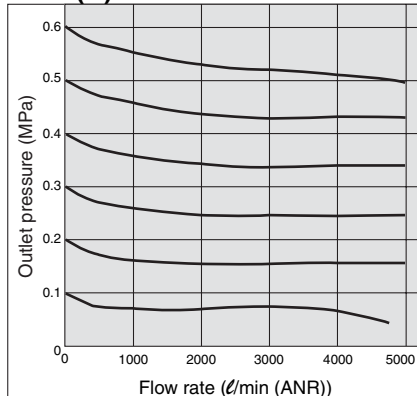
**AR60(K)** Rc 1



**AR25(K)** Rc 3/8



**AR40(K)-06** Rc 3/4



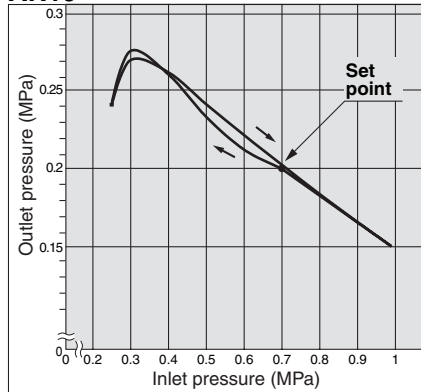
# Series AR10 to AR60

## Series AR20K to AR60K

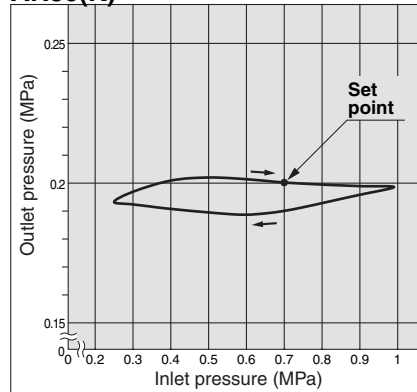
### Pressure Characteristics (Representative values)

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

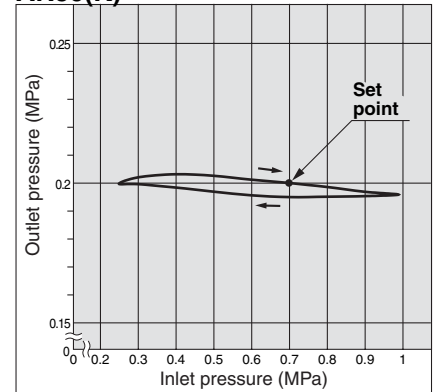
**AR10**



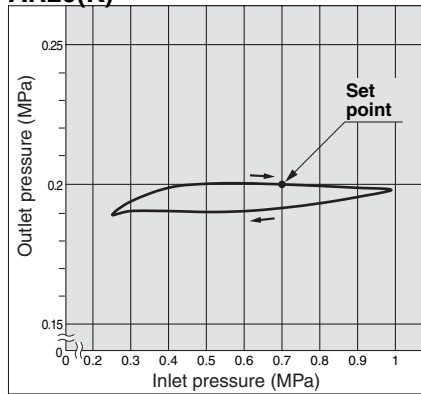
**AR30(K)**



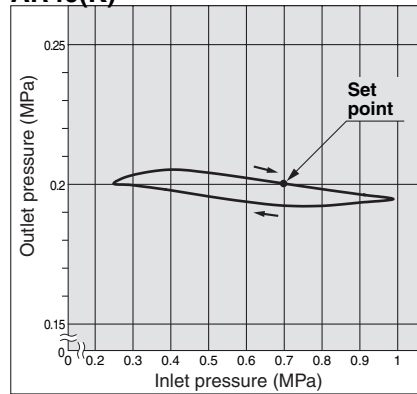
**AR50(K)**



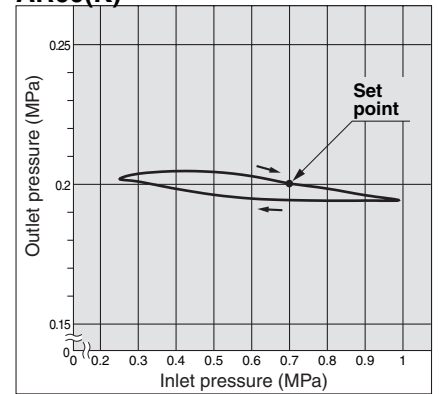
**AR20(K)**



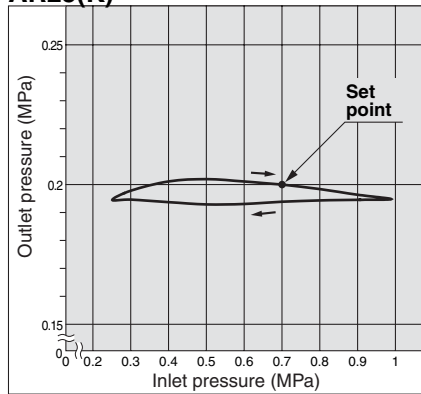
**AR40(K)**



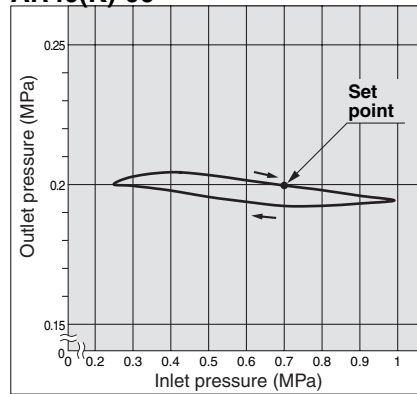
**AR60(K)**



**AR25(K)**

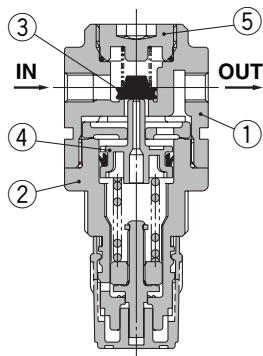


**AR40(K)-06**

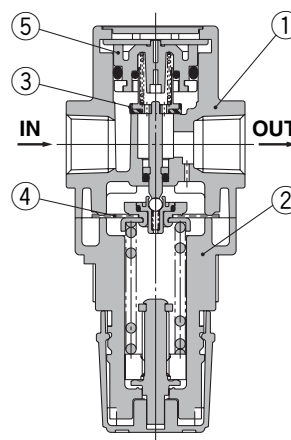


**Construction**

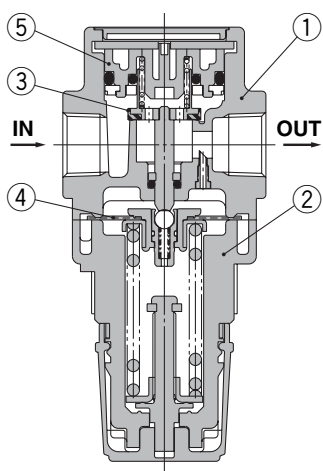
**AR10**



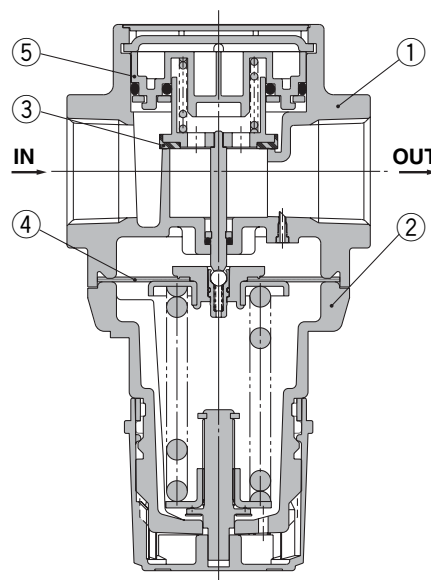
**AR20(K), AR25(K)**



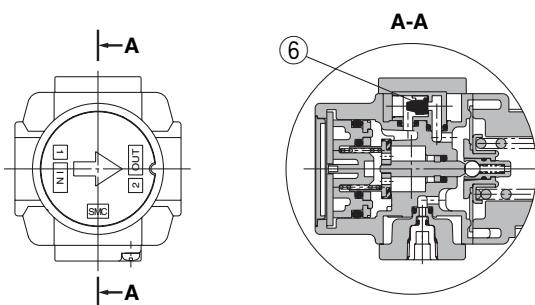
**AR30(K), AR40(K)**



**AR50(K), AR60(K)**



**AR20K to AR60K (Regulator with Backflow Mechanism)**



**Component Parts**

No.	Description	Material	Model	Note
1	Body	Zinc die-cast	AR10, AR20(K)	Platinum silver
		Aluminum die-cast	AR25(K) to AR60(K)	
2	Bonnet	Polyacetal	AR10, AR20(K) to AR40(K)-06	Black
		Aluminum die-cast	AR50(K), AR60(K)	

**Replacement Parts**

No.	Description	Material	Part no.						
			AR10	AR20(K)	AR25(K)	AR30(K)	AR40(K)	AR40(K)-60	AR50(K)
3	Valve assembly	Brass, HNBR	AR10P-090S	AR20P-410S	AR25P-410S	AR30P-410S	AR40P-410S	AR50P-410S	AR60P-410S
4	Diaphragm assembly	Weatherable NBR	AR10P-150AS <sup>Note 1)</sup>	AR20P-150AS	AR25P-150AS	AR30P-150AS	AR40P-150AS	AR50P-150AS	
5	Valve guide assembly	Polyacetal	131329	AR20P-050AS	AR25P-050AS	AR30P-050AS	AR40P-050AS	AR50P-050AS	AR60P-050AS
6	Check valve assembly <sup>Note 2)</sup>	—	—	AR20KP-020AS					

Note 1) The AR10 is a piston type. Assembly of a piston and a seal (KSYP-13).

