



HANUMAN

Booster Regulator

VBA Series

How to Order

VBA 40A - □ 04 □ - □

10A	1/4", Knob-operated type
20A	3/8", Knob-operated type
40A	1/2", Knob-operated type
22A	3/8", Air-operated type
42A	1/2", Air-operated type
43A	1/2", Max. operating pressure 1.6 MPa
11A Note)	1/4", Knob-operated type

Body size

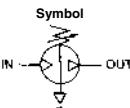
Pressure increase ratio: Twice
Pressure increase ratio: 2 to 4 times

Semi-standard

Symbol	Semi-standard
NII	Standard product
Z Note)	<ul style="list-style-type: none"> Pressure unit on the product name label: psi Pressure unit on the pressure gauge: MPa and psi

Note) Thread type: NPT, NPTF
Under the new measurement law, the pressure unit of "psi" on the pressure gauges cannot be used in Japan.

Note) Set the pressure increase ratio to 2 or more.



VBA10A-02

VBA11A-02



VBA20A-03



VBA22A-03



VBA40A-04



VBA42A-04

Symbol	Thread type
NII	Rc
F	G
N	NPT
T	NPTF

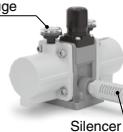
Note) Thread types apply to the IN, OUT, and EXH ports of the VBA10A and to the IN, OUT, EXH, and gauge ports of the VBA22A and VBA40A.
The gauge ports of the VBA11A are Rc thread type regardless of the thread type indication.

Port size

Symbol	Port size	Applicable series
02	1/4	VBA10A
03	3/8	VBA22A
04	1/2	VBA40A

Pressure gauge

Pressure gauge


Combination of Thread Type and Options

Body size	Thread type	Option										Semi-standard	
		NII	G	N	S	GN	GS	LN	LS	GLN	GLS	NII	-Z
10A 11A	NII	●	●	●	●	●	●	●	●	●	●	●	—
	F	●	●	●	●	●	●	●	●	●	●	●	—
	N	●	●	●	●	●	—	●	—	●	—	●	●
	T	●	●	●	●	●	—	●	—	●	—	●	●
20A 22A	NII	●	●	●	●	●	●	●	●	●	●	●	—
	F	●	●	●	●	●	●	●	●	●	●	●	—
	N	●	●	●	●	●	●	●	●	●	●	●	●
	T	●	●	●	●	●	●	●	●	●	●	●	●
40A 42A 43A	NII	●	●	●	●	●	●	●	●	●	●	●	—
	F	●	●	●	●	●	●	●	●	●	●	●	—
	N	●	●	●	●	●	●	●	●	●	●	●	●
	T	●	●	●	●	●	●	●	●	●	●	●	●

Air Tank Compatibility Chart

Air tank	Booster regulator	VBA10A/11A	VBA20A/22A	VBA40A/42A	VBA43A
VBAT05A(1)	●	—	—	—	—
VBAT05S(1)	—	—	—	—	—
VBAT10A(1)	●	●	—	—	—
VBAT10S(1)	—	●	●	●	●
VBAT20A(1)	—	—	—	—	—
VBAT20S(1)	—	●	●	●	●
VBAT38A(1)	—	●	●	●	—
VBAT38S(1)	—	●	●	●	●

