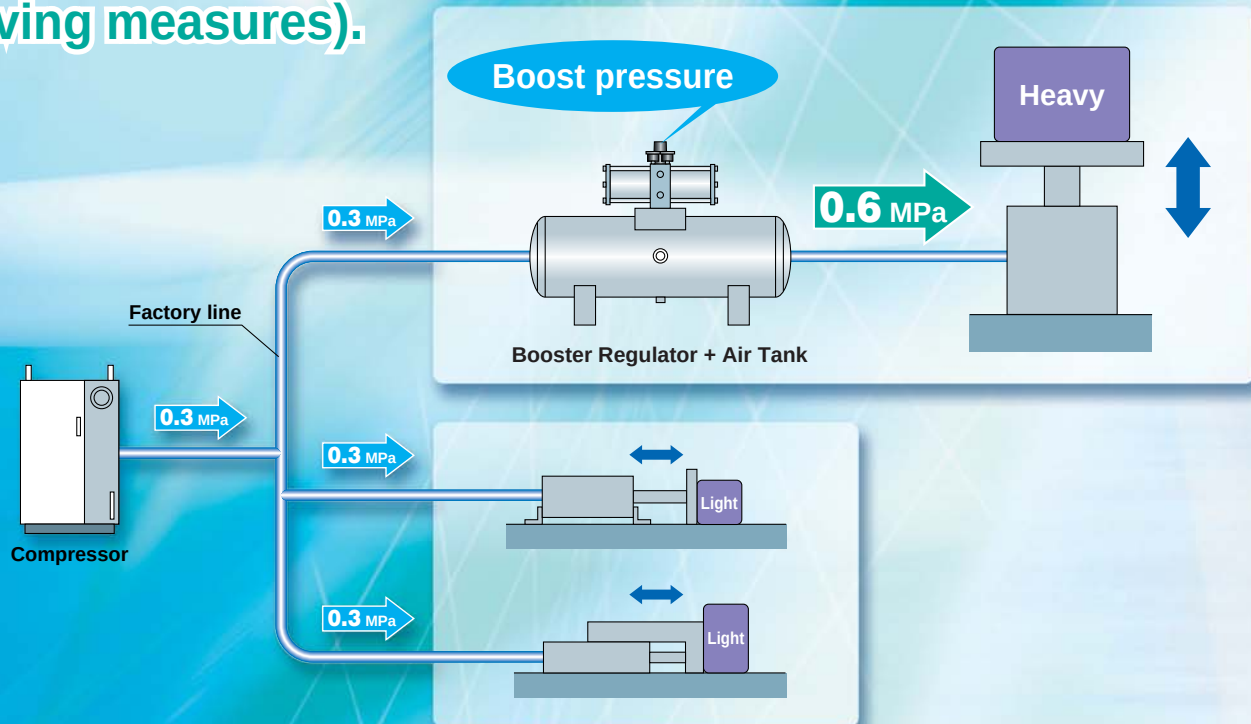


# Increase factory air pressure by up to twice as much! No need for an electrical supply!

- Using air from a factory supply line increases pressure by up to twice as much. (Fourfold pressure at the maximum with the VBA1111)
- Space-saving air tank and booster regulator can be connected directly.

Booster regulator assists supplying more pressure where force is insufficient due to low factory pressure (for energy-saving measures).



**Booster Regulator** *Series VBA*



**Air Tank** *Series VBAT*



**Series VBA/VBAT**

## Booster Regulator *Series VBA*

P.1

### Improved service life: Doubled that of conventional model

- Floating piston structure (PAT. PEND)
- Grease retaining groove

### Reduced noise: Reduced by 13 dB (A) compared with the conventional model

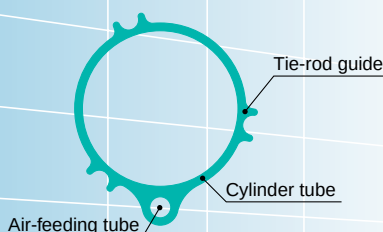
- Metal noise reduced by a damper on the impact part of the switch valve
- Exhaust noise reduced by a high-noise reduction silencer

### Improved reliability: Built-in mesh filter at IN port

- Prevent operation failure due to foreign matter.

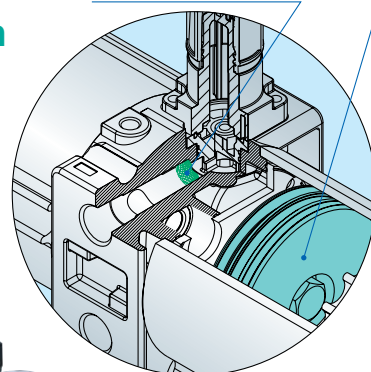
### Anti-condensation: Integrated air-feeding tube with the main tube

- Prevent condensation at air-feeding tube due to cooling of expanded exhausting air.



Floating structure  
Grease retaining groove

Built-in mesh filter



#### VBA <sup>1110</sup>/<sub>1111</sub> series

Pressure increase ratio: twofold to fourfold  
Set pressure range: 0.2 to 2 MPa



## Air Tank *Series VBAT*

P.9

This is a small capacity air tank to which a booster regulator can be connected directly. It can be used alone as a tank. The pressure vessel law is different from country to country, so as an air tank suitable to a country needs to be confirmed.

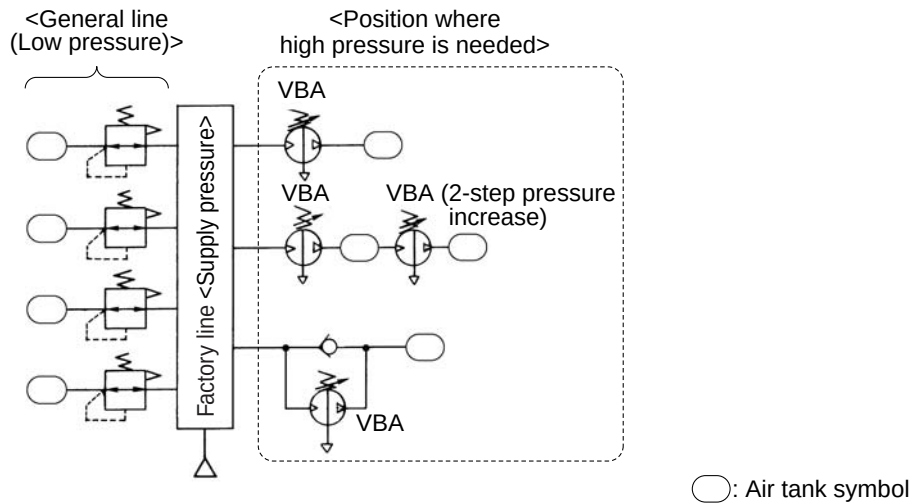
### Specifications

| Model                         | VBAT10A | VBAT20A | VBAT38A | VBAT10S             | VBAT20S | VBAT38S |
|-------------------------------|---------|---------|---------|---------------------|---------|---------|
| Tank capacity (ℓ)             | 10      | 20      | 38      | 10                  | 20      | 38      |
| Max. operating pressure (MPa) | 2.0     | 1.0     |         | 2.0                 |         |         |
| Material                      | SS400   |         |         | Stainless steel 304 |         |         |



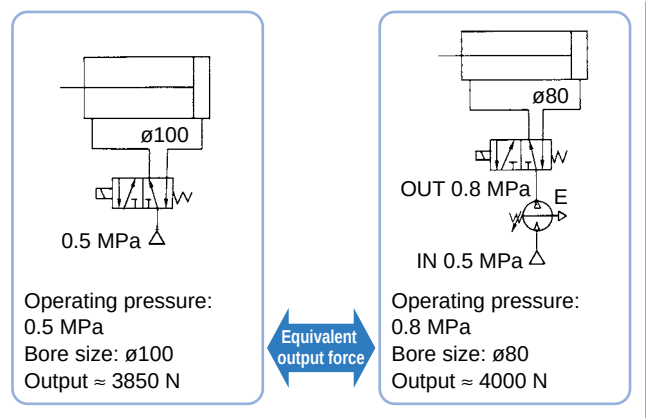
## Example of Circuit Diagram

### Energy and cost saving booster regulator for factory



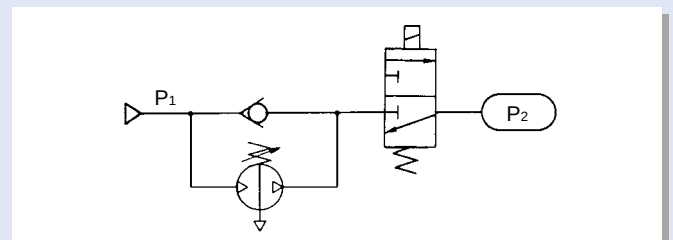
## Example of Application

- 1 When certain equipment requires a higher pressure than the factory line pressure.
- 2 When the lower pressure limit for equipment must be ensured due to the fluctuation and reduction of the factory line pressure.
- 3 When the actuator lacks power output for some reason but it is not feasible to replace it with a larger bore cylinder due to space constraints.
- 4 In spite of diverse pressure conditions of the end user, equipment that achieves the specified high power output must be provided.
- 5 When a small cylinder size is desired while ensuring sufficient power, in order to achieve a compact drive unit.

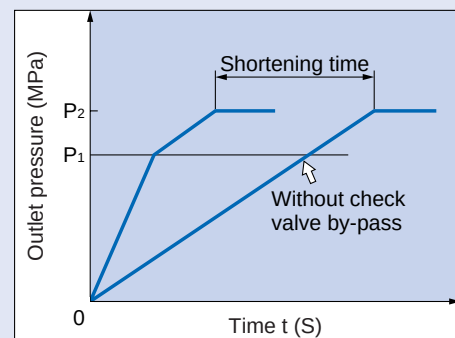


- 6 When the hydraulic pressure of an air-hydro unit must be raised.
- 7 When the pressure must be raised in an explosion-proof environment.
- 8 To boost the pressure by remote operation, using an air operated type.

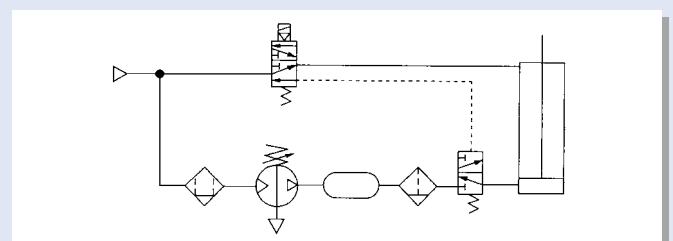
- 9 When the tank must be filled from the atmospheric pressure in a short time.



Initially, inlet pressure ( $P_1$ ) passes through the check valve, fills  $P_2$ , and results in  $P_1 = P_2$ .



- 10 When the pressure in one chamber of the cylinder must be boosted.



# Booster Regulator Series *VBA*

## How to Order

### VBA 1110 series

□ - VBA 111 0 - □ 02 GN

#### Made to Order

| Symbol | Specifications                                    |
|--------|---------------------------------------------------|
| Nil    | Standard                                          |
| 20     | Copper-free/Fluorine-free                         |
| 56     | CE explosion-proof directive (ATEX): Category 3GD |

(Refer to page 15.)

#### Body size

|     |     |
|-----|-----|
| 111 | 1/4 |
|-----|-----|

\* Pressure: 2 MPa

#### Pressure increase ratio

|   |         |
|---|---------|
| 0 | Twice   |
| 1 | 4 times |

#### Thread type

| Symbol | Thread type |
|--------|-------------|
| Nil    | Rc          |
| F      | G           |
| N      | NPT         |
| T      | NPTF        |

#### Option

| Symbol | Option                   |
|--------|--------------------------|
| Nil    | None                     |
| G      | Pressure gauge           |
| N      | Silencer                 |
| GN     | Pressure gauge, Silencer |

#### Port size

| Symbol | Port size |
|--------|-----------|
| 02     | 1/4       |



VBA1110-02



VBA1111-02

### VBA 20A 40A series

□ - VBA 40A - □ 04 GN - □

#### Made to Order

| Symbol | Specifications                                    |
|--------|---------------------------------------------------|
| Nil    | Standard                                          |
| 20     | Copper-free/Fluorine-free                         |
| 56     | CE explosion-proof directive (ATEX): Category 3GD |

(Refer to page 15.)