Note 2) Check valve assembly is applicable for a regulator with backflow mechanism (the AR20K to AR60K) only.

Assembly of a check valve cover, check valve body assembly and 2 screws

# Series AR10 to AR60

## Series AR20K to AR60K

### Working Principle (Regulator with Backflow Mechanism)

#### AR10

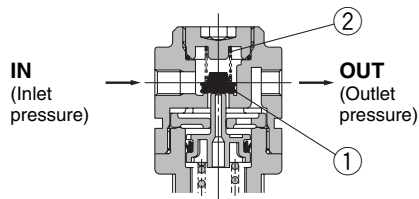


Figure 1

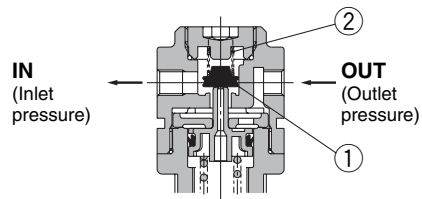


Figure 2

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, valve ① may not open due to the valve spring ② force.

#### AR20K to AR60K

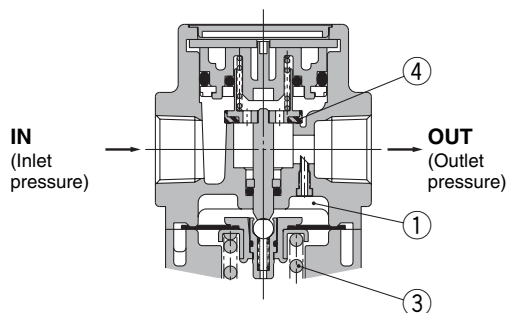
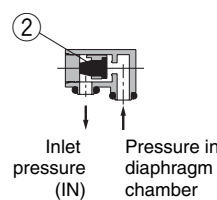
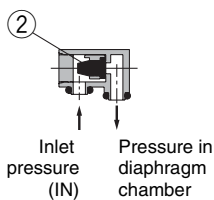
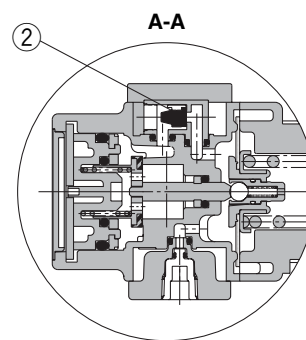
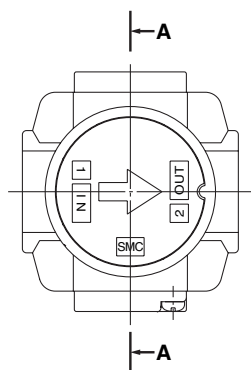


Figure 1 Normal

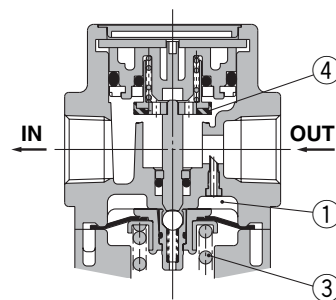


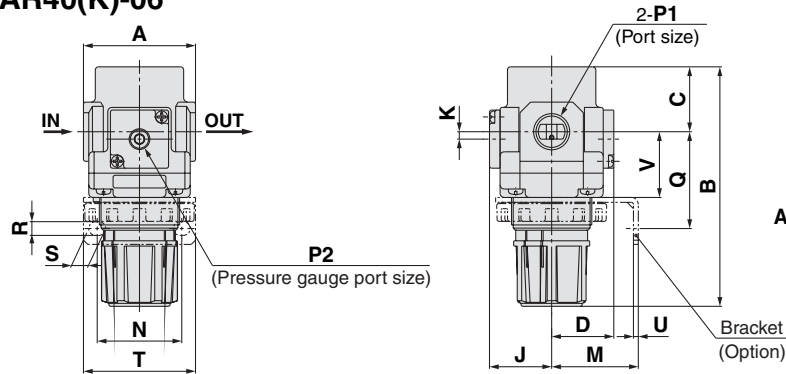
Figure 2 Back flow

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. Valve ④ opens through the stem, and the outlet pressure is released to the inlet side (Figure 2).

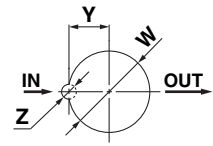


### Dimensions

#### AR10, AR20(K) to AR40(K)-06

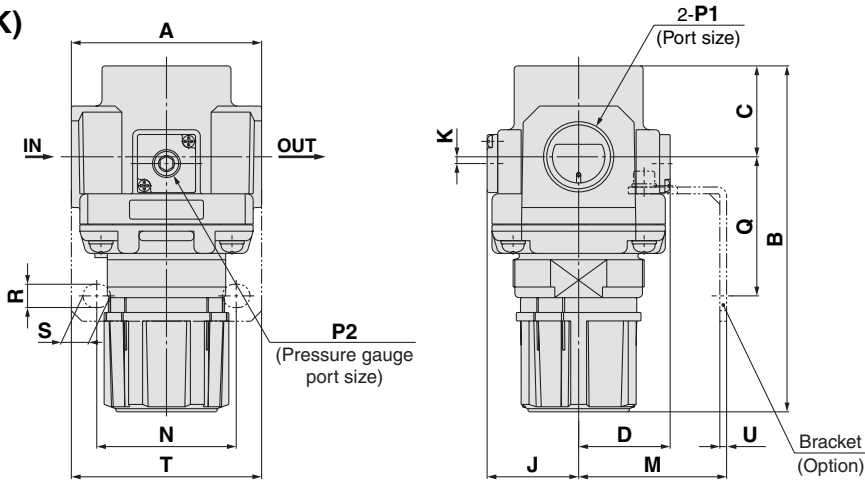


Panel fitting dimension



AR10, AR20(K) to AR30(K): Max. 3.5  
AR40(K): Max. 5

#### AR50(K), AR60(K)



Applicable model	AR20(K) to AR60(K)		AR10, AR20(K) to AR60(K)
Option	Square embedded type pressure gauge	Digital pressure switch	Round type pressure gauge
Dimensions	Center of piping	Center of piping	Center of piping

Model	Standard specifications									Optional specifications					
	P1	P2	A	B <sup>Note 1)</sup>	C	D	F	J	K	Square type pressure gauge	Digital pressure gauge	Round type pressure gauge	H	J	
AR10	M5 x 0.8	1/16	25	58	11	12.5	M18 x 1	13	0	—	—	—	—	—	
AR20(K)	1/8, 1/4	1/8	40	94	26.5	28.5	M28 x 1	28.5 <sup>Note 2)</sup>	2	□28	29.5	□27.8	40	□37.5	
AR25(K)	1/4, 3/8	1/8	53	101	28	27.5	M32 x 1.5	27.5	0	□28	28.5	□27.8	39	□37.5	
AR30(K)	1/4, 3/8	1/8	53	116	31	29.5	M38 x 1.5	29.5	3.5	□28	30.5	□27.8	41	□37.5	
AR40(K)	1/4, 3/8, 1/2	1/4	70	128	36	34	M42 x 1.5	34	3.5	□28	35	□27.8	45	□42.5	
AR40(K)-06	3/4	1/4	75	129	36	34	M42 x 1.5	34	3	□28	35	□27.8	45	□42.5	
AR50(K)	3/4, 1	1/4	90	169	43	43.5	M62 x 1.5	43.5	3.3	□28	44.5	□27.8	55	□42.5	
AR60(K)	1	1/4	95	176	46	43.5	M62 x 1.5	43.5	3.3	□28	44.5	□27.8	55	□42.5	

Model	Optional specifications										
	Bracket mount							Panel mount			
	M	N	Q	R	S	T	U	V	W	Y	Z
AR10	25	28	30	4.5	6.5	40	2	18	18.5	—	—
AR20(K)	30	34	44	5.4	15.4	55	2.3	25	28.5	14	6
AR25(K)	30	34	44	5.4	15.4	55	2.3	26	32.5	16	6
AR30(K)	41	40	46	6.5	8	53	2.3	31	38.5	19	7
AR40(K)	50	54	54	8.5	10.5	70	2.3	35.5	42.5	21	7
AR40(K)-06	50	54	56	8.5	10.5	70	2.3	37	42.5	21	7
AR50(K)	70	66	65.8	11	13	90	3.2	—	—	—	—
AR60(K)	70	66	65.8	11	13	90	3.2	—	—	—	—

Note 1) The total length of B direction is the length when the filter regulator handle is unlocked.  
Note 2) For the AR20 only, the position of the pressure gauge is above the center of the piping.

