

Direct Operated Precision Regulator/Modular Style

ARP20 to ARP40

Direct Operated Precision Regulator with Backflow Function/Modular Style

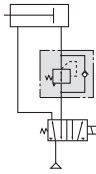
ARP20K to ARP40K

JIS symbol

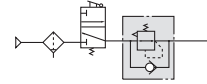
Regulator Regulator with backflow function

- 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

ARP **30** **K** - **03** **BE** -

① ② ③ ④ ⑤ ⑥

- Option / Semi-standard: Select one each for a to f.
- Option / Semi-standard symbol: Enter them alphanumerically.
Example) ARP30K-03BE-1RY

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

Direct Operated Precision Regulator/Modular Style *Series ARP20 to ARP40*

Direct Operated Precision Regulator with Backflow Function/Modular Style *Series ARP20K to ARP40K*



ARP20/ARP20K

ARP30/ARP30K

ARP40/ARP40K

		Symbol	Description	①			
				Body size			
				20	30	40	
⑥	c	Set pressure	Nil	0.005 to 0.4 MPa setting	●	●	●
			1 <small>Note 4)</small>	0.005 to 0.2 MPa setting	●	●	●
			3 <small>Note 4)</small>	0.008 to 0.6 MPa setting	●	●	●
			+				
	d	Flow direction	Nil	Flow direction: Left to right	●	●	●
			R	Flow direction: Right to left	●	●	●
			+				
	e	Knob	Nil	Downward facing knob	●	●	●
			Y	Upward facing knob	●	●	●
			+				
	f	Pressure unit	Nil	Name plate and pressure gauge in imperial units: MPa	●	●	●
			Z <small>Note 5)</small>	Name plate and pressure gauge in imperial units: psi	○ <small>Note 7)</small>	○ <small>Note 7)</small>	○ <small>Note 7)</small>
ZA <small>Note 6)</small>			Digital pressure switch: With unit conversion function	△ <small>Note 8)</small>	△ <small>Note 8)</small>	△ <small>Note 8)</small>	

Note 1) Options B, G, H are shipped together, (but not assembled).

Note 2) Set nut is included for bracket.

Note 3) 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 4) The only difference from the standard specifications is the pressure regulator spring.
It does not restrict the setting of 0.2 MPa/0.6 MPa or more.
When the pressure gauge is attached, a 0.2 MPa pressure gauge for 0.2 MPa setting will be fitted, and a 0.7 MPa pressure gauge for 0.6 MPa setting will be fitted.
When a digital pressure switch is attached, the pressure display is fixed to 1.0 MPa.

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.) The digital pressure switch will be equipped with the unit conversion function, setting to psi initially.

Note 6) 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 7) ○: For thread type: NPT only

Note 8) △: Combination available for options: E1, E2, E3, E4.

Series ARP20/30/40

Specifications

Model			ARP20(K)	ARP30(K)	ARP40(K)
Port size			1/8, 1/4	1/4, 3/8	1/4, 3/8, 1/2
Fluid			Air		
Proof pressure			1.2 MPa		
Max. operating pressure			0.7 MPa		
Set pressure range <small>Note 1)</small>	For 0.4 MPa setting	Ex.) ARP30-02BG	0.005 to 0.4 MPa		
	For 0.2 MPa setting	Ex.) ARP30-02BG-1	0.005 to 0.2 MPa		
	For 0.6 MPa setting	Ex.) ARP30-02BG-3	0.008 to 0.6 MPa		
Sensitivity			Within 0.2% F.S.		
Repeatability <small>Note 2)</small>			Within $\pm 1\%$ F.S. (or ± 3 kPa)		
Air consumption	For 0.4 MPa setting	Ex.) ARP30-02BG	1 ℓ /min (ANR) or less (at P2 = 0.4 MPa)		
	For 0.2 MPa setting	Ex.) ARP30-02BG-1	0.6 ℓ /min (ANR) or less (at P2 = 0.2 MPa)		
	For 0.6 MPa setting	Ex.) ARP30-02BG-3	1.4 ℓ /min (ANR) or less (at P2 = 0.6 MPa)		
Pressure port size <small>Note 3)</small>			1/8	1/8	1/4
Ambient and fluid temperature			-5 to 60°C (No freezing)		
	With digital pressure switch	Ex.) ARP30-02BE1	-5 to 50°C (No freezing)		
Construction			Bleed type		
Weight (kg) <small>Note 4)</small>			0.2	0.3	0.5