#### Body size

|     |                                      |
|-----|--------------------------------------|
| 20A | 3/8, Handle-operated type            |
| 40A | 1/2, Handle-operated type            |
| 22A | 3/8, Air-operated type               |
| 42A | 1/2, Air-operated type               |
| 43A | 1/2, Max. operating pressure 1.6 MPa |

\* Pressure increase ratio: Twice

#### Semi-standard

| Symbol   | Specifications                                               |
|----------|--------------------------------------------------------------|
| Nil      | Standard                                                     |
| Z (Note) | Display units for product name plate and pressure gauge: psi |

Note) For thread type NPT, NPTF.

This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)

#### Option

| Symbol | Option                                        |
|--------|-----------------------------------------------|
| Nil    | None                                          |
| G      | Pressure gauge                                |
| N      | Silencer                                      |
| S      | High noise reduction silencer                 |
| GN     | Pressure gauge, Silencer                      |
| GS     | Pressure gauge, High noise reduction silencer |

#### Port size

| Symbol | Port size | Applicable series |
|--------|-----------|-------------------|
| 03     | 3/8       | VBA2□A            |
| 04     | 1/2       | VBA4□A            |

#### Thread type

| Symbol | Thread type |
|--------|-------------|
| Nil    | Rc          |
| F      | G           |
| N      | NPT         |
| T      | NPTF        |



VBA20A-03



VBA40A-04



## Standard Specifications

| Model                                                | VBA1110-02                                               | VBA20A-03  | VBA40A-04 | VBA22A-03                       | VBA42A-04 | VBA1111-02                                               | VBA43A-04  |
|------------------------------------------------------|----------------------------------------------------------|------------|-----------|---------------------------------|-----------|----------------------------------------------------------|------------|
| Fluid                                                | Compressed air                                           |            |           |                                 |           |                                                          |            |
| Pressure increase ratio                              | Twice                                                    |            |           |                                 |           | Twice to 4 times                                         | Twice      |
| Pressure adjustment mechanism                        | Handle-operated with relief mechanism <sup>Note 1)</sup> |            |           | Air-operated <sup>Note 2)</sup> |           | Handle-operated with relief mechanism <sup>Note 1)</sup> |            |
| Max. flow rate <sup>Note 3)</sup> (d/min (ANR))      | 200                                                      | 1000       | 1900      | 1000                            | 1900      | 60                                                       | 1600       |
| Set pressure range (MPa)                             | 0.2 to 2.0                                               | 0.2 to 1.0 |           | 0.2 to 1.0                      |           | 0.2 to 2.0                                               | 0.2 to 1.6 |
| Max. supply pressure (MPa)                           | 0.1 to 1.0                                               |            |           |                                 |           |                                                          |            |
| Proof pressure (MPa)                                 | 3                                                        | 1.5        |           | 1.5                             |           | 3                                                        | 2.4        |
| Port size (IN, OUT, EXH: 3 locations) (Rc)           | 1/4                                                      | 3/8        | 1/2       | 3/8                             | 1/2       | 1/4                                                      | 1/2        |
| Pressure gauge port size (IN, OUT: 2 locations) (Rc) | 1/16                                                     | 1/8        | 1/8       | 1/8                             | 1/8       | 1/16                                                     | 1/8        |
| Ambient and fluid temperature (°C)                   | 2 to 50 (No freezing)                                    |            |           |                                 |           |                                                          |            |
| Installation                                         | Horizontal                                               |            |           |                                 |           |                                                          |            |
| Lubrication                                          | Grease (Non-lube)                                        |            |           |                                 |           |                                                          |            |
| Mass (kg)                                            | 0.85                                                     | 3.9        | 8.6       | 3.9                             | 8.6       | 0.98                                                     | 8.6        |

Note 1) If the OUT pressure is higher than the set pressure by the handle, excessive pressure is exhausted from the back of the handle.

Note 2) Please consult SMC for details on the air-operated type (VBA22A-03, VBA42A-04) and 1.6 MPa compatible type (VBA43A-04).

Note 3) Flow rate at IN= OUT= 0.5 MPa. The pressure varies depending on the operating conditions. Refer to "Flow Characteristics" on page 3 and 4.

## Options/Part No.

### Pressure Gauge, Silencer (When thread type is Rc or F.)

| Model                         | VBA1110-02  | VBA20A-03  | VBA40A-04  | VBA22A-03   | VBA42A-04  | VBA1111-02  | VBA43A-04   |
|-------------------------------|-------------|------------|------------|-------------|------------|-------------|-------------|
| Description                   | VBA1110-F02 | VBA20A-F03 | VBA40A-F04 | VBA22A-F03  | VBA42A-F04 | VBA1111-F02 | VBA43A-F04  |
| Pressure gauge                | G           | G27-20-R1  | G36-10-01  | KT-VBA22A-7 | G36-10-01  | G27-20-R1   | KT-VBA43A-7 |
| Silencer                      | N           | AN200-02   | AN300-03   | AN300-03    | AN400-04   | AN200-02    | AN400-04    |
| High noise reduction silencer | S           | —          | ANA1-03    | ANA1-03     | ANA1-04    | —           | ANA1-04     |

Note 1) In case of option GN, two pressure gauges and one silencer are included.

Note 2) KT-VBA22A-7 and KT-VBA43A-7 are pressure gauges with fittings. (Please order two units when using with IN and OUT.)

### Pressure Gauge, Silencer (When thread type is N or T.)

| Model                                                 | *VBA1110-N02<br>*VBA1110-T02<br>* indicates "N" | *VBA20A-N03*<br>*VBA20A-T03*<br>* indicates "-Z" | *VBA40A-N04*<br>*VBA40A-T04*<br>* indicates "-Z" | *VBA22A-N03*<br>*VBA22A-T03*<br>* indicates "-Z" | *VBA42A-N04*<br>*VBA42A-T04*<br>* indicates "-Z" | *VBA1111-N02<br>*VBA1111-T02<br>* indicates "N" | *VBA43A-N04*<br>*VBA43A-T04*<br>* indicates "-Z" |
|-------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|-------------------------------------------------|--------------------------------------------------|
| Pressure gauge<br>* No symbol                         | G                                               | G27-20-R1                                        | G36-10-N01                                       | KT-VBA22A-7N                                     | G36-10-01                                        | G27-20-R1                                       | KT-VBA43A-7N                                     |
| Pressure gauge<br>* indicates "-Z" <sup>Note 4)</sup> |                                                 | —                                                | G36-P10-N01                                      | KT-VBA22A-8N                                     | G36-10-N01                                       | —                                               | KT-VBA43A-8N                                     |
| Pressure gauge<br>* indicates "N" <sup>Note 5)</sup>  |                                                 | G27-20-R1-X214                                   | —                                                | —                                                | —                                                | G27-20-R1-X214                                  | —                                                |
| Silencer                                              | N                                               | AN200-N02                                        | AN300-N03                                        | AN300-N03                                        | AN400-N04                                        | AN200-N02                                       | AN400-N04                                        |
| High noise reduction silencer                         | S                                               | —                                                | ANA1-N03                                         | ANA1-N03                                         | ANA1-N04                                         | —                                               | ANA1-N04                                         |

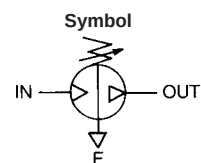
Note 1) In case of option GN, two pressure gauges and one silencer are included as accessories.

Note 2) KT-VBA22A-7N, KT-VBA43A-7N, KT-VBA22A-8N and KT-VBA43A-8N are pressure gauges with fittings. (Please order two units when using with IN and OUT.)

Note 3) Under the new measurement law, the display unit "psi" for pressure gauges cannot be used in Japan.

Note 4) Display unit for pressure gauge: psi

Note 5) Display unit for pressure gauge: psi and MPa



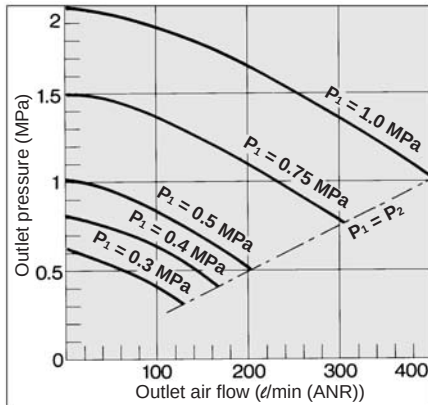
## Related Products/Part No.

| Model           | For VBA1110-02<br>For VBA1111-02 | For VBA20A-03<br>For VBA22A-03 | For VBA40A-04<br>For VBA42A-04 |
|-----------------|----------------------------------|--------------------------------|--------------------------------|
| Air tank        | VBAT05A<br>VBAT10A               | VBAT10A<br>VBAT20A<br>VBAT38A  | VBAT20A<br>VBAT38A             |
| Mist separator  | AM250C-02                        | AM450C-04, 06                  | AM550C-06, 10                  |
| Exhaust cleaner | AMC350-03                        | AMC350-04                      | AMC350-05                      |

Note) Refer to SMC "Best Pneumatics" Vol.14 catalog for Air Tank and Mist Separator, and Vol.5 catalog for Exhaust Cleaner.

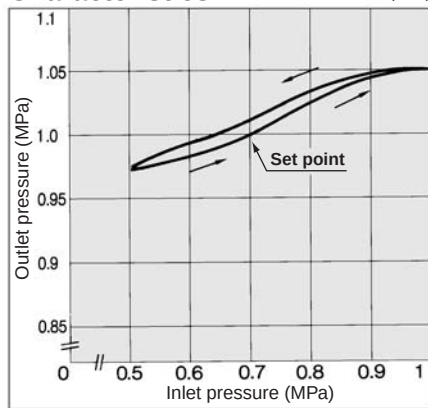
## VBA1110

### Flow Characteristics

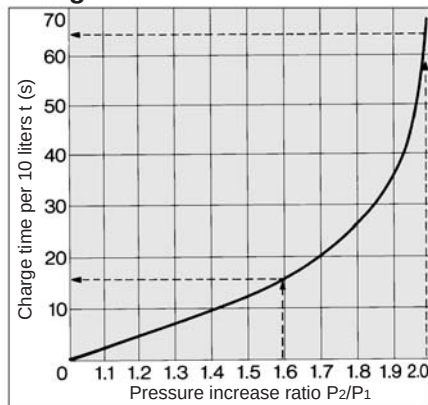


### Pressure Characteristics

Inlet pressure: 0.7 MPa  
Outlet pressure: 1.0 MPa  
Flow rate: 20 l/min (ANR)



### Charge Characteristics



#### VBA1110

- The time required to charge tank pressure from 0.8 MPa to 1.0 MPa at 0.5 MPa supply pressure:

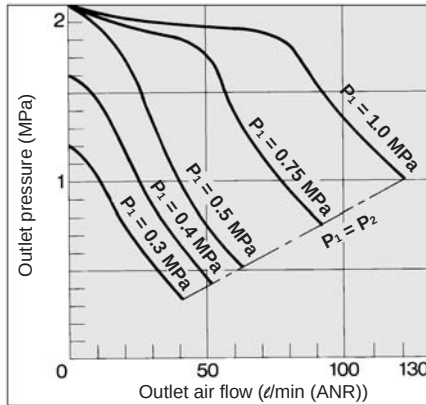
$$\frac{P_2}{P_1} = \frac{0.8}{0.5} = 1.6 \quad \frac{P_2}{P_1} = \frac{1.0}{0.5} = 2.0$$

