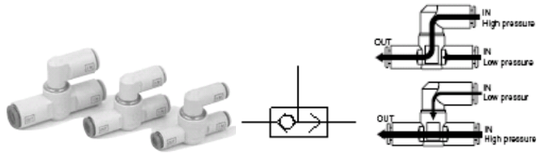
ORIGINAL INSTRUCTIONS

Installation and Maintenance Manual
Product Name Shuttle Valve
Series VR12*0F

(Basic and Well-tried Safety principles in accordance to ISO 13849)



The intended use of the Shuttle Valve is to switch the higher pressure to a downstream circuit.

This IMM is only applicable for validated products to ISO 13849. Refer to Doc. Nr. VM*-RRP0026SM.

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 or recreation equipment.

⚠ Caution

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

2 Specifications

Specifications

MODEL	VR12*0F
Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0,05 MPa
Minimum operating frequency	1 cycle /30 days
Maximum operating frequency	2 cycles / s
Ambient and fluid temperature	-5 to +60℃(No freezing)
Applicable tubing material	Nylon, Soft nylon, Polyurethane
Service life B10	Refer to VM*-RRP0026SM

Note 1) Use caution about the maximum operating pressure when soft nylon and polyurethane is used. Depending on the temperature these tubes have a lower operating pressure. Refer to the specification of the tubes.

Note 2) Brass components are all electroless nickel plated as standard. (Copper-free and fluorine-free)

Flow rate and effective area

Model		VR1210F			
Applicable Tubing O.D.	Metric size	Ø3,2	Ø4	Ø6	Ø8
	Inch size	Ø1/8”	Ø5/32”	Ø1/4”	Ø5/16”
IN → OUT	Flow Rate l/min (ANR)	150	210	420	480
	Effective Area (mm^2)	2,3	3,2	6,4	7,3

Model		VR1220F		
Applicable Tubing O.D.	Metric size	Ø6	Ø8	Ø10
	Inch size	Ø1/4”	Ø5/16”	Ø3/8”
IN → OUT	Flow Rate l/min (ANR)	440	680	1000
	Effective Area (mm^2)	6,7	10,4	15,2

Note) Flow rate is the value measured under a pressure of 0,5 MPa and a temperature of +20°C +/-5°C.

3 Installation

3.1 Installation

⚠ Warning

- Do not install the product unless the safety instructions have been read and understood.
- Do not drop and bring the product into collision when handling.
  It causes the damage of the shuttle valve when dropping or throwing it.
- Operating fluid
  Contact SMC when using the product in applications other than compressed air or nitrogen. Confirm operating fluid when using the product for general fluid.
- Use clean air
  If the compressed air includes chemicals, synthetic materials (including organic solvents), salinity, corrosive gas, etc., it may lead to damage or malfunction.

3.2 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.
- Do not apply vacuum. If evacuated, the switch absorbs outside air and results in breakage.
- Applicable fluid is limited to air and nitrogen gas. Other fluids are not acceptable. Especially, never use in the place containing inflammability fluid and gas, which may result in explosion since the product is not designed to be explosion-proof.

3.3 Piping

⚠ Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping, ensure sealant material does not enter inside the port.
- Stop using the equipment immediately when the air leaks much enough to make sound, or when the equipment does not operate properly. To see its proper mounting, bring it to appropriate function test and leakage test.
- Make sure to check periodically that piping is not loosened and that there is no air leakage.
- Regularly check that there is no external damage.

4 How to Order

Refer to the catalogue.

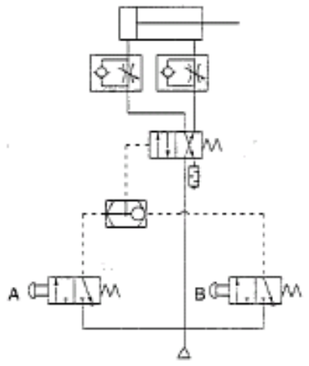
5 Outline Dimensions (mm)

Refer to the catalogue.

6 Application circuit example

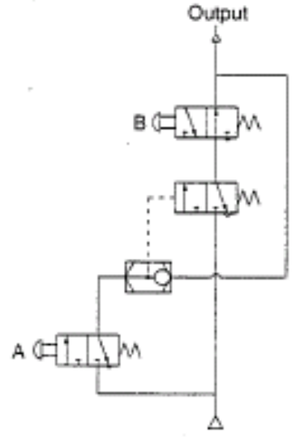
OR circuit

- The cylinder operates if either "A" or "B" is ON.



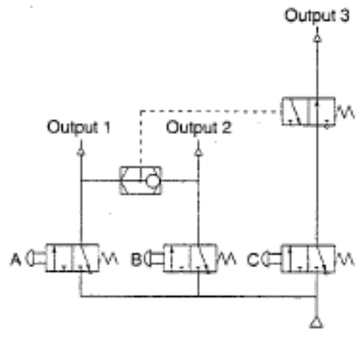
Self holding circuit

1. When "A" is turned ON, output goes ON.
2. The output ON state is maintained even if "A" is turned OFF.
3. The output goes OFF when "B" is turned ON in condition 2.



Interlock circuit

- When either "A" or "B" are ON, output 3 does not go ON even if "C" is turned ON.
- Output 3 goes ON if "C" is turned ON, only when both "A" and "B" are OFF.



7 Maintenance

7.1 General Maintenance

⚠ Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- 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.
- Be absolutely sure to wear safety glasses without when conducting periodic inspections.
- Perform periodic inspections to ensure proper operation of the switch. Unexpected problems with a machine or equipment can be minimized by verifying the operation of the switch on a regular basis.
- Take precautions when using a switch for an interlock circuitry. When a pressure switch is used for an interlock circuit, devise a multiple interlock system to prevent trouble or malfunction. Verify the operation of the switch and interlock function on a regular basis.
- Secure the space enough for maintenance. The maintenance cannot be done when there is no space.

8 Limitations of Use

⚠ Danger

Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.

Any use in an EN ISO 13849 system must be within the specified limits and application condition. The user is responsible for the specification, design, implementation, validation and maintenance of the safety system (SRP/CS).

9 Contacts

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