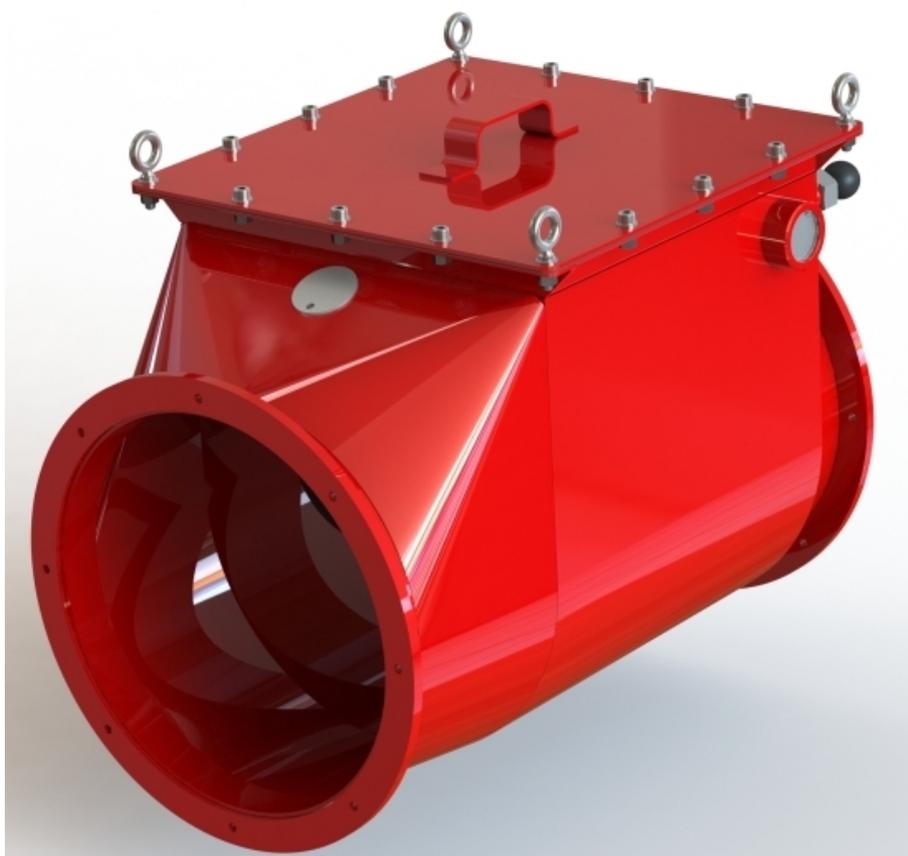




User Manual

Explosion isolation flap valve B-FLAP (DN 100 – DN 800)



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1. INTRODUCTION

1.1 CONTENTS OF THE MANUAL

This user manual has been prepared for an explosion isolation flap valve type B-FLAP in the range DN100 to DN800.

The original user manual has been prepared in the Czech language; other languages are a translation of the original. In case of any discrepancy, the original version shall prevail.

The following documents are included with this manual:

- ✓ Delivery note
- ✓ EU Declaration of Conformity in accordance with Directive 2014/34/EU
- ✓ Works checklist

Can be also supplied on request:

- ✓ Drawing of connecting flanges
- ✓ Wiring diagram for the B-FLAP indicator (if included)
- ✓ Data sheet for the inductive sensor to be used with the indicator (if included)
- ✓ Data sheet for the intrinsically safe relay (if included)
- ✓ Operational log

1.2 CLASSIFICATION OF THE VALVE

This B-FLAP has been designed in accordance with European Directive 2014/34/EU:

Equipment Group	II
Explosive atmospheres	D
Categories of equipment, internal/external	D 1 / D 2
Zone Inside:	20, 21, 22
Outside:	2, 21, 22



The electrical components (inductive sensor, intrinsically safe relays) installed on the outside of the valve must be certified for the appropriate zone or category.



1.3 THE PURPOSE OF THE USER MANUAL

This user manual is intended for all personnel that may come into contact with the valve.

This user manual is an integral part of the product and RSBP spol. s r.o. will not accept any damage or injury caused by unfamiliarity with the contents of this manual. It is essential for the user, with the appropriate qualifications (electrical, mechanical, technological, safety technology, etc), to carefully study this document and familiarize all personnel who may come into contact with the valve with its contents. The user should incorporate the section Operation and Maintenance into their own operating rules, maintenance plans.

In case of any questions, RSBP spol. s r. o. or its authorized representative should be contacted.



The user should pay special attention to Chapter 4 - Installation as the B-FLAP is a device that, if improperly installed, can be life-threatening during operation and maintenance.



B-FLAP must be installed and serviced by qualified and trained personnel using only original RSBP spare parts. Installation and service must be performed according to this manual. RSBP assumes no liability for defects, damage or malfunction of the supplied products supplied in the case of installation performed contrary to the manual or in the case of installation performed by a professionally incompetent person.

1.4 WARRANTY CONDITIONS

The B-FLAP is manufactured from high-quality materials and has been thoroughly inspected before shipment. However, if any damage or defects occur during carriage, storage, installation, operation, cleaning or maintenance, the user is obliged to immediately inform RSBP spol. s r. o. in writing.

RSBP spol. s r. o. will replace any damaged or missing parts of the B-FLAP in the shortest possible time.

The warranty for the B-FLAP is 2 years from the date of dispatch.

The warranty cannot be applied in the following cases:

- ✓ The user is not thoroughly familiar with this manual
- ✓ The B-FLAP is not used in accordance with this manual
- ✓ Improper or inadequate maintenance is performed
- ✓ Unsuitable spare parts are used (only original spare parts can be used)
- ✓ Unsuitable accessories are used or the B-FLAP has been modified without authorization



The warranty can be applied only if the damaged part, including a written description of the defect and serial number of the B-FLAP, are sent to RSBP spol. s r.o.



1.5 STORAGE

Prior to installing the B-FLAP it must be stored in its original packaging at all times and in a clean, dry place and not exposed to the effects of weather.

This user manual should be retained for the life of the B-FLAP and must be easily accessible to all who may come into contact with it during operation and maintenance.

If the B-FLAP is removed from operation or sold, it must be given to the new user together with this manual.

If the user manual is lost, a new one can be ordered from RSBP spol. s r.o.

1.6 GLOSSARY AND TERMINOLOGY

B-FLAP - Explosion isolation flap valve used to prevent the flow of explosion pressure and flame in a pipe.

Direction of flow – The direction of air/material flow within a piping system.

Indicator – Equipment used to identify the state of the closing mechanism (if fitted).

Valve body – Metal shell of the flap valve.

Flap – Rotating metal plate mounted on a shaft.

Setting screw – Adjustable end stop of opening angle.

Locking mechanism – Used to secure the flap during an explosion, i.e. locking it. B-FLAP valves DN 710 and 800 are supplemented with an additional locking mechanism that holds the flap.

Valve lid – Removable lid of the flap valve.

Operational log – Document supplied on request by company RSBP spol. s r. o. together with its products or other suitable document from the User. In a case of use of other document than the one supplied by RSBP spol. s r. o., this document must include following informations about each operation made on B-FLAP equipment.

- ✓ Date and time of peration
- ✓ Why was this operation required (regular maintenance, fault,...)
- ✓ How was the operation solved
- ✓ Name and signature of the worker who performed the operation.



2. GENERAL SAFETY INSTRUCTIONS

The user must ensure that the B-FLAP is used and operated in good working order at all times. It is necessary to follow the recommended dates for inspection and maintenance and to ensure that all necessary servicing or repair is conducted by a certified person.



All work undertaken on the B-FLAP must be recorded in order to check the history of work carried out during the operating life of the valve. All works on B-FLAP must be recorded in the operational log or in other suitable document.



3. PRODUCT DESCRIPTION

If an explosive atmosphere, in the form of a suspended dust cloud, occurs in a vessel and this atmosphere comes into contact with an ignition source, a dust explosion can occur. The B-FLAP valve protects equipment, operators and the environment from the destructive effects of such explosions.

3.1 PRINCIPLE OF OPERATION

The valve is a mechanical device designed to prevent the propagation of explosive flame and pressure from a vessel to other parts of the process. The valve is part of a protective system intended for use in potentially explosive atmospheres and in combination with other safety features of specific equipment.

