

<b>Product:</b>	Elastomer-lined butterfly valve
<b>Type:</b>	Centric
<b>Series:</b>	Z011 (A, B), Z014 (A, B), Z014 (WN), F012 (A), (K1/WN), BE250/BE300, M015 (A, K1), Z611 (A, C, K), Z614 (A, C, K), ViDos, TW80/TW100, TW150/200, Z411-A, Z414-A, Z011-AS, Z011-A INFLAS, Z011-WN INFLAS, Z014-A INFLAS, Z014-WN INFLAS
<b>Nominal widths:</b>	DN 20 - 2000

## Supplementary ATEX Operating Instructions

Any additional information which may be required can be downloaded from our website [www.ebro-armaturen.com](http://www.ebro-armaturen.com) or ordered from the following address:

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## 1 General information about this manual

### 1.1 Foreword

The original assembly instructions and operating instructions BA1.0-DGRL/MRL including technical appendix apply. These supplementary ATEX operating instructions provide additional information on the use of EBRO butterfly valves in a potentially explosive environment.

### 1.2 Basic safety instructions

The safety information in these supplementary ATEX operating instructions refers to the specific butterfly valve only. Additional hazards may potentially arise in combination with other components (attachments, e.g. actuators, sensors) and installation in system components. The owner/operator is responsible for considering these potential hazards. The generally applicable safety regulations and accident prevention regulations must be observed in addition to the information in these supplementary ATEX operating instructions! Work may only be done on the butterfly valve in an explosion-proof environment without pressure, cooled down and free of fluid.

### 1.3 Explanation of symbols

#### 1.3.1 Hazard symbols

The hazard symbols are used alongside the safety instructions and indicate dangers to people or property. They are used consistently throughout these supplementary ATEX operating instructions and must be observed.



General hazard



Hot surfaces



Corrosive



Explosive atmospheres

#### 1.3.2 Warning notices

Warnings are subdivided as far as possible into the following categories:

##### Signal word

**Nature and source of danger, including possible consequences of non-observance**

Explanation

- Measures required to avert the danger

##### Danger!

This sign warns of a situation of imminent danger which, if not avoided, will result in death or serious injury.

##### Warning!



This symbol warns of a potentially hazardous situation which, if not avoided, will result in death or serious injury.

##### Caution!

This sign warns of a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

#### 1.3.3 Design of the information symbols

The information symbols are used to flag up situations or activities where explanation is required to guarantee safe, proper and efficient handling of the butterfly valve.

Symbol	Meaning
	<b>Information</b> ... which must be noted.
	This symbol flags up special circumstances.

Any signs and symbols directly attached to the butterfly valve, such as warning signs, operating signs, direction of rotation arrows, component markings, type plate, ATEX markings, etc., must be observed. The attached signs and symbols must not be removed and must always be fully legible.

### 1.3.4 Aids and additional information

Cross references to diagrams and positions of the butterfly valve are shown in the following form:

Example: The shaft (Fig. 3-2/1) must...

Explanation: (Fig. 3-2/1) refers to position 1 in Fig. 3 in section 2.


## 1.4 Warranty and liability

The warranty and liability will depend on the contractually agreed terms and conditions. Please see the EBRO ARMATUREN GmbH terms of sale and delivery for warranty conditions.

## 1.5 Instructions for the owner/operator

The owner/operator is any natural or legal person who uses the butterfly valve or on whose instructions the butterfly valve is used. The owner/operator must ensure that the following requirements are met:

- The assembled and connected butterfly valve complies with the relevant directives.
- Only qualified personnel work on and with the butterfly valve.
- The personnel have access to the supplementary ATEX operating instructions when carrying out the relevant jobs and follow these instructions.
- Non-qualified personnel are prohibited from working on and with the butterfly valve.
- The necessary accident prevention regulations and safety regulations are observed when assembling or servicing the butterfly valve.

	Please read these instructions carefully before use. <b>Keep this manual for future reference.</b>
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## 1.6 Qualified personnel

Qualified personnel are persons who can carry out the necessary work on the butterfly valve as instructed on the basis of their training, experience and knowledge. They are most notably conversant with the relevant standards, provisions, accident prevention regulations and operating conditions, and have been authorised by the person responsible for safety to carry out the work required in any given case. They must be able to detect possible hazards and avoid these.

## 1.7 Instruction and training

As the owner/operator you are obliged to inform and brief the operating and maintenance personnel of any applicable safety and accident prevention regulations and about any safety installations relevant to working with the butterfly valve. The different professional qualifications of the employees must be considered here. The operating personnel must have understood the instructions. Measures must also be taken to ensure that the instructions are followed. This is the only way to ensure that your personnel engage in safety-conscious working practices. If further training is required for the operating personnel, please contact EBRO ARMATUREN GmbH to discuss the conditions.



Please take note of all the information in these supplementary ATEX operating instructions, especially the safety information. You must have read and noted the information before doing any work on the butterfly valve.  
Any use, configuration and variation other than set out in these supplementary ATEX operating instructions are considered improper and non-intended use of the butterfly valve!

## 2 Technical data

### 2.1 Correct use

After installation in a piping system, EBRO butterfly valves are designed to shut off, direct or regulate the flow of appropriate fluids within the approved pressure and temperature limits.

