



Installation and Maintenance Manual
Direct Operated Regulator – 6.0 MPa
Relieving type.
Series VCHR40

1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

	Caution	Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury.
	Warning	Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury.
	Danger	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

Warning

- 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 can be used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet specific requirements.
- **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 personnel.
- **Do not service machinery/equipment or attempt to remove components 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. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).
- **Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**
1) Conditions and environments beyond the given specifications, or if the product is to be 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) An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Caution

- Ensure that the air supply system is filtered to 5 μm or less.

2 Specifications

2.1 General specifications

Regulator construction	Piston type
Valve material	Polyurethane elastomer
Relief mechanism	Relieving type
Port size	G1, G1-1/2
Thread type	Conforming to ISO 1179-1 for pneumatic/hydraulic G thread
Fluid	Air
Max. operating pressure	6.0 MPa
Setting pressure	0.5 to 5.0 MPa
Fluid temperature	-5 to 60°C
Ambient temperature	-5 to 60°C
Weight	6.2 kg

2.2 Pressure Characteristics

Condition: Inlet pressure 4.0 MPa
 Outlet pressure 1.0 MPa
 Flow rate 300 l/min (ANR)

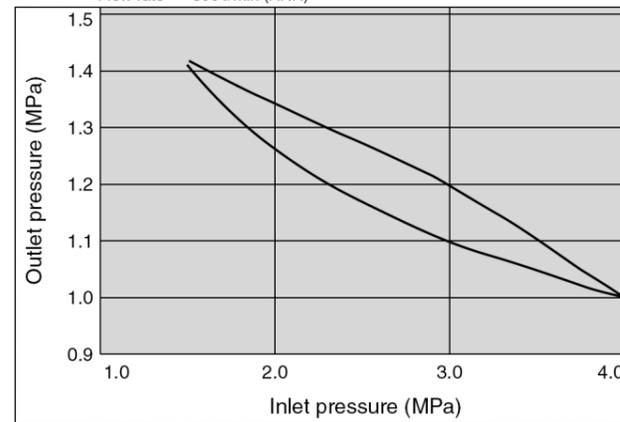


Figure 1

2.3 Flow Characteristics

Condition:
 — : Inlet pressure 6.0 MPa
 - - - : Inlet pressure 4.5 MPa

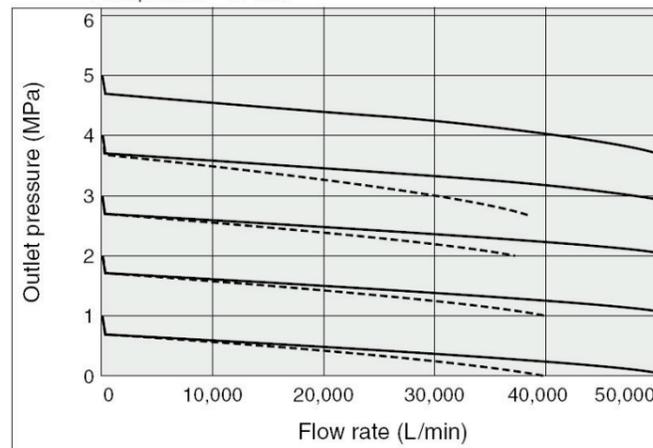
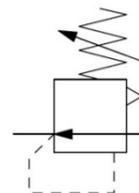


Figure 2

2.4 Circuit Symbol



2 Specifications (continued)

2.5 Ports

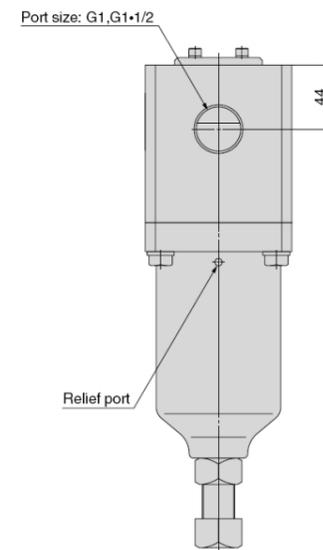


Figure 3

2.6 PED status

Pressure Equipment Directive 97/23/EC
 Equipment: Pressure accessory
 Fluid: Air (group 2 gas)
 PS: 60 bar
 DN: 19 mm
 Classification: SEP

This product meets the SEP (Sound Engineering Practice) requirements of the PED as a pressure accessory.

