



Instructions and Maintenance Manual

Booster Regulator
Series 56-VBA1110 to 56-VBA4200



II 3GD c T6 Ta = 2°C to 50°C

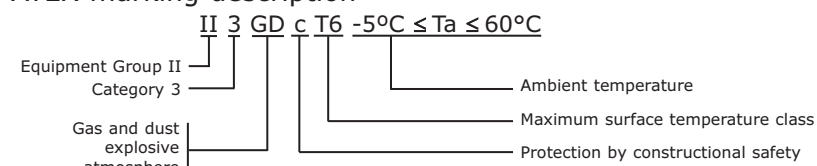
Read this manual before using this product.

For future reference, please keep this manual in a safe place.

The information within this document is to be used by pneumatically trained personnel only.

This manual should be read in conjunction with the current catalogue.

ATEX marking description



1 SAFETY RECOMMENDATION

1.1 General recommendation

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO4414 (Note1), JIS B 8370 (Note2) and other safety practices.

Note 1: ISO 4414: Pneumatic fluid power - Recommendations for the application of equipment to transmission and control systems. Note 2: JIS B 8370: Pneumatic system axiom.

CAUTION: Operator error could result in injury or equipment damage.

WARNING: Operator error could result in injury or loss of life.

DANGER: In extreme conditions, there is possible result of serious injury or loss of life.

WARNING

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

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

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

- 1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
- 2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.
- 3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Bleed air into the system gradually to create backpressure, i.e. incorporate a soft-start valve).

4. Contact SMC if the product is to be used in any of the following conditions:

- 1) Conditions and environments beyond the given specifications, or if product is used outdoors.
- 2) Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
- 3) Applications, which have the possibility of having negative effects on people, properties or animals, requiring special safety analysis.

WARNING: Clean only with a damp cloth!

WARNING: Avoid hitting the product with metallic objects!

WARNING: Avoid using this product in non-explosive environment which can become explosive due to air leakage!

CAUTION: Connect a mist separator to the primary side near the booster valve. If the quality of the compressed air is not thoroughly controlled, the booster valve could malfunction (without being able to boost) or its durability could be affected.

1.2 Conformity to standard

This product is certified to and complies with the following standards:

- Directive 94/9/EC
- EN 13463-1:2001
Non-electrical equipment for potentially explosive atmospheres
Part 1: Basic method and requirements
- prEN 13463-5:2003
Non-electrical equipment for potentially explosive atmospheres
Part 5: Protection by constructional safety "c"

2 INTENDED CONDITIONS OF USE

CAUTION:

This product is intended for use in applications:

- When certain equipment requires a higher pressure than the plant's line pressure,
- When the lower limit pressure for equipment must be ensured due to the fluctuation and reduction of the plant's line pressure.
- When the actuator lacks power output for some reason but it is not feasible to replace it with a large bore cylinder due to space constraints.
- In spite of diverse pressure conditions of the end user, equipment that achieves the specified high power output must be provided.
- When a small cylinder size is desired while ensuring sufficient power, in order to achieve a compact drive unit.
- When the hydraulic pressure of an air-hydro unit must be raised.
- When the pressure must be raised in certain explosion-proof environments (refer to marking description).
- To boost the pressure by remote operation, using an air operated type.
- When the tank must be filled from the atmosphere in a short time.