With the pressure increase ratio from 1.6 to 2.0, the charge time of 65 – 16 = 49 sec. (t) is given by the graph. Then, the charge time (T) for a 10 l tank:

$$T = t \times \frac{V}{10} = 49 \times \frac{10}{10} = 49 \text{ (s)}.$$

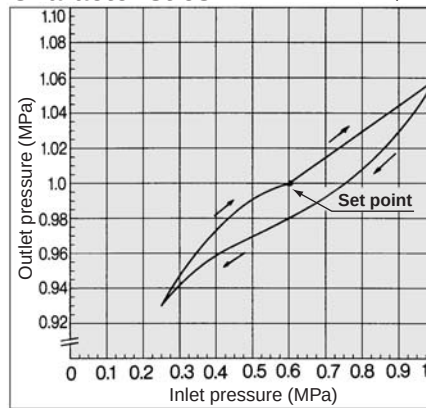
## VBA1111

### Flow Characteristics

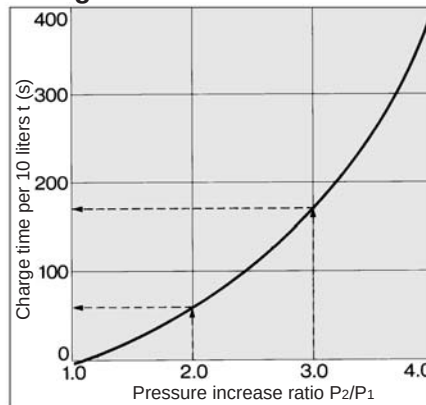


### Pressure Characteristics

Inlet pressure: 0.6 MPa  
Outlet pressure: 1.0 MPa  
Flow rate: 10 l/min (ANR)



### Charge Characteristics



#### VBA1111

- The time required to charge tank pressure from 1.0 MPa to 1.5 MPa at 0.5 MPa supply pressure:

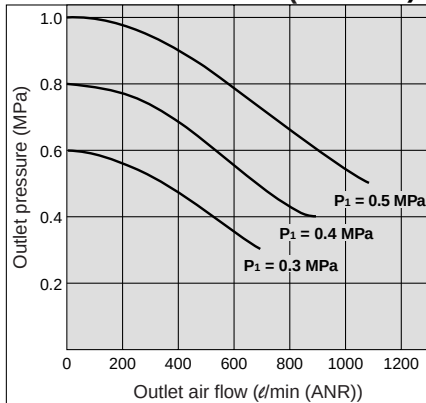
$$\frac{P_2}{P_1} = \frac{1.0}{0.5} = 2.0 \quad \frac{P_2}{P_1} = \frac{1.5}{0.5} = 3.0$$

With the pressure increase ratio from 2.0 to 3.0, the charge time of 170 – 60 = 110 sec. (t) is given by the graph. Then, the charge time (T) for a 10 l tank:

$$T = t \times \frac{V}{10} = 110 \times \frac{10}{10} = 110 \text{ (s)}.$$

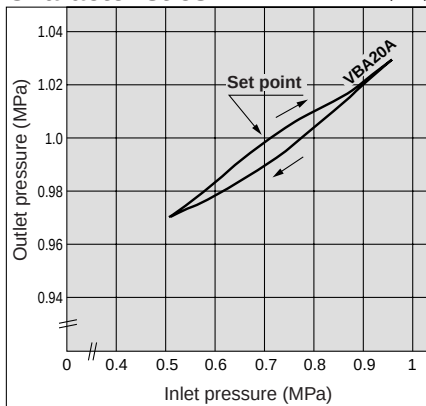
## VBA20A

### Flow Characteristics (VBA20A)

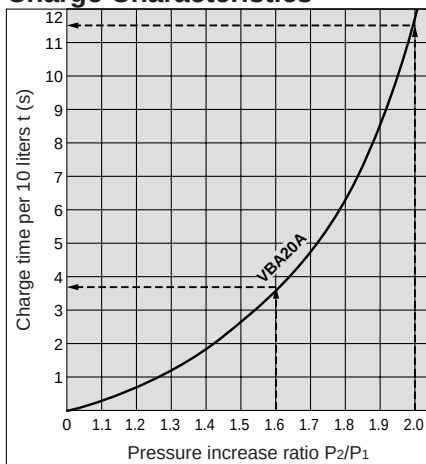


### Pressure Characteristics

Inlet pressure: 0.7 MPa  
Outlet pressure: 1.0 MPa  
Flow rate: 20 l/min (ANR)



### Charge Characteristics



#### VBA20A

- The time required to charge tank pressure from 0.8 MPa to 1.0 MPa at 0.5 MPa supply pressure:

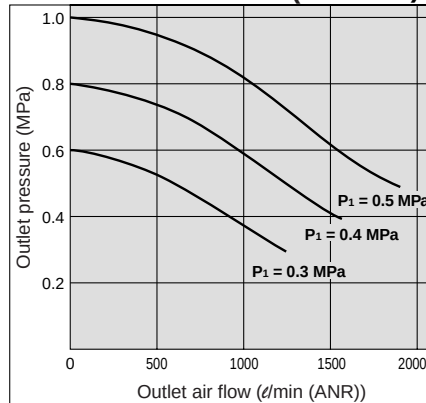
$$\frac{P_2}{P_1} = \frac{0.8}{0.5} = 1.6 \quad \frac{P_2}{P_1} = \frac{1.0}{0.5} = 2.0$$

With the pressure increase ratio from 1.6 to 2.0, the charge time of 11.5 – 3.8 = 7.7 sec. (t) is given by the graph. Then, the charge time (T) for a 100 l tank:

$$T = t \times \frac{V}{10} = 7.7 \times \frac{100}{10} = 77 \text{ (s)}.$$

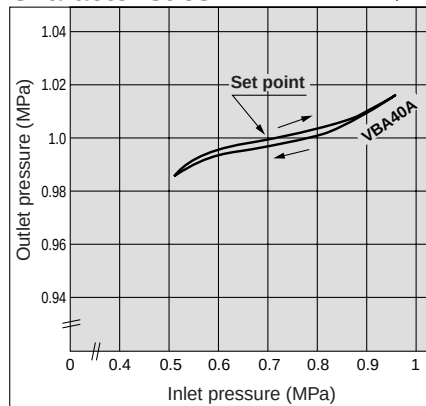
## VBA40A

### Flow Characteristics (VBA40A)

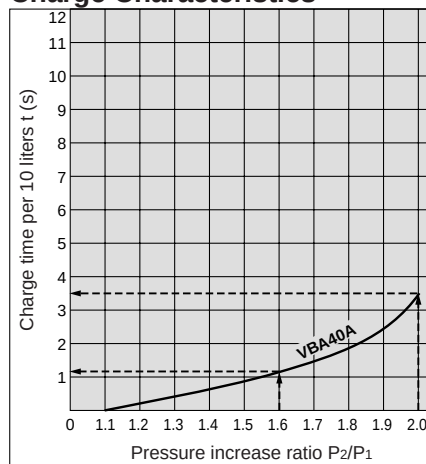


### Pressure Characteristics

Inlet pressure: 0.7 MPa  
Outlet pressure: 1.0 MPa  
Flow rate: 20 l/min (ANR)



### Charge Characteristics



#### VBA40A

- The time required to charge tank pressure from 0.8 MPa to 1.0 MPa at 0.5 MPa supply pressure:

$$\frac{P_2}{P_1} = \frac{0.8}{0.5} = 1.6 \quad \frac{P_2}{P_1} = \frac{1.0}{0.5} = 2.0$$

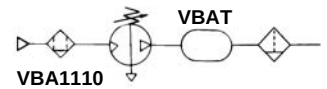
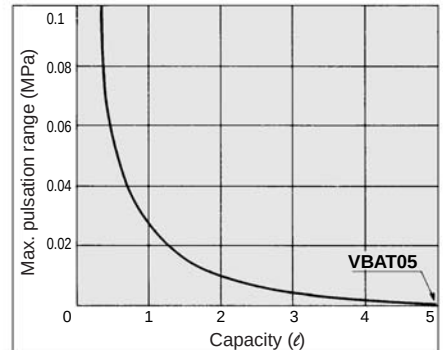
With the pressure increase ratio from 1.6 to 2.0, the charge time of 3.5 – 1.1 = 2.4 sec. (t) is given by the graph. Then, the charge time (T) for a 100 l tank:

$$T = t \times \frac{V}{10} = 2.4 \times \frac{100}{10} = 24 \text{ (s)}.$$

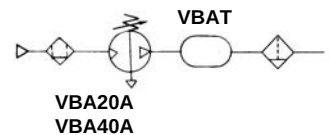
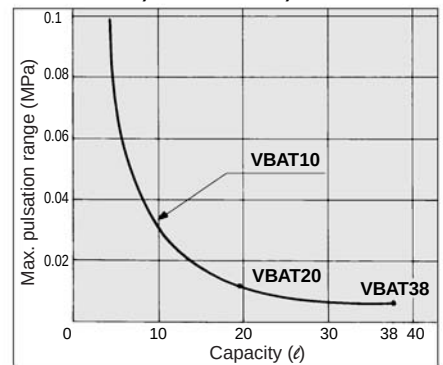
### Pulsation/ Pulsation is decreased by using tank.

If the outlet capacity is undersized, pulsation may occur.

## VBAT05A



## VBAT10A, VBAT20A, VBAT38A



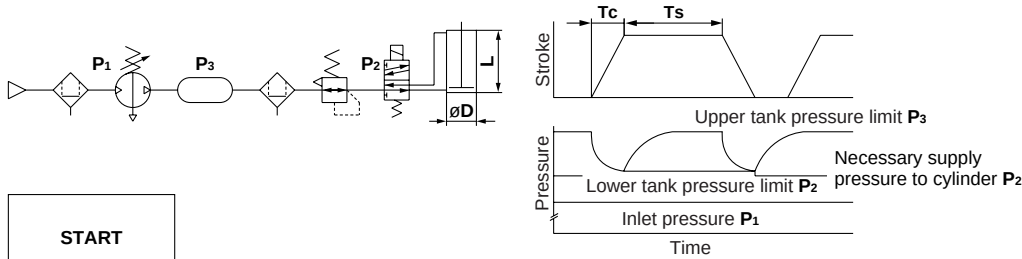
#### Conditions:

Inlet pressure: 0.5 MPa  
Outlet set pressure: 1 MPa  
Flow rate: Between 0 and max. flow rate

#### Performance of air tank

- Alleviates the pulsation generated on the outlet side.
- Manages supply air to be consumed for short periods of time by storing air through raising the tank pressure.

**Sizing** (Sizing can be achieved by using SMC Energy Saving Program Ver. 3.1. Contact your SMC sales representative.)



START

Provide requisite conditions for selection.

Necessary conditions:  
**D** [mm]: Bore size  
**L** [mm]: Cylinder stroke  
**W** [mm/s]: Cylinder operating speed  
**C** [pc.]: Number of cylinders  
**Tc** [s]: Cylinder operating time  
**Ts** [s]: Cylinder stop time  
**P1** [MPa]: Inlet pressure  
**P2** [MPa] <sup>Note 1)</sup>: Necessary supply pressure to cylinder

Example  
 100  
 100  
 200  
 1  
 0.5  
 30  
 0.5  
 0.8

Other conditions:  
**Q** [l/min (ANR)]: Necessary air flow amount  
**Qb** [l/min (ANR)]: Air flow at outlet of booster regulator  
**Tc** [s]: Cylinder stroke time  
**K**: Cylinder double-acting: 2, single-acting: 1  
**P3** [MPa] <sup>Note 1)</sup>: Pressure to charge in a tank  
**T1** [s]: Time to charge (Time to charge to **P2**)  
**T2** [s]: Time to charge (Time to charge to **P3**)  
**T** [s]: Time to charge (Time to charge from **P2** to **P3**)  
**Z**: Number of booster regulators

Note 1) **P2** is necessary supply pressure to cylinder, and set the pressure to the lower tank pressure limit or less with a regulator.  
 Adjust the pressure taking the maximum operating pressure of equipment in use into consideration.  
 Note 2) **P3** is output pressure of the booster regulator, which is also the upper pressure limit charged in a tank.

Calculate required flow **Q**.

$$Q \text{ [l/min (ANR)]} = \frac{\pi \times D^2 \times W}{4 \times 10^6} \times \frac{(P_2 + 0.101)}{0.101} \times 60 \times C$$

$$Q = \frac{\pi \times 100^2 \times 200}{4 \times 10^6} \times \frac{(0.8 + 0.101)}{0.101} \times 60 \times 1 = 841 \text{ [l/min (ANR)]}$$

Select booster regulator size from flow characteristics table.