Note 1) When a product with backflow function (ARP20K to 40K) is chosen, set the inlet pressure 0.05 MPa or higher than the set pressure.

Note 2) For the type set to 0.2 MPa only, repeatability will be within ± 3 kPa.

Note 3) Port thread is not provided for products with square embedded-type pressure gauges.

Note 4) Weight shown is for product without any options.

Optional Parts

Standard

Model		ARP20(K)	ARP30(K)	ARP40(K)	
Bracket assembly ^{Note 1)}		ARP20P-270AS	ARP30P-270AS	ARP40P-270AS	
Set nut		ARP20P-260S	ARP30P-260S	ARP40P-260S	
Pressure gauge	0.4 MPa	Round type ^{Note 2)}	G36-4-□01		
		Square embedded type ^{Note 3)}	GC3-4AS [GC3P-010AS (Pressure gauge cover only)]		
	0.2 MPa	Round type ^{Note 2)}	G36-2-□01		
		Square embedded type ^{Note 3)}	GC3-2AS [GC3P-010AS (Pressure gauge cover only)]		
	0.7 MPa	Round type ^{Note 2)}	G36-7-□01		
		Square embedded type ^{Note 3)}	GC3-7AS [GC3P-010AS (Pressure gauge cover only)]		
	Digital type ^{Note 4)}	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)]			

Clean Room Compliant (10-)

Model		10-ARP20(K)	10-ARP30(K)	10-ARP40(K)	
Bracket assembly ^{Note 1)}		ARP20P-270AS	ARP30P-270AS	ARP40P-270AS	
Set nut		ARP20P-260S	ARP30P-260S	ARP40P-260S	
Pressure gauge	0.4 MPa	Round type ^{Note 2)}	G49-4-□01		
			G49-2-□01		
			G49-7-□01		
	Digital type ^{Note 4)}	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)]	

Copper-free, Fluorine-free (20-)

Model		20-ARP20(K)	20-ARP30(K)	20-ARP40(K)
Bracket assembly ^{Note 1)}		ARP20P-270AS	ARP30P-270AS	ARP40P-270AS
Set nut		ARP20P-260S	ARP30P-260S	ARP40P-260S
Pressure gauge	0.4 MPa	Round type ^{Note 2)}	G46-4-□01-X3	
	0.2 MPa		G46-2-□01-X3	
	0.7 MPa		G46-7-□01-X3	

Clean Room Compliant, Copper-free, Fluorine-free (21-)

Model		21-ARP20(K)	21-ARP30(K)	21-ARP40(K)
Bracket assembly ^{Note 1)}		ARP20P-270AS	ARP30P-270AS	ARP40P-270AS
Set nut		ARP20P-260S	ARP30P-260S	ARP40P-260S
Pressure gauge	0.4 MPa	Round type ^{Note 2)}	G49-4-□01MS-X3	
	0.2 MPa		G49-2-□01MS-X3	
	0.7 MPa		G49-7-□01MS-X3	

Note 1) Assembly includes a bracket and set nuts.

Note 2) □ in part numbers for a round-type pressure gauge indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT. The G thread is unavailable. If it is required, select the R thread type (Nil) instead. Please contact SMC regarding the connection thread NPT and pressure gauge supply for psi unit specifications.

Note 3) Includes one O-ring and 2 mounting screws. []: Pressure gauge cover only.

Note 4) Lead wire with connector (2 m), adapter, lock pin, O-ring (1 pc.), and mounting screws (2 pcs.) are included. []: Switch body only.
For how to order the digital pressure switch, refer to the following specific page for the digital pressure switch.

