

*Perfect Valves For The World!*

## Shuttle Valve User Manual

Please read this Manual carefully and keep it for future reference



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## 1 Statements

### 1.1 This Manual is applicable for the following products:

200 Series Threaded Pneumatic Shuttle Valve

201 Series Threaded Pneumatic Shuttle Valve

204 Series Flanged Pneumatic Shuttle Valve

1.2 Please read this Manual carefully before installation and usage of the products, and follow the product specifications. If there are any problems caused by noncompliance with usage instructions or

mis-operations, ESG does not bear the corresponding liability.

- 1.3 Improper usage of valves might cause danger to people, equipment and environment nearby!
- 1.4 Please only operate the valves when they are under good conditions, and pay attention to the proper methods for storage, transit, installation and operation!
- 1.5 Please use these products under conditions that comply with Technical Specifications, including applicable medium, pressures and temperatures!
- 1.6 Please do not make unauthorized changes to any internal or external parts of these products. Only trained technical experts can perform installation and maintenance!
- 1.7 Please remove the pressure and drain the pipeline before valve installation or uninstallation!
- 1.8 Please comply with relevant policies for electro-

pneumatic device accident prevention and usage safety, to avoid accidentally starting systems or devices! Please do not touch directly the heated surfaces of electrical devices after long time operation and to avoid getting hurt!

1.9 This Manual is designed to provide information regarding Technical Specifications, Installation and Usage, Uninstallation and Maintenance, as well as Transit and Storage. If you have any questions, please contact ESG sales team or email [info@esgvalve.com](mailto:info@esgvalve.com).

## 2 Technical Specifications

### 2.1 Operation Principles

This valve opens and closes through the piston motion forced by compressed air. As fluid pressure acts onto the valve seat, the piston experiences littleresistance and thereby enables the valve

to quickly open/close. The outlet in the valve is shuttle structure, which makes more effluent fluid dynamics and less pressure loss and larger flow.

### 2.2 Technical Specifications

Valve Model: 200 Series DN 10-50,

201 Series DN 8-50,

204 Series DN 65-100

Operating Pressure: 0-16bar (0-232psi)

Control Pressure: 3-8bar (43.5-116psi)

Control Medium: Clean compressed air or neutral air

Valve Body Materials (200, 201 Series): CF8, CF8M

(204 Series): CF8

Sealing Materials (200, 201 Series): EPDM/FPM

(204 Series): EPDM

Applicable Medium: FPM: applicable for most fluids,  
except for steam

EPDM: applicable for hot water and steam, not

suitable for oil greases, fuels etc.

Medium Temperature: -20℃ ~ +150℃ (FPM)

-20℃ ~ +130℃ (EPDM)

Ambient Temperature: -20℃ ~ +80℃

Control Type (200, 201 Series): single-acting normally closed, normally open, double-acting normally closed, double-acting without spring

(204 Series): double-acting without spring

Connection Type (200, 201 Series): threaded

(204 Series): flanged

Installation Position: preferably valves should be installed vertically depending on user requirements

Leakage Class: DIN EN 12266 A Class

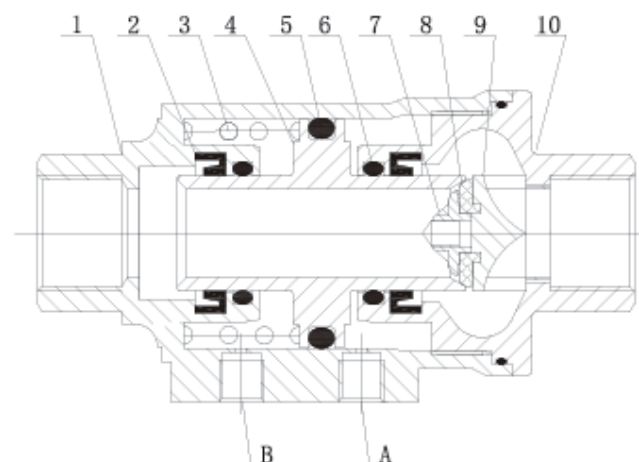
### 2.3 Pressure Range

For more detailed pressure data, please refer to relevant parameter tables in ESG product catalog. You may also refer to [www.esgvalve.com](http://www.esgvalve.com) for latest

information on product parameters.