**VBA2□A**: **Qb** = 500 [l/min (ANR)]  
**VBA4□A**: **Qb** = 1050 [l/min (ANR)]  
 Refer to "Flow Characteristics" on page 3 and 4.

Judgement of flow rate

NO: Need no tank The **VBA4□A** can supply necessary pressure.

YES The **VBA2□A** cannot obtain necessary pressure.

Obtain the tank volume **V**.

$$V \text{ [l]} = \frac{(Q - Qb/2) \times (Tc \times K/60)}{(P_3 - P_2) \times 9.9}$$

$$V = \frac{(841 - 500/2) \times (0.5 \times 2/60)}{(1.0 - 0.8) \times 9.9} = 5 \text{ [l]}$$

Select the tank with the capacity over **V**.

Select the **VBAT10□**, which can be directly connected to the **VBA2□A**.

Calculate time **T** from charge characteristics table.

Refer to "Change Characteristics" on page 3 and 4.

$$T \text{ [s]} = \left(\frac{V}{10}\right) \times \frac{T_2 - T_1}{Z}$$

$$T = \left(\frac{5}{10}\right) \times \frac{12 - 3.7}{1} = 4.2 \text{ [s]}$$

Judgement of charge time  $T \leq T_s$

NO

Extend stop time **Ts** up to charge time **T** or more.

NO

Increase number of booster regulators (**Z**) to decrease **T**.

YES

YES

YES

END

When running continuously for longer periods of time, confirm the life expectancy. When the life expectancy is shorter than required, select a larger sized booster regulator.

## Caution

- Use the VBA1111 (pressure increase ratio 4) with pressure increase ratio of 2 to 4. Usage of pressure increase ratio below 2 (pressure increase ratio 2) is preferred for the VBA1110. A stable operation and increased life expectancy will result.
- Inlet supply pressure volume is approximately twice the volume of the outlet side. {approx. 2 times (pressure increase ratio 2), approx. 4 times (pressure increase ratio 4)}. Boost regulator requires that the inlet side volume should be the sum of the flow volume running into the outlet side and the volume exhausted from E port (for driving), because air is the power source.

Avoid pulsation (Max. 0.05 MPa)

YES Select the tank from table below.

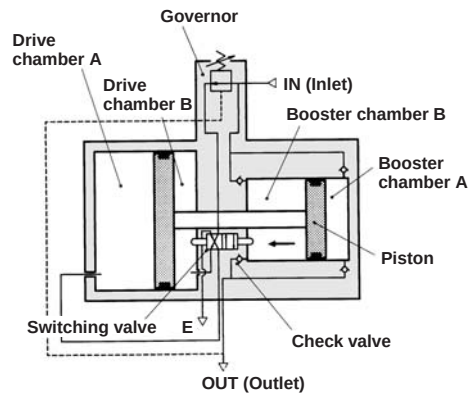
| Tank part no.  | Inner volume | Applicable combination model |        |        |
|----------------|--------------|------------------------------|--------|--------|
| <b>VBAT05□</b> | 5 l          | VBA1110                      | —      | —      |
| <b>VBAT10□</b> | 10 l         | VBA1110                      | VBA2□A | —      |
| <b>VBAT20□</b> | 20 l         | —                            | VBA2□A | VBA4□A |
| <b>VBAT38□</b> | 38 l         | —                            | VBA2□A | VBA4□A |



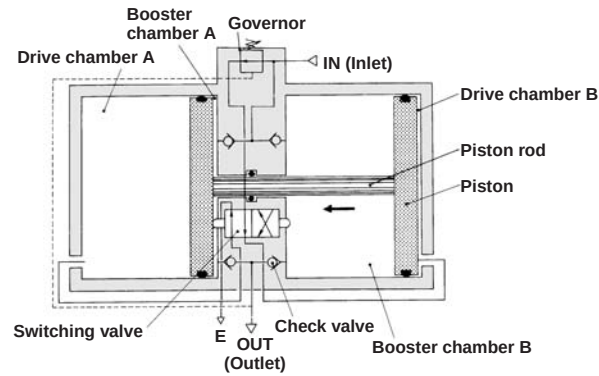
Construction/Principle

The IN air passes through the check valve to booster chambers A and B. Meanwhile, air is supplied to drive chamber B via the governor and the switching valve. Then, the air pressure from drive chamber B and booster chamber A are applied to the piston, boosting the air in booster chamber B. As the piston travels, the boosted air is pushed via the check valve to the OUT side. When the piston reaches the end, the piston causes the switching valve to switch, so that drive chamber B is in the exhaust state and drive chamber A is in the supply state respectively. Then, the piston reverses its movement, this time, the pressures from booster chamber B and drive chamber A boosts the air in booster chamber A and sends it to the OUT side. The process described above is repeated to continuously supply highly pressurized air from the IN to the OUT side. The governor establishes the outlet pressure by handle operation and pressure adjustment in the drive chamber by feeding back the outlet pressure.

VBA1111

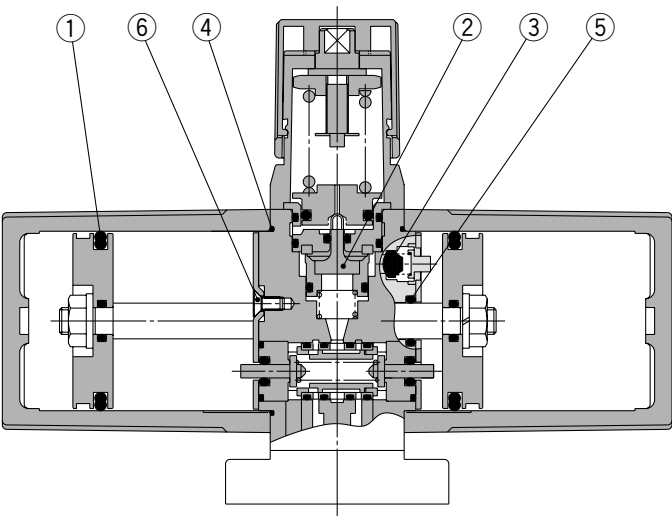


VBA1110/20A/40A

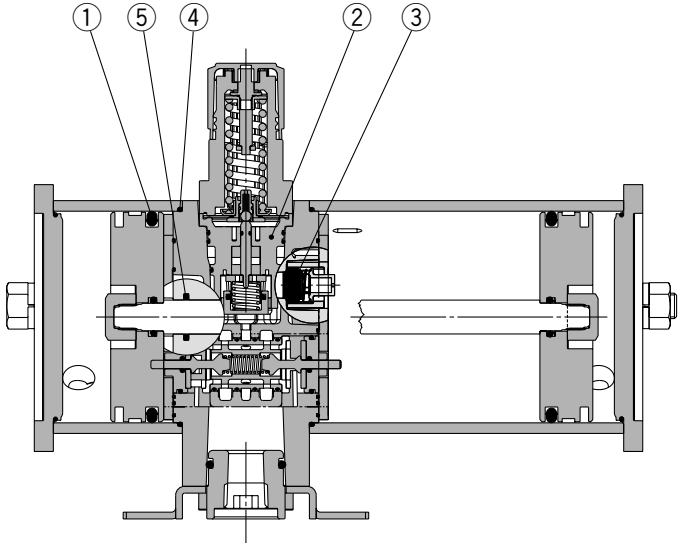


Construction/Replacement Parts

VBA1111<sup>0</sup>



VBA20A, 40A



Replacement Parts/Replacement Part Kits

Place an order with the following applicable model number.

| Model     | VBA1111 <sup>0</sup> -02 | VBA20A-03   | VBA40A-04   |
|-----------|--------------------------|-------------|-------------|
| Order no. | KT-VBA1110-2             | KT-VBA20A-1 | KT-VBA40A-1 |

The kit includes the parts from ① to ⑥ and a grease pack.

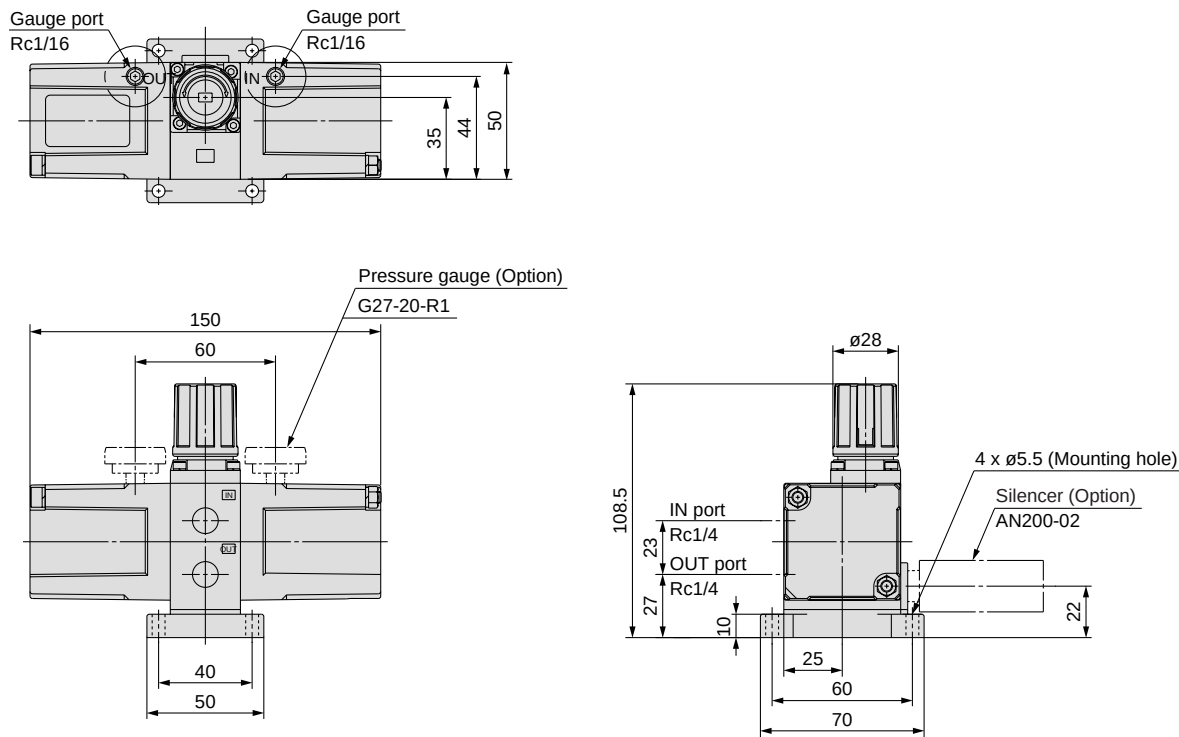
| No. | Description       | Model | VBA1111 <sup>0</sup> -02 | VBA20A-03 | VBA40A-04 |
|-----|-------------------|-------|--------------------------|-----------|-----------|
|     |                   |       | Quantity                 |           |           |
| 1   | Piston seal       |       |                          | 2         |           |
| 2   | Governor assembly |       |                          | 1         |           |
| 3   | Check valve       |       |                          | 4         |           |
| 4   | Gasket            |       |                          | 2         |           |
| 5   | Rod seal          |       | 2                        | 1         | 1         |
| 6   | Mounting screw    |       | 8                        | 8         | 12        |
| —   | Grease pack       |       | 1                        | 1         | 2         |

\* The grease pack has 10 g of grease.  
\* Make sure to refer to the procedure for maintenance.