**Standard Specifications**

Model	VBA10A-02	VBA20A-03	VBA40A-04	VBA22A-03	VBA42A-04	VBA43A-04	VBA11A-02
Fluid	Compressed air						
Pressure increase ratio	Twice						
Pressure adjustment mechanism	Knob-operated with relief mechanism Note 2)			Air-operated		Knob-operated with relief mechanism Note 2)	
Max. flow rate Note 3) (L/min (ANR))	230	1000	1900	1000	1900	1600	70
Set pressure range (MPa)	0.2 to 2.0	0.2 to 1.0		0.2 to 1.0		0.2 to 1.6	0.4 to 2.0
Supply pressure range (MPa)	0.1 to 1.0						
Proof pressure (MPa)	3		1.5		2.4		3
Port size (Rc) (IN/OUT/EXH: 3 locations)	1/4	3/8	1/2	3/8	1/2		1/4
Pressure gauge port size (Rc) (IN/OUT: 2 locations)	1/8						
Tank connection port (with plug) Note 5)	1/4	3/8	1/2	3/8	1/2		1/4
Ambient and fluid temperature (°C)	2 to 50 (No freezing)						
Installation	Horizontal						
Lubrication	Grease (Non-lube)						
Weight (kg)	0.84	3.9	8.6	3.9	8.6	8.6	0.89

Note 1) Be sure to secure an air supply capacity of the minimum operating pressure (0.1 MPa) or more.

Note 2) If the OUT pressure is higher than the set pressure by the knob, excess pressure is exhausted from the back of the knob.

Note 3) Flow rate at IN= OUT= 0.5 MPa. The pressure varies depending on the operating conditions.

Note 4) Set the pressure increase ratio to 2 or more.

Note 5) The tank connection port cannot be used for applications other than the connection with VBAT.

Options/Part No.**Pressure Gauge, Silencer (When thread type is Rc or G.)**

Model	VBA10A-02	VBA20A-03	VBA40A-04	VBA22A-03	VBA42A-04	VBA43A-04	VBA11A-02
Description	VBA10A-F02	VBA20A-F03	VBA40A-F04	VBA22A-F03	VBA42A-F04	VBA43A-F04	VBA11A-F02
Pressure gauge	G G27-20-01		G36-10-01	KT-VBA22A-7	G36-10-01	G27-20-01	G27-20-01
Silencer	N AN20-02	AN30-03	AN40-04	AN30-03	AN40-04	AN40-04	AN20-02
High-noise reduction silencer	S ANA1-02	ANA1-03	ANA1-04	ANA1-03	ANA1-04	ANA1-04	ANA1-02
Elbow for silencer	L KT-VBA10A-18	—	—	—	—	—	KT-VBA10A-18

Note 1) In the case of options GN, two pressure gauges and one silencer are included in the same container as accessories.

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

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

Note 4) Pressure unit on the pressure gauge: MPa and psi

Pressure Gauge, Silencer (When thread type is NPT or NPTF.)

Model	VBA10A-N02*	VBA20A-N03*	VBA40A-N04*	VBA22A-N03*	VBA42A-N04*	VBA43A-N04*	VBA11A-N02*
Description	VBA10A-T02*	VBA20A-T03*	VBA40A-T04*	VBA22A-T03*	VBA42A-T04*	VBA43A-T04*	VBA11A-T02*
Pressure gauge *: when Nil *: when "Z"	G27-20-01	G36-10-N01	KT-VBA22A-7N	G36-10-N01	G27-20-N01	G27-20-01	
Pressure gauge *: when "Z" Note 4)	G27-P20-01-X30	G36-P10-N01-X30	KT-VBA22A-8N	G36-P10-N01-X30	G27-P20-N01-X30	G27-P20-01-X30	
Silencer	N AN20-N02	AN30-N03	AN40-N04	AN30-N03	AN40-N04	AN40-N04	AN20-N02
High-noise reduction silencer	S —	ANA1-N03	ANA1-N04	ANA1-N03	ANA1-N04	ANA1-N04	—
Elbow for silencer	L KT-VBA10A-18N	—	—	—	—	—	KT-VBA10A-18N

Note 1) In the case of options GN, two pressure gauges and one silencer are included in the same container as accessories.