# Air Filter AR20 to AR60 Made to Order



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



AR30-03-X425

## ① Special Temperature Environment

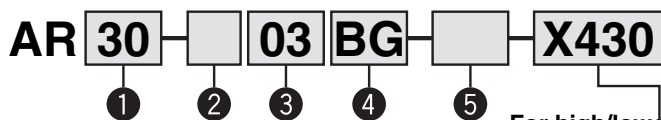
Special materials are used in the manufacturing of seals and resin parts to allow them to withstand various temperature conditions in cold or tropical (hot) climates.

### Specifications

Made-to-order part no.	-X430	-X440
Environment	Low temperature	High temperature
Ambient temperature (°C)	-30 to 60°C	-5 to 80°C
Fluid temperature (°TM/C)	-5 to 60°C (with no freezing)	
Material	Rubber parts	Special NBR
	Main parts	FKM
	Metal (Aluminum die-cast), etc.	

### Applicable Model

Model	AR25	AR30	AR40	AR40-06	AR50	AR60
Port size	1/4, 3/8	1/4, 3/8	1/4, 3/8, 1/2	3/4	3/4, 1	1



- Option / Semi-standard: Select one each for a to g.
  - Option / Semi-standard symbol: Enter them alphanumerically.
- Example) AR30-03BG-1NR-X430

X430	Low temperature
X440	High temperature

	Symbol	Description	① Body size						
			25	30	40	50	60		
② Thread type	Nil	Rc	●	●	●	●	●		
	N	NPT	●	●	●	●	●		
	F	G	●	●	●	●	●		
③ Port size	+		●	●	●	●	●		
	02	1/4	●	●	●	—	—		
	03	3/8	●	●	●	—	—		
	04	1/2	—	—	●	—	—		
	06	3/4	—	—	●	●	—		
④ Option	+		—	—	—	●	●		
	a	Mounting	Nil	Without mounting option	●	●	●	●	●
			B	With bracket	●	●	●	●	●
			H	With set nut (for panel fitting)	●	●	●	—	—
b	Pressure gauge	G	Round type pressure switch (without limit indicator)	●	●	●	●	●	
				+	●	●	●	●	●
c	Set pressure	1	Nil	0.05 to 0.85 MPa set	●	●	●	●	●
			1	0.02 to 0.2 MPa set	●	●	●	●	●
			+	●	●	●	●	●	
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	Handle facing	Nil	Downward facing handle	●	●	●	●	●	
			Y	Upward facing handle	●	●	●	●	●
g	Pressure unit	Nil	Name plate and pressure gauge in imperial units: MPa	●	●	●	●	●	
			Z	Name plate and caution plate for bowl in imperial units (PSI, F)	○	○	○	○	○
			+	○	○	○	○	○	

Note 1) Option B, G and H are not assembled and are supplied loose at the time of shipment.

Note 2) Assembly of a bracket and set nuts (the AR25 to AR40) Including 2 mounting screws for the AR50 and AR60

Note 3) Mounting thread for pressure gauge: 1/8 for the AR25 to AR30; 1/4 for the AR40 to AR60. Pressure gauge type: G43

Note 4) The only difference from the standard specifications is the adjusting spring for the regulator. It does not restrict the setting of 0.2 MPa or more. When the pressure gauge is attached, a 0.2 MPa pressure gauge will be fitted.

Note 5) For 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.)

Note 6) ○: For thread type: NPT only

## ② High Pressure

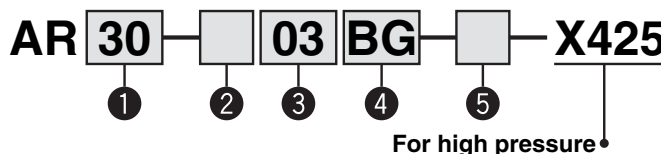
Strong materials are used in the manufacturing of air filters intended for high pressure operation. Also, construction modification allows a wider regulating pressure range.

### Specifications

Made-to-order part no.	-X425
Proof pressure (MPa)	3.0
Maximum operating pressure (MPa)	2.0
Set pressure range (MPa)	0.1 to 1.6
Ambient and fluid temperature (°C)	-5 to 60°C (with no freezing)

### Applicable Model

Model	AR20	AR25	AR30	AR40	AR40-06	AR50	AR60
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



- Option / Semi-standard: Select one each for a to f.
  - Option / Semi-standard symbol: Enter them alphanumerically.
- Example) AR30-03BG-NR-X425

	Symbol	Description	① Body size						
			20	25	30	40	50	60	
② Thread type	Nil	Rc	●	●	●	●	●		
	N	NPT	●	●	●	●	●		
	F	G	●	●	●	●	●		
③ Port size	+		●	●	●	●	●		
	01	1/8	●	—	—	—	—		
	02	1/4	●	●	●	—	—		
	03	3/8	—	●	●	—	—		
	04	1/2	—	—	—	●	—		
	06	3/4	—	—	—	●	●		
④ Option	+		—	—	—	●	●		
	a	Mounting	Nil	Without mounting option	●	●	●	●	●
			B	With bracket	●	●	●	●	●
			H	With set nut (for panel fitting)	●	●	●	—	—
b	Pressure gauge	G	Round type pressure switch (with limit indicator)	●	●	●	●	●	
				+	●	●	●	●	●
c	Exhaust mechanism	Nil	Relieving type	●	●	●	●	●	
			N	Non-relieving type	●	●	●	●	●
d	Flow direction	Nil	Flow direction: Left to right	●	●	●	●	●	
			R	Flow direction: Right to left	●	●	●	●	●
e	Handle facing	Nil	Downward facing handle	●	●	●	●	●	
			Y	Upward facing handle	●	●	●	●	●
f	Pressure unit	Nil	Name plate and pressure gauge in imperial units: MPa	●	●	●	●	●	
			Z	Name plate and caution plate for bowl in imperial units (PSI, F)	○	○	○	○	○
			+	○	○	○	○	○	

Note 1) Option B, G and H are not assembled and are supplied loose at the time of shipment.

Note 2) Assembly of a bracket and set nuts (the AR20 to AR40) Including 2 mounting screws for the AR50 and AR60

Note 3) For 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.)

Note 4) ○: For thread type: NPT only

# Options

# Digital Pressure Switch

ISE35 — **N** — **25** — **M** **L** **A**

① ② ③ ④ ⑤

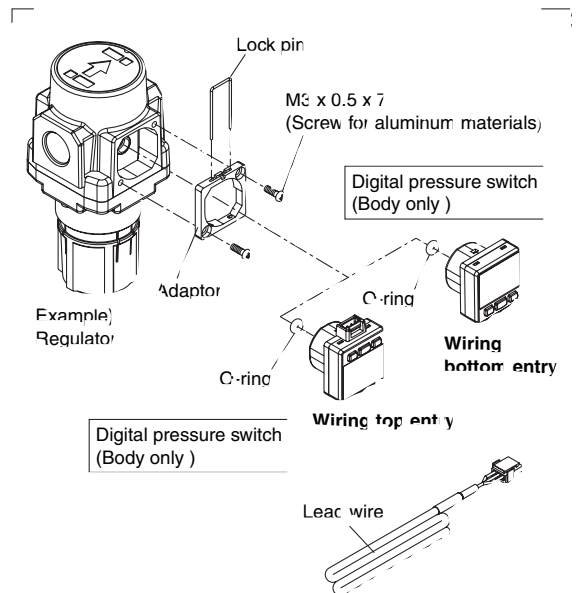
	Symbol	Description
① Lead wire entry	N	Wiring bottom entry
	R	Wiring top entry
② Output	25	NPN output
	65	PNP output
③ Display unit (Note 1)	Nil (Note 2)	With unit switching function
	M	Fixed SI unit
	P (Note 2)	Pressure unit: PSI (initial value) with unit display switching function
④ Lead wire	Nil	Without lead wire
	L	Lead wire with connector
⑤ Lead wire entry	Nil	Without accessories (switch body only)
	A	With accessories (adaptor, O-ring, mounting screw (2 pcs.), lock pin)

Note 1) This product is for overseas use only according to the new Measurement Law.  
 Note 2) Unit name plate is attached.  
 Note 3) Instruction manual is attached.  
 Note 4) When ordering the body only, select the symbol from ① to ⑤ respectively.