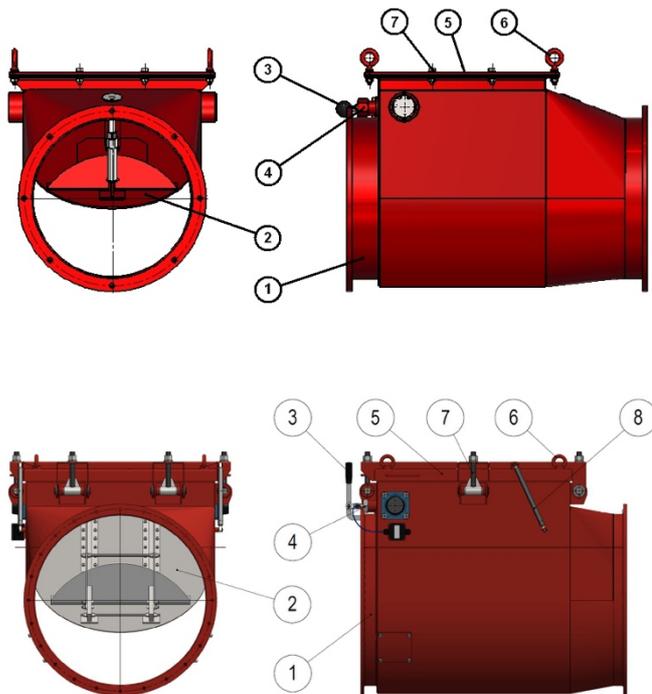


Figure 1 – Basic parts of the B-FLAP valve DN 100 – 630 (top view) and DN 710 and 800 (bottom view)



The valve is used to protect equipment (e.g. dust collection filters) that are connected to supply pipes. The typical location of the valve is in the dirty air inlet to a filter. In the event of an explosion, the valve is closed by the pressure wave, thereby preventing the spread of the explosion to other parts of the equipment or production plant. The valve is installed in the supply pipe before entering the vessel. Its actual location depends on the class of dust (St1 or St2).



- 1 – Filter
- 2 – Fan
- 3 – Rotary valve
- 4 – Back flap
- 5 – Explosion venting device

Figure 2 – Diagram of the working B-FLAP

3.2 SPECIFICATIONS

3.2.1 BASIC DIMENSIONS

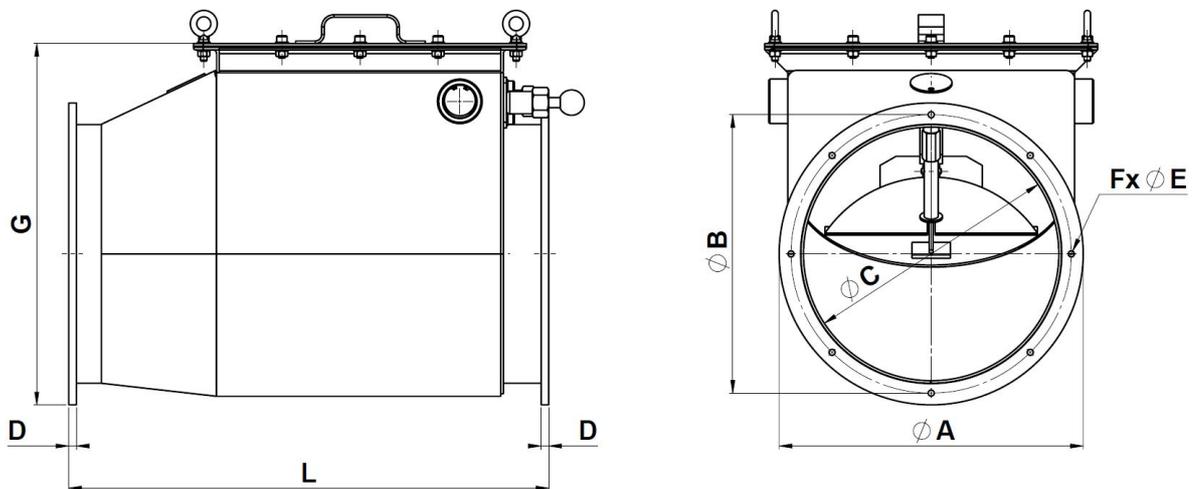


Figure 3 – Basic dimensions of the B-FLAP



BASIC PRODUCT LINE AND DIMENSIONS:

TYPE	Basic dimensions of the flange				
	ØA [mm]	ØB [mm]	ØC [mm]	D [mm]	F x ØE
DN 100	155	132	100	6	6 x 9,5
DN 125	185	157	125	6	6 x 9,5
DN 150	210	182	150	8	6 x 9,5
DN 200	255	233	200	10	6 x 9,5
DN 250	315	283	250	10	6 x 9,5
DN 300	370	337	300	10	6 x 9,5
DN 315	375	352	315	10	8 x 9,5
DN 355	430	392	355	10	8 x 9,5
DN 400	475	438	400	12	8 x 9,5
DN 450	525	488	450	12	8 x 9,5
DN 500	575	538	500	12	8 x 9,5
DN 560	635	600	560	12	12 x 9,5
DN 630	705	670	630	15	12 x 9,5
DN 710	814	775	710	16	16 x 14
DN 800	904	861	800	16	24 x 14

TYPE	VALVE							
	Wall thickness T [mm]	Valve height G [mm]	Length L [mm]	Weight [kg]	Pressure resistance [bar]	Minimum installation distance [m]	Maximum installation distance [M]	Class of dust
DN 100	3	220	320	7.5	2.5	3	7	St1, St2
DN 125	3	245	350	10	1	2	8	St1, St2
DN 150	3	270	380	13	1	2	8	St1, St2
DN 200	3	330	440	18	1	2	8	St1, St2
DN 250	3	375	510	26	1	2	8	St1, St2
DN 300	3	440	580	35	1	2	8	St1, St2
DN 315	3	440	600	35	1	2	8	St1, St2
DN 355	4	520	675	55	0.67	3	7	St1
DN 400	4	570	750	73	0.67	3	7	St1
DN 450	4	620	825	84	0.67	3	7	St1
DN 500	4	680	900	102	0.67	3	7	St1
DN 560	5	750	950	120	0.67	3	5	St1
DN 630	5	820	1060	180	0.67	3	5	St1
DN 710	5	1063	1156	326	0,7	3	7	St1
DN 800	5	1143	1246	370	0.7	3	7	St1



3.2.2 MATERIAL SPECIFICATION

The construction material of the valve is structural carbon steel with KOMAXIT RAL 3000 (red) surface finish. Stainless steel with a natural finish is an option on request.

3.3 OPTIONAL ACCESSORIES

3.3.1 VALVE POSITION INDICATOR

For remote indication of the flap position (open/shut), the B-FLAP can be equipped with an electric indicator on request.

The indicator consists of a proximity sensor and intrinsically safe relay

- a) **Proximity sensor** is an inductive sensor activated by a cam shaft in the flap valve. The inductive sensor is used in a two-wire version with ATEX certification, which can be deployed in Zone 20. The sensor is connected to a remote intrinsically safe relay.
- b) **Intrinsically safe** relay provides an interface between a safe and hazardous area (Zone 20). The intrinsically safe relay requires a power supply of 230V/50Hz and at least a 1A fuse breaker (B or C characteristic). The intrinsically safe relay includes a switching contact, where the operating status of the flap (open/shut) is indicated.



a



b

Figure 4 – Inductive sensor (a) and intrinsically safe relay (b) for indicating the position of the isolation valve

The proximity sensor, intrinsically safe relay and junction box can be supplied together or separately on request. For more information, see Chapter 5 – Valve Position Indicator.



The power supply and wiring connection to the intrinsically safe relay are not included (unless requested).

3.3.2 DUST ACCUMULATION SENSOR

It's possible to deliver a dust accumulation sensor on Clients request. The dust accumulation sensor indicates dust accumulation on flaps bearing surface. Dust accumulation sensor is connected to intrinsically safe relay (see chap. 3.3.1.).

In a case of use is the dust accumulation sensor (5) screwed into an adapter (3) (see Fig. 5). In the adapter is inserted borosilicate glass (1). Dust accumulation sensor is screwed via an o-ring 25x2,5 (2), which push the borosilicate glass on a bearing surface of the adapter. Sensor is secured against loosening with a nut (4).

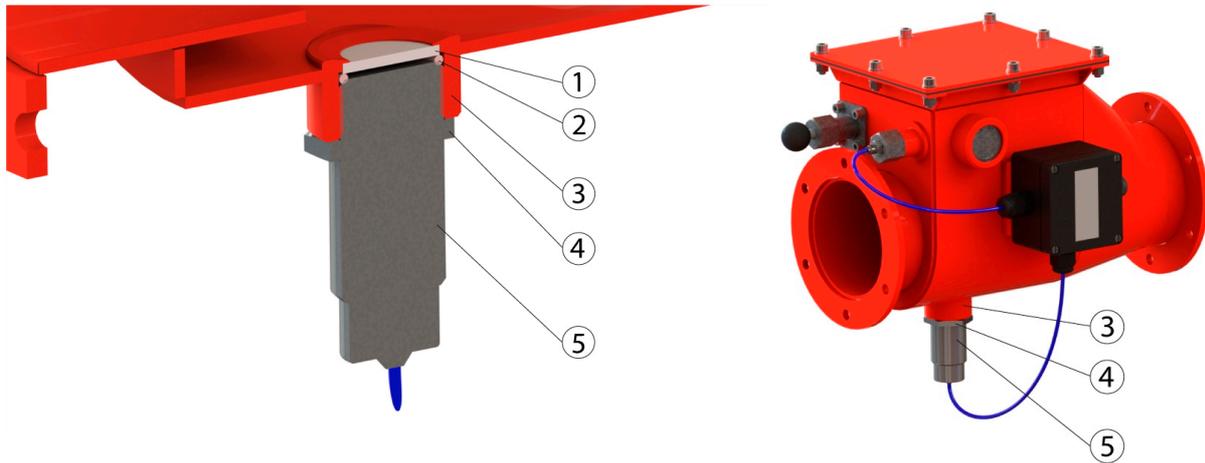


Figure 5 – Set of dust accumulation sensor (1 – borosilicate glass, 2 – o-ring, 3 – adapter, 4 – nut, 5 – dust accumulation sensor)

As the dust accumulation sensor is used capacitive sensor with following parameters:

Operating voltage	5 ... 15 V
Way of electro-connection	twin-wire on intrinsically safe relay
Rated operating distance	10 mm
Housing length (without cable)	82mm
Connection cable	PVC housing (length ca 1,5 m) – 2 x 0,14 mm ²
Outer thread	M30 x 1,5
Ambient temperature	-20 ... 70 °C (-4 ... 158 °F)
Protection degree	IP67
Way of installation	into the mechanical part of flap valve
Fixation	with 2 nuts
ATEX Marking	II 1G Ex ia IIC T1-T6 Ga

If the dust accumulation sensor isn't included in the delivery, special plug is used (6). Blinding plug is shown on Fig 6. It is composed of plug M30x 1,5 (6) (DIN 908), stainless steel lid (7), o-ring 25x2,5 (4) an Cu seal (8). Plug is tightened with a torque 40 Nm.