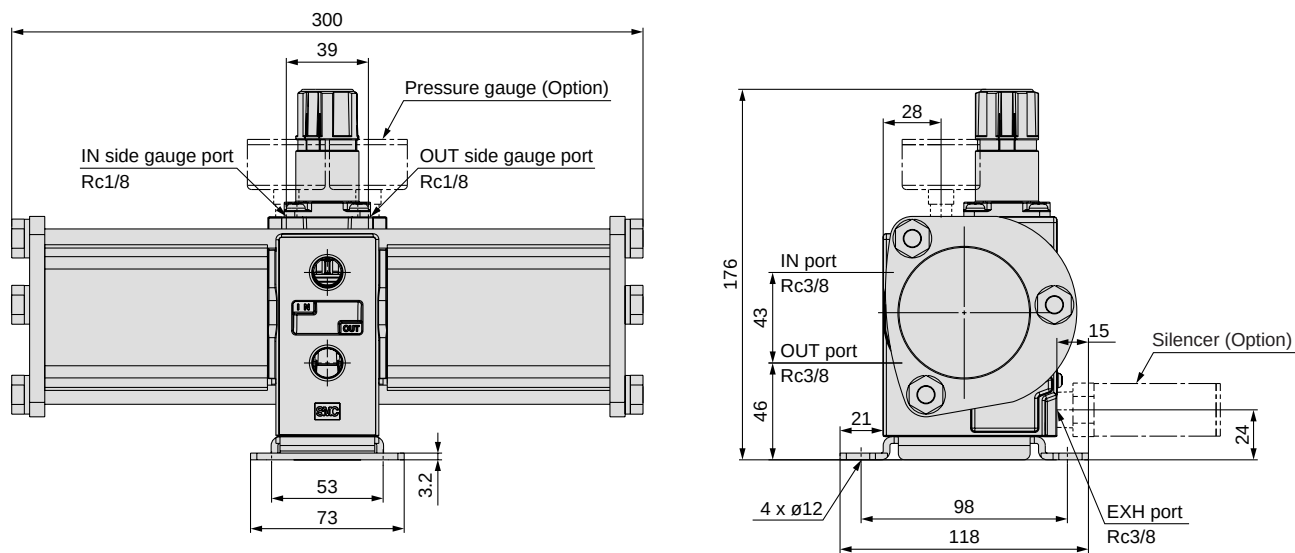
# Series VBA

## Dimensions

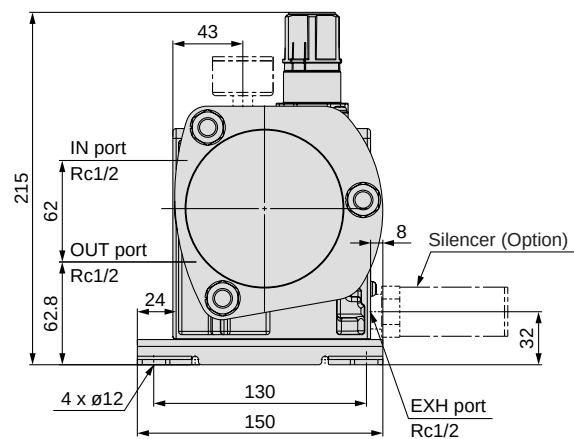
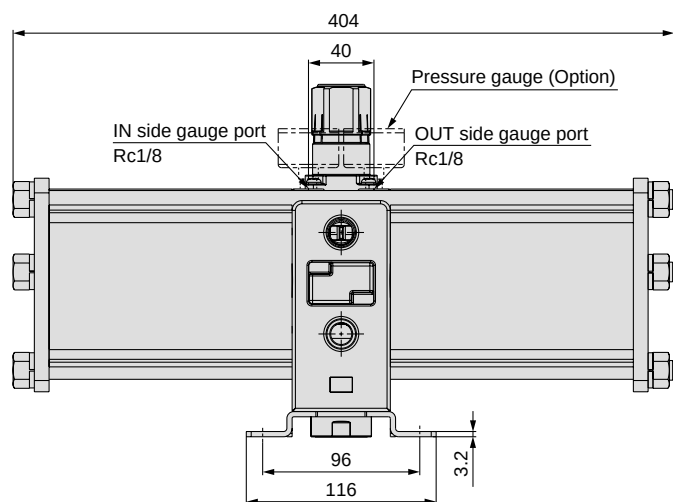
### VBA1110-02, VBA1111-02



### VBA20A-03



## Dimensions

**VBA40A-04**

# Air Tank Series *VBAT*

## How to Order

**Modeling Example:**   - VBAT 10 A   - S    

**Made to Order**

| Symbol | Specifications            |
|--------|---------------------------|
| Nil    | Standard                  |
| 20     | Copper-free/Fluorine-free |

(Refer to page 15.)

**Tank inner volume**

| Material | Inner volume |
|----------|--------------|
| 05       | 5 ℓ          |
| 10       | 10 ℓ         |
| 20       | 20 ℓ         |
| 38       | 38 ℓ         |

**Material**

| Symbol | Material            |
|--------|---------------------|
| A      | Carbon steel        |
| S      | Stainless steel 304 |

**Thread type**

| Symbol | Thread type |
|--------|-------------|
| Nil    | Rc          |
| F      | G           |
| N      | NPT         |

Note) Display unit for NPT thread product's nameplate: psi only (The psi unit cannot be used in Japan.)

**Overseas-compatible product**

| Symbol | Standard   |
|--------|------------|
| -Q     | CE marking |

\* Refer to page 10 for other overseas-compatible products.

**Option**

| Symbol | Option      |
|--------|-------------|
| Nil    | None        |
| V      | Drain valve |

**Option**

| Symbol             | Option                            | Applicable model                         |
|--------------------|-----------------------------------|------------------------------------------|
| Nil                | None                              | All models                               |
| R <sup>Note)</sup> | Safety valve (Set pressure 1 MPa) | VBAT05A<br>VBAT10A<br>VBAT20A<br>VBAT38A |
| S <sup>Note)</sup> | Safety valve (Set pressure 2 MPa) | VBAT05A<br>VBAT10A                       |

Note) The safety valve is not applicable for copper-free, fluorine-free specification (20-).

- Compact connections are possible with booster regulators.
- It can be used alone as a tank. The pressure vessel law is different from country to country, so as an air tank suitable to a country needs to be confirmed.
- Also compatible with overseas standards (Refer to page 10 for details.)



VBAT05A



VBAT10S



VBAT20S



VBAT38A

### Specifications and option combinations

| Option                                                      | Material                              | Option       |                      | Thread type |   |     |
|-------------------------------------------------------------|---------------------------------------|--------------|----------------------|-------------|---|-----|
|                                                             |                                       | Safety valve | Drain valve          | Rc          | G | NPT |
| Specifications                                              | A: Carbon steel<br>S: Stainless steel |              |                      |             |   |     |
| Standard VBAT□                                              | A                                     | ○            | ○                    | ●           | — | —   |
|                                                             | S                                     | —            | ○                    | ●           | — | —   |
| Overseas-compatible product: CE marking <sup>Note 1)</sup>  | A                                     | ●            | ●                    | ○           | ○ | —   |
| Overseas-compatible special product ASME <sup>Note 2)</sup> | A                                     | ●            | ●                    | ○           | — | ○   |
| Made to Order: Copper-free/Fluorine-free 20-VBAT□           | A                                     | —            | ○ <sup>Note 3)</sup> | ●           | — | —   |
|                                                             | S                                     | —            | ○ <sup>Note 3)</sup> | ●           | — | —   |

Note 1) Tanks for overseas are only carbon steel products.

Note 2) Tank volumes are only 5 ℓ or 10 ℓ.

Note 3) Drain valve material is stainless steel.

### Model (Carbon Steel)

| Model                              | VBAT05A                                        | VBAT10A | VBAT20A | VBAT38A |
|------------------------------------|------------------------------------------------|---------|---------|---------|
| Tank capacity (ℓ)                  | 5                                              | 10      | 20      | 38      |
| Max. operating pressure (MPa)      | 2.0                                            |         |         |         |
| IN port size (Rc)                  | 3/8                                            | 1/2     | 3/4     | 3/4     |
| OUT port size (Rc)                 | 3/8                                            | 1/2     | 1/2     | 3/4     |
| Ambient and fluid temperature (°C) | 0 to 75                                        |         |         |         |
| Mass (kg)                          | 6.6                                            | 10.0    | 14.0    | 21.0    |
| Material                           | Carbon steel                                   |         |         |         |
| Paint                              | Outside: Silver paint, Inside: Rustproof paint |         |         |         |

\* Accessories and options are enclosed in a package.

### Model (Stainless Steel)

| Model                              | VBAT05S         | VBAT10S | VBAT20S | VBAT38S |
|------------------------------------|-----------------|---------|---------|---------|
| Tank capacity (ℓ)                  | 5               | 10      | 20      | 38      |
| Max. operating pressure (MPa)      | 2.0             |         |         |         |
| IN port size (Rc)                  | 3/8             | 1/2     | 3/4     | 3/4     |
| OUT port size (Rc)                 | 3/8             | 1/2     | 1/2     | 3/4     |
| Ambient and fluid temperature (°C) | 0 to 75         |         |         |         |
| Mass (kg)                          | 3.2             | 4.9     | 12.0    | 19.0    |
| Material                           | Stainless steel |         |         |         |

\* Accessories and options are enclosed in a package.

## List of Air Tank for Overseas

The pressure vessel law is different from country to country, so an air tank suitable to a country needs to be manufactured. Please select from the below table. For details on all products except for CE markings, please contact SMC.

| Country/Region         | Law                                                                        | Exportable models                | Details                                                                                                                     |
|------------------------|----------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| EU                     | CE Marking<br>Simple Pressure Vessels Directive                            | VBAT05A-SV-Q, VBAT05AF-SV-Q      | Applicable product<br>Self-declaration document attached                                                                    |
|                        |                                                                            | VBAT10A-SV-Q, VBAT10AF-SV-Q      |                                                                                                                             |
|                        |                                                                            | VBAT20A-RV-Q, VBAT20AF-RV-Q      |                                                                                                                             |
|                        |                                                                            | VBAT38A-RV-Q, VBAT38AF-RV-Q      |                                                                                                                             |
| South Korea            | High Pressure Gas Safety<br>Management Law<br>Industrial Safety Health Law | VBAT05A-RV-X101, VBAT05S-RV-X101 | Exemption<br>Maximum operating pressure: 0.97 MPa                                                                           |
|                        |                                                                            | VBAT10A-RV-X101, VBAT10S-RV-X101 |                                                                                                                             |
|                        |                                                                            | VBAT20A-RV-X101, VBAT20S-RV-X101 |                                                                                                                             |
|                        |                                                                            | VBAT38A-RV-X101, VBAT38S-RV-X101 |                                                                                                                             |
| Singapore,<br>Malaysia | Factory Act                                                                | VBAT05A-SV-X102                  | Applicable product<br>Product complies with ASME specifications<br>JBA (Japan Boiler Association) certification<br>attached |
|                        |                                                                            | VBAT10A-SV-X102                  |                                                                                                                             |
|                        |                                                                            | VBAT20A-RV-X102                  |                                                                                                                             |
|                        |                                                                            | VBAT38A-RV-X102                  |                                                                                                                             |
| U.S.A.                 | ASME standard<br>Industrial Safety and Health Law                          | VBAT05AN-SV, VBAT05A-SV          | Exemption                                                                                                                   |
|                        |                                                                            | VBAT10AN-SV-X11, VBAT10A-SV-X11  |                                                                                                                             |
| Thailand,<br>Taiwan    | No applicable specifications                                               | Standard product                 | —                                                                                                                           |

### VBAT□A (Carbon Steel) Accessories/Part No.

| Model                                                              | VBAT05A                                               | VBAT10A     | VBAT20A     | VBAT38A |
|--------------------------------------------------------------------|-------------------------------------------------------|-------------|-------------|---------|
| Accessory kit number contains a set of the following parts ① to ⑤. | VBAT5A-Y-2                                            | VBAT10A-Y-2 | VBAT20A-Y-2 |         |
| ① Bushing assembly for connection (1 pc.) <sup>Note)</sup>         | VBAT5A-Y-1                                            | VBAT10A-Y-1 | VBAT20A-Y-1 |         |
| ② Hexagon socket head cap screw/SW (4 pcs.)                        | M5                                                    | M5/M10      | M10         |         |
| ③ Anchor bolt/Nut (4 pcs.)                                         | No accessories                                        |             | M12         |         |
| ④ Drain port plug (1 pc.)                                          | Hexagon socket head taper plug R1/4 (Stainless steel) |             |             |         |
| ⑤ Safety valve port plug (1 pc.)                                   | Hexagon socket head taper plug R3/8 (Steel)           |             |             |         |

Note) Equipped with an ozone-resistant O-ring.

