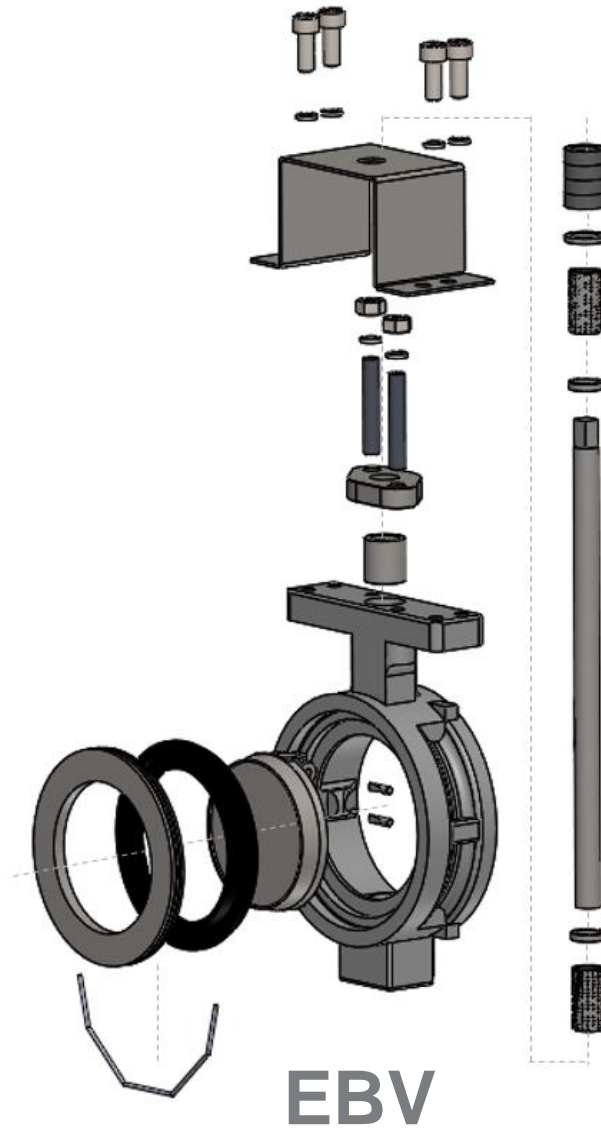


# OPERATING MANUAL



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# 1. Introduction

## 1.1. General information

In order to ensure a successful and safe operation of our valves the entire Operating Manual must have been read through and understood prior to installation and commissioning.

Should difficulties or questions arise that cannot be solved with the help of the Operation Manual, please contact the supplier/manufacturer.

This Operating Manual was compiled in accordance with the regulations of guideline 2014/68/EU and covers the areas of: installation/commissioning, maintenance, repair, storage, packaging, transport and disposal.

The operator is responsible for adhering to local safety regulations. When using the valve outside the Federal Republic of Germany, the operator must ensure that valid national regulations are adhered. The manufacturer reserves all rights of technical changes and improvements at any time.



**Caution**

**The disregard of the caution and warning notices may lead to hazards, which in turn may cause the warranty to become invalid.**



**Notes**

**Please keep this instruction manual in a safe place for future reference**

## 1.2. Target group

This Operation Manual is directed to people who are entrusted with the installation planning, installation, commissioning or maintenance/repair and have qualifications in accordance with their activities and functions. This also includes the knowledge of applicable accident prevention regulations, generally recognized safety regulations, EU guidelines and country-specific standards and regulations.

### 1.3. Manufacturer's contact address

Should difficulties or questions arise that cannot be solved with the help of the Operating Manual, please contact the manufacturer.

Our technical team and customer service officers are pleased to assist you with any question you may have.

**m-tech gmbh**  
Teslastr. 6  
74670 Forchtenberg  
Germany  
Phone: +49 7947 939-0  
Telefax. +49 7947 939-010  
E-mail: [info@m-tech-gmbh.com](mailto:info@m-tech-gmbh.com)  
Website: [www.m-tech-gmbh.com](http://www.m-tech-gmbh.com)

### 1.4. Personnel qualification

Transport, installation, commissioning, maintenance or repair must only be performed by trained or instructed personnel.