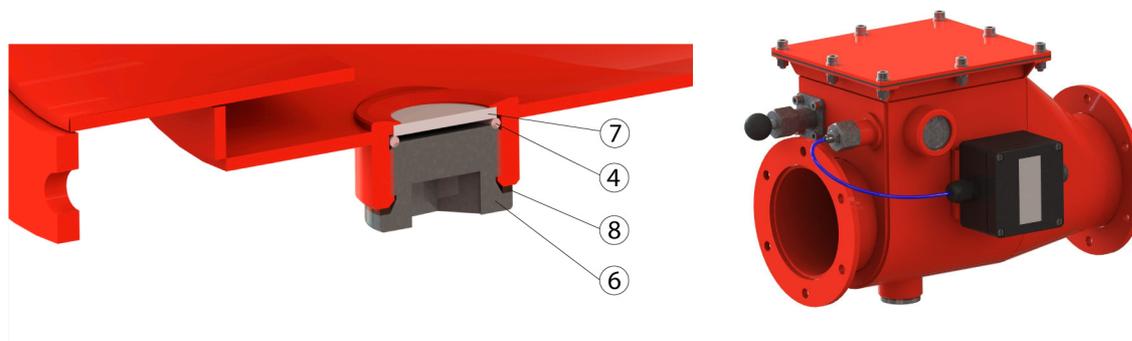


Figure 6 – Blinding of the adapter (4 – o-ring, 6 –plug (DIN 908, M30x1,5), 7 – stainless steel lid, 8 - Cu seal,)

3.3.3 – SPECIAL FLANGE GASKET

Besides the standard EPDM flange gasket is possible to deliver also gaskets from special material, on request.

3.4 PARAMETERS ENSURING THE SAFE USE OF THE VALVE ACCORDING TO THE ATEX CERTIFICATE

Name of protective equipment	B-FLAP
Purpose of B-FLAP	Equipment preventing the spread of explosion
Used dust	ST1 all sizes, ST2 DN 100 - DN 315 only
Zone inside the pipe	20
System type – location of the fan	Suction system – fan behind the vessel
Maximum air velocity in the pipe	35 m/s
Maintenance	To ensure the operation of the B-FLAP, the operator must ensure the valve is clean at all times.
Temperature	- 40°C to + 80°C



Size	DN100		DN125-315	DN 355-500	DN560-630	DN710-800
Maximum P_{red} in the vessel $p_{red, max}$ [bar]	1.5 (ST1)	1 (ST2)	0.9	0.65	0.65	0.45
Pressure resistance of the valve p_{max} [bar]	2.5	2.5	1	0.67	0.67	0.7
Minimum installation distance [m]	3	3	2	3	3	3
Maximum installation distance [m]	7	7	8	7	5	7



RSBP spol. s r. o. is responsible for setting the opening angle of the valve.



The user must not adjust the angle of the valve.



In the event of an explosion, the valve must be inspected by RSBP spol s r. o. or an authorized technician to ensure its continued operation.



Explosion isolation flap can be used in combination with explosion venting device, but only such type which will stay open after the explosion. It is not possible to combine it together with types of explosion venting which are automatically closed.



4. INSTALLATION IN THE PROTECTED EQUIPMENT

The valve is delivered fully assembled. The installation is done in accordance with the RSBP spol. s r. o. documentation.

4.1 CHECKING THE VALVE BEFORE INSTALLATION

Immediately after delivery and then prior to the start of installing the valve, the following checks should be performed:

- ✓ Check the integrity of the original valve packaging.
- ✓ Check the valve body for scratches and dents.
- ✓ Check the integrity of the gaskets (3 pieces total – 2 for the flanges, 1 under the valve lid).
- ✓ Check if any fasteners are missing (screws, nuts, washers).
- ✓ Check the integrity of the indicator (if included).
- ✓ Check that the locking mechanism moves freely.

After the checklist has been successfully completed, the valve is ready to install. In the event of discovering any defects or deficiencies, immediately contact the manufacturer or your dealer.

4.2 INSTALLING THE VALVE

4.2.1 LOCATING IT IN THE PIPEWORK

The valve is bolted into the inlet piping of the equipment and must always be positioned according to the arrow that indicates the direction of air flow in the system.

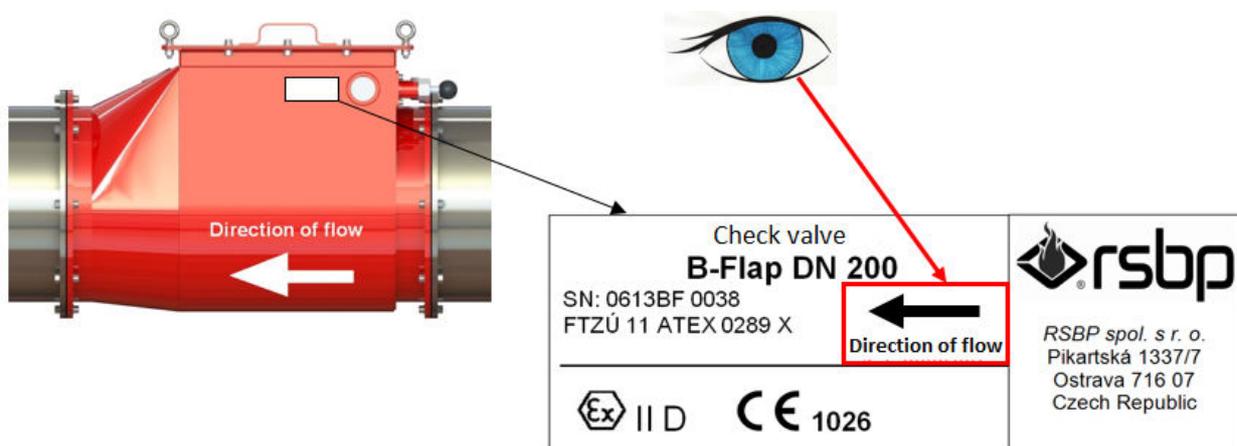


Figure 7 – Valve labeling

The valve must be installed in the pipe in the horizontal direction with the lid on top as shown above.



The maximum allowable gradient for installation is 30°, but only in the upwards direction of air flow (see Figure 8).

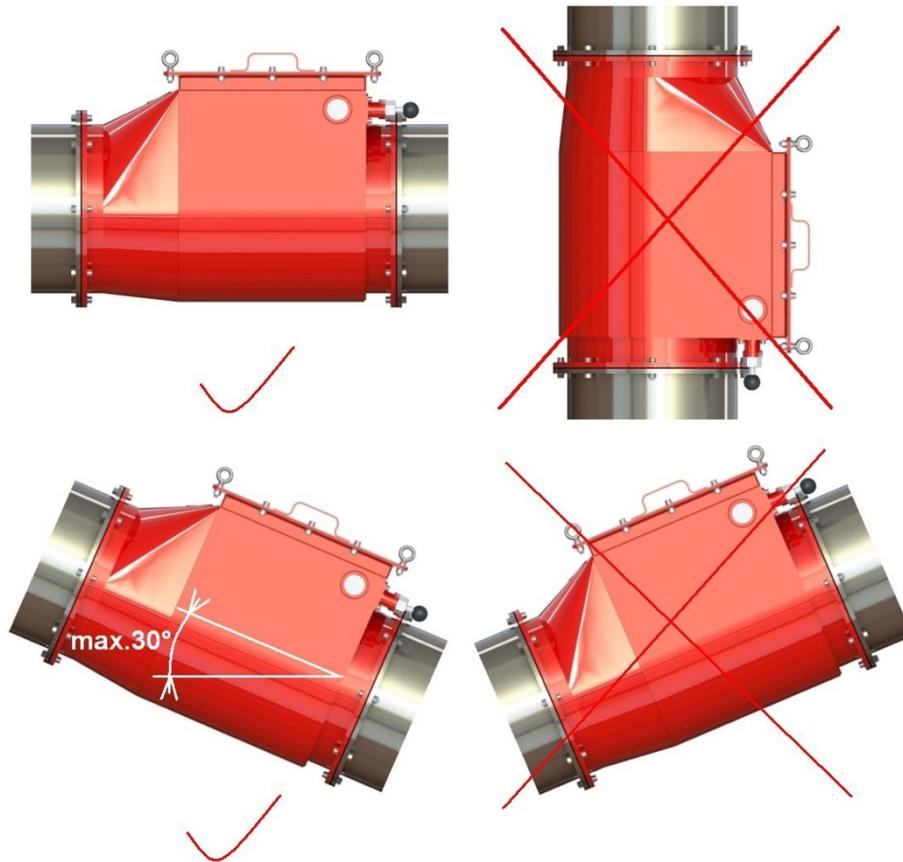


Figure 8 – Proper placement of the valve in the pipe

4.2.2 INSTALLATION DISTANCE

The following table is used for the installation distance of the valve for dust class St1 and St2 (St 2 only up to DN315):