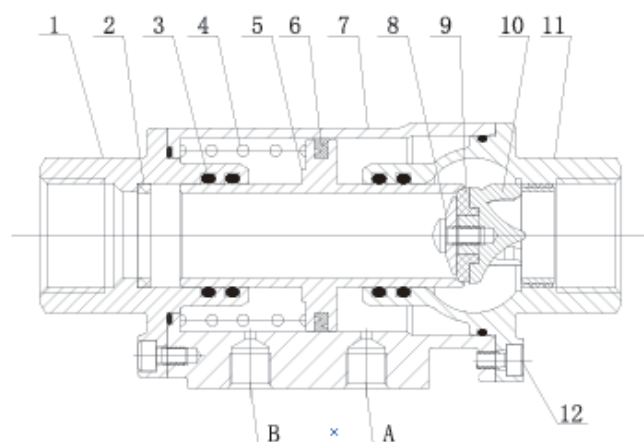
### 2.4 Product Part Structure Illustration

#### 2.4.1 200 Series



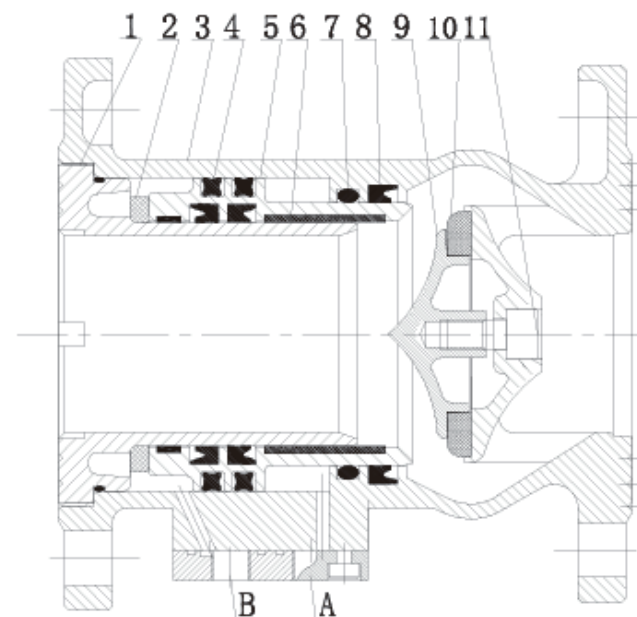
1	Valve Body	6	O-ring
2	Y-ring	7	Washer
3	Spring	8	Seat Seal
4	Piston	9	Valve Core
5	Piston Seal	10	Outlet End Cover
A	Air Inlet for Valve Opening		B Air Inlet for Valve Closing

### 2.4.2 201 Series



1	Inlet End Cover	6	Piston Seal	11	Outlet End Cover
2	Washer Seal	7	Valve Body	12	Hexagon Socket Screw
3	O-ring	8	Washer	A	Air Inlet for Valve Opening
4	Spring	9	Seat Seal	B	Air Inlet for Valve Closing
5	Piston	10	Valve Core		

### 2.4.3 204 Series



1	Inlet End Cover	6	Supporting Ring	11	Valve Core Screw
2	Washer Seal	7	O-ring	A	Air Inlet for Valve Opening
3	Valve Body	8	Y-ring	B	Air Inlet for Valve Closing
4	Piston Seal	9	Washer		
5	Piston	10	Seat Seal		

### 3 Installation and Usage

- 3.1 Please choose the installation direction according to specific application conditions;
- 3.2 Before installation, please ensure to clean the pipelines, especially if they are new. Welding slag, rust and dust must be rinsed clean to prevent impurities from damaging the valve;
- 3.3 The pipeline should be supported firmly and without vibration. When installing a heavier valve, additional support is required to hang or prop up the valve to prevent damages to the valve and pipeline because of excessive weight or vibration;
- 3.4 Before valve installation, please check the model, parameters, specifications and connection types on the valve label, and ensure that the application