### VBAT□S (Stainless Steel) Accessories/Part No.

| Model                                                              | VBAT05S                                               | VBAT10S     | VBAT20S     | VBAT38S |
|--------------------------------------------------------------------|-------------------------------------------------------|-------------|-------------|---------|
| Accessory kit number contains a set of the following parts ① to ④. | VBAT5S-Y-3                                            | VBAT10S-Y-3 | VBAT20S-Y-3 |         |
| ① Bushing assembly for connection (1 pc.) <sup>Note)</sup>         | VBAT5A-Y-1                                            | VBAT10A-Y-1 | VBAT20A-Y-1 |         |
| ② Hexagon socket head cap screw/SW (4 pcs.)                        | M5                                                    | M5/M10      | M10         |         |
| ③ Anchor bolt/Nut (4 pcs.)                                         | No accessories                                        |             | M12         |         |
| ④ Drain port plug (1 pc.)                                          | Hexagon socket head taper plug R1/4 (Stainless steel) |             |             |         |

Note) Equipped with an ozone-resistant O-ring.

### Options/Part No.

| Model                                              | VBAT05A | VBAT10A | VBAT20A | VBAT38A |
|----------------------------------------------------|---------|---------|---------|---------|
| Safety valve (Set pressure 1 MPa) <sup>Note)</sup> | VBAT-R  |         |         |         |
| Safety valve (Set pressure 2 MPa) <sup>Note)</sup> | VBAT-S  |         | —       |         |
| Drain valve                                        | VBAT-V1 |         |         |         |

Note) The set pressure of the safety valve cannot be changed.

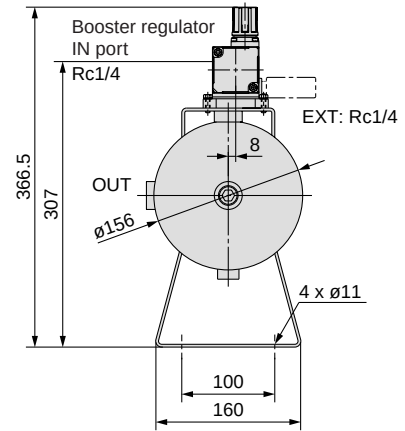
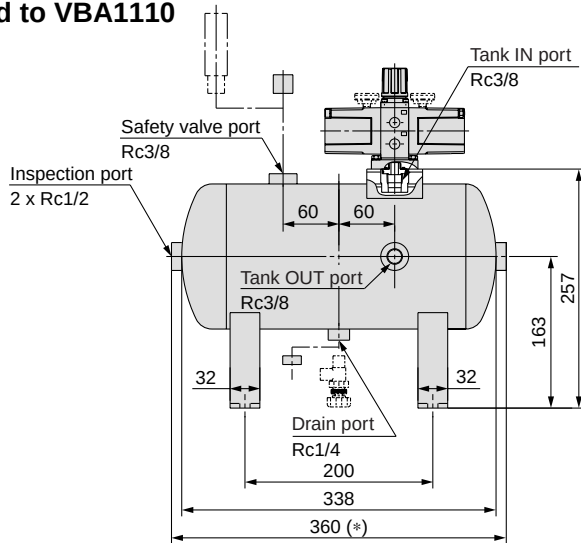


# Series VBAT

## Dimensions: VBAT05A, 10A (Material: Carbon Steel)

### VBAT05A

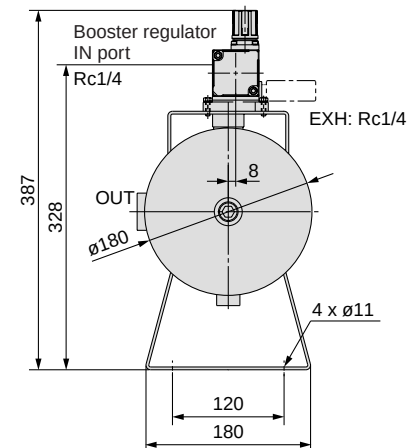
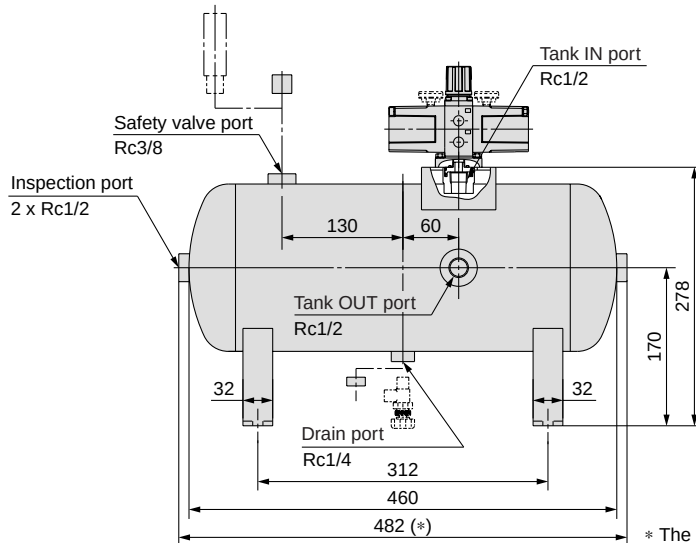
Connected to VBA1110



\* The length may be longer than the specification if the plugs mounted on the both sides of the tank are not fit to the end.

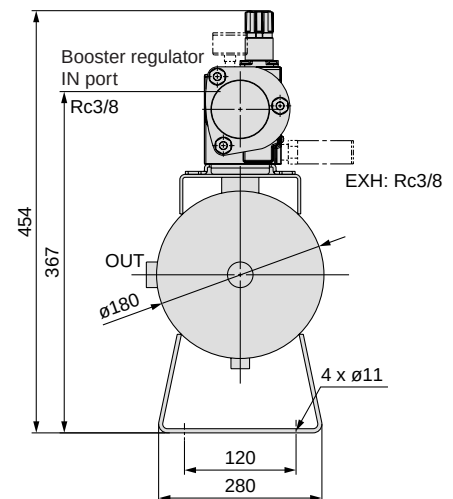
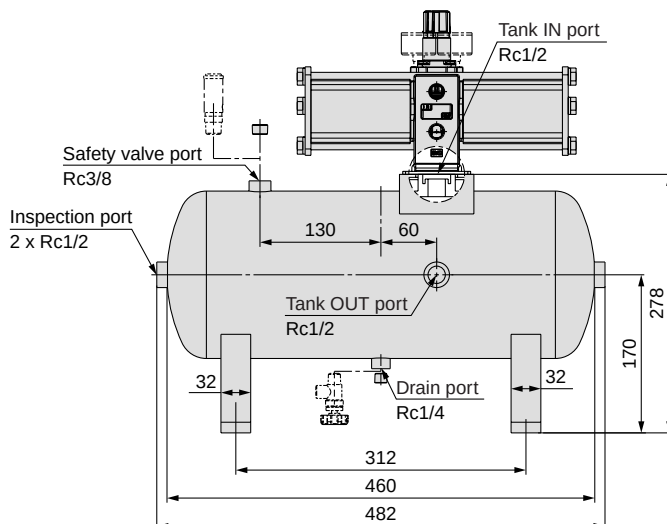
### VBAT10A

Connected to VBA1110



\* The length may be longer than the specification if the plugs mounted on the both sides of the tank are not fit to the end.

Connected to VBA20A

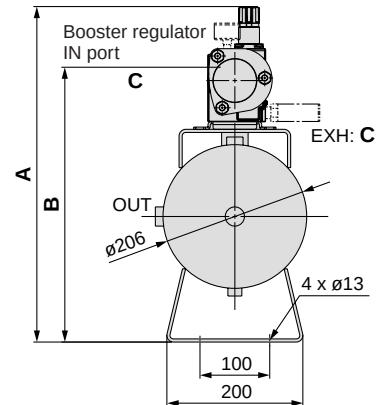
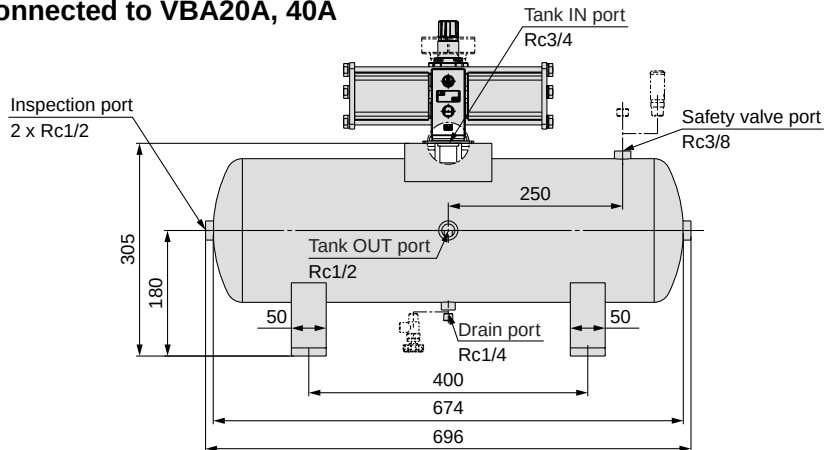


\* The length may be longer than the specification if the plugs mounted on the both sides of the tank are not fit to the end.

## Dimensions: VBAT20A, 38A (Material: Carbon Steel)

### VBAT20A

Connected to VBA20A, 40A

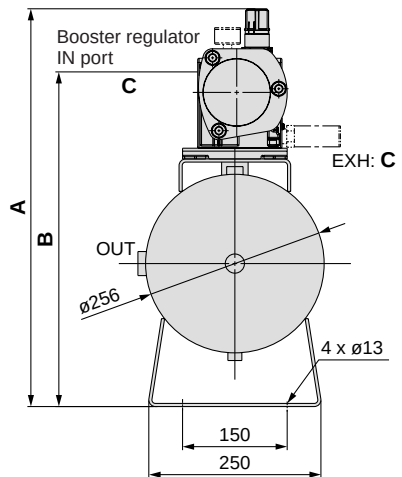
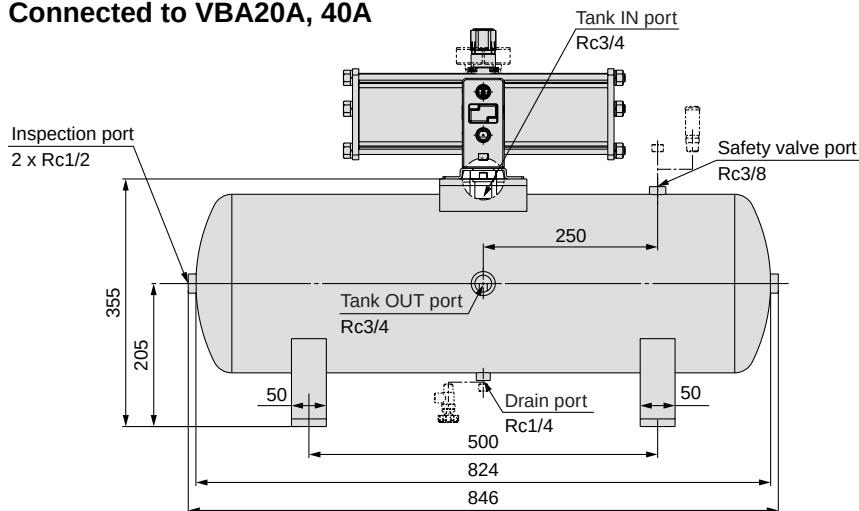


| Booster regulator model | A   | B   | C     |
|-------------------------|-----|-----|-------|
| <b>VBA20A</b>           | 481 | 394 | Rc3/8 |
| <b>VBA40A</b>           | 520 | 430 | Rc1/2 |

\* The length may be longer than the specification if the plugs mounted on the both sides of the tank are not fit to the end.