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

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

Note 4) Pressure unit on the pressure gauge: MPa and psi

Related Products/Part No.**Mist Separator, Exhaust Cleaner**

Model	For VBA10A-02	For VBA20A-03	For VBA40A-04
Description	For VBA11A-02	For VBA22A-03	For VBA42A-04
Mist separator	AM250C-02	AM450C-04, 06	AM550C-06, 10
Exhaust cleaner	AMC310-03	AMC510-06	AMC610-10



Solid line: Operating range
Operate so that the flow rate follows the solid line even when the outlet side air has been consumed.

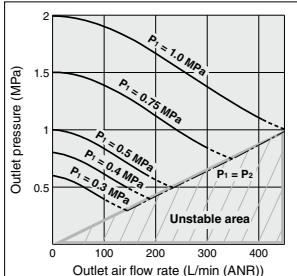
Ex.) For the VBA10A: When the inlet pressure is 0.5 MPa and the set pressure is 1.0 MPa, operate at an outlet air flow rate of 180 L/min (ANR) or less.

Dotted line: Outside of the set pressure range

P_1 : Inlet pressure P_2 : Outlet pressure

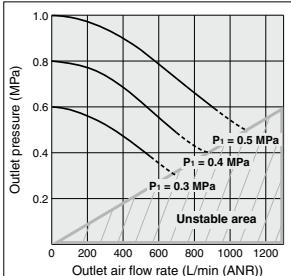
VBA10A

Flow Rate Characteristics



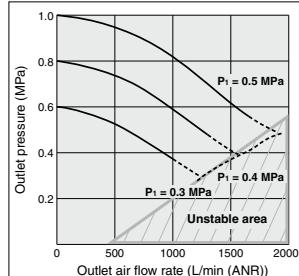
VBA20A, 22A

Flow Rate Characteristics



VBA40A, 42A

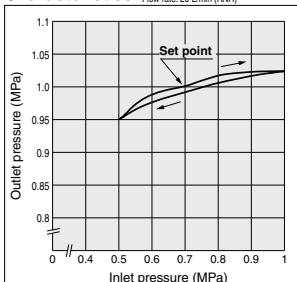
Flow Rate Characteristics



When operated at a flow rate that falls within the unstable area ($P_2 < P_1$ conditions) as shown in the graphs above, the booster regulator may not operate normally and may therefore fail to increase the pressure.

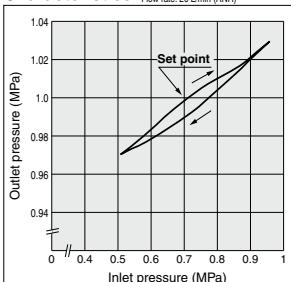
Pressure Characteristics

Inlet pressure: 0.7 MPa Outlet pressure: 1.0 MPa (Representative value)
Flow rate: 20 L/min (ANR)



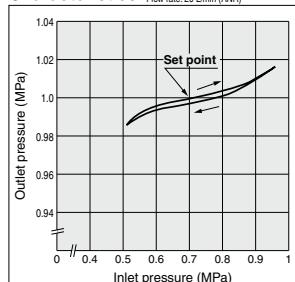
Pressure Characteristics

Inlet pressure: 0.7 MPa Outlet pressure: 1.0 MPa (Representative value)
Flow rate: 20 L/min (ANR)

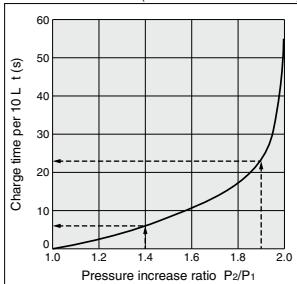


Pressure Characteristics

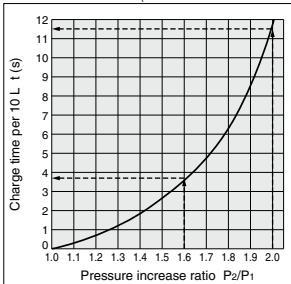
Inlet pressure: 0.7 MPa Outlet pressure: 1.0 MPa (Representative value)
Flow rate: 20 L/min (ANR)