### 2.2 Technical specifications

Additional information is provided in these supplementary ATEX operating instructions on the use of the butterfly valves in explosive atmospheres.

The original assembly instructions and operating instructions BA1.0-DGRL/MRL including technical appendix are fundamental requirements. They contain important information and safety instructions for the safe handling and operation of the butterfly valve.

Further data sheets relevant to the type of butterfly valve and containing additional information and technical data are available on the EBRO website.

Technical information on the butterfly valve can be found on the type plates and in the delivery note.

### 2.3 Nominal widths

DN 20 - 2000

Explosion-proof butterfly valves (Z 011-A, Z 014-A and Z 014-WN) designed to specification up to DN 600.

### 2.4 Fittings (interface)

Mounting flange conforming to DIN EN ISO 5211

EBRO butterfly valves can be operated manually, hydraulically, pneumatically or electrically.

### 2.5 Temperature range

The usual ambient conditions apply:

- Temperature range -20°C to +60°C
- Pressure 80 kPa (0.8 bar) to 110 kPa (1.1 bar)
- Air with the usual oxygen content

Different ambient conditions are to be assessed by the owner/operator.

ViDos model restricted to the operating temperature ( $5^{\circ}\text{C} \leq T_a \leq 40^{\circ}\text{C}$ ).

Explosion-proof butterfly valves of type Z 011-A, Z 014-A and Z 014-WN restricted to the operating temperature ( $xx^{\circ}\text{C} \leq T_a \leq xx^{\circ}\text{C}$ ), depending on the materials used.

The maximum operating temperature (TS) and the maximum operating pressure (PS) of the butterfly valve depend on the material and must be taken into account when placing purchase orders (pressure, temperature, fluid). The butterfly valve component materials are selected in the purchase order on the basis of the operating conditions. Due account must be taken of the specifications in the original assembly instructions and operating instructions including technical appendix (BA1.0-DGRL/MRL) in the section featuring the pressure/temperature diagram (P/T ratings).

## 2.6 Pressure rating

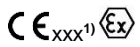

The pressure (PS) and temperature (TS) levels indicated on the butterfly valve must not be exceeded.

## 2.7 Labelling

The butterfly valves designed for ATEX zones carry an additional ATEX plate in addition to the standard type plate for the butterfly valve.

Do not cover or paint over the type plate.

Information on the additional ATEX plate



 II xxx<sup>2)</sup> Ex h<sup>3)</sup> xxx<sup>4)</sup> xx...xx<sup>5)</sup> X<sup>6)</sup> xx<sup>7)</sup>  
 II xxx<sup>2)</sup> Ex h<sup>3)</sup> xxx<sup>4)</sup> Tx<sup>5)</sup> X<sup>6)</sup> xx<sup>7)</sup>  
 -xx°C ≤ Ta ≤ +xx°C <sup>8</sup>

1)	The <b>CE</b> mark must be followed by the number of the notified body which was responsible for equipment of category 1 during the production inspection phase.
2)	The butterfly valve as supplied is marked with the relevant equipment category according to the purchase order. Equipment group II - other areas (above ground) Equipment category 1 - gases/vapours G, suitable for zone 0 - dust D, suitable for zone 20 Equipment category 2 - gases/vapours G, suitable for zone 1 - dust D, suitable for zone 21 Equipment category 2 - gases/vapours G, suitable for zone 2 - dust D, suitable for zone 22 When using "/": inside / outside
3)	The code letter "h" is the symbol for non-electrical equipment.
4)	Explosion group example: IIB (gas), explosion group IIIC (conductive dusts)
5)	Temperature class example: T6 (gas), max. surface temperature T80°C (dust)
6)	"X" note special conditions: ambient temperature range -20°C ≤ Ta ≤ +60°C No aluminium with Ga or 1G outdoors
7)	Equipment protection level example: Gb (high protection level) (gas), equipment protection level Db (high protection level) (dust)
8)	Ambient temperature range, permissible temperature range in the explosion pressure shock-resistant design, or ViDos

### Example ATEX type plate

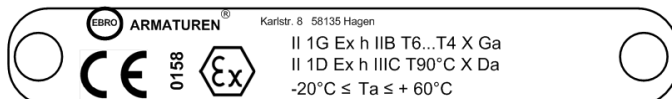


Fig. 1-2.7/1

### Example ATEX type plate for explosion-proof butterfly valve

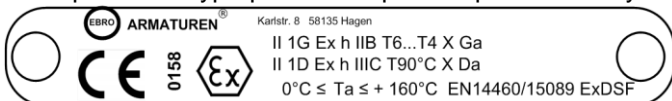



Fig. 1-2.7/2

ExDSF: explosion pressure shock-resistant

### 2.7.1 Reference to sales contract

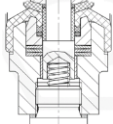
	Important information on the design of the butterfly valve can be found in the sales contract or delivery note. When addressing queries to the EBRO after-sales service department, please state the sales contract number and order item or the serial number, e.g. 123456 (from the standard type plate).
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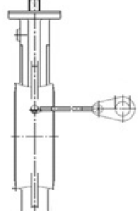
**For:**  
 Manufacturer:  
 Type:  
 Nominal width DN:

**Design/Example**  
 EBRO  
 Wafer-type butterfly valve Z 011-A  
 125

PN (bolt circle):	PN 6/10/16 - EN 1092-1 / Class 150 - ASME B16.5
Housing material:	EN-JL1040 (GG25)
Installation length:	DIN EN 558, GR 20
Coating system:	EBRO CS2
Housing colour:	EBRO blue
Head/mounting flange:	F 05 - EN ISO 5211
Liner material:	NBR white, EG
Liner design:	Loose, without bevel
Disc material:	1.4408
Disc-shaft connection design:	Dual shaft, plug-in
Disc surface:	High-gloss mirror finish Ra 0.4 µm
Max. operating pressure:	10.00 bar
Shaft material:	1.4104
Shaft end design:	V=14x17mm / L=17mm
Shaft seal material:	NBR
Bearing material:	Brass
Lower housing closure:	Locking screw 1.4408
Anti-static design:	1 earthing clip, 1 contact spring
Flange sealing face:	Spherical
Pressure test:	DIN EN 12266 - P12
EX approval:	Atex type test certificate
Category G:	II -/2G Ex h IIB T6...T5 X -/Gb
Category D:	II 1D/2D Ex h IIIC T80°C X Da/Db
Temperature range (ATEX):	-20°C ≤ Ta ≤ +60°C

## 2.8 Anti-static design


	A contact spring ensures metallic contact between the shaft and the locking screw on butterfly valves > DN 32. Electrostatic charge can therefore be conducted away from the inside to the housing.
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	The earthing clip on the butterfly valve housing is used for the connection to the equipotential bonding system.
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## 2.9 Configuration

### 2.9.1 Notes on safe operation

	The butterfly valve is designed for safe operation in explosive atmospheres (gases, exhalations, vapours or particles), as specified in the purchase order. It may not be used in hybrid mixtures. Hybrid mixtures are mixtures of air and flammable substances in different states of matter. Butterfly valves of explosion pressure shock-resistant design are also flameproof for protection in explosions of hybrid mixtures with explosion processes comparable to those encountered with propane/air mixtures.
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### 2.9.2 Insulating elastomers

Liners (elastomers) suitable for use in explosive dust areas:  
DEKRA EXAM-approved, electrostatic properties, IEC 60079-32-2

Elastomer	Colour	Mixture	Max. TS	Ignition temperature	Glow temperature	Min. ignition energy
			TF	≥ 3/2 * TF	≥ TF + 75°C	
NBR	White	C721-08, CL700-08, C710-08	80°C	120°C	155°C	> 1mJ
EPDM	White	D723-08, DL700-08, D710-08	110°C	165°C	185°C	> 1mJ
FKM	White	IL700-08, I710-08	160°C	240°C	235°C	> 1mJ



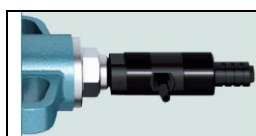
### 2.9.3 Conductive elastomers

Conductive liners must be used for a potentially explosive gas application involving liquid inside the butterfly valve. These can also be used in explosive dust applications:  
DEKRA EXAM-approved, electrostatic properties, IEC 60079-32-2

Elastomer	Colour	Mixture	Max. TS	Ignition temperature	Explosion group
			TF	$\geq 1.25 * TF$	
NBR	Black	C633-01, C739-01	90°C	113°C	IIC
EPDM	Black	D732-01, D735-01, D744-01, D749-01,	120°C	150°C	IIC

The owner/operator must carry out a risk assessment to identify electrostatic ignition hazards which may occur during the transport of the fluid due to its electrostatic properties and take any necessary measures to eliminate such hazards.

### 2.9.4 ViDos design




#### Vibration function

The NTS EL vibrator gets the disc into a linear vibration horizontally. The frequency of the vibration is controlled by the compressed air.

The pneumatic linear vibrators in the NTS EL range are the only pneumatic piston vibrators which may be used in potentially explosive areas outside the butterfly valve.

In addition to other technical data, the marking on the pneumatic impactor contains the following information which must be noted by the owner/operator:

 II 2G c IIB T5	 II 2D c T100°C
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	<p>Before using the pneumatic linear vibrators in the NTS EL range supplied by NetterVibration, it is essential to read and follow the operating instructions for Netter pneumatic linear vibrators in the NTS 120 (HF, NF) EL to NTS 350 (HF, NF) EL range in BA No. 1477.</p> <p>The declaration of conformity of NetterVibration is mandatory and must be complied with!</p>
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## 3 Operation

### 3.1 Use in explosive environments

These instructions cover additional safety advice in respect of foreseeable risks during the installation, connection, operation and disassembly of the butterfly valve in a potentially explosive atmosphere. The following points are important if EBRO butterfly valves are operated in an explosive atmosphere:


- Butterfly valves to be designed for explosive atmospheres (cf. section 2).
- Reference to be made to original assembly instructions and operating instructions BA 1.0-DGRL/MRL including technical appendix.
- The safety regulations applicable to butterfly valves, control systems and actuators are the same as for the piping system in which they are installed.
- The associated documentation (operating instructions, explanations) supplied by manufacturers of individual components must be observed in full.
- It is the responsibility of the owner/operator to assess the specific local risks and to add to these instructions where applicable in respect of the location.