Work on electrical equipment of the device must only be performed by a qualified electrician or instructed people under the guidance and supervision of a qualified electrician according to the rules of engineering.

### 1.5. Safekeeping

Access to the entire Operating Manual must be guaranteed at all times at the place of operation of the valve in order to be able to look at it any time.

## 2. Safety instructions

### 2.1. General safety instructions

The valves comply with the state of the art and the recognized rules of technical safety, but dangers can still arise. Operate the valves only in perfect condition taking into account the entire operating manual.



**Caution**

**Use of material-incompatible media, exceeding the limit values of medium pressure and temperature and mechanical additional loads can result in failure of the valve material and bursting of the valve.**

### 2.2. Safety instructions for the operator

The persons entrusted with the installation, maintenance or repair must be qualified in accordance with their activities and functions.

Based on their technical training, experience and their knowledge of the applicable standards, the personnel must be able to evaluate the work entrusted to them, understand the interactions between valve and system and recognize possible dangers.

They must also have knowledge of applicable accident prevention regulations, generally recognized safety regulations, EC guidelines and country-specific standards and regulations and all application-based regional and company-internal regulations and requirements.

### 3. Product description

#### 3.1. Functional principle EBV

The double offset butterfly valves EBV series from m-tech is designed to cover a wide range of applications. The standard configuration is focused on general purpose applications in oil and gas pipelines, chemical and petrochemical, energy and power, pulp and paper, HVAC. Only use the valve with suitable media as neutral gases, water, alcohols, oils, fuels, hydraulic liquids, salt solutions, lyes, organic solvents, steam (180 °C). The EBV valves can be operated manually or automated with pneumatic or electrical rotary actuators, within the permitted pressure and temperature ranges.



Attention

The EBV series are not suitable for media with solid particles.

#### 3.2. Marking



Each EBV gets a type plate on the front side of the valve with following data:

Marking		Comment
Manufacturer	m-tech	Logo and address
Type	EBV	Double Eccentric Butterfly Valve
Serial Number	e.g. 34526 / EBV065NC202	number assigned to identify a specific valve and its associated information
Max service pressure	16 bar	Maximum allowed pressure
Test pressure	Shell (water) 24 bar, seat (gas) 6 bar	Test pressure body with water using a factor of 1.5 and test pressure seat with gas
Built	e.g. 2018	Assembly year
AB	e.g. 341257	Purchase order confirmation number
Flow direction		Marking of the flow direction