Size	DN100	DN125-315	DN 355-500	DN560-630	DN710-800
Minimum installation distance [m]	3	2	3	3	3
Maximum installation distance [m]	7	8	7	5	7



If the installation distance is too close, the valve may not close in time and the explosion may pass through the valve and into the pipe. If the installation distance is too far, the valve can be destroyed by the explosion pressure.



INSTALLATION REQUIREMENTS FOR THE PROPER OPERATION OF THE VALVE (PROPER CLOSURE)

<p>Changing pipe diameter (DN) in front of a flap in the direction of the explosion</p>	<p>We always choose the closest size flap to pipe size. If it is not possible to specify the exact size, you must use an adapter. The adapter is mounted directly in front of the flap and its inclination must not be higher than 16° (see picture on the right).</p>	
<p>Elbow mounted in front of flap in the direction of the explosion</p>	<p>It has no effect on the function of the flap. The angle can not be larger than 90°.</p>	
<p>The space behind the flap</p>	<p>Behind the flap must be straight pipe with a length of at least 5x DN.</p>	
<p>Settling dust</p>	<p>Dust deposits are unacceptable for the proper functioning of the flap. For maximum elimination of deposits, see chapter 6.</p>	



4.2.3 FLANGE GASKETS

Prior to installing the valve, appropriate sealing must be used where the pipe joins with the valve. When cutting into an existing pipe allowance must be made for two gaskets 2x3 mm thick (t) and the overall length of the valve (L).

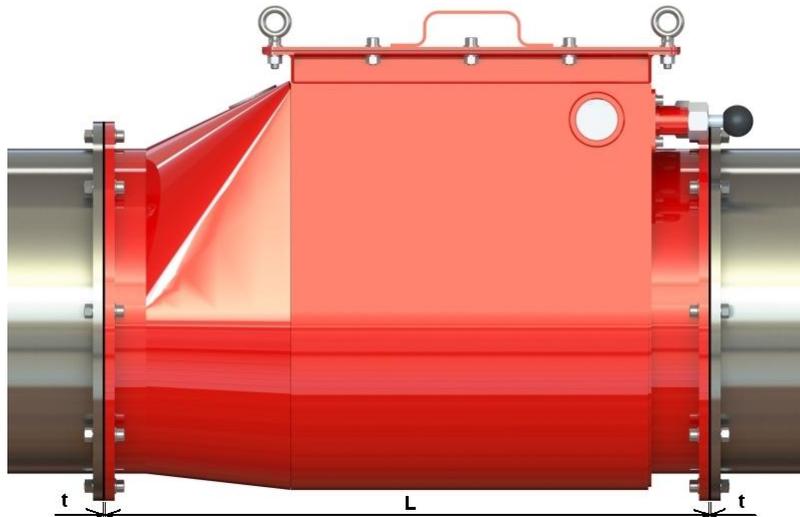


Figure 9 – Duct length considering the gasket thickness

4.2.4 INSTALLATION IN THE PIPE

The first hole in the pipe flange must be on centre to ensure correct horizontal and vertical alignment of the valve (see Figure 10).

For easier handling, use lifting equipment rigged through the eyelets on the lid of the valve (from DN 300 upwards). For DN 710 and 800 the lifting eyelets are located directly on the valve lid. During handling and lifting **must be all the screws on the lid properly tightened.**

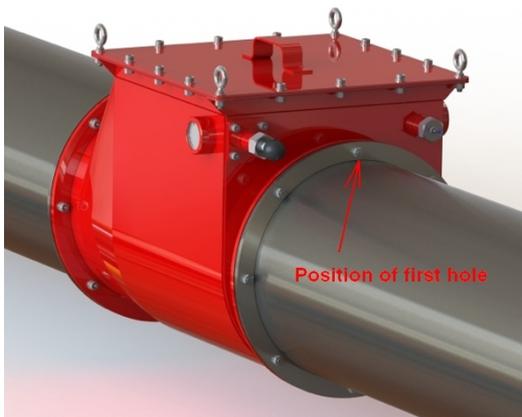


Figure 10 – Proper mating of flanges

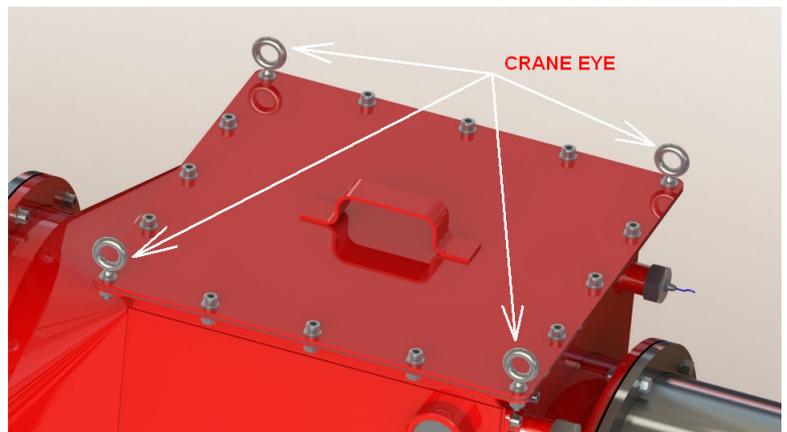


Figure 11 – Lifting eyelets on the valve lid



Connect the valve to the pipe flanges using the correct fasteners as shown below. The tightening torques are:

M5 = 3 Nm

M6 = 5 Nm

M8 = 12 Nm

M10 = 25 Nm

M12 = 43 Nm

At least one connecting screw on the input and output flange must include serrated lock washers or other type of spring washer on both sides (screws and nuts) to make an electrically conductive connection.

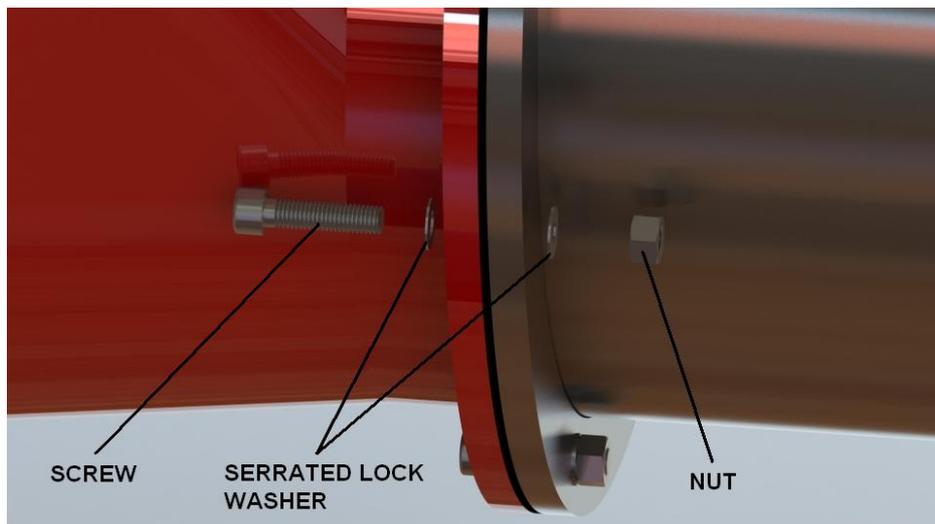


Figure 12 – Grounding using serrated lock washers

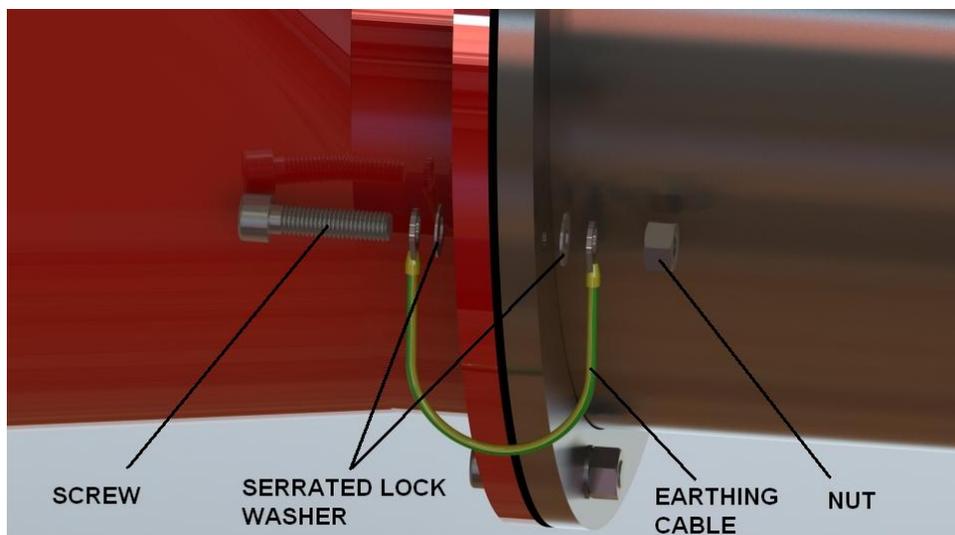


Figure 13 – Electrically conductive connection through an earthing cable



After installing the valve in the pipe, the valve lid must be removed. Valves DN710 and 800 have T-screws. Loosen the T-screws starting with those at the hinge end to remove the force on the cover seal. Once the lid is open 19 tis necessary to check the correct operation of the flap.