- Butterfly valves made of aluminium or aluminium alloys may not be used in equipment category 1 (zone 0) in direct contact with the potentially explosive atmosphere as there is a risk of explosion from sparks on impact, friction or abrasion.
- Substances which are sensitive to impact or friction in relation to their flammability or explosive capacity (e.g. according to Class 4.1 ADR) and hybrid mixtures may not be conveyed.
- The butterfly valve is not suitable for conveying or metering self-reactive substances.
- Potential sources of ignition (e.g. glowing or burning particles, smouldering embers, foreign bodies) must be kept out of the butterfly valve during operation.

	<p>A risk of ignition on impact or friction must be avoided in the case of aluminium enclosures in zone 20; the following limits must not be exceeded:</p> <ul style="list-style-type: none"> <li>• <b>Impact speed &lt; 1 m/s</b></li> <li>• <b>Impact energy &lt; 500J</b></li> </ul>
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### 3.2 Information on the sealing collar

Before use, check whether the collar meets the relevant requirements (section 2.9.1). The sealing collar must be in perfect condition for the butterfly valve to form a tight seal in the pipeline during operation.

	<p>Check the sealing collar regularly as the liner thickness may be worn down during operation.</p>
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Only non-chargeable goods must be conveyed to ensure safe operation in potentially explosive atmospheres of zones 20, 21 and 22. Goods are non-chargeable if their specific contact resistance is less than  $10^8 \Omega$ .

**Important information relating to the INFLAS model with inflatable collar:**

	<p><b>The valve disc must be closed when supplying the collar with compressed air! The disc must be opened and closed at zero pressure otherwise the collar may be damaged.</b></p>
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### 3.3 Compressed air

Take air from the explosion-proof ambient air outside the explosive zone for the compressed air supply to the inflatable collar of the INFLAS butterfly valve. Ensure that the compressed air supply does not contain any components or particles which could increase any explosion hazard. The compressed air supply must not cause the temperature to rise above the limit.

#### **Danger!**



**Risk of fatal or serious injury to operating personnel or passers-by from the compressed air supply in the hazard zone.**


Measures must be taken when operating the INFLAS butterfly valve to ensure that the compressed air does not pose any risk of explosion.

- Take compressed air from the area outside the hazard zone.
- Filter compressed air before admission to the butterfly valve.
- Monitor the temperature of the compressed air.

### 3.4 Surface temperature

The surface temperature mainly depends on the operating conditions (e.g. fluid, insulation).

The operating temperature (TS) limit must not be exceeded. The pressure/temperature diagram (P/T ratings) must be observed (cf. original assembly instructions and operating instructions BA1.0-DGRL/MRL including technical appendix).

	<p>The surface temperature limit is specified for the purposes of assessment in the ATEX area in practice. Temperature classes (T1 to T6) and the permissible surface temperature in TXX°C are defined to this end and indicated on the additional ATEX type plate.</p> <p><b>The owner/operator must analyse this risk.</b></p>
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The table below acts as a reference for the calculation of the maximum permissible surface temperature in the application in any given case. The safety margin for equipment category 1D is to be decided by the owner/operator.

Liner material	Marking on the butterfly valve	Temperature class	Maximum surface temperature (explosive gases)			Marking on the butterfly valve	Maximum surface temperature (explosive particles)
			Equipment category 1G	Equipment category 2G	Equipment category 3G		Equipment category 1D-3D
<b>NBR (black)</b>	<b>T6...T5</b>	T6	68°C	80°C	80°C	<b>T90°C</b>	90°C
		T5	80°C	90°C	90°C		
<b>EPDM (black)</b>	<b>T6...T4</b>	T6	68°C	80°C	80°C	<b>T120°C</b>	120°C
		T5	80°C	95°C	95°C		
		T4	108°C	120°C	120°C		
<b>NBR (white)</b>	<b>T6</b>	T6	68°C	80°C	80°C	<b>T80°C</b>	80°C
<b>EPDM (white)</b>	<b>T6...T4</b>	T6	68°C	80°C	80°C	<b>T110°C</b>	110°C
		T5	80°C	95°C	95°C		
		T4	108°C	110°C	110°C		
<b>FKM (white)</b>	<b>T6...T3</b>	T6	68°C	80°C	80°C	<b>T160°C</b>	160°C
		T5	80°C	95°C	95°C		
		T4	108°C	130°C	130°C		
		T3	160°C	160°C	160°C		

 **Danger!**




**Danger to life due to increased surface temperature of the butterfly valve in a potentially explosive atmosphere.**

Impact of heat through fluid, from outside, e.g. sunlight, must not lead to an increase in the surface temperature.

- Do not exceed the permissible temperature range of the butterfly valve.
- Protect the butterfly valve from strong sunlight.
- Monitor the temperature.

### 3.5 Risk posed by foreign bodies

There may be possible ignition hazards due to the entry of foreign bodies, e.g. metal pieces in the pipework. This risk is entirely related to operational circumstances and must be analysed by the owner/operator. The penetration of foreign bodies through the housing can be ruled out as a general principle due to the safety requirements for pressure equipment built into the design of the components.

	<p>The entry of foreign bodies from upstream systems through the piping system which will be connected must be prevented with a very high degree of certainty.</p>
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### 3.6 Electrostatic charge

#### 3.6.1 Electrostatic charge through the fluid

The liquid flowing through a piping system can generate an electrostatic charge as a result of separation /friction processes and this can cause a hazard.