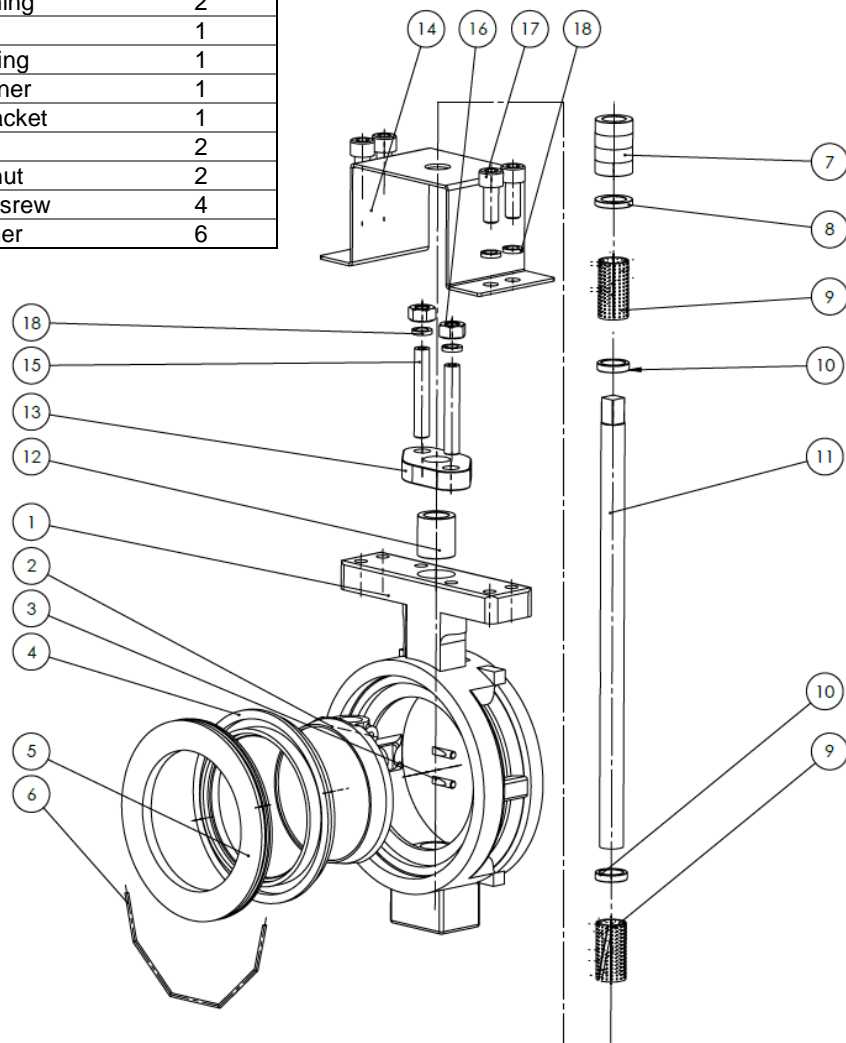
Attention

In order to be able to identify a valve, the type plate can not be damaged.

Do not remove, cover or paint over the type plate.

3.3. Part list and exploded view of the valve

Pos.	Part name	Qty.
1	Body	1
2	Disc	1
3	Pin	2
4	Seat	1
5	Seat retainer	1
6	Spring wire	1
7	Gland packing	1
8	Spacer	1
9	Stem bushing	2
10	Thrust bushing	2
11	Stem	1
12	Retaining ring	1
13	Gland retainer	1
14	Mounting bracket	1
15	Stud	2
16	Hexagon nut	2
17	Socket head screw	4
18	Lock washer	6



### 3.4. Tightening torque

The following table shows the recommended tightening torque for the packing of the valve.

Valve size		Gland retainer	
mm	Inch	Nuts	Torque (Nm)
DN50	2"	M8	6
DN65 – DN125	2 1/2" – 5"	M10	10
DN150	6"	M10	12
DN200	8"	M10	15
DN250	10"	M12	20
DN300	12"	M12	30



Attention

**Lower torques may lead to malfunction or leakages.  
Do not exceed tightening torques.**

### 4. Transport and storage

Valves have to be handled, transported and stored with care:

- The valve is to be kept in its original packaging and/or with the protection caps on the flange connections. The valve should be stored and transported (also to the installation site) on a pallet (or supported in a similar way).
- If stored prior to installation, the valve is to be stored in a closed room and to be protected against harmful influences such as dirt or moisture.
- Especially the flange connections must not be damaged by mechanical or any other influences.
- Valves must be stored in the same way they were delivered. The drive can not be activated.



Attention

**The valve must be transported carefully to avoid damage of the valve and operator.**



## 5. Installation

### 5.1. Preparation

Before installing the EBV, confirm that it is appropriate for the intended use and ensure that the pipeline is thoroughly cleaned of any contamination, especially of hard foreign substances.

If installation on existing pipeline, verify the distance between pipeline ends to be equal to face to face valve dimension. The gap, however, must not be larger than necessary so that no additional stress is generated in the pipeline during installation.