### VBAT38A

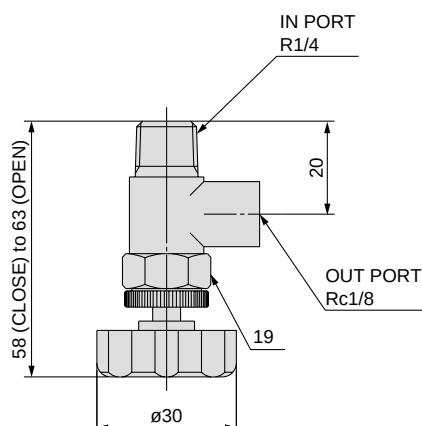
Connected to VBA20A, 40A



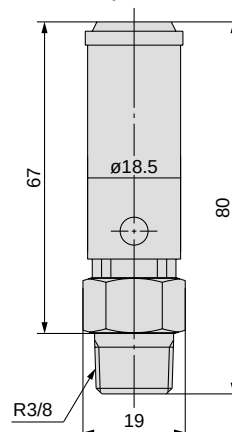
| Booster regulator model | A   | B   | C     |
|-------------------------|-----|-----|-------|
| <b>VBA20A</b>           | 531 | 444 | Rc3/8 |
| <b>VBA40A</b>           | 570 | 480 | Rc1/2 |

\* The length may be longer than the specification if the plugs mounted on the both sides of the tank are not fit to the end.

### Drain valve: VBAT-V1



### Safety valve: VBAT-R, VBAT-S

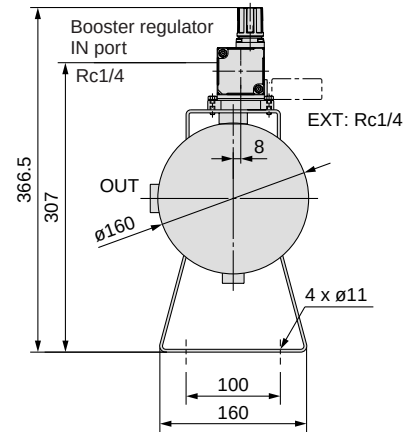
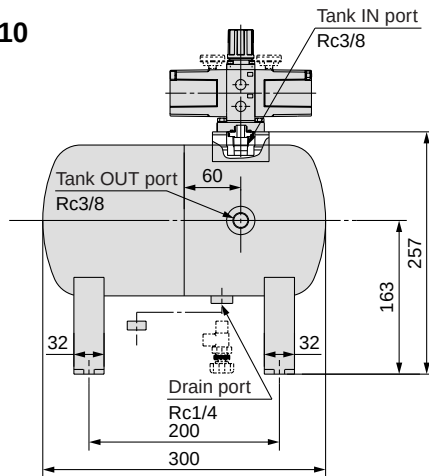


# Series VBAT

## Dimensions: VBAT05S, 10S (Material: Stainless Steel 304)

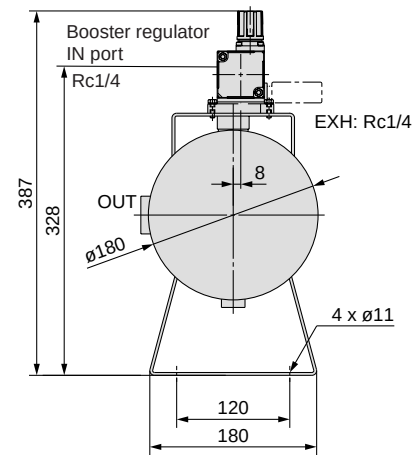
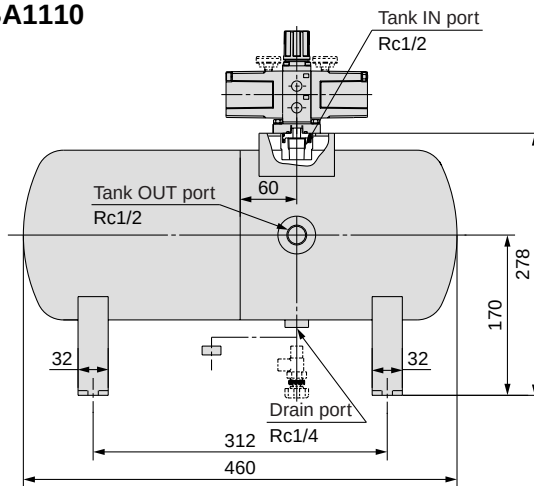
### VBAT05S

Connected to VBA1110

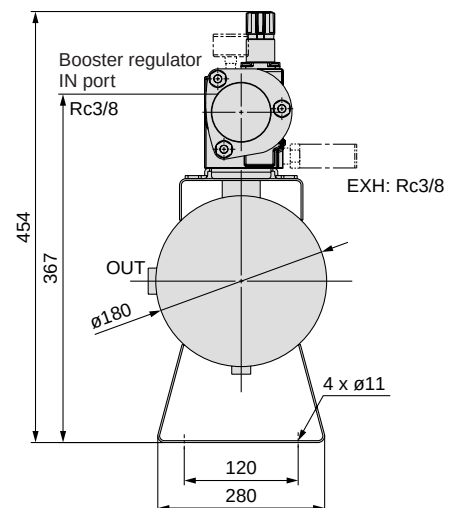
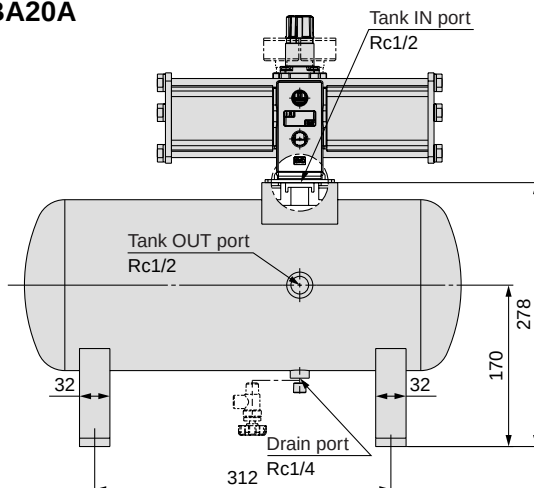


### VBAT10S

Connected to VBA1110



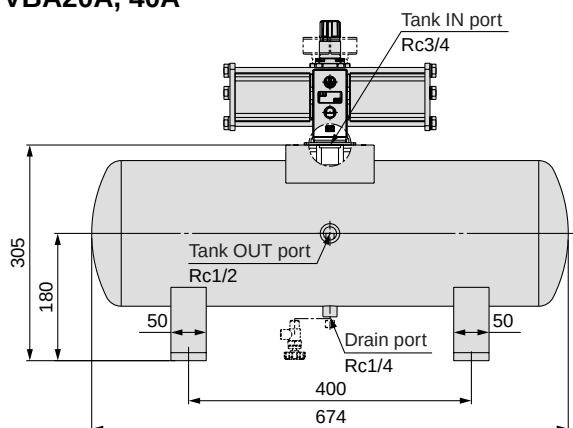
Connected to VBA20A



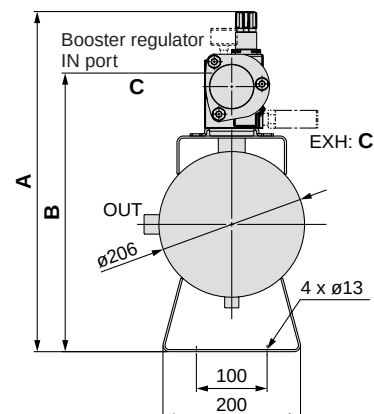
## Dimensions: VBAT20S, 38S (Material: Stainless Steel 304)

### VBAT20S

Connected to VBA20A, 40A

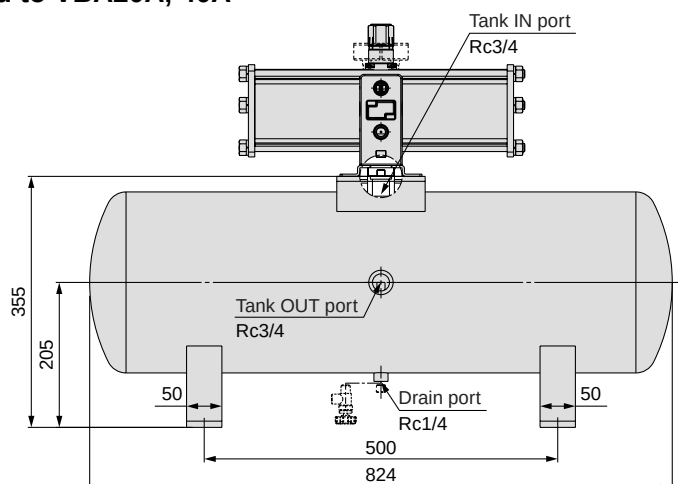


| Booster regulator model | A   | B   | C     |
|-------------------------|-----|-----|-------|
| <b>VBA20A</b>           | 481 | 394 | Rc3/8 |
| <b>VBA40A</b>           | 520 | 430 | Rc1/2 |

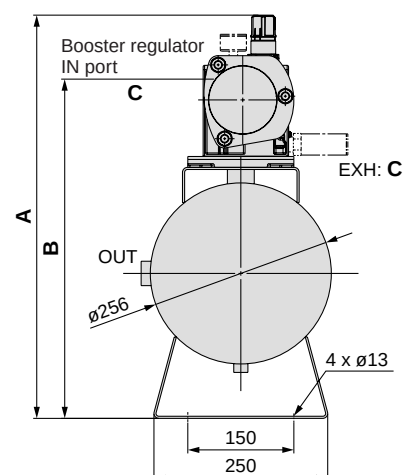


### VBAT38S

Connected to VBA20A, 40A



| Booster regulator model | A   | B   | C     |
|-------------------------|-----|-----|-------|
| <b>VBA20A</b>           | 531 | 444 | Rc3/8 |
| <b>VBA40A</b>           | 570 | 480 | Rc1/2 |





## 1 Copper-free/Fluorine-free

The inner or outer copper parts material has been changed to stainless steel or aluminum. The fluorine resin parts has been changed to general resin.

### 20 – Standard model no.

- Made to Order  
Copper-free, Fluorine-free

\* Inquire about booster regulator with pressure gauge.  
\* This option cannot be selected for air tank with safety valve.

## 2 CE explosion-proof directive (ATEX) compliant

### 56 – Standard model no.

- Made to Order  
CE explosion-proof directive (ATEX): Category 3GD

## 3 Ozone resistant

Ozone resistance is strengthened through the use of fluoro rubber (diaphragm) and hydrogenated NBR (valve, rod seal) for the rubber parts of the seal material.

### 80 – Standard model no.

- Made to Order  
Ozone resistant

\* Weather resistant NBR (diaphragm) and hydrogenated NBR (valve) is used for the rubber parts of standard products.



# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)\*<sup>1)</sup> and other safety regulations\*<sup>2)</sup>.

\* 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.

ISO 4413: Hydraulic fluid power – General rules relating to systems.

IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots -Safety.

JIS B 8370: General rules for pneumatic equipment.

JIS B 8361: General rules for hydraulic equipment.

JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

JIS B 8433-1993: Manipulating industrial robots - Safety.

etc.

\* 2) Labor Safety and Sanitation Law, etc.

**⚠ Caution:** Operator error could result in injury or equipment damage.

**⚠ Warning:** Operator error could result in serious injury or loss of life.

**⚠ Danger :** In extreme conditions, there is a possibility of serious injury or loss of life.

## **⚠ Warning**

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.





# Safety Instructions

## Caution

**The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

## Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited Warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.\*3)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

\* 3) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).



## Series VBA

# Specific Product Precautions 1

Be sure to read this before handling. Refer to the back of pages 1 and 2 for Safety Instructions. For Common Precautions, refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

### Booster Regulator Specific Product Precautions

#### Design

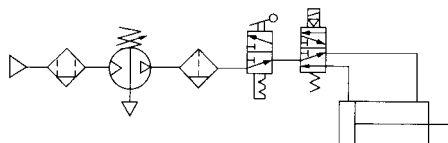
## ⚠ Warning

### 1. Warning concerning abnormal outlet pressure

- If there is a likelihood of causing an outlet pressure drop due to unforeseen circumstances such as equipment malfunction, thus leading to a major problem, take safety measures on the system side.
- Because the outlet pressure could exceed its set range if there is a large fluctuation in the inlet pressure, leading to unexpected accidents, take safety measures against abnormal pressures.
- Operate the equipment within its maximum operating pressure and set pressure range.