## Applicable Series

F.R.L. unit	AC20, AC25, AC30, AC40, AC50, AC55, AC60 AC20A, AC30A, AC40A, AC50A, AC60A AC20B, AC25B, AC30B, AC40A, AC50A, AC55B, AC60B AC20C, AC25C, V30C, AC40C AC20D, AC30D, V40D
Regulator	AR20, AR25, AR30, AR40, AR50, AR60
Filter regulator	AW20, AW30, AW40, AW60
Mist separator regulator	AWM20, AWM30, AWM40
Micro mist separator regulator	AWD20, AWD30, AWD40

## Digital Pressure Switch Details



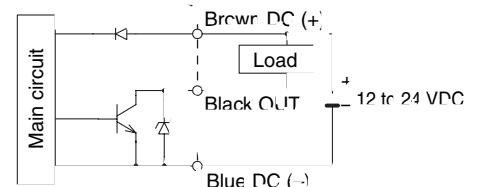
## Specifications

Rated pressure range	0 to 1 MPa	
Set pressure range	-0.1 to 1 MPa	
Withstand pressure	1.5 MPa	
Set pressure resolution	0.01 MPa	
Power supply voltage	12 to 24 VDC, Ripple (p-p) 10% or less (with power supply polarity protection)	
Current consumption	55 mA or less (at no load)	
Switch output	NPN or PNP open collector 1 output	
Max. load current	80 mA	
Max. applied voltage	30 V (with NPN output)	
Residual voltage	1 V or less (with load current of 80 mA)	
Response time	1 s	
Anti-chatter function	(Response time selections: 0.25, 0.5, 2, 3)	
Short circuit protection	With short circuit protection	
Repeatability	1%F.S. or less	
Hysteresis	Hysteresis mode	Variable (can be set from 0)
	Window comparator mode	
Display	3-digit, 7-segment indicator, 2-color display (Red/Green) can be interlocked with the switch output.	
Display accuracy	2%F.S. 1 digit (at 25°C ±3°C)	
Indication light	Illuminates when output is turned ON. (Green)	
Environmental resistance	Enclosure	IP40
Lead wire with connector		ø3.4 3-wire 25AWG 2 m

## Output

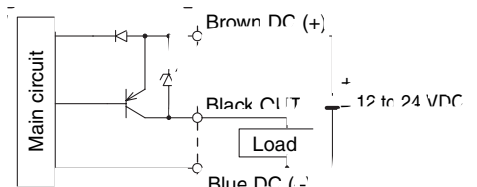
### NPN open collector

Max 30 V, 80 mA  
 Residual output voltage V or less



### PNP open collector

Max 30 mA  
 Residual output voltage V or less








## Series AC

# Safety Instructions

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

### ■Explanation of the Labels

Labels	Explanation of the labels
 <b>Danger</b>	In extreme conditions, there is a possible result of serious injury or loss of life.
 <b>Warning</b>	Operator error could result in serious injury or loss of life.
 <b>Caution</b>	Operator error could result in injury <sup>Note 3)</sup> or equipment damage. <sup>Note 4)</sup>

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems

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

Note 3) Injury indicates light wounds, burns and electrical shocks that do not require hospitalization or hospital visits for long-term medical treatment.

Note 4) Equipment damage refers to extensive damage to the equipment and surrounding devices.

### ■Selection/Handling/Applications

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

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or post analysis and/or tests to meet the specific requirements. The expected performance and safety assurance are the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

#### 2. Only trained personnel should operate pneumatic machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of the systems using pneumatic equipment should be performed by trained and experienced operators. (Understanding JIS B 8370 General Rules for Pneumatic Equipment, and other safety rules are included.)

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

1. Inspection and maintenance of the machinery/equipment should only be performed once measures to prevent falling or runaway of the driven objects have been confirmed.
2. If the equipment must be removed, confirm the safety process as mentioned above. Turn off the supply pressure for the equipment and exhaust all residual compressed air in the system, and release all the energy (liquid pressure, spring, condenser, gravity).
3. Before the machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc.

#### 4. If the equipment will be used in the following conditions or environment, please contact SMC first and be sure to take all necessary safety precautions.

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, requiring special safety analysis.
4. If the products are used in an interlock circuit, prepare a double interlock style circuit with a mechanical protection function for the prevention of a breakdown. And, examine the devices periodically if they function normally or not.

### ■Exemption from Liability

1. SMC, its officers and employees shall be exempted from liability for any loss or damage arising out of earthquakes or fire, action by a third person, accidents, customer error with or without intention, product misuse, and any other damages caused by abnormal operating conditions.

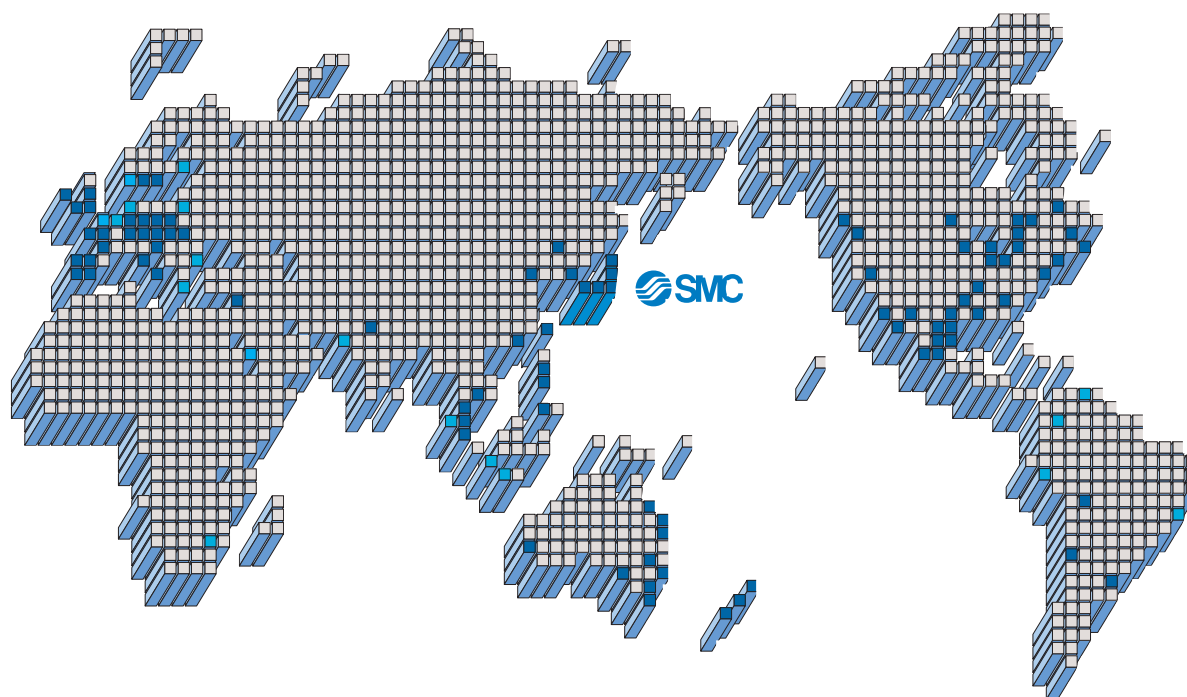
2. SMC, its officers and employees shall be exempted from liability for any direct or indirect loss or damage, including consequential loss or damage, loss of profits, or loss of chance, claims, demands, proceedings, costs, expenses, awards, judgments and any other liability whatsoever including legal costs and expenses, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

3. SMC is exempted from liability for any damages caused by operations not contained in the catalogs and/or instruction manuals, and operations outside of the specification range.

4. SMC is exempted from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.



# SMC'S GLOBAL MANUFACTURING, DISTRIBUTION AND SERVICE NETWORK



## EUROPE

### AUSTRIA

SMC Pneumatik GmbH

### BELGIUM

SMC Pneumatics N.V./S.A.

### BULGARIA

SMC Industrial Automation Bulgaria EOOD

### CROATIA

SMC Industrijska automatika d.o.o.

### CZECH REPUBLIC

SMC Industrial Automation CZ s.r.o.

### DENMARK

SMC Pneumatik A/S

### ESTONIA

SMC Pneumatics Estonia OÜ

### FINLAND

SMC Pneumatics Finland OY

### FRANCE

SMC Pneumatique SA

### GERMANY

SMC Pneumatik GmbH

### HUNGARY

SMC Hungary Ipari Automatizálási Kft.

### IRELAND

SMC Pneumatics (Ireland) Ltd.

### ITALY

SMC Italia S.p.A.

### LATVIA

SMC Pneumatics Latvia SIA

### LITHUANIA

SMC Pneumatics Lietuva, UAB

### NETHERLANDS

SMC Pneumatics BV

## NORWAY

SMC Pneumatics Norway A/S

## POLAND

SMC Industrial Automation Polska Sp.z.c.o

## ROMANIA

SMC Romania s.r.l.

## RUSSIA

SMC Pneumatik LLC.

## SLOVAKIA

SMC Priemyselna automatizacia s.r.o

## SLOVENIA

SMC INDUSTRIJSKA AVTOMATIKA d.o.o

## SPAIN/PORTUGAL

SMC España, S.A.

## SWEDEN

SMC Pneumatics Sweder AB

## SWITZERLAND

SMC Pneumatik AG

## UK

SMC Pneumatics (U.K.) Ltd.

## ASIA

### CHINA

SMC (China) Co., Ltd.

### HONG KONG

SMC Pneumatics (Hong Kong) Ltd

### INDIA

SMC Pneumatics (India) Pvt. Ltd.

### INDONESIA

PT SMC Pneumatics Indonesia

### MALAYSIA

SMC Pneumatics (S.E.A.) Sdn. Bhd.

### PHILIPPINES

SHOKETSU-SMC Corporation

## SINGAPORE

SMC Pneumatics (S.E.A.) Pte. Ltd.