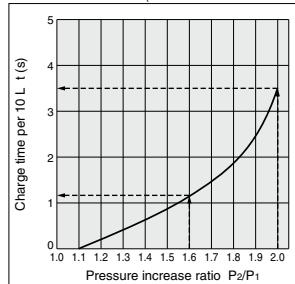
Charge Characteristics (Pressure increase ratio: Twice)



Charge Characteristics (Pressure increase ratio: Twice)



Charge Characteristics (Pressure increase ratio: Twice)



VBA10A

- The time required to charge pressure in the tank from 0.7 MPa to 0.95 MPa at 0.5 MPa supply pressure:

$$\frac{P_2}{P_1} = \frac{0.7}{0.5} = 1.4 \quad \frac{P_2}{P_1} = \frac{0.95}{0.5} = 1.9$$

With the pressure increase ratio from 1.4 to 1.9, the charge time of $23 - 6 = 17$ sec. (t) is given by the graph. Then, the charge time (T) for a 100 L tank:

$$T = t \times \frac{V}{10} = 17 \times \frac{100}{10} = 17 \text{ (s).}$$

VBA20A, 22A

- The time required to charge pressure in the tank 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, 42A

- The time required to charge pressure in the tank 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:

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



Solid line: Operating range
Operate so that the flow rate follows the solid line even when the outlet side air has been consumed.

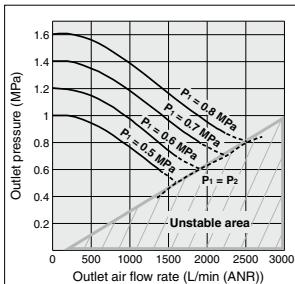
Ex.) For the VBA10A: When the inlet pressure is 0.5 MPa and the set pressure is 1.0 MPa, operate at an outlet air flow rate of 180 L/min (ANR) or less.

Dotted line: Outside of the set pressure range

P₁: Inlet pressure P₂: Outlet pressure

VBA43A

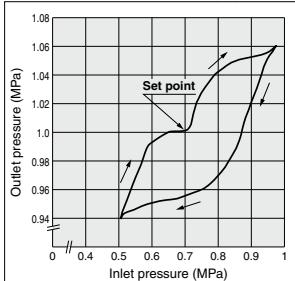
Flow Rate Characteristics



When operated at a flow rate that falls within the unstable area (P₂ < P₁ conditions) as shown in the graphs above, the booster regulator may not operate normally and may therefore fail to increase the pressure.

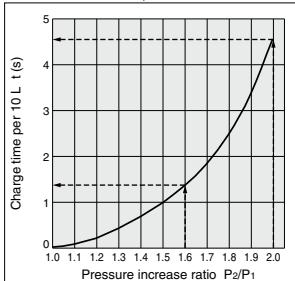
Pressure Characteristics

Inlet pressure: 0.7 MPa
Outlet pressure: 1.0 MPa
(Representative value)
Flow rate: 20 L/min (ANR)



Charge Characteristics

(Pressure increase ratio: Twice)



VBA43A

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

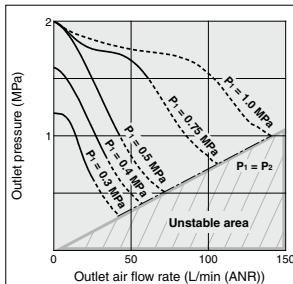
$$\frac{P_2}{P_1} = \frac{0.8}{0.5} = 1.6 \quad \frac{P_2}{P_1} = \frac{1.0}{0.5} = 2.0$$