- requirements are satisfied. At the same time, please check the end cover, valve body, etc. to ensure that there is no visible damage;
- 3.5 When equipping the valve with control air supply, please ensure that the air source is dry and clean, and the capacity and pressure are enough for valve application;
- 3.6 Before valve installation, please close the pipeline and remove the pressure, and pay close attention to the danger of high-pressure or hazardous fluids in the pipeline;
- 3.7 When installing flanged valves, the flanges at both ends must be tightened diagonally. The rotation of bolts on one side should be controlled within one turn. Do not tighten only on one side, as this could cause tilting forces and negatively impact the usage;
- 3.8 Pay attention to protect the uninstalled valve body seal, seat and connecting threads from damage and



attachment of dirt and impurities.

### 4 Uninstallation and Maintenance

#### 4.1 Uninstalling Valves

4.1.1 Before uninstalling the valves, high-pressure fluid in the valves must be drained, and the medium pressure removed in the valve. If the medium is of high temperature, flammable, toxic or corrosive, it must be removed completely to prevent accidental damage to people and equipment.

#### 4.1.2 Uninstalling End Cover:

4.1.2.1 200 Series Shuttle Valve: Hold the valve body hexagons by clamping it with a vice. Use an appropriately sized wrench to hold the hexagons of end cover, and rotate the thread counterclockwise to remove the end cover.

4.1.2.2 201 Series Shuttle Valve: Hold the valve body directly by hand. Use an appropriately sized hexagonal wrench to rotate down the 6 hexagon socket screws of both

end-covers counterclockwise, to remove the end cover.

4.1.2.3 204 Series Shuttle Valve: Hold the valve by clamping the outlet end flange with a vice. Use a dedicated tool to snap it into the groove, and rotate the inlet end cover slowly counterclockwise to remove the end cover.

NOTE: When unscrewing the end cover or screw, slowly and evenly remove it, in order to prevent inner spring from ejecting end covers, causing danger and damage. Protect all packing surfaces during uninstallation to prevent damage, and keep records for reloading.



200 Shuttle Valve 201 Shuttle Valve

#### 4.1.3 Uninstalling Valve Seat Seal:

4.1.3.1 After uninstalling the end cover, take out the piston and packing by hand from the valve body, and then the packing in end cover and valve seat seal; protect piston outer circle edge to prevent damage.

4.1.3.2 200 Series Shuttle Valve: Hold the end cover directly by hand. Use an appropriately sized I-type wrench or special fork to rotate down the screws or pressing washer counterclockwise, to remove the valve core seat.

4.1.3.3 201 Series Shuttle Valve: Hold the end cover directly by hand. Use an appropriately sized I-type wrench or cross screwdriver to rotate down the screws counterclockwise, to remove the valve core seat.

4.1.3.4 204 Series Shuttle Valve: From the valve body outlet end, use an appropriately sized hexagonal wrench to rotate down the valve core screws counterclockwise, to remove the valve core seat.

NOTE: After uninstalling the parts, protect all sealing surfaces to avoid damaging, and properly store the accessories to avoid losing parts for some small accessories. Keep records for reloading.

4.1.3.5 Uninstalling Other Packings: Other packings mainly contain end cover inner and outer O-ring, Y-ring and piston seal on the piston. When uninstalling the packings, pay attention to avoid using sharp tools, and make sure to protect the sealing surfaces of the uninstalled packings and the valve itself, to avoid damaging or losing parts, and make records for reloading.

#### 4.2 Reloading Valves

##### 4.2.1 Reloading Valve Seat Seal

4.2.1.1 200 Series Shuttle Valve: Hold the end cover directly by hand. Reload the valve seat seal and other parts back according to the uninstallation reloading records. Use an appropriately sized I-type wrench or special



fork to rotate and tighten the screws or pressing washer clockwise, to reload the valve seat seal.