3 SPECIFICATIONS

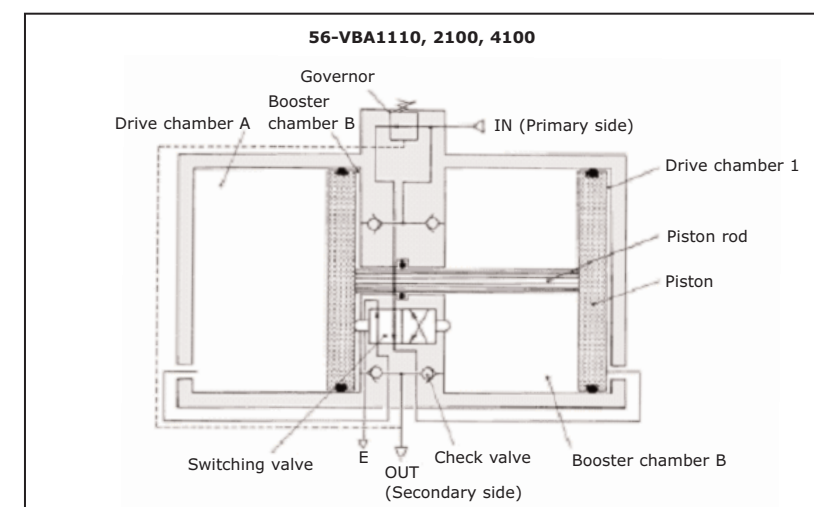
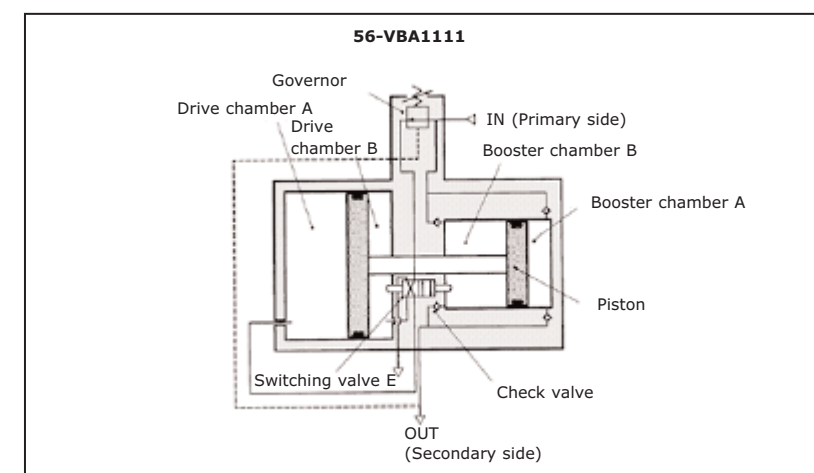
Model	Handle operated style			Air operated style		
	56-VBA1111-02	56-VBA1110-02	56-VBA2100-03	56-VBA4100-04	56-VBA2200-03	56-VBA4200-04
Pressure increase ratio	MAX. 4			MAX. 2		
Fluid	Compressed air					
Proof pressure	3.0MPa			1.5MPa		
Max. supply pressure	1.0MPa					
Set pressure range	0.2 to 2.0MPa			0.2 to 1.0MPa		
Ambient and fluid temperature range	2 to 50°C (no condensation)					
Lubrication	Not required					
Installation	Horizontal					
Pressure adjustment mechanism	Relieving style					
Max. flow Note 1) l/min (ANR)	60	400	1000	1900	1000	1900
Connecting port size Rc (PT)	1/4 (IN/OUT)		3/8 (IN/OUT)	1/2 (IN/OUT)	3/8 (IN/OUT)	1/2 (IN/OUT)
Exhaust port size Rc (PT)	1/4		3/8	1/2	3/8	1/2
Pilot port size Rc (PT)				1/8		
Pilot pressure range				0.1 to 0.5MPa		
Weight (kg)	0.98	0.85	3.8	7.5	3.8	7.5

Production batch code

The production batch code printed on the label indicates the month and year of production as per the following table:

Year		2003	2004	2005	...	2021	2022	2023	...
Month	Year	H	I	J	...	Z	A	B	...
Jan	O	HO	IO	JO	...	ZO	AO	BO	...
Feb	P	HP	IP	JP	...	ZP	AP	BP	...
Mar	Q	HQ	IQ	JQ	...	ZQ	AQ	BQ	...
Apr	R	HR	IR	JR	...	ZR	AR	BR	...
May	S	HS	IS	JS	...	ZS	AS	BS	...
Jun	T	HT	IT	JT	...	ZT	AT	BT	...
Jul	U	HU	IU	JU	...	ZU	AU	BU	...
Aug	V	HV	IV	JV	...	ZV	AV	BV	...
Sep	W	HW	IW	JW	...	ZW	AW	BW	...
Oct	X	HX	IX	JX	...	ZX	AX	BX	...
Nov	Y	HY	IY	JY	...	ZY	AY	BY	...
Dec	Z	HZ	IZ	JZ	...	ZZ	AZ	BZ	...