Requirements:

- The housing of the butterfly valve must be earthed as prescribed.
- This earthing must be permanently redundant for the use of the butterfly valve in zones 0 and 20.
- A suitable liner must be used.

Redundancy:

- The butterfly damper is permanently earthed with its earth connection on site in the equipotential bonding of the system.

At the same time, the connection between the housing and mating flange has an equipotential bonding function (discharge resistance  $<10^9 \Omega$ ), e.g. through the use of conductive flange gaskets and non-insulating coated pipe flanges.

#### 3.6.2 Electrostatic charge from plastic hoses (where applicable)

Electrostatic charging cannot be ruled out in a butterfly valve with inflatable liner (INFLAS) due to friction between the condensate and the inner surface of the compressed air hose in conjunction with the flow of compressed air.

These charges can become a hazard in the event of an inadvertent discharge. They must therefore be avoided.

- Ensure that the maintenance unit is checked at regular intervals and that any water which has collected is drained off.

Solid particles within the compressed air and moving along the inner surface of the hose can also cause electrostatic charge.

- Use a fine filter and install it in a suitable place. A suitable place for the fine filter is before the compressed air passes through the plastic hose if used.

### 3.7 Coatings

Butterfly valves can have a coating ex factory or according to order. The coating for an explosive atmosphere must be specified when placing the purchase order.

Butterfly valves with ATEX type plate are safe to use as indicated on the plate.



**An additional coating of paint or varnish may not be applied.**

### 3.8 Dust deposits

Layers of dust on the butterfly valve can diminish the heat exchange between the butterfly valve and the ambient air. This can result in a heat build-up. Any existing deposits or dust layers must be removed in order to ensure that the surface temperature does not exceed the permitted limit.



**Blasting down with compressed air must be avoided as an explosive atmosphere might be generated by swirling dust.**

If large amounts of dust are present, the valve must be cleaned more frequently.



**The dust layer must not be more than 1 mm thick.  
Processes which generate strong charges are not permitted in outdoor areas.**

**⚠ Danger!****Danger to life through ignition of dust in a potentially explosive atmosphere.**

In case of deposits (dust) on the butterfly valve surface, it is imperative that heat from external sources, e.g. solar radiation, fluid in the pipeline, does not lead to a critical increase in the surface temperature.

- Remove dust deposits from the butterfly valve regularly.

**3.9 Explosion-proof butterfly valves**

Explosion-proof butterfly valves are butterfly valves with discs designed for a higher pressure rating so that they can withstand an explosion without bursting.

The use of explosion-proof butterfly valves will not prevent the occurrence of an explosion but it will mitigate the effects.

The butterfly valves will only function as intended in closed position without additional measures.

Explosion-proof butterfly valves must be ordered where applicable.

The ATEX type plate includes the information "EN14460/15089" and "ExDSF".

ExDSF: explosion pressure shock-resistant.

The explosion-proof butterfly valve is not an autonomous protective system as defined in Directive 2014/34/EU. Explosion resistance and flame arresting properties have been tested in accordance with EN 15089:2009.

The design as explosion-proof device can also be found in the order confirmation.

The pressure (incl. explosion pressure) of the explosion-proof version of the butterfly valve must not exceed **PS**. Available versions: 1, 3, 6 and 10 bar. The explosion pressure depends on the system pressure. When closed, the butterfly valves of this type arrest flames in case of explosions of organic particles in dust explosion classes St1 and St2.

Explosion-proof butterfly valves in a nominal width of  $\leq$  DN 300 of the PS 10 bar type (with one continuous shaft) act as flame arresters when closed in case of organic particles and light metal particles (St3). The maximum explosion pressure above atmospheric acting on the butterfly valve must not exceed 10 bar.

	Max. explosion pressure			
Version [PS]:	1 bar	3 bar	6 bar	10 bar

**3.9.1 Important information for your safety after an explosion**

The butterfly valve is built in conformity with the latest standards of technology and the accepted safety requirements. There can be risks to life and limb of users or third persons following an explosion in the system.



**Heed and follow the safety instructions issued by the system owner/operator.**

The butterfly valve should be replaced following an explosion.

Maintenance or repair work on an explosion-proof butterfly valve may only be carried out by the manufacturer who will check whether the valve essentially meets the requirements laid down for explosion-proof equipment.

Hazards may arise before removing the butterfly valve:

- These hazards must be assessed and eliminated by the owner/operator.
- There must be no danger for the user.

**⚠ Danger!****Risk of fatal or serious injury to operating personnel or passers-by from operating materials, hazardous substances, fluid, high pressure or negative pressure.**

Care must be taken when opening the butterfly valve after an explosion as there is a risk of liquids, air, gases and solids under high pressure spurting out. However, there may also be low pressure in the system once the combustion gases have cooled down.

- Follow instructions and directives issued by the owner/operator.

- Release the pressure before removing the butterfly valve from the pipeline.
- Use the personal protective equipment specified in the safety data sheet (owner/operator) for the handling of the hazardous substance in any given case.

### **Warning!**



#### **Risk of fatal or serious injury to operating personnel or passers-by from hot surfaces.**

Hot surfaces may be present after an explosion as a result of the combustion gases. There is a risk of severe injuries or burns in case of contact with the hot surfaces of the butterfly valve.