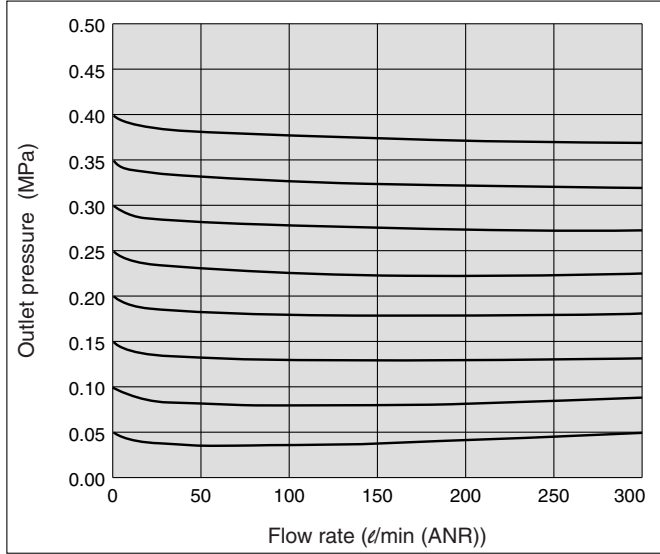
Series ARP20/30/40

Condition:
Inlet pressure 0.7 MPa

Conditions:
Inlet pressure 0.5 MPa
Outlet pressure 0.2 MPa
Flow rate 20 ℓ/min (ANR)

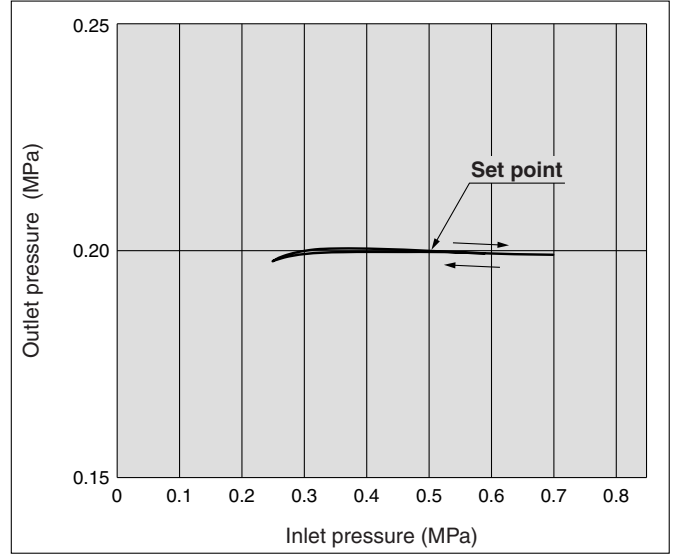
Flow Characteristics (Representative values)

ARP20(K) Rc1/4

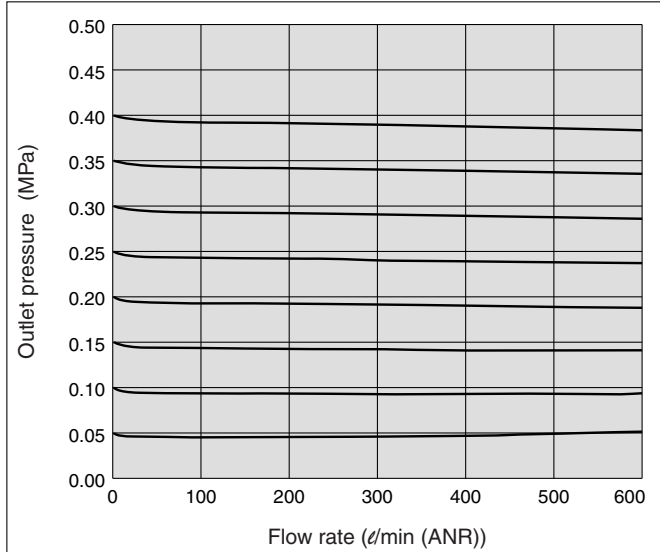


Pressure Characteristics (Representative values)