With the pressure increase ratio from 1.6 to 2.0, the charge time of 4.5 - 1.3 = 3.2 sec. (t) is given by the graph. Then, the charge time (T) for a 100 L tank:

$$T = t \times \frac{V}{10} = 3.2 \times \frac{100}{10} = 32 \text{ (s).}$$

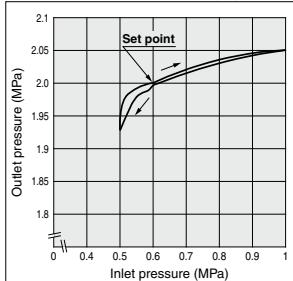
VBA11A

Flow Rate Characteristics



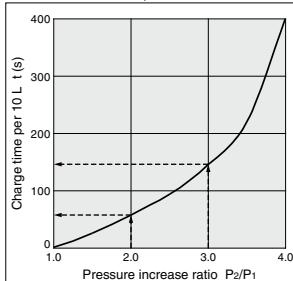
Pressure Characteristics

Inlet pressure: 0.5 MPa
Outlet pressure: 2.0 MPa
(Representative value)
Flow rate: 10 L/min (ANR)



Charge Characteristics

(Pressure increase ratio: Twice)



VBA11A

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

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

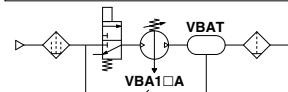
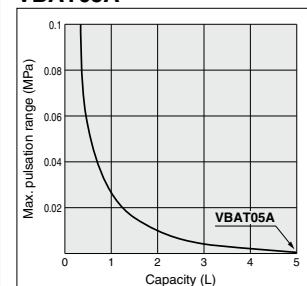
With the pressure increase ratio from 2.0 to 3.0, the charge time of 147 - 58 = 89 sec. (t) is given by the graph. Then, the charge time (T) for a 100 L tank:

$$T = t \times \frac{V}{10} = 89 \times \frac{10}{10} = 89 \text{ (s).}$$

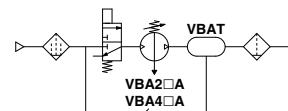
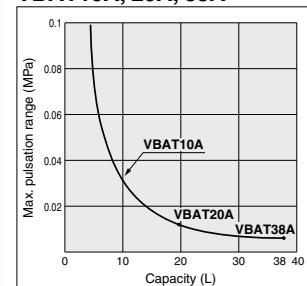
Pulsation/Pulsation is decreased with a tank.

If the outlet capacity is undersized, pulsation may occur.

VBAT05A

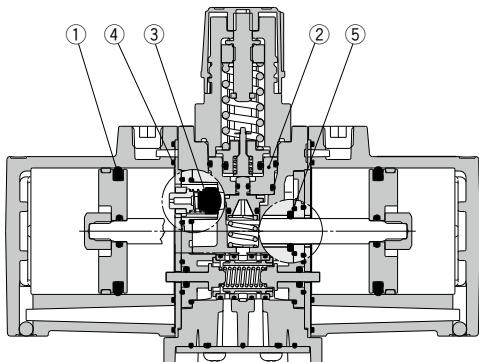
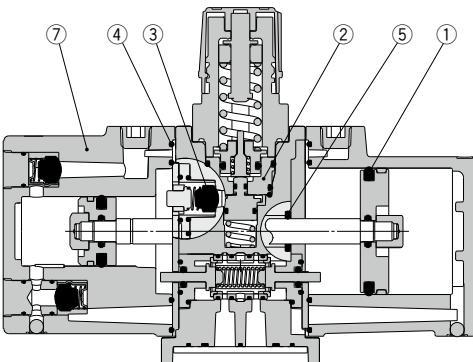
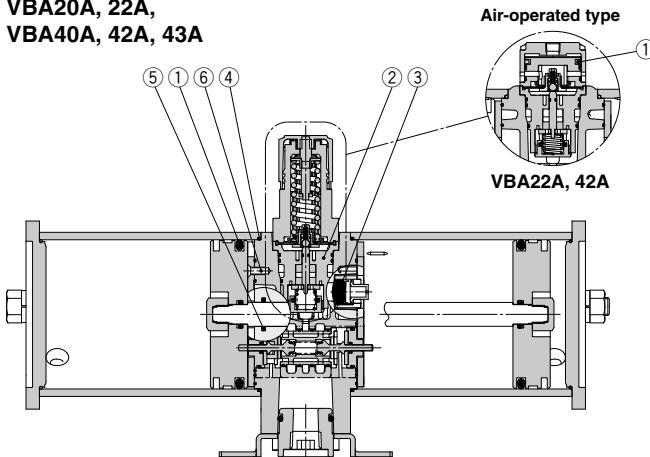