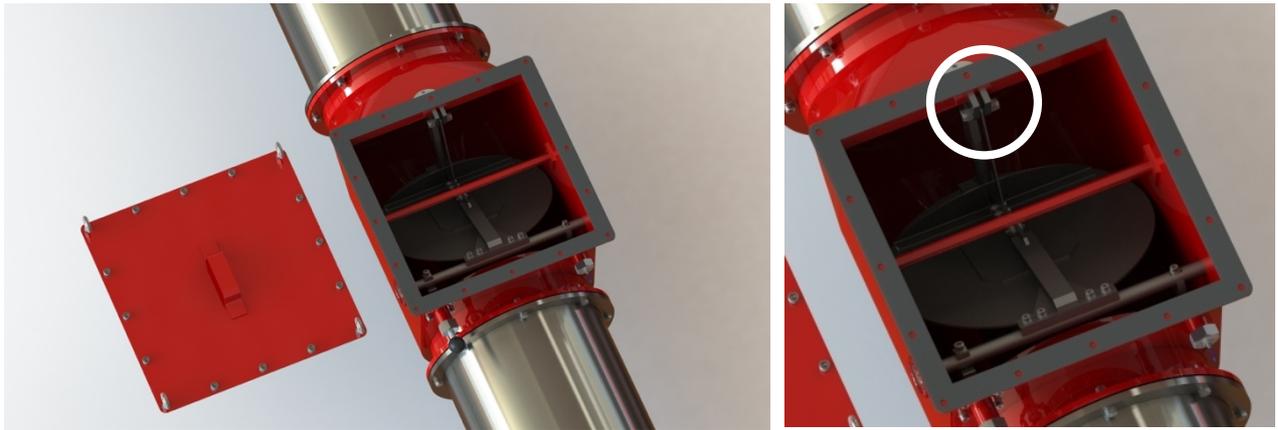


Figure 14 – Opening the valve lid and checking the open position retaining lock

Firstly disengage the valve plate from its open position lock so that it is free to move. Then using a feeler gauge check the correct distance between the screws of the locking mechanism. On the valves where are two pairs of locking screws (DN 710 and DN 800), adjust the distance on both pairs.

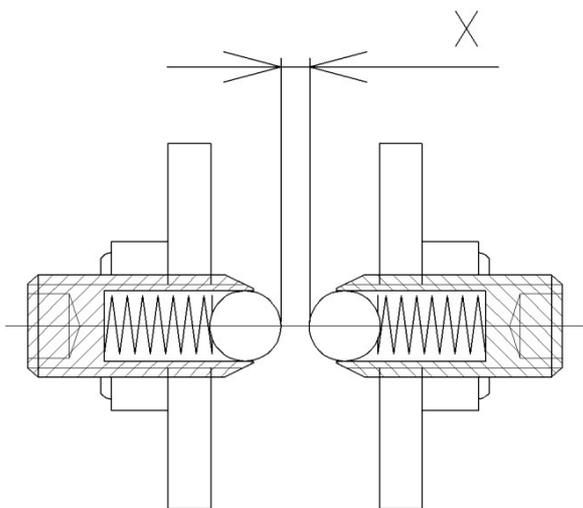


Figure 15 – Screws of the open position locking mechanism

TYPE (DN)	DISTANCE X (mm)
DN 100	0.7 mm
DN 125	0.7 mm
DN 150	0.6 mm
DN 200	0.5 mm
DN 250	0.8 mm
DN 300	0.9 mm
DN 315	0.9 mm
DN 355	0.7 mm
DN 400	0.9 mm
DN 450	0.9 mm
DN 500	0 mm + ½ thread rev
DN 560	0 mm + ½ thread rev
DN 630	0 mm
DN 710	2,2 mm
DN 800	2 mm

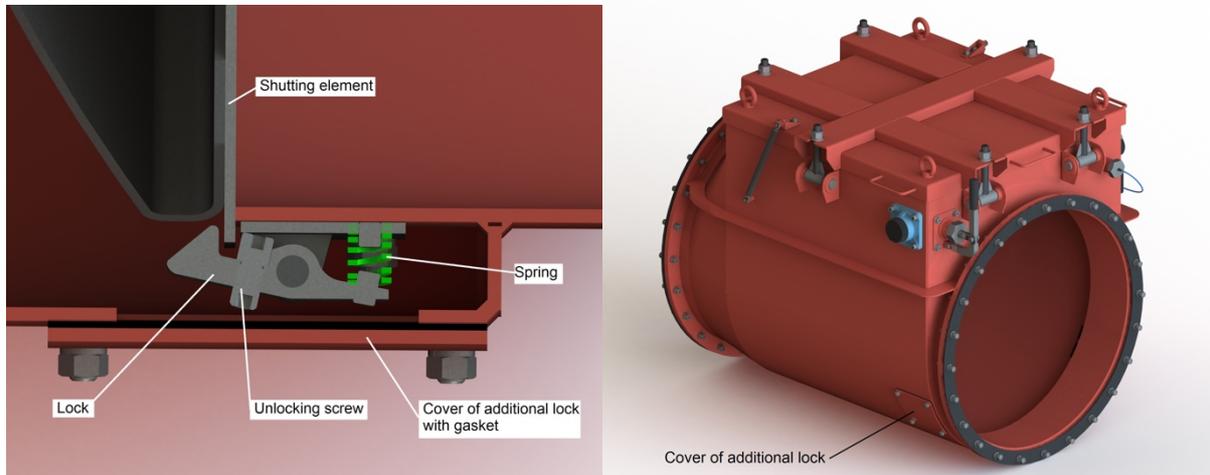


Figure 16 – Additional lock (B-FLAP DN 710 and DN 800)

To check the closing locking mechanism, release the flap to close and latch it. The flap must close and latch smoothly without any play. If everything works properly, unlatch the flap and return it to the open position. With back flaps DN 710 and DN 800 when unlocking you have to keep in mind there are two locking points as shown in figure 16. These are accessible after removing the covers and seals from holes on both sides of the flap. To unlock these additional locking points you rotate the unlocking screws clockwise (picture 16). Once released, return the flap to its open and locked position. When that is complete it is necessary to reset the closing locks. This time it is necessary to rotate the screws anti-clockwise so the spring is free and whole mechanism is ready to be locked. Once complete place the covers and seals.

The opening angle of the flap (set screw) is set by the RSBP spol. s r.o. and the user is not permitted to change it.

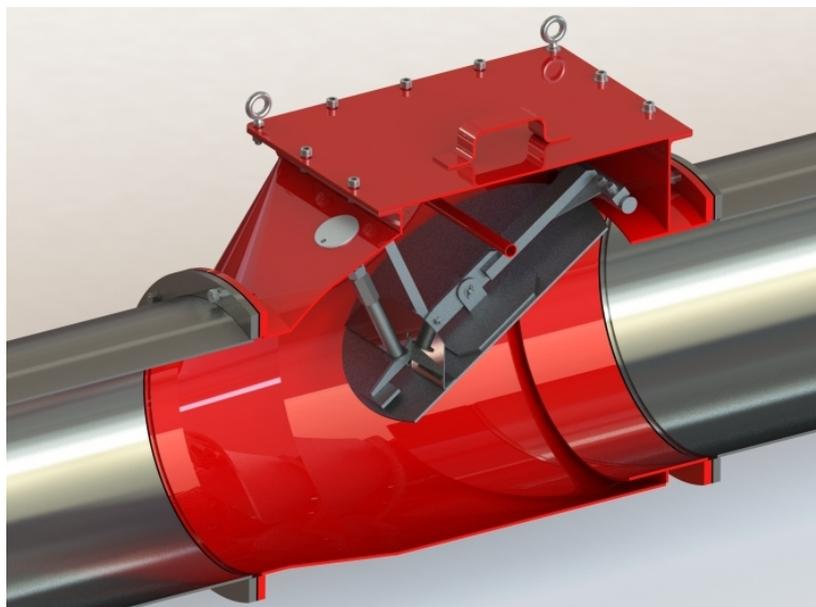


Figure 17 – The correct position of the flap ready for putting into operation



After testing the flap, close the valve lid, ensuring it is sealed, and screw tight.