## SOUTH KOREA

SMC Pneumatics Korea Co., Ltd.

## TAIWAN

SMC Pneumatics (Taiwan) Co., Ltd.

## THAILAND

SMC Thailand Ltd

## NORTH AMERICA

### CANADA

SMC Pneumatics (Canada) Ltd.

### MEXICO

SMC Corporation (Mexico) S.A. de C.V.

### USA

SMC Corporation of America

## SOUTH AMERICA

### ARGENTINA

SMC Argentina S.A

### BOLIVIA

SMC Pneumatics Bolivia S.R.L.

### BRAZIL

SMC Pneumaticos Do Brazil Ltda.

### CHILE

SMC Pneumatics (Chile) S.A.

### VENEZUELA

SMC Neumatica Venezuela S.A

## OCEANIA

### AUSTRALIA

SMC Pneumatics (Australia) Pty. Ltd.

### NEW ZEALAND

SMC Pneumatics (N.Z.) Ltd.



### Safety Instructions

Be sure to read "Precautions for Handling Pneumatic Devices" (M-03-E3A) before using.

## SMC Corporation

Akihabara UDX 15F,  
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN  
Phone: 03-5207-8249 FAX: 03-5298-5362  
URL <http://www.smcworld.com>  
© 2006 SMC Corporation All Rights Reserved

Specifications are subject to change without prior notice  
and any obligation on the part of the manufacturer.

D-DN

1st printing JX printing KR 120DN Printed in Japan.

This catalog is printed on recycled paper with concern for the global environment.

# Pilot Operated Regulator

## Series AR425 to 935

### Standard Specifications

Model	AR425	AR435	AR625	AR635	AR825	AR835	AR925	AR935
Port size	1/4, 3/8, 1/2		3/4, 1		1 1/4, 1 1/2		2	
Fluid	Air							
Proof pressure	1.5 MPa							
Max. operating pressure	1.0 MPa							
Set pressure range (MPa) <sup>(1)</sup>	0.05 to 0.83	0.02 to 0.2	0.05 to 0.83	0.02 to 0.2	0.05 to 0.83	0.02 to 0.2	0.05 to 0.83	0.02 to 0.2
Air consumption (for bleed hole) <sup>(2)</sup>	5 ℓ/min (ANR) (at maximum pressure)							
Pressure gauge port size	1/4							
Ambient and fluid temperature	-5 to 60°C (No freezing)							
Construction	Internal pilot relieving type (Pilot air is always bleeding.)							
Weight (kg)	0.7		1.1		2.5		4.5	

Note 1) Outlet pressure range: P2 is 90% of P1 or less. Note 2) Air consumption differs depending on the set pressure. Due to the construction, the pressure gap between inlet and outlet cannot be set within 0.03 MPa, even if the handle is set at the maximum.

### Accessory (Option)/Part No.

Description	Model	Part no.			
		AR4□5	AR6□5	AR8□5	AR9□5
Bracket		B24P	B25P	—	—
Pressure gauge with limit indicator <sup>(1)</sup>		G46-10-□02 (Max. 1.0 MPa), G46-2-□02 (Max. 0.2 MPa)			

Note 1) In the gauge part no. (e.g. G46-10-□02), □ indicate kind of the connecting thread. Put nothing for Rc and "N" for NPT thread. Please consult with SMC for NPT pressure gauge.  
 Note 2) Use caution not to tighten excessively when mounting a pressure gauge, otherwise it may result in a breakdown. Use a pipe tape for sealing. Recommended torque: 12 to 14 N·m.

### Internal pilot operated relieving type regulator



AR8□5



AR6□5

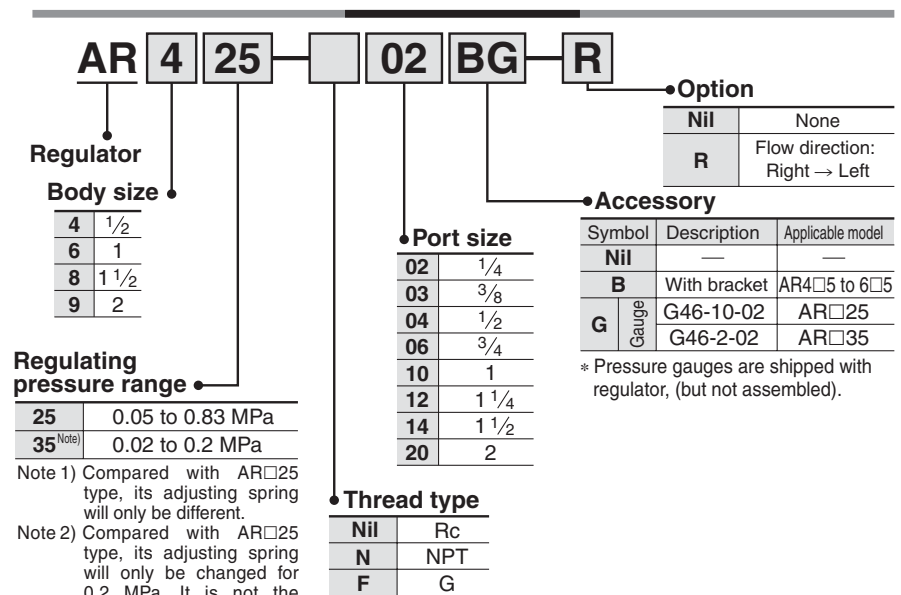


AR6□5-□□BG

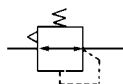


AR425-□□BG

### How to Order



### JIS Symbol



F.R.L.  
 AV  
 AU  
 AF  
**AR**  
 IR  
 VEX  
 AMR  
 ITV  
 IC  
 VBA  
 VE□  
 VY1  
 G  
 PPA  
 AL

# Series AR425 to 935

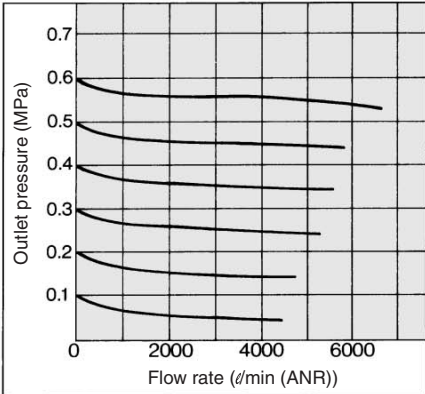
## Flow Characteristics

Inlet pressure: 0.7 MPa

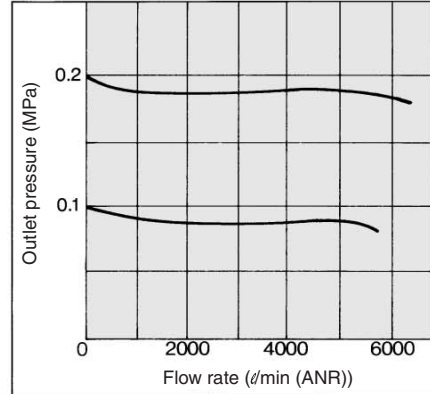
## Pressure Characteristics

Inlet pressure: 0.7 MPa  
Outlet pressure: 0.2 MPa  
Flow rate: 20 ℓ/min (ANR)