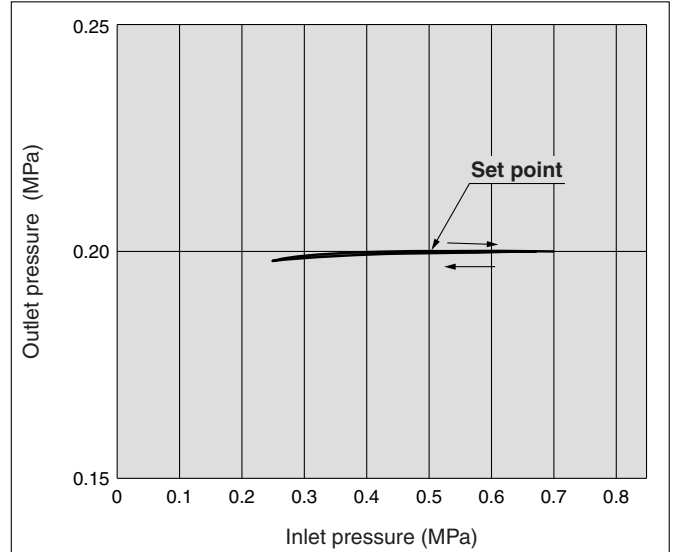
ARP20(K)



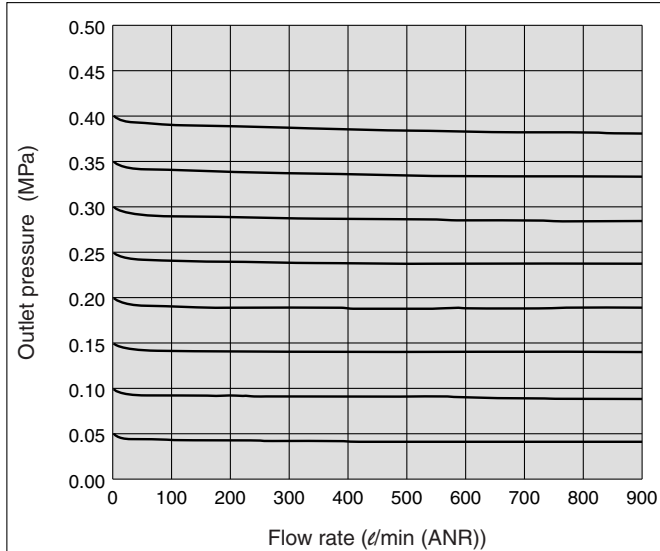
ARP30(K) Rc3/8



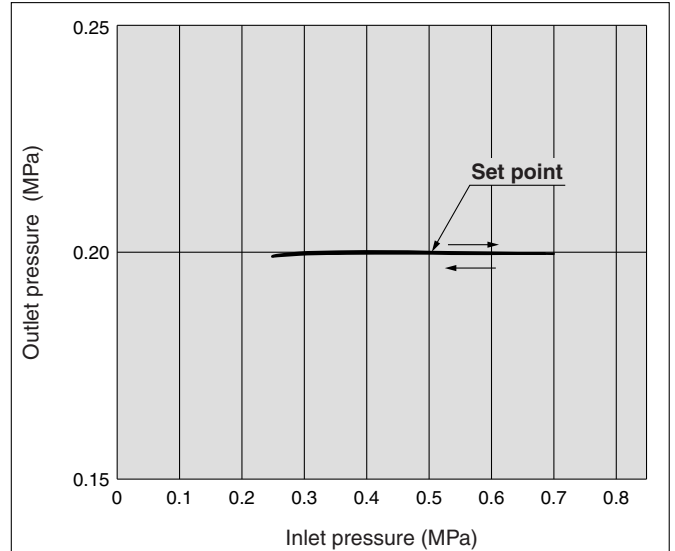
ARP30(K)



ARP40(K) Rc1/2



ARP40(K)