If a position indicator is fitted, it needs to be adjusted before the lid is closed (see Chapter 5). Close the lid after setting and test the indicator.

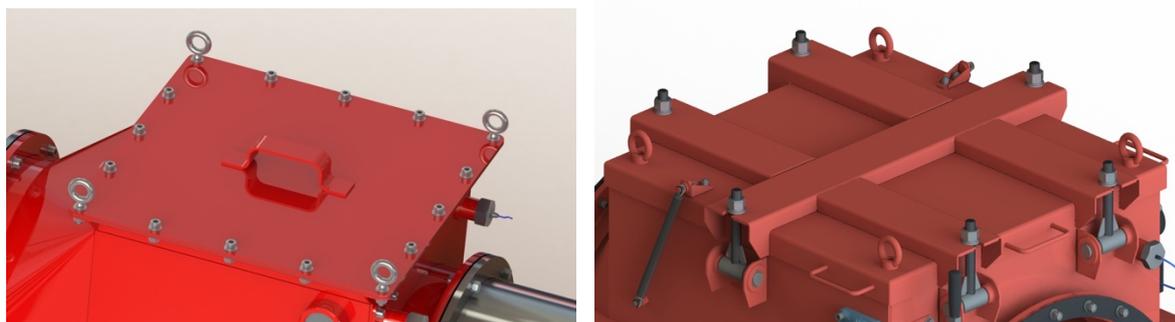


Figure 18 – The valve lid (DN100 - DN630 on the left side, and DN710 and DN800 the right side)



5. VALVE POSITION INDICATOR

The flap position sensor is an electronic component supplied by RSBP s.r.o. as an optional accessories for Explosion isolation flap valve supplied by this company too. It can be delivered with the valve, but also separately (as an accessory, spare part, etc.)

5.1 GENERAL INFORMATIONS

The flap position sensor is an electronic component used to detect and display closed and/or open position of the valve. Information about the position of the valve can be relayed through the sensor to the customer's control system for further processing, indicating, visualization etc.

The sensor assembly consists of a mechanical part on the valve, an inductive sensor (in execution for explosive atmospheres) with a cable length of ca 1,5 m and from evaluation intrinsically safe relay. These components can be included with the valve or delivered separately. According to need, the valve can also be delivered without the sensor assembly, in such case is the sensor non-functional. In such case is the hole for sensor blinded, but flap valve itself can be retrofited with the sensor later. The intrinsically safe relay must be powered by 230VAC/50Hz or 24VDC (the power supply voltage must be specified at the time of order) and is located (individually or parallelly) into a plastic cabinet, switchboard, switchboard cabinet etc. From the intrinsically safe relay (switching NC/NO) is connected a signal cable into the Clients control system. These components, including power supply security, power supply cable, connection cable between proximity switch and intrinsically safe relay, signal cable, cable traces and switchboards are not included in the standard delivery from RSBP. For the proper function the proximity sensor must be connected to evaluation intrinsically safe relay either directly (if the length is shorter than 1,5 m) or indirectly via a junction box and connecting cable (if the length is bigger than 1,5 m).



All settings of the flap position sensor are made solely by RSBP spol. s r. o. or its authorized representative.

5.2 INTRINSICALLY SAFE RELAY – FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

Power voltage AC (as requested on order)	120 to 230VAC (48 to 62Hz)
Power voltage DC (as requested on order)	24VDC (18V to 31.2V)
Rated current for AC version	33 mA
Rated current for DC version	12 mA
Explosion certification (AC version)	II (1) G Ex [ia] IIC II (1) D [Ex iaD]
Explosion certification (DC version)	II 3 (1) G Ex nA nC [ia] IIC T4 II (1) D [Ex iaD]
Output contact rating	125V/1A switching (AC and DC load)
Ambient temperature	-20 to +70°C
Relative humidity	less than 95% (non-condensing)
Cabling connectivity	0.25 to 2.5 mm ²
Housing	IP30 (casing), IP20 (terminals)



Weight	160 g (approximately)
Dimensions (H x W x D)	108 x 17.6 x 114.5 mm
Mounting method	DIN rail

5.3 INDUCTIVE SENSOR – FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

Power voltage	up to 15VDC (from an intrinsically safe relay)
Type of electrical connection	two-wire connection to an intrinsically safe relay
Sensor range	1 mm
Sensor length (without cable)	30 mm
Connecting cable	PVC sheath (length approx. 1.5 m) - 2 x 0.14 mm ²
External thread	M8 x 1
Ambient temperature	-20 to +80°C
Housing	IP67
Weight	0.094 kg
Mounting method	on the mechanical part of the BFV valve
Fixation	2 x adjusting nuts
Explosion certification	II 1D Ex iaD 20 T 90°C Ta: -20 ... 70°C II 1D Ex iaD 20 T 100°C Ta: -20 ... 80°C II 1G Ex ia IIC T6 Ta: -20 ... 55°C II 1G Ex ia IIC T5 Ta: -20 ... 65°C II 2G Ex ia IIC T6 Ta: -20 ... 70°C II 2G Ex ia IIC T5 Ta: -20 ... 80°C

5.4 ASSEMBLY AND DISASSEMBLY



All supplied items and procedures associated with the assembly of the flap-closed sensor are undertaken by the RSBP or its authorized representative.

The inductive sensor is installed directly into the hole of the check valve body and secured by two adjusting nuts after determining the correct position of the sensor. Between the reading surface of sensor and sensors peg must be set a distance of ca 1 mm (see Fig. 19). Function of the sensor must be checked. The intrinsically safe relay (for potentially explosive atmospheres) is installed in a safe area (control room, substation etc.). – and either close to the flap valve or in a bigger distance (control room, switch board etc.).

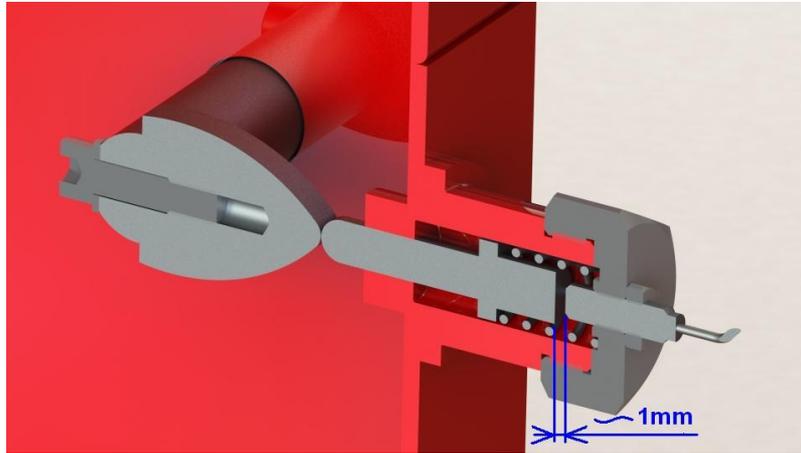


Figure 19 – Correct position of the proximity sensor to the sensors peg

Proximity sensor during its correct operation doesn't pollute the environment, doesn't discharge harmful substances and doesn't transmit any electromagnetic radiation higher than acceptable limits. B-FLAP sensor doesn't have any environmental impact.



The removal and disposal of the flap-closed sensor is undertaken solely by RSBP or its authorized representative. Process is given according to the legislation about elimination of electro-waste and metal-waste, individual parts and components are ecologically eliminated or recycled.

5.5 ELECTRICAL CONNECTION

The electrical connection is undertaken in accordance with drawing 3-001-804-1 (Czech version) or 3-001-804-2 (English). The recommended types of cables and the exact values for power supply protection are given in these drawings.

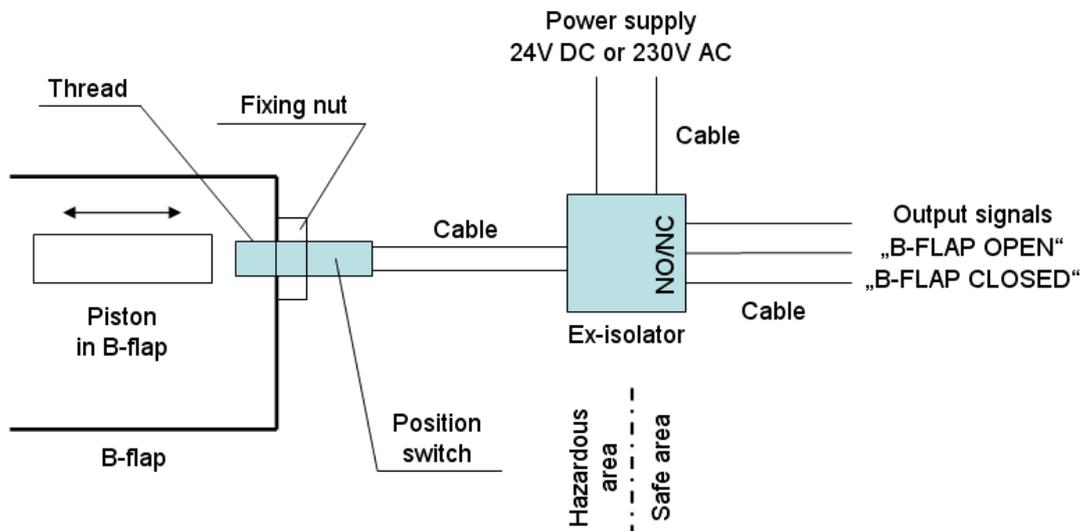


Figure 20 – Position switch connection scheme



If the flap is open, the flap indicator pin is remote from the inductive sensor and the intrinsically safe relay contact indicates “Flap open”.