3 Installation

3.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gasses, etc. as these can cause damage or malfunction.
- Compressed air that contains a large amount of drainage can cause malfunction of pneumatic equipment such as regulators. Therefore take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer or water separator.

3.2 Mounting

Caution

- Confirm the 'IN' and 'OUT' ports showing the inlet/outlet of the air flow, or the arrow mark, before connection. Reverse connection will result in malfunctions.
- Provide adequate space above, beneath and in front of the product for maintenance or operation.
- The regulator has 4 x Ø10.5 mm mounting holes;
- Air will be released from the relief/vent ports when the 'OUT' port pressure is above the set point. Ensure that the air jet, volume of air and noise does not cause a hazard. See Figure 3

3 Installation (continued)

3.3 Environment

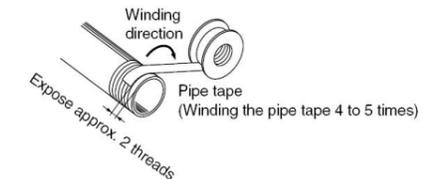
Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.

3.4 Piping

Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- Pipe tape is not necessary since this product uses a pneumatic and hydraulic purpose G thread which conforms to ISO 1179-1. When an R (taper) thread is used, leave 1 to 2 threads at the tip exposed before winding the piping tape around it 4 to 5 times.



Connecting a R thread

Figure 4

- Tighten fittings to the specified tightening torque.

Thread	Tightening Torque N·m
G 1	36 to 38
G 1-1/2	48 to 50

Table 1

Warning

- When tightening piping or fittings, ensure the product is securely supported, so that twisting or bending is not applied to the product.
- Insufficient tightening torque will cause looseness or insufficient sealing. However, over tightening will cause damage to the thread.
- Support the external piping separately.
- If rigid piping, such as steel piping, is subject to excessive load or transmission of vibrations from the piping side, use flexible tubing, etc. between them to avoid it.

3.5 Lubrication

Caution

- This product has grease applied to mechanical parts at manufacture. Do not lubricate in service as valve seals may be damaged.

4 Settings

- The outlet pressure is set by rotating the adjusting bolt, at the bottom of the regulator. See Figure 5. Loosen the locknut first.
- The adjusting bolt (32 mm across flats) can be rotated by a spanner, or with a screwdriver using the Ø11mm hole in the bolt head.

Warning

- Adjust the outlet pressure while confirming the pressure gauge values on the inlet and outlet sides.
- Over-rotating the adjusting bolt will damage the inner components of the product.
- The set outlet pressure should be less than 85% of the inlet pressure.
- Setting the outlet pressure to more than 85% of the inlet pressure may cause fluctuation of flow or pressure on the inlet side, resulting in unstable operation.
- The maximum value of the set pressure range has a tolerance, therefore, the set pressure may exceed this value.
- Tighten the locknut when adjustment is complete. The locknut is not an anti-tamper device. Appropriate measures against foreseeable misuse must be taken if this can cause a hazard.

Caution

- Adjust after carefully confirming the inlet pressure.
- When adjusting the outlet pressure, a torque is applied to the adjusting bolt. Support the product separately, so that the torque force is not transferred to the external piping.