4.2.1.2 201 Series Shuttle Valve: Hold the end cover directly by hand. Reload the valve core seat seal and other parts back according to the uninstallation reloading records. Use an appropriately sized I-type wrench or cross screwdriver to rotate and tighten the screws clockwise, to reload the valve seat seal.

4.2.1.3 204 Series Shuttle Valve: Reload the valve seat seal and washer back according to the uninstallation reloading records. From the valve body outlet end, use an appropriately sized hexagonal wrench to rotate and tighten the valve core screws clockwise, to reload the valve seat seal.

NOTE: When tightening the screws or pressing washer, it is necessary to apply thread locking glue onto the

external thread full-circle for three-threaded wild, and then tighten it with a wrench. Tighten the valve seat seal to make it pressed evenly without warping. If the force is too large, the seat seal will be not flat because of curling edge.

4.2.2 Reloading Piston: Lubricant should be evenly applied in the piston packing groove. Carefully put the piston seal into the groove, and then lubricate once again on the outer circle of the piston seal.

NOTE: Before piston is installed into valve body and end cover hole, lubricate should be applied evenly on the inner surface of valve body and on the outer surface of the both end seals of the piston, then install the piston.

4.2.3 Reloading Other Packings: After maintenance and repair of the uninstalled valves, they should be installed back according to the uninstallation reloading records step by step.

NOTE: When installing the packings, they must be installed properly, with no distortion of the rubber ring. Before installing the washer, lubricant should be evenly applied in the corresponding area. Then install the seal and lubricate once again on the outer surface of the seal. Reasonable and effective application of lubricating oil is a prerequisite for ensuring proper and effective function of the valve.

#### 4.2.4 Reloading End Cover

4.2.4.1 200 Series Shuttle Valve: Hold the valve body hexagonal joints by clamping it with a vice. The relative parts should be installed back according to the uninstallation reloading records step by step. NOTE: Press the end cover by hand and rotate it into valve body thread. Use an appropriately sized wrench to fix the hexagon of the end cover, to rotate and tighten the end cover clockwise.

4.2.4.2 201 Series Shuttle Valve: Hold the valve body directly by hand. Then according to the uninstallation reloading records step by step, use an appropriately sized hexagonal wrench to rotate and tighten the 6 hexagon set screws of end covers clockwise to reload.

4.2.4.3 204 Series Shuttle Valve: Hold the valve body by clamping the outlet end flange, press the end cover into valve body by hand, and use a dedicated tool to snap it into the groove, to rotate the end cover clockwise to tighten.

#### 4.3 Reloaded Valve Inspection

For repaired valves, the offline pressure test must be performed. When there is no abnormality, it can be installed back in the pipeline for future usage.

4.3.1 Valve Seat Inspection: Compressed air can be passed through according to the valve arrow directions. Put the whole valve body and connection into the water, and keep the pressure for 30 seconds, to observe

whether there is any leakage on the outlet valve seat seal. Having no air bubbles means passing, otherwise it needs to be repaired again.

- 4.3.2 Other Sealing Inspection: Input 7 bar compressed air into the A inlet of the valve body platform. Put the B inlet part into water (pay attention to avoid the water entering inlets and chamber under the water), and keep pressure for 30 seconds to observe whether there is any leakage on the connection of B inlet and end cover. Having no air bubbles means passing, otherwise it needs to be repaired again. (NOTE: A and B inlets need to be inspected one by one)

#### 4.4 Valve Maintenance

Device inspections should be performed at least once a year. Short-term maintenance is recommended depending on the usage conditions. If you have any problems, please contact ESG sales team or email

[info@esgvalve.com](mailto:info@esgvalve.com).

## 5 Transit and Storage

- 5.1 Pay attention to protect devices from moisture, dust, and collision during transit and storage.
- 5.2 Recommended storage temperature: -20 ~ +65 °C.
- 5.3 Discarding devices improperly may negatively impact the environment. Please ensure that devices and packaging are disposed in an environmentally friendly manner.