4 CONSTRUCTION



Maintenance part list

Model	Maintenance kit part number	Contents
56-VBA1110	KT-VBA1110	Packing and wearing parts
	KT-VBA1110-P	Packing
56-VBA1111	KT-VBA1111	Packing and wearing parts
	KT-VBA1111-P	Packing
56-VBA1311	KT-VBA1311	Packing and wearing parts
	KT-VBA1311-P	Packing
56-VBA2100	KT-VBA2100-1	Packing and wearing parts
	KT-VBA2100-1-P	Packing
56-VBA2200	KT-VBA2200-1	Packing and wearing parts
	KT-VBA2100-1-P	Packing
56-VBA4100	KT-VBA4100-1	Packing and wearing parts
	KT-VBA4100-1-P	Packing
56-VBA4200	KT-VBA4200-1	Packing and wearing parts
	KT-VBA4100-1-P	Packing

5 INSTALLATION

CAUTION:

- Do not install unless the safety instructions have been read and understood.
- When transporting this product, hold it lengthwise with both hands. Never hold it by the black handle that protrudes from the centre because the handle could become detached from the body, causing the body to fall and leading to injury.
- When this product is shipped from the factory, it is protected by dust proof sealing (vinyl) against infiltration of dust into positioner cylinder. Leave sealing in place after unpacking until ready to connect to the pneumatic circuit.
- Install this product so that the tie rod painted silver is horizontal.
- Considering the transmission of piston cycle vibration, use retaining bolts (56-VBA1: M5; 56-VBA2 4: M10) and tighten them to the specified torque (56-VBA1: 3Nm; 56-VBA2, 4: 24Nm).
- If it is necessary to prevent the transmission vibration, place an isolating rubber material in between the product and the mounting surface.

5.1 Precautions on design

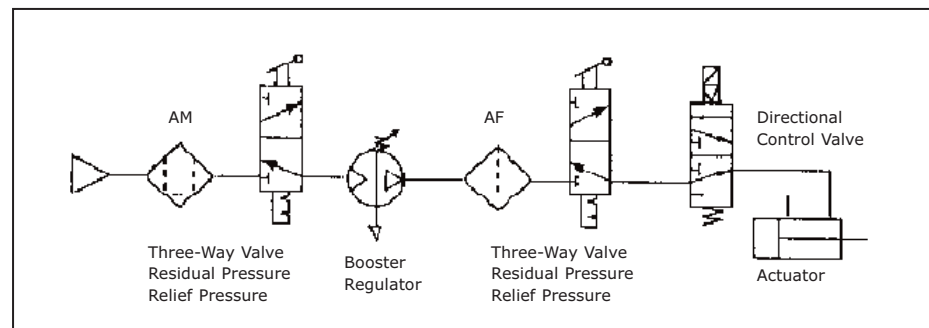
WARNING:

1. Warning concerning abnormal secondary pressure

- If there is a likelihood of causing secondary pressure drop due to unforeseen circumstances such as equipment malfunction, thus leading to a major problem, safety measures must be provided on the system side.
- Because the secondary pressure could exceed its set range if there is a large fluctuation in the primary pressure, and lead to unexpected accidents, provide safety measures against abnormal pressures.
- Operate the equipment by maintaining its maximum operating pressure and set pressure range.

2. Residual pressure measures

- Connect a 3 port valve to the OUT side of the booster valve if the residual pressure must be released quickly from the secondary pressure side, such as when servicing the equipment (refer to the diagram below). The residual secondary pressure cannot be released if the 3 port valve is connected to the IN side because the check valve in the booster valve will activate.



CAUTION:

3. System Configuration

- Make sure to install a mist separator (AM series) on the primary side of the booster valve.
- Also install a cleaning device such as an air filter or a mist separator on the secondary side as necessary. Because the booster valve contains a sliding mechanism and the inner wall of the tank for the booster valve is untreated, dust flows out to the secondary side.
- If required downstream, connect a lubricator to the secondary side because the accumulation of oil in the booster valve could lead to equipment malfunction.
- After completing the work, release the supply pressure from the primary side by operating the residual pressure release valve, thus stopping any unnecessary movement and preventing equipment malfunction.

4. Exhaust air measures

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

5. Space for service access

- Provide a sufficient space for performing maintenance and inspection.

5.2 Environment

WARNING:

- Do not use in an environment where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
- The product should not be exposed to prolonged sunlight. Check the external surface temperature to not exceed the maximum surface temperature mentioned in the specifications. Use a protective cover.
- Do not mount the product in a location where it is subject to strong vibrations and/or shock. Check the product specifications for above ratings.
- Do not mount the product in a location where it is exposed to radiant heat.