**Caution**

**Before starting the installation the pipeline must be fully depressurized and ensure that no pressure is trapped inside the valve.**

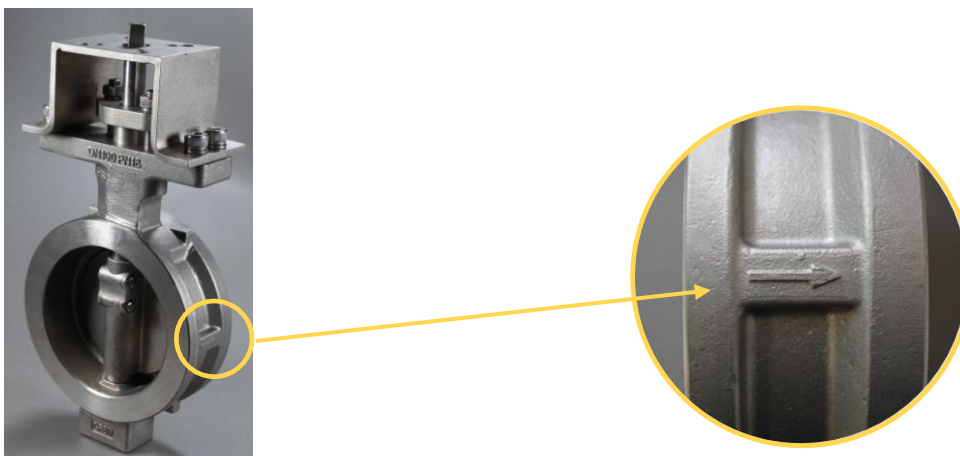


**Attention**

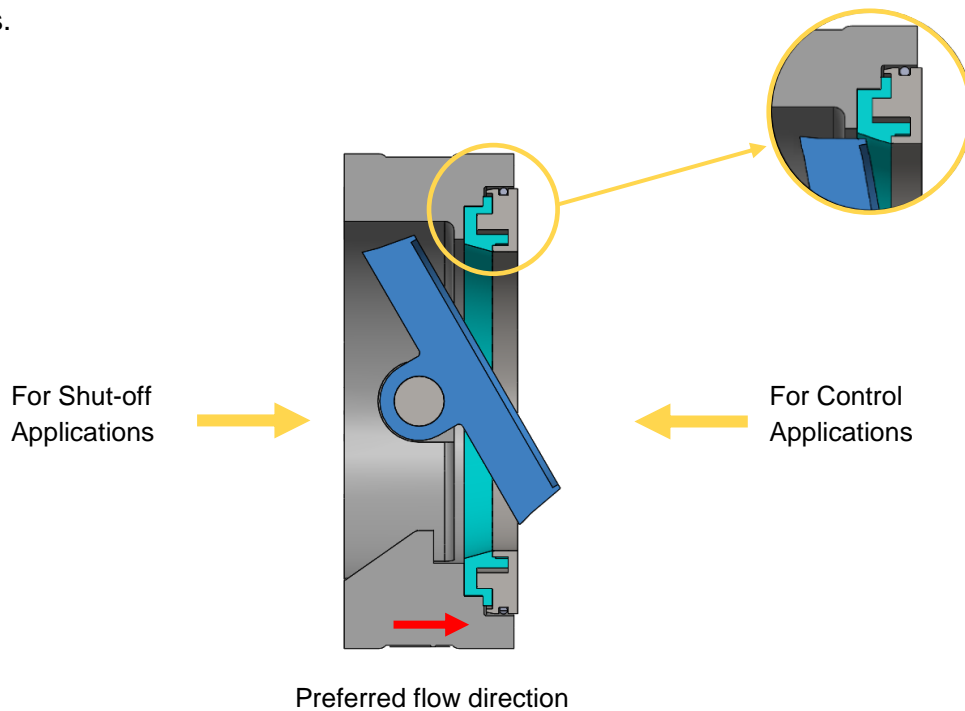
**The valve must be carefully transported to the installation site and can only be unpacked there.**

### 5.2. Installation

The EBV butterfly valves are bi-directional and can be used for both control and shut-off applications. All EBV valves are marked on the body with a preferred flow direction.