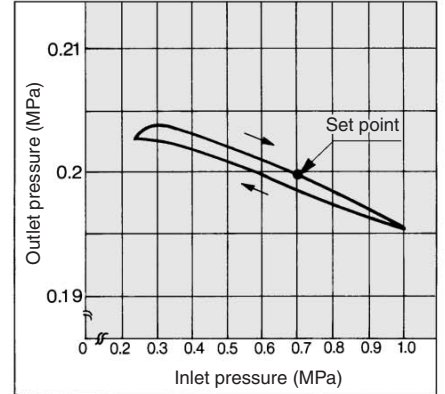
**AR425** Rc 1/2



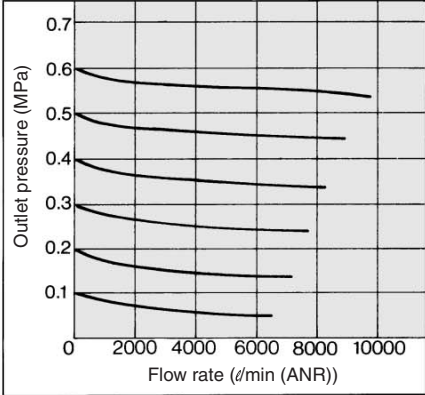
**AR435** Rc 1/2



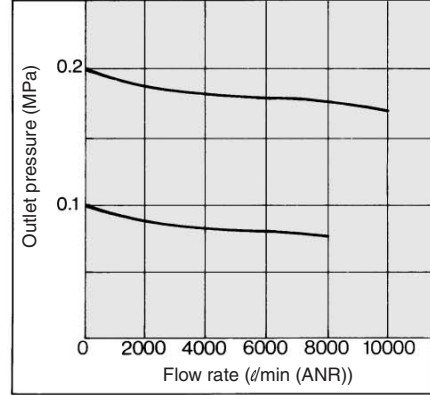
**AR425/435** Rc 1/2



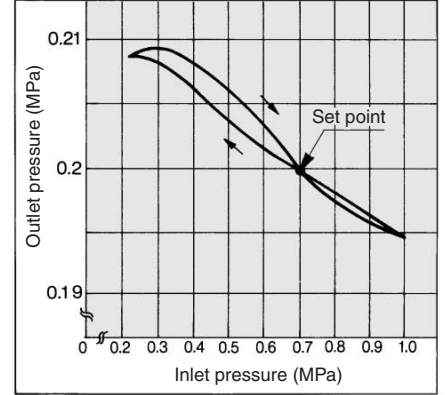
**AR625** Rc 1



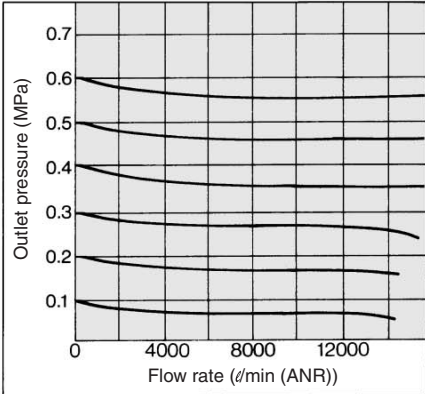
**AR635** Rc 1



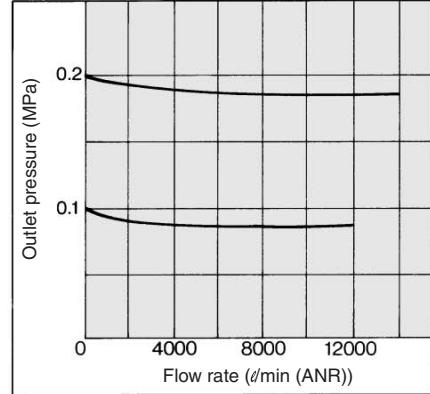
**AR625/635** Rc 1



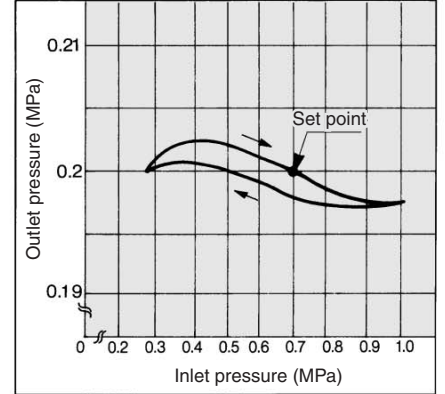
**AR825** Rc 1 1/2



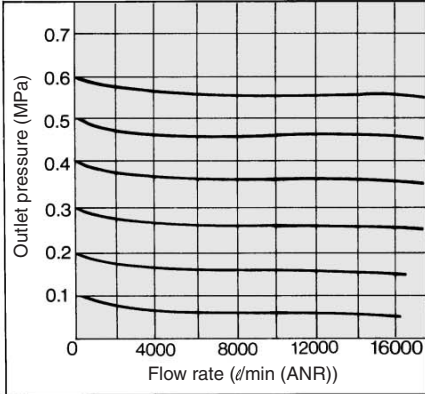
**AR835** Rc 1 1/2



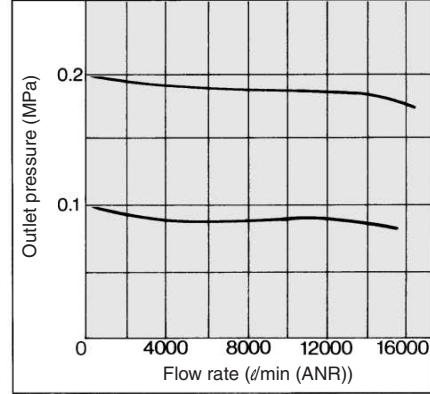
**AR825/835** Rc 1 1/2



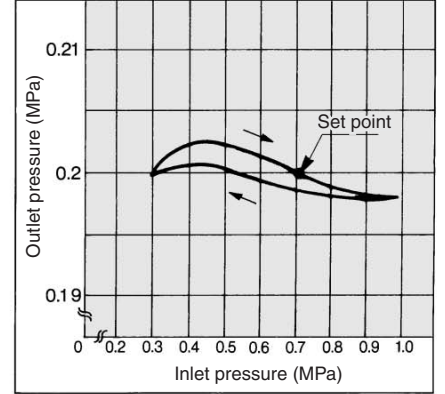
**AR925** Rc 2



**AR935** Rc 2

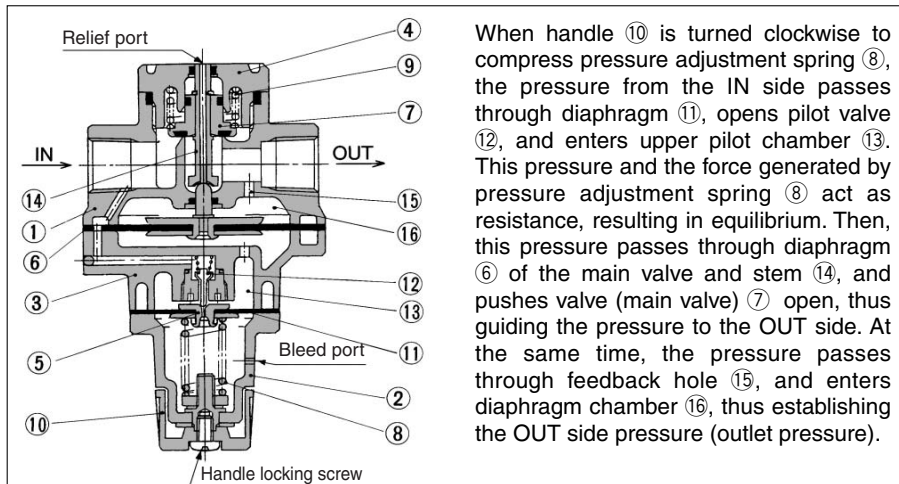


**AR925/935** Rc 2



# Pilot Operated Regulator Series AR425 to 935

## Construction



When handle ⑩ is turned clockwise to compress pressure adjustment spring ⑧, the pressure from the IN side passes through diaphragm ⑪, opens pilot valve ⑫, and enters upper pilot chamber ⑬. This pressure and the force generated by pressure adjustment spring ⑧ act as resistance, resulting in equilibrium. Then, this pressure passes through diaphragm ⑥ of the main valve and stem ⑭, and pushes valve (main valve) ⑦ open, thus guiding the pressure to the OUT side. At the same time, the pressure passes through feedback hole ⑮, and enters diaphragm chamber ⑯, thus establishing the OUT side pressure (outlet pressure).

### Component Parts

No.	Description	Material	Note
①	Body	Aluminum die-casted *	Platinum silver painted
②	Bonnet	Aluminum die-casted	Platinum silver painted
③	Chamber	Aluminum die-casted	Platinum silver painted
④	Valve guide	Zinc die-casted *	Platinum silver painted

\* In the case of AR825/835/925/935, the material is aluminum alloy.

### Replacement Parts

No.	Description	Material	Part no.			
			AR425, 435	AR625, 635	AR825, 835	AR925, 935
⑤⑪	Exhaust valve assembly (Note)	—	132586A	132586A	132586A	132586A
⑥	Main valve side diaphragm assembly	—	132581A	132659A	13275A	13285A
⑦	Valve assembly	—	132572A	132653A	132752A	132829A
⑧	Adjusting spring	Steel wire	135053 (AR425) 135025 (AR435)	135053 (AR625) 135025 (AR635)	135053 (AR825) 135025 (AR835)	135053 (AR925) 135025 (AR935)
⑨	Valve spring	Stainless steel	135211	132656	132713	13289
⑩	Handle	ABS	13414			

Note) Diaphragm is included.

## ⚠ Precautions

Be sure to read before handling.  
Refer to pages 14-21-3 to 14-21-4 for Safety Instructions and Common Precautions.