5.3 Piping

CAUTION:

- Before piping make sure to clean up chips, cutting oil, dust etc. Use an air blower to thoroughly flush the piping or wash the piping to thoroughly remove any cutting chips, clogging oil, or debris from inside the piping, before connecting them. If they enter the inside of the booster valve they could cause the booster valve to malfunction or its durability could be affected.
- When installing piping or fitting into a port, ensure that sealant material does not enter the port inside. When using seal tape, leave 1.5 to 2 threads exposed on the end of pipe/fitting.
- To bring the booster valve's ability into full play, make sure to match the piping size to the port size.

5.4 Lubrication

CAUTION:

- Our products have been lubricated for life at manufacturer, and do not require lubrication in service.

6 HANDLING

WARNING:

- Do not exceed the set pressure when turning the governor handle (56-VBA *1**) or supplying pilot pressure (56-VBA-200). If the primary pressure rises, the secondary pressure will also rise, possibly exceeding the maximum operating pressure.

CAUTION:

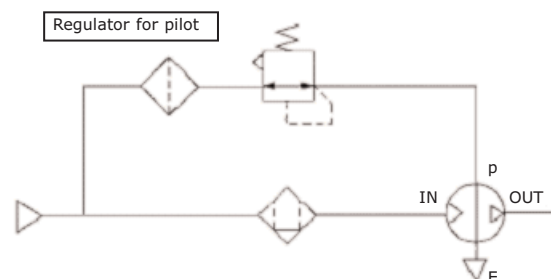
1. Setting the pressure on the handle operated style (56-VBA*1**)

- 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 (+).
- After completing the pressure setting, push the handle in.
- After the pressure has been set, the secondary pressure will be released from the area of the handle, due to the relief construction of the handle.
- To reset the pressure, first reduce the pressure so that it is lower than the desired pressure; then, set it to the desired pressure.

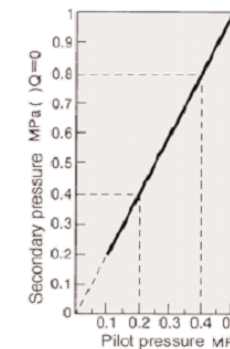


2. Setting the pressure on the air operated style (56-VBA2200, 56-VBA4200)

- Connect the secondary pipe of the pilot regulator for remote operation to the pilot port (P). (Refer to the diagram below.)
- Refer to the diagram below for the pilot pressure and the secondary pressure.
- The recommended pilot regulators are AR2000 and AW2000.



- 2 times of pilot pressure is secondary pressure.
- At 0.4MPa at primary pressure Pilot pressure Pilot pressure 0.2MPa to 0.4MPa; secondary pressure 0.4MPa to 0.8MPa



3. Drainage

- 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.

4. Exhaust air

- After operating this product for an extended time in the set state, if the booster valve is switched, it could take a longer period of time to discharge the air from the E port. This symptom is normal.

7 MAINTENANCE

WARNING:

- Not following proper procedures could cause to the product malfunction and could lead to damage to the equipment or machine.
- If handled improperly, compressed air can be dangerous. Assembly, handling and repair of pneumatic system should be performed only by qualified personnel.
- Drain: remove condensate from the filter bowl on a regular basis.
- Shut-down before maintenance: before attempting any kind of maintenance make sure the supply pressure is shut off and all residual air pressure is released from the system to be worked on.
- Start-up after maintenance: apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.
- Do not make any modification to the product

8 EUROPEAN CONTACT LIST

SMC Corporation

Country	Telephone	Country	Telephone
Austria	(43) 2262-62 280	Italy	(39) 02-92711
Belgium	(32) 3-355 1464	Netherlands	(31) 20-531 8888
Czech Republic	(420) 5-414 24611	Norway	(47) 67 12 90 20
Denmark	(45) 70 25 29 00	Poland	(48) 22-548 50 85
Finland	(358) 9-859 580	Portugal	(351) 22 610 89 22
France	(33) 1-64 76 1000	Spain	(34) 945-18 4100
Germany	(49) 6103 4020	Sweden	(46) 8-603 0700
Greece	(30) 1- 342 6076	Switzerland	(41) 52-396 3131
Hungary	(36) 1-371 1343	Turkey	(90) 212 221 1512
Ireland	(351) 1-403 9000	United Kingdom	(44) 1908-56 3888

Websites

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