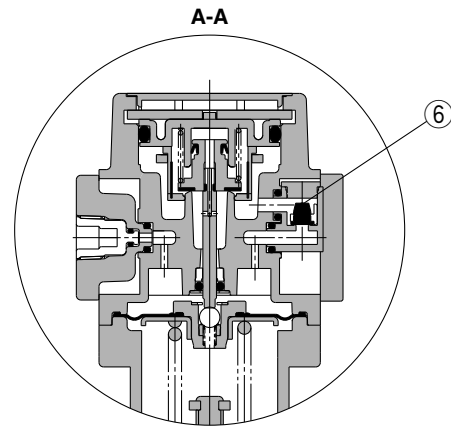
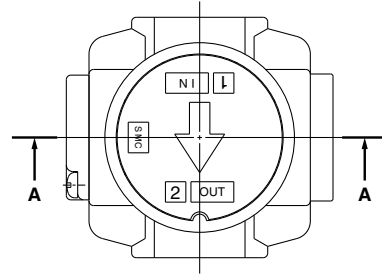
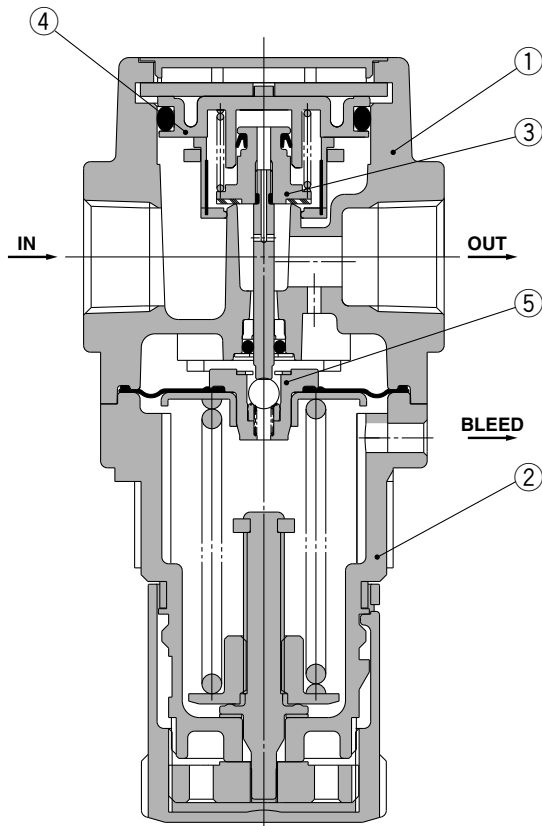


Direct Operated Precision Regulator/Modular Style *Series ARP20/30/40*

Construction

ARP20(K)/30(K)/40(K)

ARP20K/30K/40K (With backflow function)



Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted	External color: White
2	Bonnet	Polyacetal	External color: White

Replacement Parts

No.	Description	Material	Part no.		
			ARP20(K)	ARP30(K)	ARP40(K)
3	Valve assembly	Brass, HNBR, NBR	ARP20P-330AS	ARP30P-330AS	ARP40P-330AS
4	Valve guide assembly	Polyacetal, NBR	ARP20P-050AS	ARP30P-050AS	ARP40P-050AS
5	Diaphragm assembly	HNBR, Stainless steel, Brass	ARP20P-151AS	ARP30P-151AS	ARP40P-151AS
6 (Note)	Check valve assembly	—	AR20KP-020AS		

Note) Check valve assembly is the replacement part for a regulator with backflow function (ARP20K to 40K).