If the flap is closed, the flap indicator pin is close to the inductive sensor and the intrinsically safe relay contact indicates “Flap closed”.

5.6 OPERATION OF THE INDICATOR

The flap-closed sensor is able to work automatically. The operator is not allowed to change the sensor parameters set by RSBP or its authorized representative. Individual operation of the sensor is not possible.

If the valve is not closed by an explosion (e.g. shocks), the operator may release the closed flap and put it back into its working (i.e. open) position. If the valve is closed by an explosion, RSBP or its authorized representative must be contacted. They will then assess the suitability of each component of the valve for further use or take steps to repair it (complete or partial replacement, repair, etc.).



The operator must be trained by RSBP or its authorized representative in order to operate the flap valve and B-FLAP sensor. Untrained personnel are expressly prohibited from operating flap valve and sensor.

5.7 PROHIBITED ACTIONS

The operator or others coming into contact with the valve may not perform the following prohibited activities on the sensor:

- ✓ Damage the check valve in any way, loosen the adjusting nut for the flap-closed sensor
- ✓ Damage the mechanical part of the check valve in any way used for the flap-closed sensor
- ✓ Mechanically damage the flap-closed sensor (all its components) in any way
- ✓ Mechanically damage the electrical wiring (power, indicator) for the flap-closed sensor



All of the above activities (assembly, disassembly, maintenance, service, operation, damage, defects) should be clearly recorded in the operational log including date, name and signature of any engineer who has serviced the valve.

After correctly setting the indicator, close the valve lid (including sealing) and screw tight.

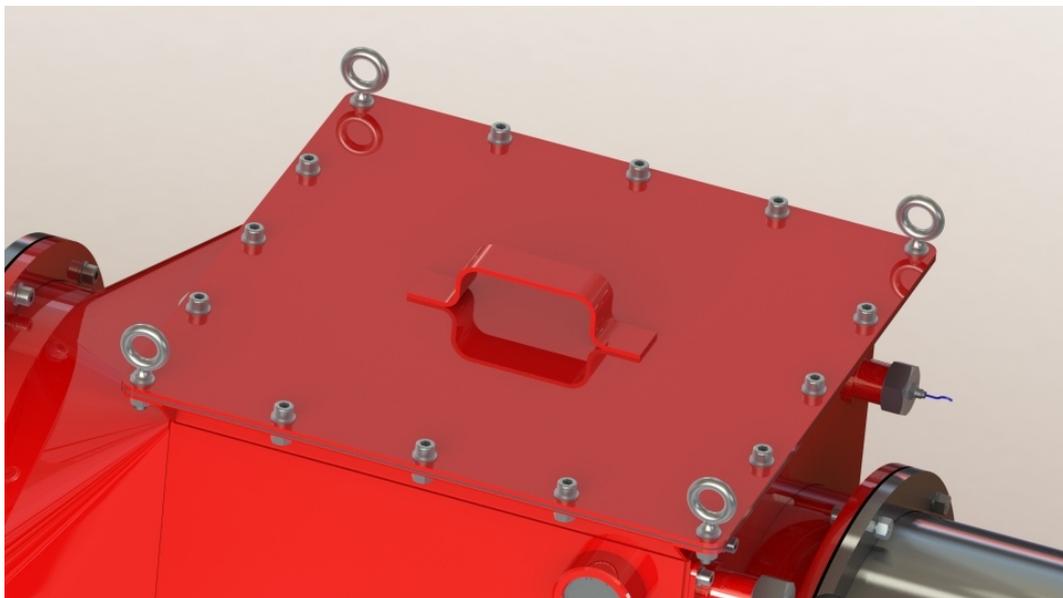


Figure 21 – B-FLAP ready for putting into operation



6. OPERATION, MAINTENANCE AND STAFF TRAINING

The equipment may only be operated by authorized operators trained to use the equipment. Normal operation poses no threat from electric shock or heat.

The maintenance intervals must be determined on the basis of the operating conditions of the equipment. The following procedure should be followed:

1. Maintenance 2 weeks after putting into operation
2. Maintenance 6 weeks after putting into operation
3. Maintenance 8 weeks after putting into operation

On the basis of ascertained operational conditions (rate of the dust deposit accumulation inside the B-FLAP etc.) shall the customer settle regular maintenance interval (e.g. once per month). Minimum required maintenance interval is once per year. Each maintenance must be logged into Operational logbook (date and time). In the logbook must be also written if the maintenance covered only checking, cleaning, parts replacement or repair and what kind of works was exactly done. It is also important to write down name of the worker who performed this operation and his signature.

B-FLAP maintenance includes regular checking of mechanical damage or heavy pollution of the B-FLAPs inside part or its plugging which can have serious influence on the function of closing element. This maintenance can be performed only by trained person.



The valve lid must not be dismantled while the equipment is operating and air is flowing through the pipe on which it is installed.

Maintenance procedure:

- ✓ Open the valve lid.
- ✓ Visually inspect the inside of the valve.
- ✓ In case of heavy soiling, use either mechanical cleaning tools or an industrial vacuum cleaner to clean it.
- ✓ Visually inspect the mechanical integrity of the valve.
- ✓ Close the valve lid.



Figure 22 – The internal area of the valve and recommended tools for cleaning

During the regular training are the workers informed about risks coming from accidental or prescribed movement in the area where is the B-FLAP installed. Training must be performed at least once per year including new employees.

It is recommended that Users incorporate the instructions in this chapter in their own operational safety rules.



All activities carried out on this product must be recorded in the operational log in order to check the history of any service or performance activities.



7. SERVICE



Inspecting and servicing the valve can only be done by a qualified person using only RSBP genuine spare parts.

The following service interval is recommended to ensure the proper operation of the valve:

1. Service (operational check)	3 weeks after putting into operation
2. Service (operational check)	6 weeks after putting into operation
3. Service	6 months after putting into operation
4. Service	1 year after putting into operation
All additional service (for faultless operation)	Once a year

Scope of service activities:

- ✓ Checking for mechanical damage to the housing
- ✓ Checking the sealings
- ✓ Checking the integrity of the lock and release mechanism
- ✓ If the position indicator is installed, check the power cord, alarm function and settings.
- ✓ Applying lubricant to the lock mechanism(s) and flap indicator



In the event of an explosion, the valve must be inspected by the manufacturer or a qualified technician to ensure its proper operation for further safe usage.



Service on the valve begins by checking the service history of the valve. Visually inspect the body of the valve, the locking bar and indicator (if installed).

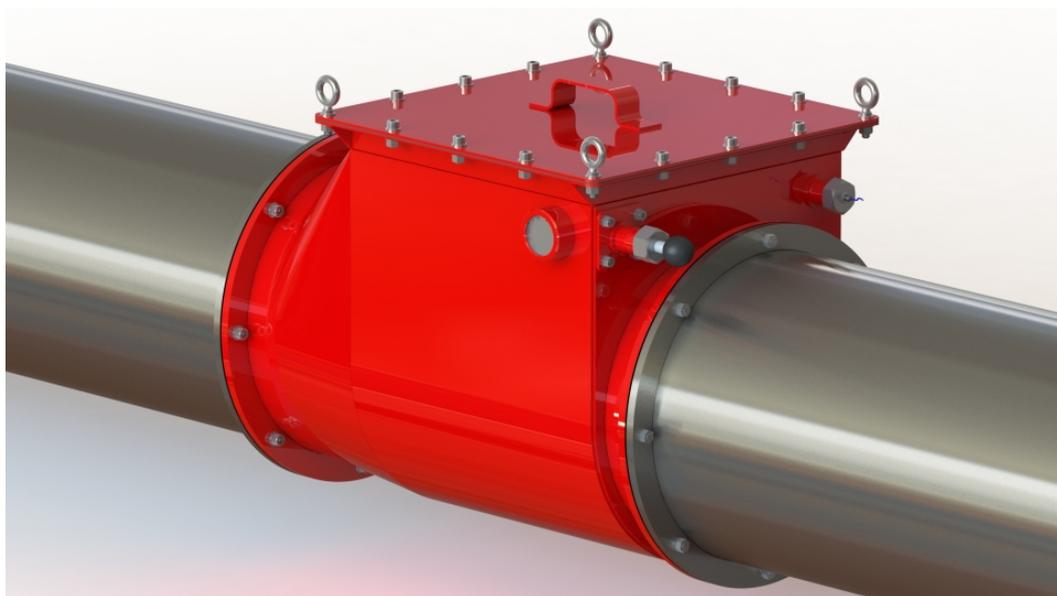


Figure 23 – B-FLAP installed in the pipe

Open the valve lid.