- Allow the hot surface of the butterfly valve to cool.
- Measure the temperature of the surface.
- Wear personal protective clothing.

### **3.9.2 General information on the protective effect**

Mechanical abrasion, corrosion, contamination and coatings can affect the protective effect.



Visual inspections must be carried out at regular intervals to check the disc and liner for wear and damage.

The ease of movement and function of the valve disc and the tightness of the disc in closed position must also be checked regularly.

### **3.10 Transport, handling and storage**

Leave the butterfly valve slightly open in its original protective packaging. Padding is needed for protection in transit. Use suitable transport/lifting equipment. Leave protective covers on the butterfly valve until just before installation. Packaging must be disposed of properly.

Recommended storage conditions:

- Room temperature > 5°C, < 25°C
- Relative air humidity 50 to 60 %
- Darkened room (protection from direct sunlight)
- Room free of explosive atmosphere

### **3.11 Assembly, installation and start of operation**

#### **3.11.1 Required tools**

Use tools which are suitable for installation and assembly (not supplied with the product).

#### **3.11.2 Assembly**

Follow the original assembly instructions and operating instructions BA 1.0-DRGL/MRL including technical appendix.

#### **3.11.3 Safety instructions for installation**



The installation may only be carried out by qualified personnel.

##### **Installation in an explosion-proof atmosphere.**

The inside diameter of the pipes must correspond to the nominal diameter of the butterfly valve.

Check the pipeline connection fitting and clean if necessary.

Checks on the pipe sections:

- Check that they are not subject to any stress or vibration
- Check that they are plane-parallel and aligned

Inspect the butterfly valve before installation, making sure that it is clean and has not been damaged in transit. Do not install the butterfly valve if it is damaged or dirty.

### 3.11.4 Information on the electrical installation

Butterfly valves do not contain any electrical components. Electrical components can be supplied for installation with the product (e.g. electric actuator, sensors). The owner/operator is required to check the marking on the components before start of operation in order to ensure that they are designed for potentially explosive atmospheres. The documents provided by the suppliers apply to electrical components.

The applicable national regulations and provisions must be observed.

**⚠ Danger!**



**Risk of fatal or serious injury to operating personnel or passers-by due to electrostatic charge/electric shock.**

Electrical equipment and components may only be connected by a qualified electrician. There is a risk of electric shock from electrical installations and exposed terminals if these are not connected correctly.

- Earth the actuator and butterfly valve.
- Work on electrical connections may only be carried out by qualified specialists with the supply voltage switched off and with measures in place to prevent it from being switched back on.

**⚠ Danger!**



**Risk of fatal or serious injury to operating personnel or passers-by from ignition of an explosive atmosphere by electrostatic charge.**

When assembling and operating the butterfly valve, make sure that the butterfly valve and any attached components (e.g. actuator) are earthed.

- Connect the butterfly valve to a fixed earthing point to provide safe earthing.
- The butterfly valve must be permanently included in the equipotential bonding system.

### 3.11.5 Information for work on the pneumatic system (INFLAS butterfly valve)

There are two connections for compressed air on the INFLAS butterfly valve housing. The pressure lines must be depressurised before beginning any work on the butterfly valve or on the compressed air components.

Do not operate the INFLAS butterfly valve if it is not in safe working order. The INFLAS valve must not be operated if there are visible signs of external damage or leakage at the compressed air connections.

**⚠ Danger!**



**Danger of fatal or serious injury to operating personnel from uncontrolled start-up of valve parts.**

- The INFLAS valve must be safely installed in a pipeline before the pneumatic system is switched on. Follow instructions and directives issued by the owner/operator.
- The pneumatic components must be connected by a qualified specialist.

### 3.11.6 Information on mechanically generated sparks due to the use of actuators

Impacts on the valves must not exceed the guide values for category 1G (60Nm) and category 1D (125Nm).



**The valve movement must not exceed 1m/s.**

**The max. drive power for electr. and pneumatic actuators  $P < 3$  kW.**

**Danger!**

**Risk of fatal or serious injury to operating personnel or passers-by from ignition of an explosive atmosphere.**

Exceeding the maximum permissible torques of the butterfly valve by an actuator can lead to a potential ignition source due to impact energy if components of the butterfly valve are destroyed.

- Do not exceed the butterfly valve torque limits.
- Actuator and torque cut-off in case of overload.

### 3.12 Checks before start of operation

The final process which should be carried out after installation and before start of operation is to flush the pipeline with the butterfly valve open. The butterfly valve should then be operated with the usual manual force. Rectify any visible malfunctions before start of operation.

#### 3.12.1 Pressure testing

The test conditions for the pipeline section apply for the pressure test on the butterfly valve in the installed pipeline system – but with the following restrictions:

- The test pressure for the butterfly valve must not exceed **PSx1.5** (PS: butterfly valve type plate). Test the valve in open position.
- Apply **PSx1.1** for the end sealing test (closed butterfly valve).

**Warning!**

**Potentially hazardous situation through fluid ejection which, if not avoided, will result in death or serious injury.**

The butterfly valve is under pressure from the fluid and might leak. Do not use the butterfly valve as an end gate.

- Close the pipe end at the butterfly valve with a blank flange.
- Cordon off the test area.
- Only use suitable equipment and safe means (e.g. water) to check for leaks.
- If fluid escapes under high pressure, move away from the danger zone. Cordon off the danger area. Depressurise the piping system.