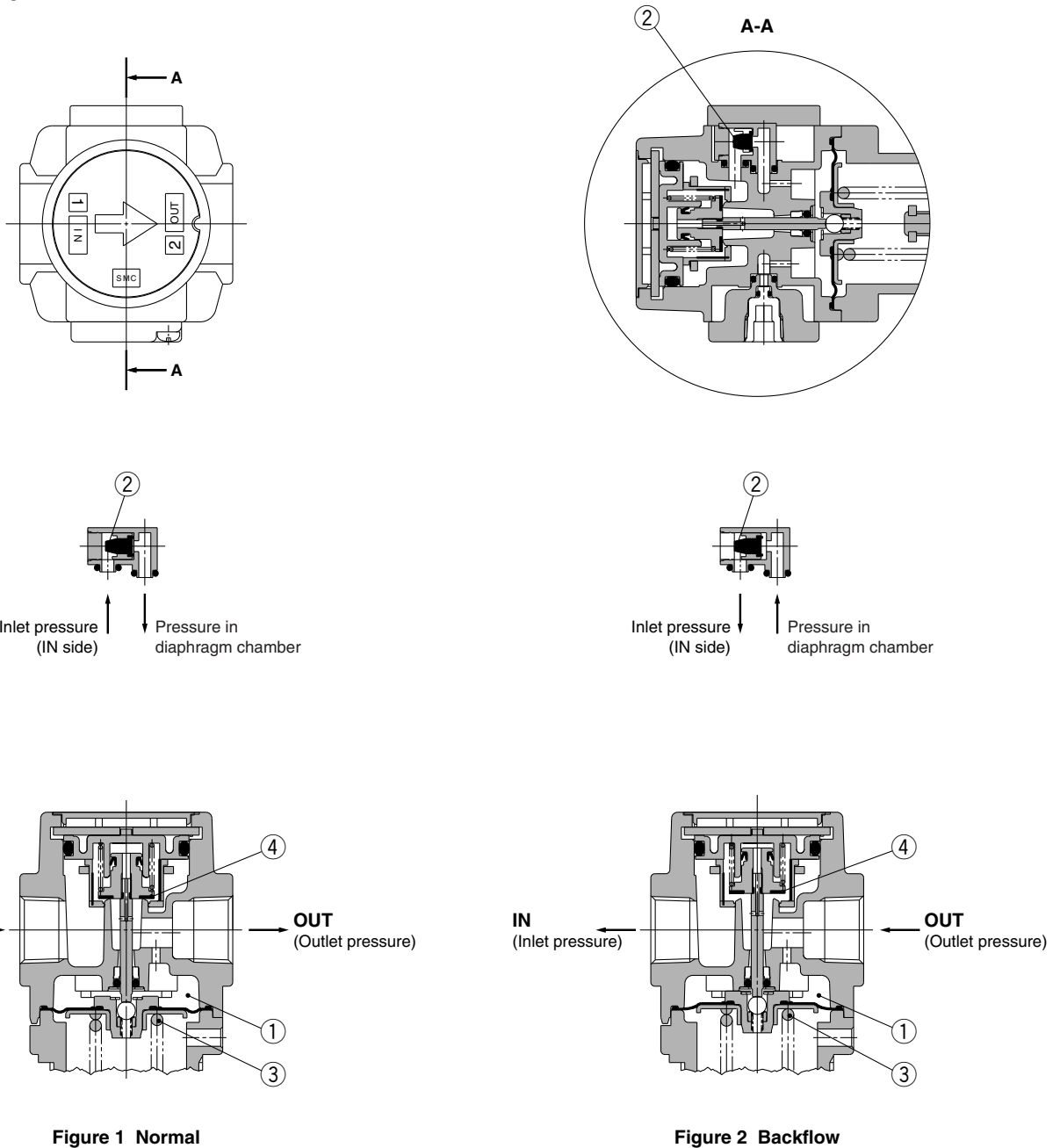
Assembly of check valve body assembly, check valve cover and 2 screws

* Please consult SMC for special application specifications.