## Mounting/Adjustment

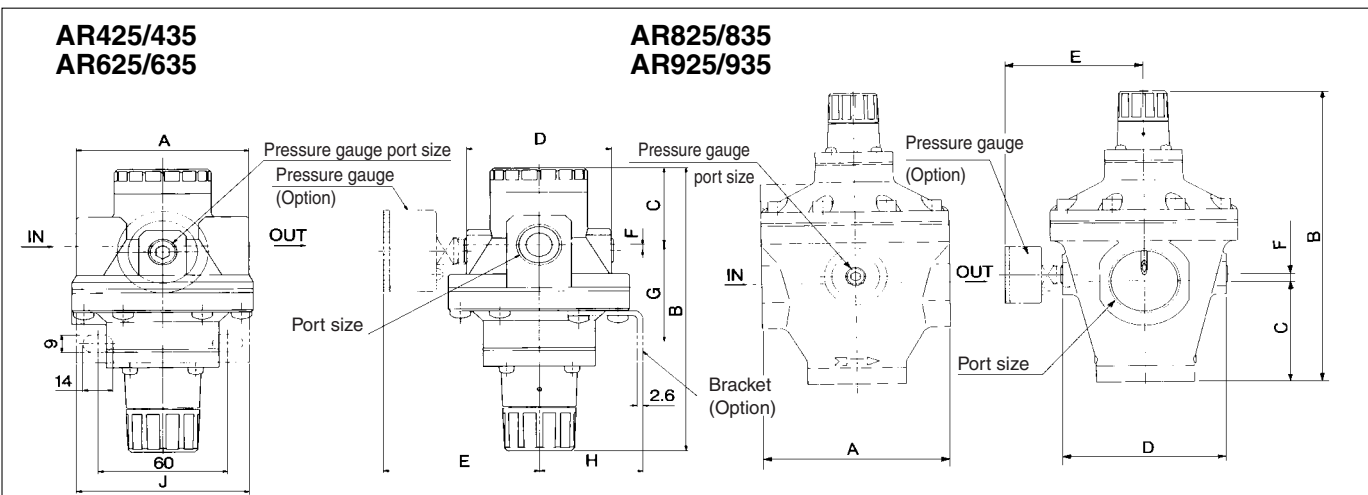
### ⚠ Warning

1. Install the valve guide (on the opposite side of the handle) 60 mm away from the ground surface to facilitate maintenance inspection.
2. Do not use the regulator with flow exceeding the Max. flow indicated in "Flow Characteristics" as this can cause failure in pressure adjustment.

### ⚠ Caution

1. Release the lock to adjust the pressure. After the adjustment, engage the lock. Failure to observe this procedure could damage the handle or cause the outlet pressure to fluctuate.  
<Lock operating method>  
Loosen the handle locking screw to unlock it, and tighten it to lock it.
2. Please contact SMC if this product is to be used between solenoid valve and actuator.

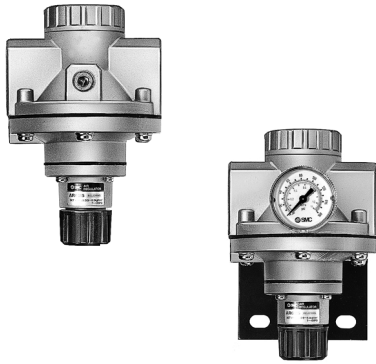
## Dimensions



\* For products with pressure gauge, pressure gauges are shipped together with product.

Model	Port size	Pressure gauge port size	A	B	C	D	E	F	Bracket dimensions			Bracket part no.
									G	H	J	
AR425/435	1/4, 3/8, 1/2	1/4	80	145.5	39.5	67	73	3	46.5	48	80	B24P
AR625/635	3/4, 1	1/4	98	155	43	78	78.5	7	85	52	90	B25P
AR825/835	1 1/4, 1 1/2	1/4	126	216	75	110	94.5	5	—	—	—	—
AR925/935	2	1/4	160	241	90	140	109.5	10	—	—	—	—





## Specifications

Model	NAR425	NAR435	NAR625	NAR635	NAR825	NAR835	NAR925	NAR935	
Port Size	1/4 • 3/8 • 1/2		3/4 • 1		1 1/4 • 1 1/2		2		
Proof pressure psig (MPa)	220 (1.5)								
Max. operating pressure psig (MPa)	150 (1.0)								
Temperature	23~140° F (-5° ~ 60° C)								
Pressure regulating range psig (MPa)	7-120 (0.05~0.83)	3-30 (0.02~0.2)	7-120 (0.05~0.83)	3-30 (0.02~0.2)	7-120 (0.05~0.83)	3-30 (0.02~0.2)	7-120 (0.05~0.83)	3-30 (0.02~0.2)	
Body	ADC, AC2A-F	ADC, AC2A-F	ADC, AC2A-F	ADC, AC2A-F	AC2A-F	AC2A-F	AC2A-F	AC2A-F	
Bonnet	ADC								
Chamber	ADC, AC2A-F	ADC, AC2A-F	ADC, AC2A-F	ADC, AC2A-F	AC2A-F	AC2A-F	AC2A-F	AC2A-F	
Valve guide	ZDC, AC2A-F	ZDC, AC2A-F	ZDC, AC2A-F	ZDC, AC2A-F	AC2A-F	AC2A-F	AC2A-F	AC2A-F	
Weight lbs (kgf)	1.54 (0.7)		2.43 (1.1)		5.51 (2.5)		9.92 (4.5)		
Option	Bracket	B24P		B25P		—		—	
	Gauge	K50A-MP1.0-N02M (0~160 psig) Std. NAR O 25							
		K50A-MP2.0-N02M (0~30 psig) Std. NAR O 35							

## How To Order

NAR **4** **25** — **N** **02** **B** — **R**

Body size  
 4 — 1/2  
 6 — 1  
 8 — 1 1/2  
 9 — 2

Pressure regulating range  
 25 — 7-120 psig  
 35 — 3-30 psig

Pipe size (NPT)  
 02 — 1/4  
 04 — 1/2  
 06 — 3/4  
 10 — 1  
 12 — 1 1/4  
 14 — 1 1/2  
 20 — 2

Option  
 Nil — None  
 R — IN-OUT Reversal  
 (Right→Left)