#### 3.12.2 Functional testing

The shut-off function of the butterfly valve must be tested before start of operation by switching it on and off several times when installed.

#### 3.12.3 Earth connection testing

Connect the earthing cable to the earthing connection on the system. Check the contact resistance at the following points:

- between the earthing cable and the actuator shaft
- between the actuator shaft and the earth connection of the system

The leakage resistance must have a value of  $< 10^6 \Omega$ .


### 3.13 Operation

The valve is operated by the handle or hand wheel on the gear unit. To close the butterfly valve, push/turn the handle/hand wheel clockwise as far as it will go. If fitted with a handle, the close position is reached when the handle is perpendicular to the direction of flow. If fitted with a hand wheel, see the display on the gear unit. To open the butterfly valve, move/turn the handle/hand wheel anticlockwise as far as it will go. When the handle is parallel to the direction of flow, the butterfly valve is open. In case of the hand wheel, see the position indicator on the gear unit.



### 3.14 Manual mode/automatic mode

The butterfly valve with manual control requires normal manual force to operate.

	Do not use extensions on the handle to open/close the butterfly valve. Use the hand wheel as the butterfly valve could be destroyed.
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It is possible to retrofit the butterfly valve with an actuator. Please note the torque specifications on the data sheet for the butterfly valve in this regard. The owner/operator is responsible for the retrofit.

#### **Danger!**




#### **Risk of fatal or serious injury to operating personnel or passers-by due to change of actuation mode.**

A change in the actuation mode can lead to additional hazards, e.g. crushing of hands during automatic operation without protective equipment. Damage may be caused to the butterfly valve by oversized or unsuitable actuators.

- Only operate the valve when installed in a pipeline system/protective system.
- Observe regulations, guidelines, accident prevention regulations, data sheets and operating instructions issued by the owner/operator. Hazards must be assessed by the owner/operator.

## 4 Maintenance

Please also read and follow the maintenance instructions for EBRO butterfly valve series Z, F, M, TW (WA 1.0).

	Butterfly valves must not be repaired in potentially explosive environments as it is possible/inevitable that sparks will be unintentionally generated by tools on impact. It is therefore imperative to remove the valve and repair it in a safe environment. Users must ensure that there is no potentially explosive atmosphere escaping during disassembly.
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### 4.1 Safety information relating to maintenance

#### **Danger!**



#### **Risk of fatal or serious injury to operating personnel or passers-by from butterfly valve under pressure (fluid).**

Discharge the pressure and fluid from the pipeline before removing the butterfly valve.

- Do not work on the pipeline or butterfly valve until they are depressurised.

#### **Warning!**



**Potentially hazardous situation through ejection of fluid and residues from butterfly valve, which, if not avoided, will result in death or serious injury.** The butterfly valve may be contaminated through the fluid with chemical substances (e.g. toxic, flammable, corrosive).

- Observe the same safety regulations of the owner/operator for the piping system.
- The danger must be assessed by the owner/operator.
- If fluid escapes under high pressure, move away from the danger zone and cordon off the danger area.
- Depressurise the piping system.


#### **Caution!**



**Potentially hazardous situation which, if not avoided, could result in minor or moderate injury.**

The butterfly valve could be hot due to the fluid throughput. Contact may cause burns.

- Allow components to cool down.


	<p>Maintenance work to be done by qualified personnel only.</p> <p>Take the pipeline section out of service and take measures to prevent it from being switched on again.</p> <p>Wait until the pressure has been discharged from the pipeline and butterfly valve.</p> <p>The butterfly valve must be free of pressure and fluid. Ensure that the residual fluid does not escape from the pipeline in an uncontrolled manner.</p> <p>The owner/operator is responsible in case of improper maintenance.</p>
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## 4.2 General information

The butterfly valve requires no servicing but should be integrated into the maintenance cycle and inspection of the system. The servicing frequency will depend on the use of the butterfly valve. The user should consider the following factors when deciding on the maintenance interval: fluid type, flow rate, operating frequency, pressure, medium and temperature. External visual inspections should be carried out regularly to check that the butterfly valve is not damaged or leaking. If the closure is not tight or if preventive measures are required, the butterfly valve can be refitted with a minimum number of components which do not require machining. Only use original spare parts supplied by EBRO Armaturen GmbH.

Procedure recommended by EBRO Armaturen GmbH:

- Routine visual check of internal surfaces after  $\approx$  1,000 operating hours to verify tight fit and firm seating
- Routine check of shaft bearing after  $\approx$  3,000 operating hours to verify ease of movement The actuator will need to be dismantled temporarily for this purpose, unless it is a valve which is manually actuated by hand wheel/hand lever
- Routine check after  $\approx$  10,000 operating hours by the manufacturer (the valve will need to be sent back to the manufacturer for this purpose) who will perform the following tests in accordance with DIN EN 12266, Part 1 and Part 2:
  - Pressure testing P10
  - Leakage test P11 and P12
  - Functional testing F20
- Visual check of all functional parts, particularly of the seating and shaft bearing
- The routine check after 10,000 operating hours can be adapted to the operating conditions

	The owner/operator will be responsible for any damage caused to the butterfly valve through the use of non-original spare parts.
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	Please contact the after-sales service department at EBRO ARMATUREN GmbH if you have any questions regarding maintenance, especially about disassembly, assembly, drawings, data sheets, spare parts and replacement butterfly valves.
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## 4.3 Replacing the actuator

Never change the hand lever while still installed. The notch on the shaft indicates the position of the disc. When mounting the hand lever, make sure that is in the correct position in line with the disc position.