Series ARP20/30/40

Working Principle (Regulator with Backflow Function)

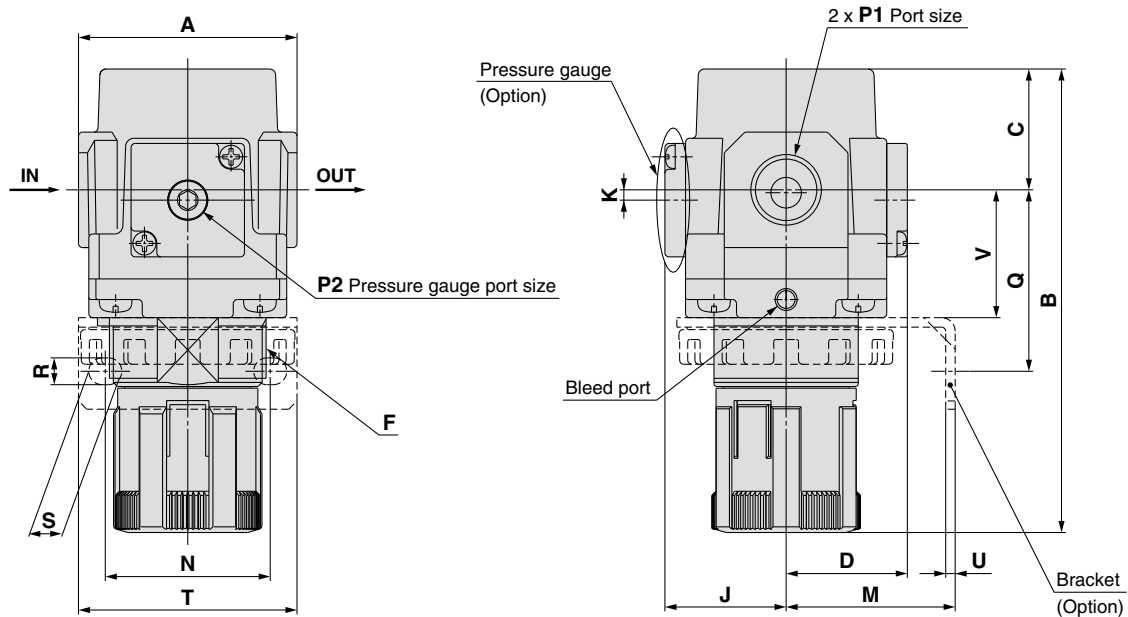
ARP20K/30K/40K



When the inlet pressure is higher than the set 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 to the inlet side (Figure 2). This lowers the pressure in the diaphragm chamber ① and the force generated by the pressure regulator spring ③ pushes down the diaphragm. Valve ④ opens through the stem, and the outlet pressure is released to the inlet side (Figure 2).

Direct Operated Precision Regulator/Modular Style **Series ARP20/30/40**

Dimensions



Panel fitting dimension

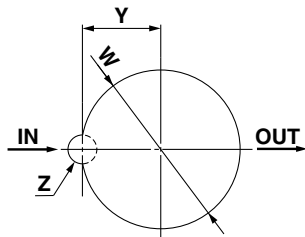


Plate thickness
 ARP20(K), ARP30(K): Max. 3.5
 ARP40(K): Max. 5

* The dimensions for special applications (not including round-type pressure gauge). The dimensions for special applications are the same as those of the standard product. However, as for the 10-, 20-series, a fitting is attached to the bleed port and it protrudes from the face with the OUT port by approx. 11 mm.

Pressure Gauge Option

Option	Square embedded type pressure gauge	Digital pressure switch (Electrical entry: Wiring bottom entry)	Digital pressure switch (Electrical entry: Wiring top entry)	Round type pressure gauge
Dimensions				

Model	Standard specifications								
	P1	P2	A	B ^{Note 1)}	C	D	F	J	K
ARP20(K)	1/8, 1/4	1/8	40	98	27	28.5	M28 x 1	28.5 ^{Note 2)}	2
ARP30(K)	1/4, 3/8	1/8	53	117	29	29.5	M38 x 1.5	29.5	2.5
ARP40(K)	1/4, 3/8, 1/2	1/4	70	148	41	34	M42 x 1.5	34	1

Model	Optional specifications																
	Square embedded type pressure gauge		Digital pressure switch		Round type pressure gauge ^{Note 3)}		Bracket mount dimension							Panel mount			
	H	J	H	J	H	J	M	N	Q	R	S	T	U	V	W	Y	Z
ARP20(K)	□28	29.5	□27.8	40	∅37.5	66	30	34	47	5.4	15.4	55	2.3	28	28.5	14	6
ARP30(K)	□28	30.5	□27.8	41	∅37.5	67	41	40	44	6.5	8	53	2.3	31	38.5	19	7
ARP40(K)	□28	35	□27.8	45	∅42.5	74	50	54	54	8.5	10.5	70	2.3	35.5	42.5	21	7

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

Note 2) For ARP20(K) only, the position of the pressure gauge is above the center of the piping.