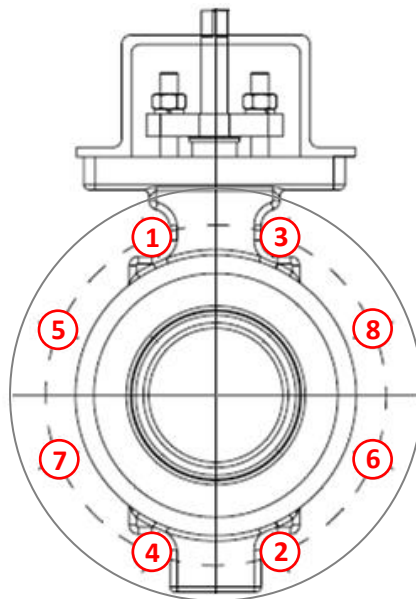
For shut-off applications, it is recommended to install the EBV in the preferred flow direction, because when the medium flows through the valve, the disc is pressed firmly into the seat as a differential pressure rise. As a result, a better sealing is achieved but the breakaway torque increases.



For control applications, it is recommended to install the EBV in the non-preferred flow direction, because when the medium flows through the valve, the valve disc is slightly pressed out of the seat. This reduces the pre-loaded pressure and the breakaway torque.

Please follow the next working steps to ensure a proper installation:

1. Transport the valve in the protective packaging to the installation site and unpack it only there.
2. Inspect the valve and actuator for any damages that may have occurred during transport. Damaged valves or actuators should not be installed.
3. Before the installation, a function inspection must be performed: The valve must open and close properly. Discernible malfunctions must be remedied prior to commissioning.
4. Ensure that only valves are installed with the pressure class, the connection type and connection dimensions which meet the application requirements. Observe the marking on the body valve.
5. Tighten the flange bolts crosswise according to the following diagram.



Attention

The valve fits only between flat face and raised face flanges. Suitable flange gaskets are required for the installation.

## 6. Operation

The EBV valve is a rotary valve, also known as quarter-turn valve. In order to operate the valve from the fully-closed position to the fully-open position or vice versa, is required just a quarter or 90° turn of the handle or actuator.

### 6.1. Manual operation



The EBV valve can be operated manually by hand lever or manual gearbox.

The EBV is in open position, when the hand lever is in line with the pipeline and in closed position, when the handle is perpendicular to the pipeline. It requires a quarter turn (90 degree turn) by turning the hand lever, in order to operate the EBV into the open and closed position. Clockwise to close and counterclockwise to open the valve.

## 6.2. Automated operation



The valve can be operated automatically with electric and pneumatic actuator, which must be properly selected to provide required torque for a safe operation of the valve.

For a correct automated operation, it is necessary to comply with the mounting and operating instructions of the actuator.



**Attention**

**Non-observance of these instructions may cause damage to the valve and pipe system.**

**If in doubt, please contact the actuator manufacturer**

## 7. Maintenance

### 7.1. General

For the maintenance of the EBV, m-tech has available for each valve size two different kind of spare part kits: seat and packing.

If other parts are required, m-tech recommends replacing the entire valve.



**Caution**

**Before starting any maintenance the pipeline must be fully depressurized and ensure that no pressure is trapped inside the valve.**



**Attention**

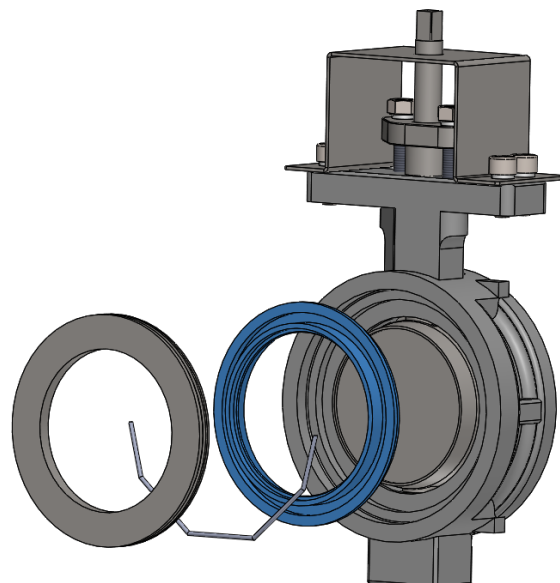
**The valve must not be taken out of service for more than a month.**



**Attention**

**Do not interchange parts with valves from other manufacturer or from different rated valves. M-tech will not be held liable if the valve is modified in any way without consent.**

### 7.2. Seat replacement



In order to perform the replacement of the seat, please follow the next working steps:

1. Ensure that the valve is in fully closed position.



**Attention**

**If the valve is equipped with an actuator, it is recommended to remove this to handle the valve better. Then ensure that the valve is closed, before removing it from the pipeline.**

2. After removing from the pipe system, place the valve carefully on the workbench and open it. Be careful not to damage the sealing edge of the disc or the mating face.