### 2. Residual pressure measures

- Connect a 3-port valve to the OUT side of the booster regulator if the residual pressure must be released quickly from the outlet pressure side for maintenance, etc. (Refer to the below diagram.) The residual outlet pressure side cannot be released even if the 3-port valve is connected to the IN side because the check valve in the booster regulator will activate.



## ⚠ Caution

### 1. System configuration

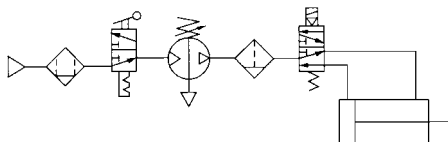
- The IN port of the booster regulator has metallic mesh to prevent dust from entering the booster regulator. However, it cannot remove dust continuously or separate drainage. Make sure to install a mist separator (AM series) at the inlet side of the booster regulator.
- The booster regulator has a sliding part inside, and it generates dust. Also, install a cleaning device such as an air filter or a mist separator on the outlet side as necessary.
- Connect a lubricator to the outlet side, because the accumulated oil in the booster regulator may result in a malfunction.

### 2. Exhaust air measures

- Provide a dedicated pipe to release the exhaust air from each booster regulator. If exhaust air is converged into a pipe, the back pressure that is created could cause improper operation.
- Depending on the necessity, install a silencer or an exhaust cleaner on the exhaust port of the booster regulator to reduce the exhausting sound.

### 3. Maintenance space

- Allow the sufficient space for maintenance and inspection.



#### Selection

## ⚠ Caution

### 1. Verify the specifications.

- Consider the operating conditions and operate this product within the specification range that is described in this catalog.

### 2. Selection

- Based on the conditions (pressure, flow rate, takt time, etc.) required for the outlet side of the booster regulator, select the size of the booster regulator in accordance with the selection procedures described in this catalog or model selection program.
- Use the VBA1111 (pressure increase ratio 4) with pressure increase ratio of 2 to 4. Usage of pressure increase ratio below 2 (pressure increase ratio 2) is preferred for the VBA1110. A stable operation and increased life expectancy will result.
- Inlet supply pressure volume is approximately twice the volume of the outlet side. {approx. 2 times (pressure increase ratio 2), approx. 4 times (pressure increase ratio 4)}. Booster regulator requires that the inlet side volume should be the sum of the flow volume running into the outlet side and the volume exhausted from E port (for driving), because air is the power source.
- When running continuously for longer periods of time, confirm the life expectancy. The life expectancy of a booster regulator is dependent upon the operational cycle. Thus, when used for driving cylinders, etc. in the outlet side, life expectancy will be reduced.
- Make sure the outlet pressure is set more than 0.1 MPa higher than the inlet pressure. A pressure difference less than 0.1 MPa makes the operation unstable and may result in malfunction.

#### Mounting

## ⚠ Caution

### 1. Transporting

- When transporting this product, hold it lengthwise with both hands. Never hold it by the black handle that protrudes from the center because the handle could become detached from the body, causing the body to fall and leading to injury.

### 2. Installation

- Install this product so that the silver-colored tie-rods and cover are placed horizontally. If mounted vertically, it may result in malfunction.
- Because the piston cycle vibration is transferred, use the following retaining bolts (VBA1: M5; VBA2, 4: M10) and tighten them with the specified torque (VBA1: 3 N·m; VBA2, 4: 24 N·m).
- If the transmission of vibration is not preferred, insert an isolating rubber material before installation.
- The pressure gauge should be mounted with the following torque. R 1/16 for VBA1: 3 to 4 N, R 1/8: 7 to 9 N



## Series VBA

# Specific Product Precautions 2

Be sure to read this before handling. Refer to the back of pages 1 and 2 for Safety Instructions. For Common Precautions, refer to “Precautions for Handling Pneumatic Devices” (M-03-E3A).

### Booster Regulator Specific Product Precautions

#### Piping

## ⚠ Caution

### 1. Flushing

- Use an air blower to flush the piping to thoroughly remove any cutting chips, cutting oil, or debris from the piping inside, before connecting them. If they enter the inside of the booster regulator, they could cause the booster regulator to malfunction or its durability could be affected.

### 2. Piping size

- To bring the booster regulator's ability into full play, make sure to match the piping size to the port size.

#### Air Supply

## ⚠ Caution

### 1. Quality of air source

- Connect a mist separator to the inlet side near the booster regulator. If the quality of the compressed air is not thoroughly controlled, the booster regulator could malfunction (without being able to boost) or its durability could be affected.
- If dry air (atmospheric pressure dew point:  $-17^{\circ}\text{C}$  or less) is used, the life expectancy may be shortened because dry air will accelerate evaporation of grease inside.

#### Operating Environment

## ⚠ Caution

### 1. Installation location

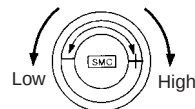
- Do not install this product in an area that is exposed to rain-water or direct sunlight.
- Do not install in locations influenced by vibrations. If it must be used in such an area due to unavoidable circumstances, please contact SMC beforehand.

#### Handling

## ⚠ Caution

### 1. Setting the pressure on the handle-operated type

- If air is supplied to the product in the shipped state, the air will be released.  
Set the pressure by quickly pulling up on the governor handle, and rotating it in the direction of the arrow (+).
- There is an upper and lower limit for the handle rotation. If over-rotating the handle even after reaching to the limit, the internal parts may be damaged. If the handle suddenly feels heavy while being turned, stop turning the handle.
- Once the setting is completed, push the handle down.
- To decrease the outlet pressure, after the pressure has been set, rotate the handle in the direction of the arrow (–). The residual air will be released from the area of the handle, due to the relief construction of the governor.
- To reset the pressure, first reduce the pressure so that it is lower than the desired pressure; then, set it to the desired pressure.



### 2. Draining

- If this product is used with a large amount of drainage accumulated in the filter, mist separator, or the tank, the drainage could flow out, leading to equipment malfunction. Therefore, drain the system once a day. If it is equipped with an auto-drain, check its operation once a day.

### 3. Exhaust

- Exhausting time from E port may be longer for a booster regulator which is set to switch in longer hour intervals. This is not an abnormal phenomenon.

### 4. Maintenance

- Life expectancy varies depending on the quality of air and the operating conditions. As a symptom of the end of life expectancy, it can be found by breathing all the time beneath the handle, or hearing the exhausting sound from booster regulator in 10 to 20 second intervals despite no air consumption in the outlet side. Conduct maintenance earlier than scheduled in such cases.
- When maintenance is required, confirm the model and serial number of the booster regulator, and please contact SMC for maintenance kit.
- Maintenance should be carried out according to the specified maintenance procedure by individuals possessing enough knowledge and experiences in maintaining pneumatic equipment.
- The list of spare parts and kit part number are shown on page 6, and the figure shows the position of the parts.



# Series VBAT

## Specific Product Precautions

Be sure to read this before handling. Refer to the back of pages 1 and 2 for Safety Instructions. For Common Precautions, refer to “Precautions for Handling Pneumatic Devices” (M-03-E3A).

### Air Tank Specific Product Precautions

#### Design

##### ⚠ Warning

###### 1. Operating pressure

- Operate this product at or below the maximum operating pressure. If it is necessary, take appropriate safety measures to ensure that the maximum operating pressure is not exceeded.
- Even when the tank alone is used, use a pressure switch or a safety valve to make sure that the maximum operating pressure is not exceeded.

###### 2. Connection

- Connect a filter or a mist separator to the OUT side of the tank. Because the inner surface of the tank is untreated, there is a possibility of dust flowing out to the outlet side.
- Using tank accessories, a VBA booster regulator can be connected directly in the combinations indicated below.

|          |         | Booster regulator |        |        |
|----------|---------|-------------------|--------|--------|
|          |         | VBA111□-02        | VBA2□A | VBA4□A |
| Air tank | VBAT05A | ●                 | —      | —      |
|          | VBAT05S | ●                 | —      | —      |
|          | VBAT10A | ●                 | ●      | —      |
|          | VBAT10S | ●                 | ●      | —      |
|          | VBAT20A | —                 | ●      | ●      |
|          | VBAT20S | —                 | ●      | ●      |
|          | VBAT38A | —                 | ●      | ●      |
|          | VBAT38S | —                 | ●      | ●      |

#### Selection

##### ⚠ Caution

- Consider the operating conditions and operate this product within the specification range.
- Follow “Sizing” on page 5 or SMC Energy Saving Program Ver. 3.1. to select the size of the air tank if it will be used with a booster regulator connected to it.

#### Mounting

##### ⚠ Caution

###### 1. Accessories

- The accessories are secured by bands to the feet of the tank. Once removed, make sure not to lose them.

###### 2. Installation

- Tank should be installed away from people. It is dangerous if the accumulated air inside the tank were to seep out.
- When connecting a booster regulator with the tank, refer to the operating manual first, which is provided with the air tank before assembling.
- To mount the air tank on a floor surface, use the four holes to secure the tank with bolts or anchor bolts.

#### Maintenance

##### ⚠ Warning

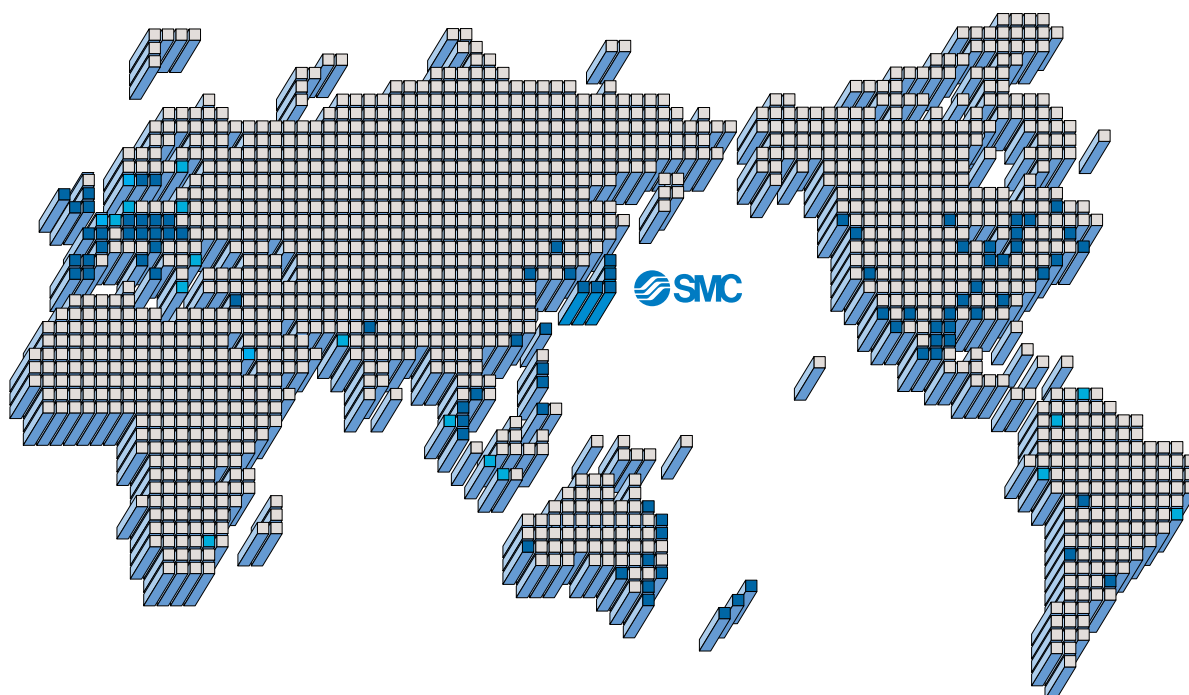
###### 1. Inspection

- The use of pressure vessels could lead to an unexpected accident due to external damage or internal corrosion caused by drainage. Therefore, make sure to check periodically for external damage, or the extent of internal corrosion through the port hole. An ultrasonic thickness indicator may also be used to check for any reduction in material thickness.

###### 2. Draining

- If this product is used with a large amount of drainage, the drainage could flow out, leading to equipment malfunction or corrosion inside the tank. Therefore, drain the system once a day.

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### Safety Instructions

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

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D-DN

1st printing MP printing MP 13500DN Printed in Japan.

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