## 4.4 Replacing the seal

Remove the butterfly valve from the pipeline in order to replace the seals. Do not apply force when detaching parts. Please refer to the original assembly instructions and operating instructions BA1.0-DGRL/MRL including technical appendix.

	<p>Not all elastomers are suitable for use as sealing collars (cf. sections 2.9.1 and 2.9.2).</p> <p>The sealing collar must be suitable for use in explosive atmospheres as marked on the additional ATEX plate. The owner/operator is responsible for the replacement process.</p>
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## 4.5 Cleaning and disinfection

The sealing collar of the butterfly valve is protected by a coating of silicone-based lubricant. The lubricant can be removed with a suitable cleaning agent.

## 5 Troubleshooting and repair

Follow the original assembly instructions and operating instructions BA 1.0-DRGL/MRL including technical appendix.

## 6 Removal from service, scrap disposal and return

The precautions outlined in section 4 also apply when taking the butterfly valve out of operation. The butterfly valve can be completely dismantled and the materials sorted according to type ready for disposal in line with the relevant disposal regulations/environmental protection regulations.

Clean the butterfly valve if returning it to the EBRO after-sales service department. It must be free of gaseous, liquid or solidified media.

Please ask for the **return form** and fill in the form. Returns must be accompanied by the completed return form.

## 7 Index, glossary and appendices

Appendix: EU Declaration of Conformity

## EU DECLARATION OF CONFORMITY

### SOFT SEALING BUTTERFLY VALVES

KE ZXX FXX CE ATEX EN R2

Within the meaning of the European directive 2014/34/EU, issued on 26 February 2014 declares the manufacturer:

**EBRO ARMATUREN, Gebr. Bröer GmbH, 58135 Hagen Karlstrasse 8**

that the products

**Typ:** Soft sealing butterfly valves  
**Version:** centric, free shaft  
**Series:** Z011(A,B), Z014 (A,B), Z014 (WN), F012 (A), (K1/WN), BE250/BE300 M015 (A,K1), Z611 (A,C,K), Z614 (A,C,K), ViDos, TW80/TW100, TW150/200, Z411(A), Z414(A), Z011 AS, Z011-A INFLAS, Z011-WN INFLAS, Z014-A INFLAS, Z014-WN INFLAS

with the sales order number as serial number (type plate valve) and marking of the device category are in conformity with the provisions of Directive 2014/34/EU.

Based on European directive 2014/34/EU and its harmonized European Standards "Non-electrical equipment for use in potentially explosive atmospheres"

- EN ISO 80079-36:2016, EN ISO 80079-37:2016

were tested by performing a conformity assessment procedure with the following result:

- ⇒ The butterfly valves can be used according to the ATEX label.
- ⇒ For Category 1, EU type examination with the test number **BVS 15 ATEX H036 X N1**.
- ⇒ For Category 2, the technical documentation is available at the DEKRA EXAM GmbH, Dindendahlstr.9, D-44809 Bochum, linked to the document no. **BVS 18 ATEX H/B 076**

The valves are marked accordingly:

CE<sup>xxx1)</sup> II xxx<sup>2)</sup> Ex h<sup>3)</sup> XXX<sup>4)</sup> Xx<sup>5)</sup> X<sup>6)</sup> XXX<sup>7)</sup>  
 -XX°C ≤ Ta ≤ +XX°C<sup>8)</sup>

Explosionsschutz Richtlinie 2014/34/EU (ATEX 95)

1)	Behind the <b>CE</b> Mark shall be the number of the notified body which was active in the stage of the final inspection of Category 1 equipment.
2)	The labeling of the delivered valve with the corresponding device category is carried out according to its suitability. (Group Group II - remaining areas (above ground) Equipment category 1 - gases / vapors G, suitable for zone 0 - dusts D, suitable for zone 20 Equipment category 2 - gases / vapors G, suitable for zone 1 - dusts D, suitable for zone 21 Equipment category 3 - gases / vapors G, suitable for zone 2 - dusts D, suitable for zone 22 When using "r": inside / outside
3)	The code letter "r" is the symbol for non-electrical devices. Explosion protection according to ISO 80079-36, -37 standards. Type of protection "constructive safety"
4)	Explosion group. Example: IB (gas), explosion group A/C (conductive dusts)
5)	Temperature class. Example: T4 (gas), max. Surface temperature 135 °C (gas)
6)	Observe special conditions for "r": Ambient temperature range -20 °C ≤ Ta ≤ +60 °C. For Gc, Dc or IG, ID in the outside area no aluminum housing
7)	Device protection level. Example: Gb (high protection level) (gas), device protection level Gb (high protection level) (dust)
8)	Permit. Design and operating temperature range in explosion-proof design (EN14460 / 15080, ExD3P), variable Vots Ambient temperature range -20 °C ≤ Ta ≤ +60 °C

Hagen, März 2019

  
 Lydia Bröer, Managing Director

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