VBAT10A, 20A, 38A



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

- Performance of air tank
 - Alliates the pulsation generated on the outlet side.
 - When air consumption exceeds air supply during intermittent operation, required air will be accumulated in the tank for use. This does not apply for continuous operation.
 - Operation at a flow rate that falls within the unstable area under temporary P₁ ≥ P₂ conditions can be prevented when the outlet side air has been consumed.

**Construction/Replacement Parts****VBA Series****VBA10A****VBA11A****VBA20A, 22A,
VBA40A, 42A, 43A****Replacement Parts/Kit No.**

Place an order with the following applicable kit number.

Model	VBA10A	VBA20A	VBA40A	VBA22A	VBA42A	VBA43A	VBA11A
Kit no.	KT-VBA10A-1	KT-VBA20A-1	KT-VBA40A-1	KT-VBA22A-1	KT-VBA42A-1	KT-VBA43A-1	KT-VBA11A-20

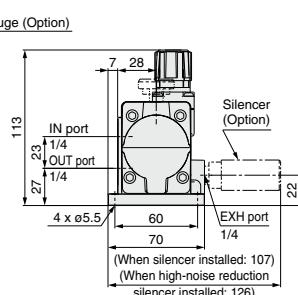
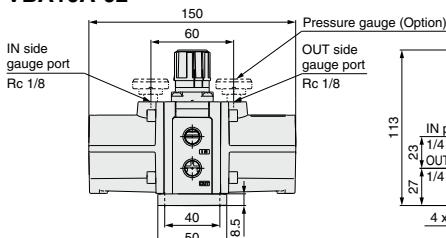
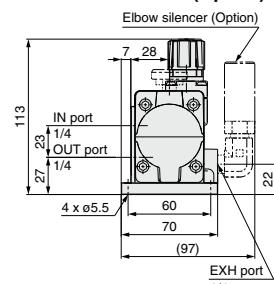
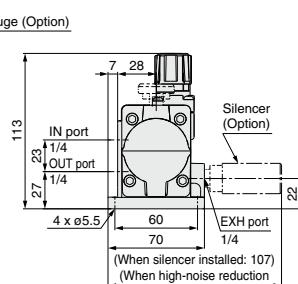
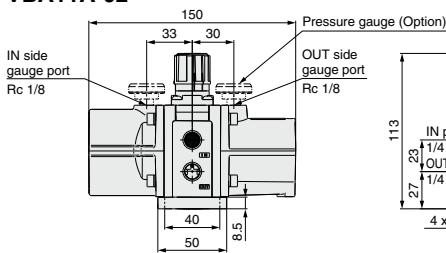
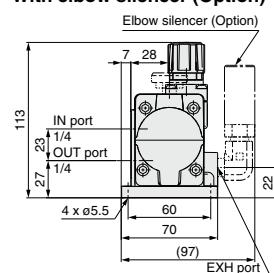
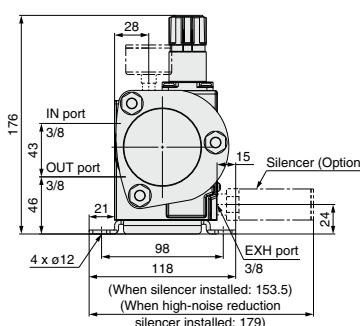
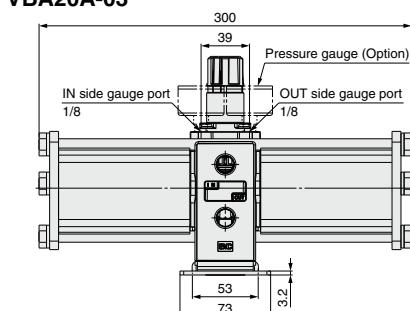
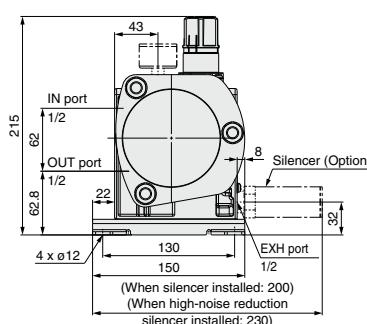
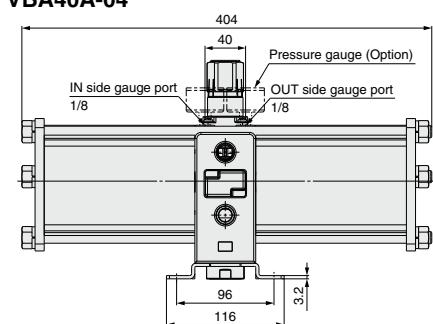
The kit includes the parts from ① to ⑦ and a grease pack.

