



Modular Type Regulators *Series AR*

| Regulator Series AR  Pages 346 through to 355 | Model | Port size | Options |
|---|----------|---------------|--|
| | AR10 | M5 x 0.8 | Bracket Square embedded type pressure gauge (except the AR10) Round type pressure gauge Digital pressure switch (except the AR10) Panel mount |
| | 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 | |
| Regulator with Backflow Function Series AR□K  Pages 346 through to 355 | AR20K | 1/8, 1/4 | |
| | 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 | |

AC

AF□

AR

AL

AW□

A□G

AV

AF800
AF900

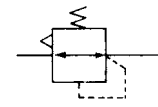
Regulator

AR10 to AR60

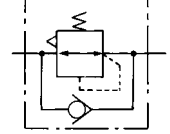
Regulator with Backflow Function

AR20K to AR60K

JIS Symbol
Regulator



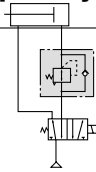
Regulator with
Backflow Function



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

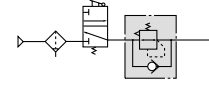
Example 1)

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

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

① ② ③ ④ ⑤ ⑥

Made to Order

(Refer to pages 354 and 355 for details.)

- 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

| | | Symbol | Description | ① | | | | | | | | | |
|---|-------------------------|-----------------------|--|--|----------------------------------|----|----|----|----|----|---|---|---|
| | | | | Body size | | | | | | | | | |
| | | | | 10 | 20 | 25 | 30 | 40 | 50 | 60 | | | |
| ② | With backflow function | Nil | Without backflow function | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | | K ^{Note 1)} | With backflow function | — | ● | ● | ● | ● | ● | ● | ● | | |
| + | | | | | | | | | | | | | |
| 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 | Option | a | Mounting | Nil | Without mounting option | ● | ● | ● | ● | ● | ● | ● | |
| | | | | B ^{Note 3)} | With bracket | ● | ● | ● | ● | ● | ● | ● | ● |
| | | | | H | With set nut (for panel fitting) | ● | ● | ● | ● | ● | — | — | — |
| | | + | | | | | | | | | | | |
| b | Pressure gauge | Nil | Without pressure gauge | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | | E | Square embedded type pressure gauge (with limit indicator) | — | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | G | Round type pressure gauge (without limit indicator) | ● | — | — | — | — | — | — | — | — | |
| | | | Round type pressure gauge (with limit indicator) | — | ● | ● | ● | ● | ● | ● | ● | ● | |
| | Digital pressure switch | M | Round type pressure gauge (with color zone) | — | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | | E1 ^{Note 4)} | Output: NPN output / Electrical entry: Wiring bottom entry | — | ● | ● | ● | ● | ● | ● | ● | ● |
| | | | E2 ^{Note 4)} | Output: NPN output / Electrical entry: Wiring top entry | — | ● | ● | ● | ● | ● | ● | ● | ● |
| | | | E3 ^{Note 4)} | Output: PNP output / Electrical entry: Wiring bottom entry | — | ● | ● | ● | ● | ● | ● | ● | ● |
| | | E4 ^{Note 4)} | Output: PNP output / Electrical entry: Wiring top entry | — | ● | ● | ● | ● | ● | ● | ● | | |

Regulator *Series AR10 to AR60*

Regulator with Backflow Function *Series AR20K to AR60K*



AR20, AR20K AR40, AR40K

| | | Symbol | Description | 1 | | | | | | | | | |
|---|---------------|--------|-------------------|------------------------|--|----|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | | | Body size | | | | | | | | | |
| | | | | 10 | 20 | 25 | 30 | 40 | 50 | 60 | | | |
| 6 | Semi-standard | c | Set pressure | Nil ^{Note 5)} | 0.05 to 0.85 MPa setting | | ● | ● | ● | ● | ● | ● | ● |
| | | | | 1 ^{Note 6)} | 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 ^{Note 7)} | Name plate and pressure gauge in imperial units: psi | | ○ ^{Note 9)} | ○ ^{Note 9)} | ○ ^{Note 9)} | ○ ^{Note 9)} | ○ ^{Note 9)} | ○ ^{Note 9)} | ○ ^{Note 9)} |
| | | | | ZA ^{Note 8)} | Digital pressure switch: With unit conversion function | | — | △ ^{Note 10)} | △ ^{Note 10)} | △ ^{Note 10)} | △ ^{Note 10)} | △ ^{Note 10)} | △ ^{Note 10)} |

Note 1) The AR10 type comes with a backflow function as a standard feature. (K is not available.) When using the AR10 type as w/ backflow function, backflow may not occur with the set pressure 0.15 MPa or less. Please 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 (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 electrical entry. (Select "wiring bottom entry" when the semi-standard Y is chosen simultaneously.)