Reference for Adjusting bolt Torque

Set pressure	1 MPa	2 MPa	3 MPa	4 MPa	5 MPa
Torque N·m	3	6	9	12	15

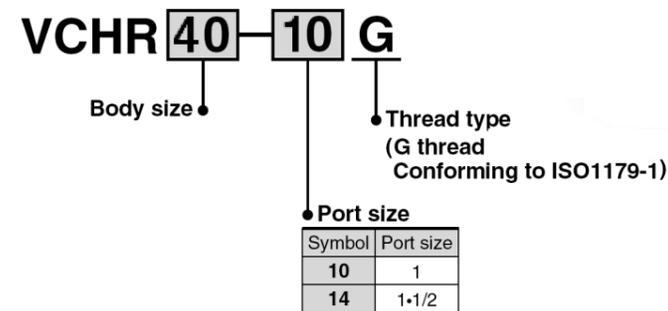
Table 2

- Setting the outlet pressure should be conducted by increasing the

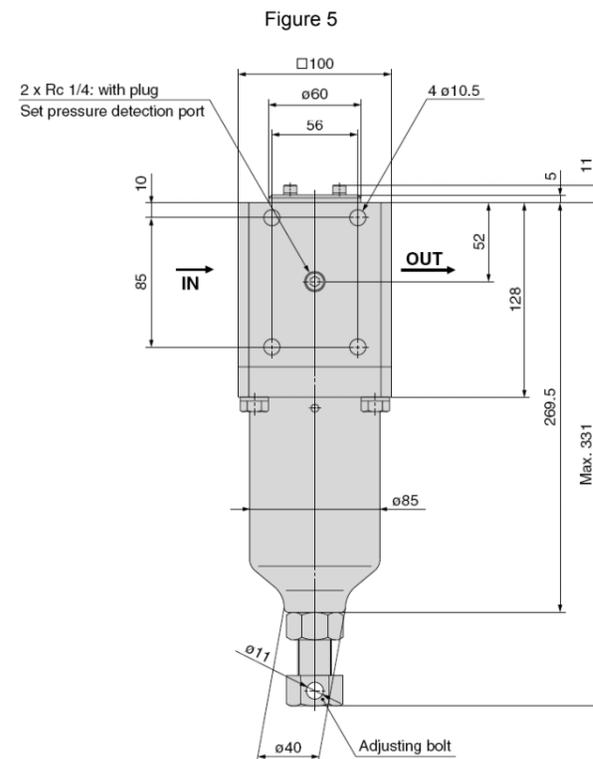
pressure.

- Setting the outlet pressure by decreasing the pressure may result in going below the required set pressure.
- Turning the adjusting bolt in the clockwise direction, increases the pressure.
- Turning the adjusting bolt counter-clockwise, will decrease the outlet pressure.

5 How to Order



6 Outline Dimensions (mm)



8 Limitations of Use

Warning

- This product must not be used as a safety accessory as defined by the Pressure Equipment Directive 97/23/EC.
- Install a protective device if the outlet pressure exceeding the set outlet pressure could cause equipment damage or malfunction.
- The outlet pressure may fluctuate when the air has not been consumed for a long time, or the product is used in a shut-off or balancing circuit on the outlet side.
- Grease may leak into the outlet side, as it is applied to inner sliding parts and seals.
- Do not use in circuits requiring highly precise relief sensitivity or setting precision.

7 Maintenance

7.1 General Maintenance

- This product does not require maintenance. However the following advice should be followed:
 - Ensure the proper function of the regulator is regularly checked
 - Ensure there is no build-up of dirt or debris on the regulator, especially around the vent ports and adjustment screw.

Caution

- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

9 Contacts

AUSTRIA	(43) 2262 62280-0	LATVIA	(371) 781 77 00
BELGIUM	(32) 3 355 1464	LITHUANIA	(370) 5 264 8126
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DENMARK	(45) 7025 2900	POLAND	(48) 22 211 9600
ESTONIA	(372) 651 0370	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	ROMANIA	(40) 21 320 5111
FRANCE	(33) 1 6476 1000	SLOVAKIA	(421) 2 444 56725
GERMANY	(49) 6103 4020	SLOVENIA	(386) 73 885 412
GREECE	(30) 210 271 7265	SPAIN	(34) 945 184 100
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