Note 3) For dimensions of round-type pressure gauge for special application, please contact SMC.

Options

Digital Pressure Switch

ISE35-**N**-**25**-**M****L****A**

① ② ③ ④ ⑤

	Symbol	Description
① Electrical entry	N	Wiring bottom entry
	R	Wiring top entry
+		
② Output	25	NPN output
	65	PNP output
+		
③ Unit <small>Note 1)</small>	Nil <small>Note 2)</small>	With unit conversion function
	M	Fixed SI unit
	P <small>Note 2)</small>	Pressure unit: psi (Initial value), with unit conversion function
+		
④ Lead wire	Nil	Without lead wire
	L	Lead wire with connector (2 m)
+		
⑤ Accessories	Nil	Without accessories (Switch body only)
	A	With accessories (Adapter, O-ring: 1 pc., Mounting screw: 2 pcs., Lock pin)

Note 1) Under the New Measurement Law, sales of switches with the unit switching function have not been allowed for use in Japan.

Note 2) Unit name plate is attached.

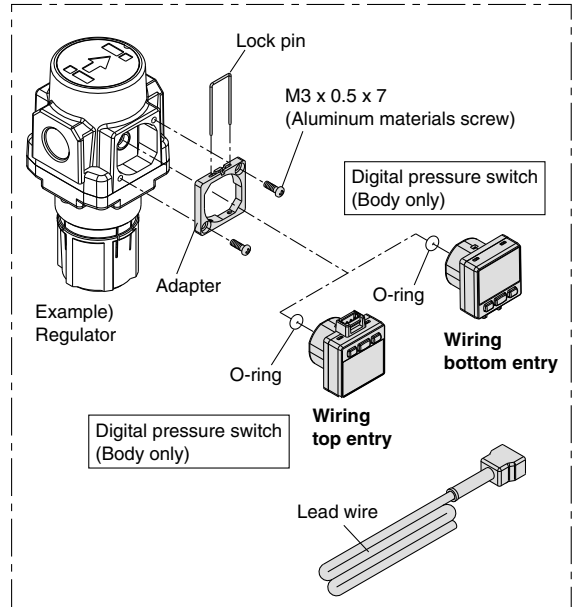
Note 3) Operation manual is included.

Note 4) When ordering the body only, select the symbol from ① to ⑤ respectively.

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	
Maximum load current	80 mA	
Maximum applied voltage	30 V (at NPN output)	
Residual voltage	1 V or less (with load current of 80 mA)	
Response time	1 s	
Anti-chattering function	(0.25, 0.5, 2, 3)	
Short-circuit protection	Yes	
Repeatability	±1% F.S. or less	
Hysteresis	Hysteresis mode	Variable (0 or above)
	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 (25°C±3°C)	
Indicator light	Light up when output is turned ON. (Green)	
Environment resistance Enclosure	IP40	
Lead wire with connector	φ3.4 3-wire 25AWG 2 m	

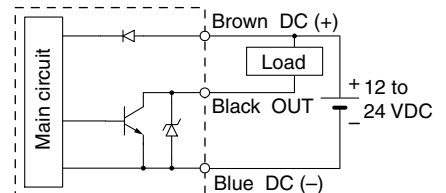
Digital Pressure Switch Construction



Output Specifications

NPN open collector output

Max. 30 V, 80 mA
Residual voltage 1 V or less



PNP open collector

Max. 80 mA
Residual voltage 1 V or less