Note 5) Only the AR10 has a pressure setting of 0.05 to 0.7 MPa.

Note 6) 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 7) 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 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 thread type: M5 and NPT only

Note 10) △: Select with options: E1, E2, E3, E4.

Standard Specifications

| Model | AR10 | AR20(K) | AR25(K) | AR30(K) | AR40(K) | AR40(K)-06 | AR50(K) | AR60(K) |
|--|--|------------------|----------|----------|---------------|------------|---------|---------|
| Port size | 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 |
| Pressure gauge port size ^{Note 1)} | 1/16 ^{Note 2)} | 1/8 | | | 1/4 | | | |
| Fluid | Air | | | | | | | |
| Ambient and fluid temperature ^{Note 3)} | −5 to 60°C (with no freezing) | | | | | | | |
| Proof pressure | 1.5 MPa | | | | | | | |
| Maximum operating pressure | 1.0 MPa | | | | | | | |
| Set pressure range | 0.05 to 0.7 MPa | 0.05 to 0.85 MPa | | | | | | |
| Relief pressure ^{Note 4)} | Set pressure + 0.05 MPa [at relief flow rate of 0.1 ℓ/min (ANR)] | | | | | | | |
| Construction | Relieving type | | | | | | | |
| Mass (kg) | 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 (AR20(K) to AR60(K)).

Note 2) Use a bushing (part no:131368) when connecting the R1/8 pressure gauge to the Rc1/16.

Note 3) -5 to 50°C for the products with the digital pressure switch.

Note 4) Not applicable to the AR10.

Series AR10 to AR60

Series AR20K to AR60K

Options/Part No.

| Option | | Model | AR10 | AR20(K) | AR25(K) | AR30(K) | AR40(K) | AR40(K)-06 | AR50(K) | AR60(K) | |
|-------------------------------------|--|-------------------------|------------------------------|--|-------------|-------------|--------------|------------|--------------------------------|------------------------|--|
| Bracket assembly ^{Note 1)} | | | AR10P-270AS | AR20P-270AS | AR25P-270AS | AR30P-270AS | AR40P-270AS | | AR50P-270AS ^{Note 2)} | | |
| Set nut | | | AR10P-260S | AR20P-260S | AR25P-260S | AR30P-260S | AR40P-260S | | ___ ^{Note 3)} | ___ ^{Note 3)} | |
| Pressure gauge | ^{Note 4)} Round type | Standard | G27-10-R1 | G36-10-□01 | | | G46-10-□02 | | | | |
| | | 0.02 to 0.2 MPa setting | G27-10-R1 ^{Note 5)} | G36-2-□01 | | | G46-2-□02 | | | | |
| | ^{Note 4)} Round type (with color zone) | Standard | — | G36-10-□01-L | | | G46-10-□02-L | | | | |
| | | 0.02 to 0.2 MPa setting | — | G36-2-□01-L | | | G46-2-□02-L | | | | |
| | ^{Note 6)} Square embedded type | Standard | — | GC3-10AS [GC3P-010AS (Pressure gauge cover only)] | | | | | | | |
| | | 0.02 to 0.2 MPa setting | — | GC3-2AS [GC3P-010AS (Pressure gauge cover only)] | | | | | | | |
| Digital pressure switch | | | — | NPN output: Wiring bottom entry ^{Note 7)} | | | | | | | |
| | | | | NPN output: Wiring top entry ^{Note 7)} | | | | | | | |
| | | | | PNP output: Wiring bottom entry ^{Note 7)} | | | | | | | |
| | | | | PNP output: Wiring top entry ^{Note 7)} | | | | | | | |

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), adapter, lock pin, O-ring (1 pc.), mounting screw (2 pcs.) are attached. []: Switch body only

Also, regarding how to order the digital pressure switch, please refer to page 388.

⚠ Specific Product Precautions

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions and pages 287 to 291 for F.R.L. Precautions.

Selection

⚠ Warning

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

Maintenance

⚠ Warning

1. 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.

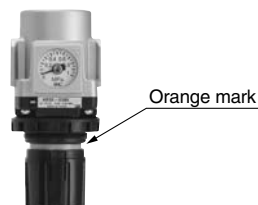
Mounting and Adjustment

⚠ Warning

1. 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.
2. The pressure gauge included with regulators for 0.02 to 0.2 MPa setting is for up to 0.2 MPa use only (except the AR10). Exceeding 0.2 MPa of pressure can damage the gauge.
3. Do not use tools on the pressure regulator knob as this may cause damage. It must be operated manually.

⚠ Caution

1. 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).



2. A knob cover is available to prevent careless operation of the knob. Refer to page 389 for details.