Accessory  
 Nil — None  
 B — Bracket  
 G — Gauge

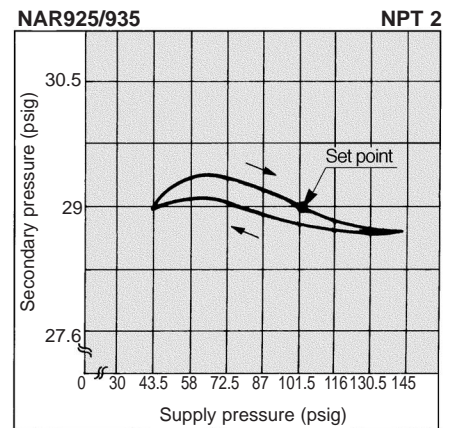
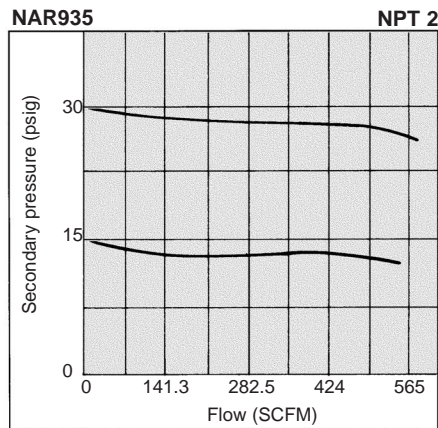
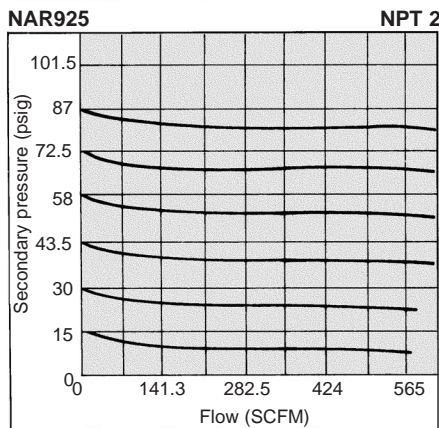
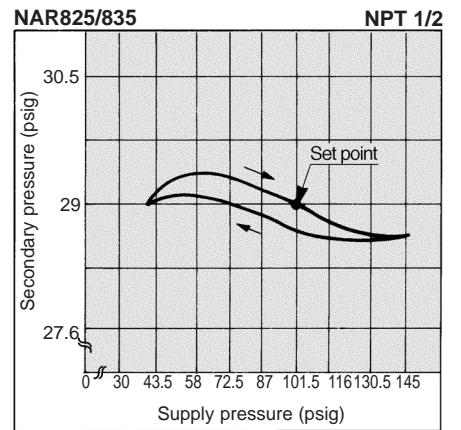
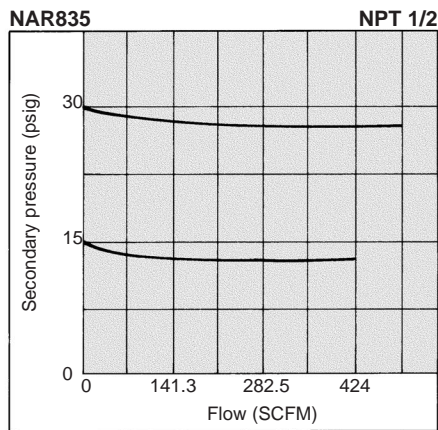
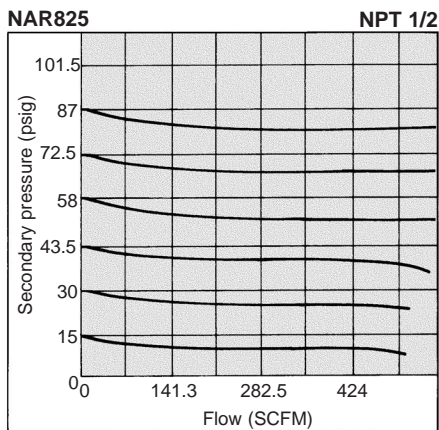
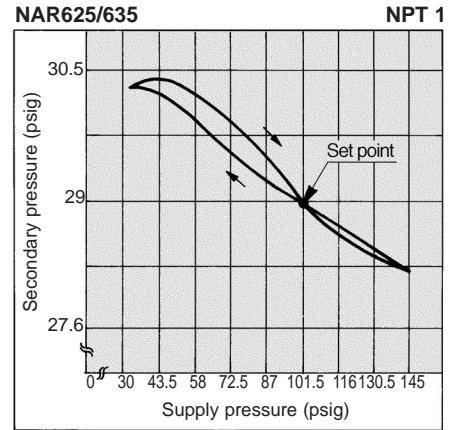
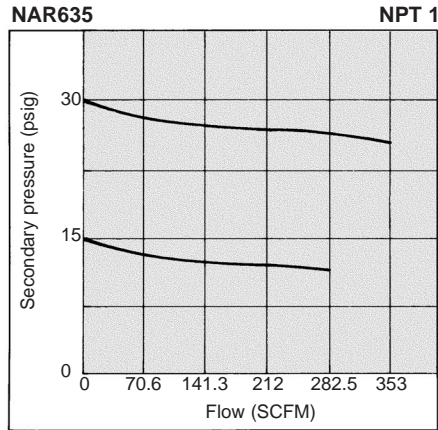
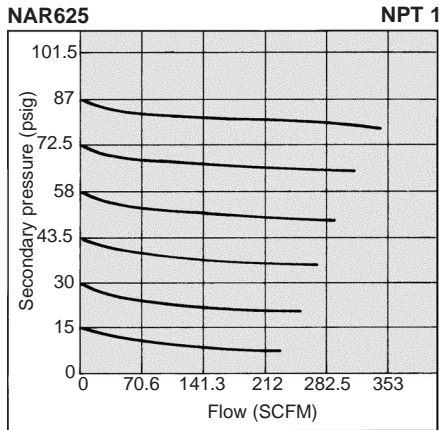
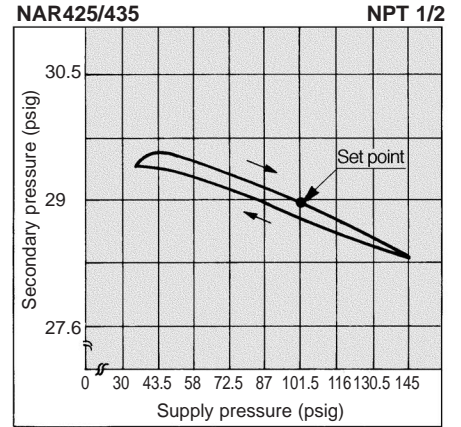
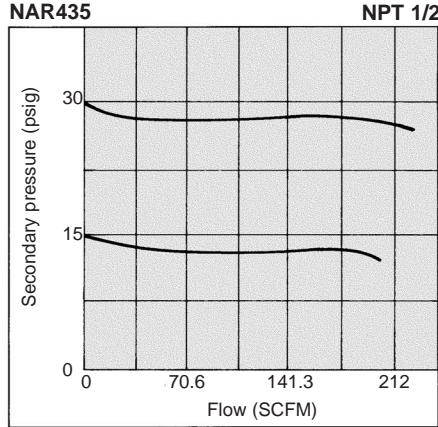
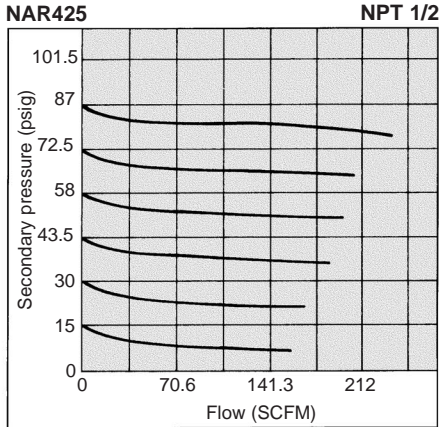
## Flow and Pressure Characteristics

NAR425, 435, 625, 635, 825, 835, 925, 935

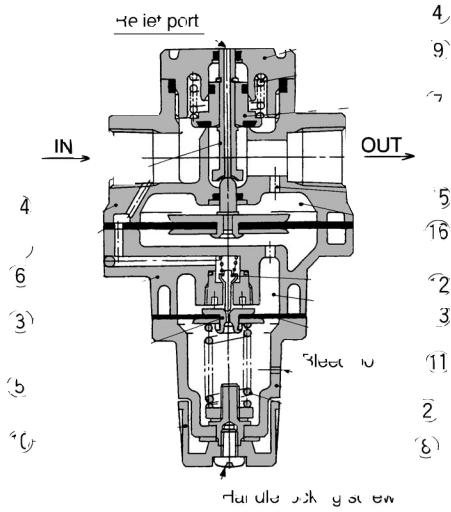
### Flow characteristics Condition: Supply pressure 100 psig

### Pressure characteristics

Supply Pressure - 100 psi (0.7 MPa)  
 Secondary Pressure - 30 psi (0.2 MPa)  
 Flow - 0.7SCFM (20l/min)

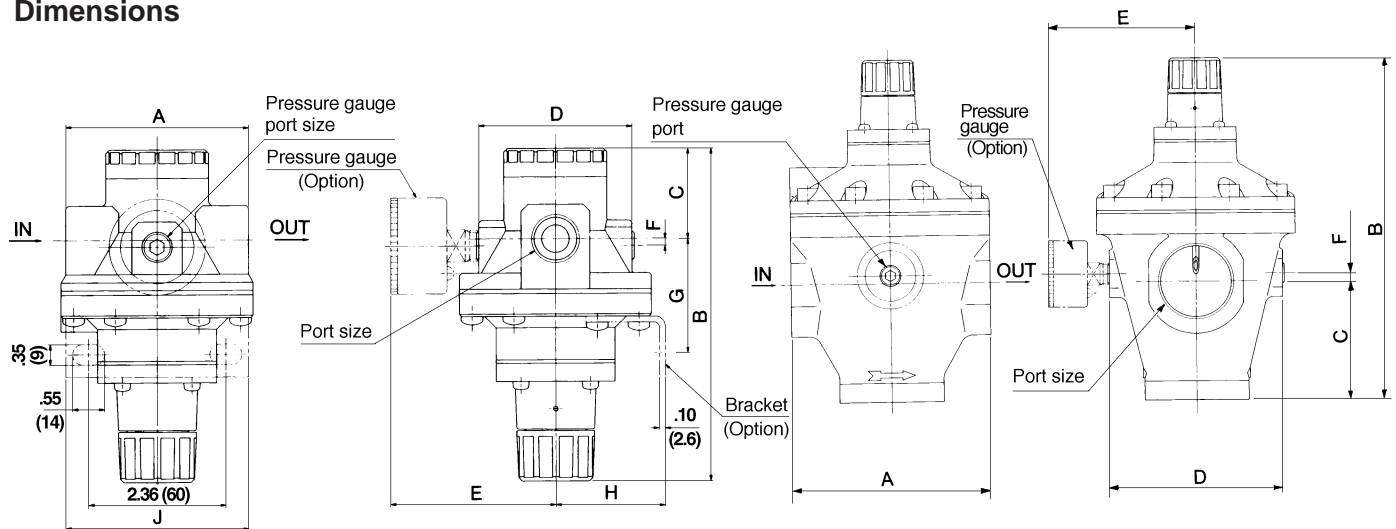


Construction



No.	Name	Material	Model			
			NAR425•435	NAR625•635	NAR825•835	NAR925•935
⑤	Exhaust valve assembly	—	132586A	132586A	132586A	132586A
⑥	Main valve diaphragm assembly	—	132581A	132659A	13275A	13285A
⑦	Valve assembly	—	132572A	132653A	132752A	132829A
⑧	Regulating spring	SWPB	135053(NAR425) 135025(NAR435)	135053(NAR625) 135025(NAR635)	135053(NAR825) 135025(NAR835)	135053(NAR925) 135025(NAR935)
⑨	Valve spring	SUS304	135211	132656	132713	13289
⑪	Pilot Diaphragm	—	135019-1A	135019-1A	135019-1A	135019-1A
	Repair Kit	—	KT-AR4□5	KT-AR6□5	KT-AR8□5	KT-AR9□5

Dimensions



Model	A	B	C	D	E	F	Bracket Dimensions		
							G	H	J
NAR425•435	3.15 (80)	5.55 (141)	1.46 (37)	2.64 (67)	3.01 (76.5)	0.12 (3)	1.83 (46.5)	1.89 (48)	3.15 (80)
NAR625•635	3.86 (98)	5.98 (151.9)	1.57 (40)	3.07 (78)	3.23 (82)	0.28 (7)	3.35 (85)	2.05 (52)	3.54 (90)
NAR825•835	4.96 (126)	8.54 (216.9)	2.95 (75)	4.33 (110)	3.86 (98)	0.20 (5)	—	—	—
NAR925•935	6.30 (160)	9.53 (242)	3.50 (89)	5.51 (140)	4.45 (113)	0.39 (10)	—	—	—