No.	Model	VBA10A	VBA20A	VBA40A	VBA22A	VBA42A	VBA43A	VBA11A
Quantity								
1	Piston seal		2		2 large 1 small	2	1 each large and small	
2	Governor assembly				1			
3	Check valve				4		2	
4	Gasket				2			
5	Rod seal				1			
6	Mounting screw	—	8	12	8	12	—	
7	Cover C assembly				—		1	
—	Grease pack	1		2	1	2	1	

* The grease pack has 10 g of grease.

* Make sure to refer to the procedure for maintenance.

* For details on the replacement parts kit, refer to the procedure for maintenance.

**Dimensions****VBA10A-02****With elbow silencer (Option)****VBA11A-02****With elbow silencer (Option)****VBA20A-03****VBA40A-04**

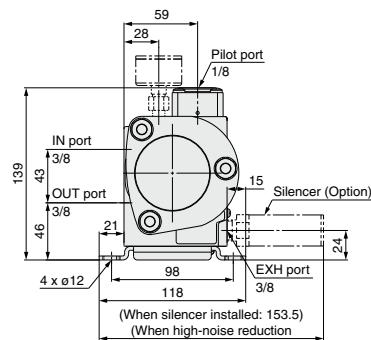
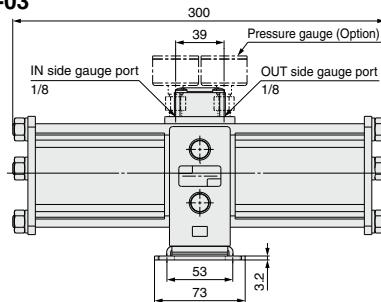


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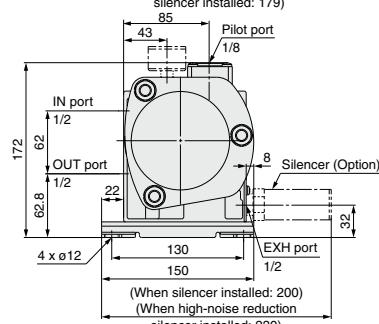
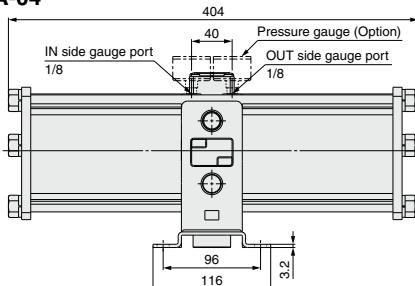
Dimensions

VBA Series

VBA22A-03



VBA42A-04



VBA43A-04