**Attention**

**Replace the entire valve and send it to the factory for repair if the valve is damaged with scratches and grooves.**

3. The seat retainer is fixed to the valve body with a spring wire. Take the seat retainer out from the valve tapping smoothly from the stem side with a wooden or plastic rod and a hammer. Do not strike the valve directly.
4. Remove the seat.
5. Clean the seat area and polish with the utmost care the disc sealing surface. Ensure that the sealing surface is free of any grooves and scratches.
6. Close the valve and put a new valve seat on the seat retainer.
7. Put the spring wire into the ring groove in the body and tap it to fix it at both ends. Ensure that the spring ends are completely embedded into the body groove to prevent spring popup.
8. Assembly the seat retainer with the seat into the body. Firstly, insert the retainer slot on the side where the spring is. Then tap the other side of the retainer into the valve body by using wood or plastic hammer.



**Notes**

Usually the end of a spring retainer can not be higher as the actual body. However, this has no effect as long as the retainer and the housing are pressed evenly through the flange.

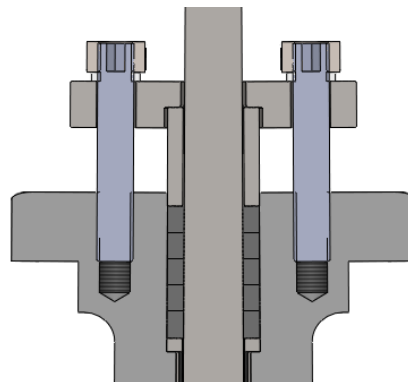
9. The valve is ready and can be mounted again on the pipeline in closed position.



**Notes**

After replacing the seat, the valve torque will be increased at the beginning cycles.

**7.3. Packing replacement**



In order to perform the replacement of packing, the valve should be properly supported.

1. Ensure that the valve is in fully closed position.



**Attention**

If there is an actuator, remove it for better handling. Then ensure that the valve is closed, before removing it from the pipeline.

2. Remove the actuator or the handle and the mounting bracket from the valve.

3. Remove the nuts, lockwashers and gland retainer.



**Attention**

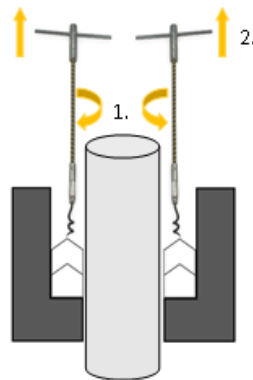
Do not remove the studs

4. Remove the retaining ring from the stem.
5. Remove the old packing using packing puller as illustrated below



**Attention**

**Do not damage the surface of the stem and packing area.  
After removing the old packing, it is not necessary to remove the spacer.**



6. Clean the stuffing box and remove all waste material.
7. Put the new packing rings in the correct orientation into the stuffing box.

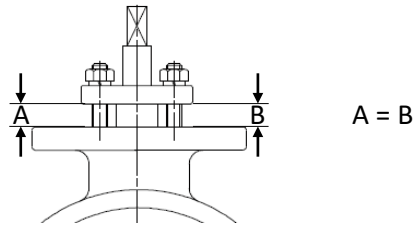


**Attention**

**For bigger valves, it may be necessary to compress each packing rings into the stuffing box before adding the next one**

8. Then assembly the retaining ring, the gland retainer, the lockwashers and the nuts.
9. Tighten the nuts crosswise and evenly until the nuts tightening torque ist achieved. The nuts tightening torque are indicated in section 3.3.





10. Operate the disc several times.

11. Reinstall the mounting bracket and then the actuator or the handle.