The lid of the valve must not be removed while the equipment is in operation and air is flowing in the pipe on which it is installed.

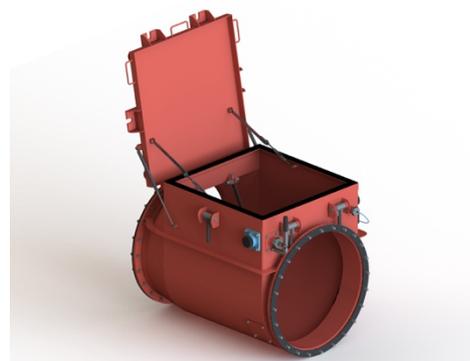


Figure 24 – Open B-FLAP (DN100 – DN630 on the left side, DN710 and DN800 on the right side)



Check the internal chamber of the valve body. If it appears dirty, clean the valve with either mechanical tools or an industrial vacuum cleaner.

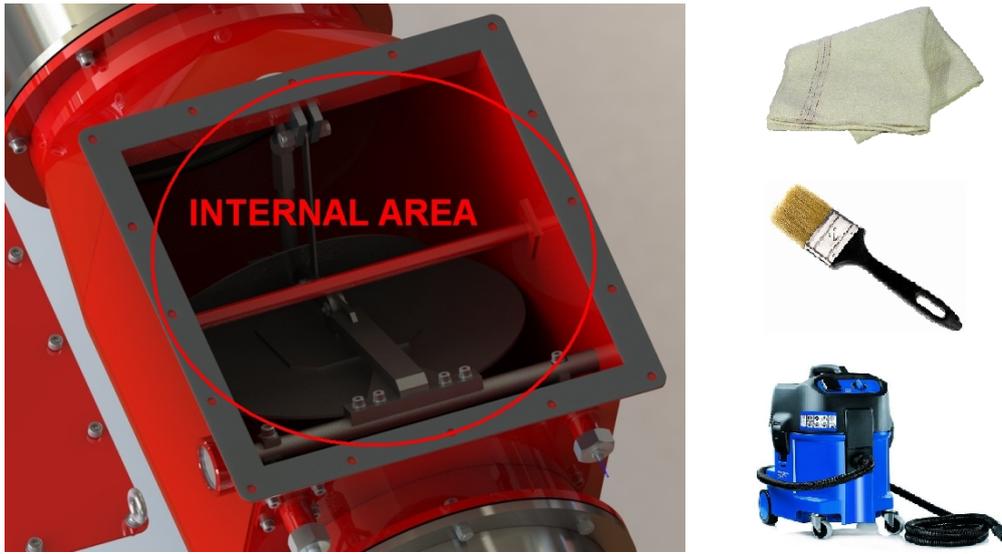


Figure 25 – Open B-FLAP (the internal area of the valve which is necessary to clean and recommended tools for cleaning)

Check for mechanical damage to the internal chamber of the valve body (casing, flap, screws, etc.).

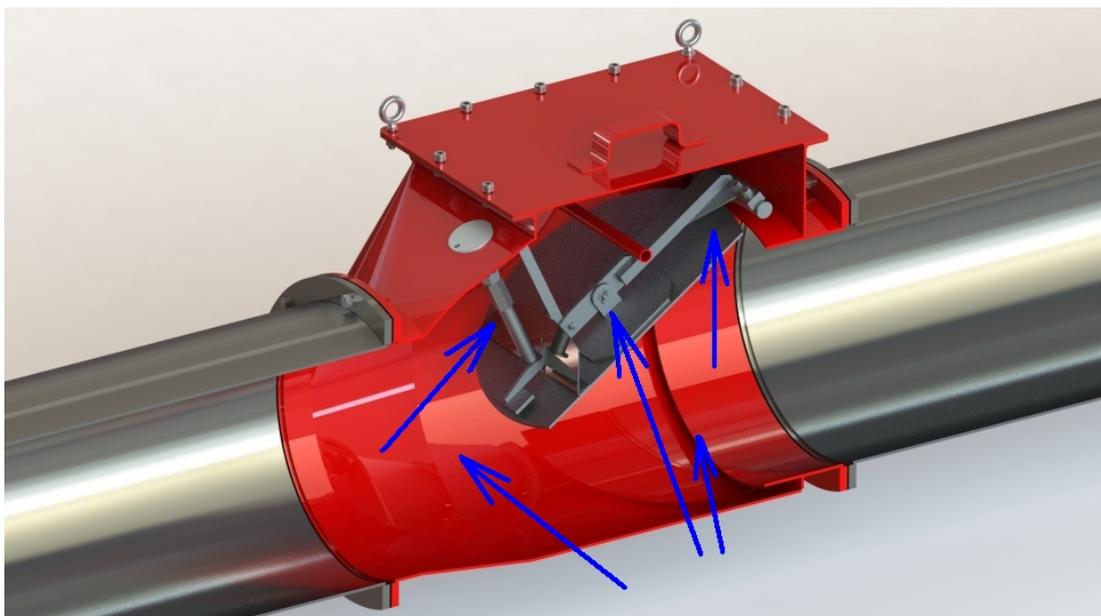


Figure 26 – Section through B-FLAP indicating important areas of the valve for checking

Use a gauge to verify the correct distance between the screws of the locking mechanism (for the distance refer to Chapter 4.2.4). On valves DN 710 and DN 800, where are two locking devices used, you have to check distance on both.



Figure 27 – Open B-FLAP, locking device

Check that the B-FLAP properly closes and latches.

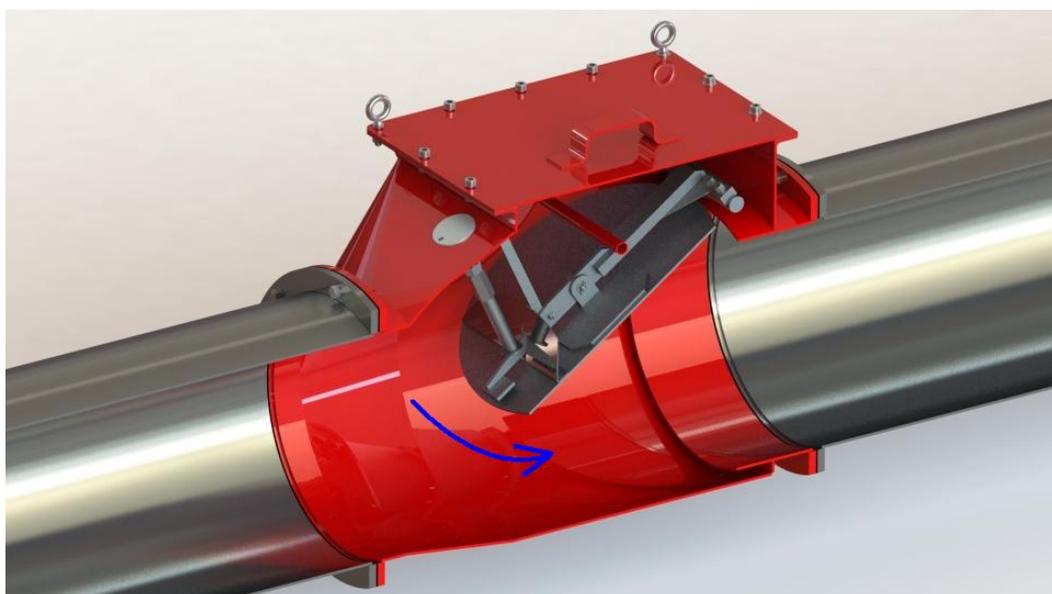


Figure 28 – Section through B-FLAP showing closure test

Apply lubricant (recommended Mogul LV 2-3 or equivalent) to the internal area of the locking mechanism. This is valid for all locking mechanisms. The locking mechanism is same on all models, only the lever is added on the valves DN 710 and DN 800 for better unlocking. On the larger valves is also recommended to lubricate the stainless pins, for smoother operation of the lever. Back flaps DN 710 and DN 800 have additional locking, which must also be lubricated.

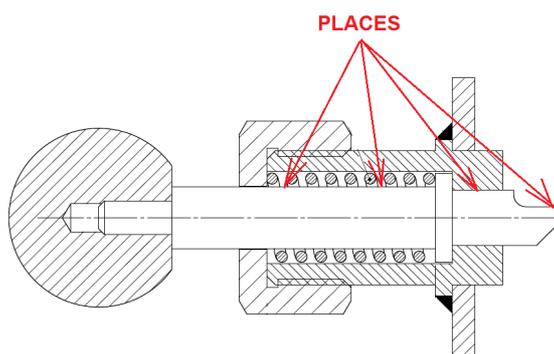


Figure 29 – Locking mechanism of B-FLAP up to DN 630

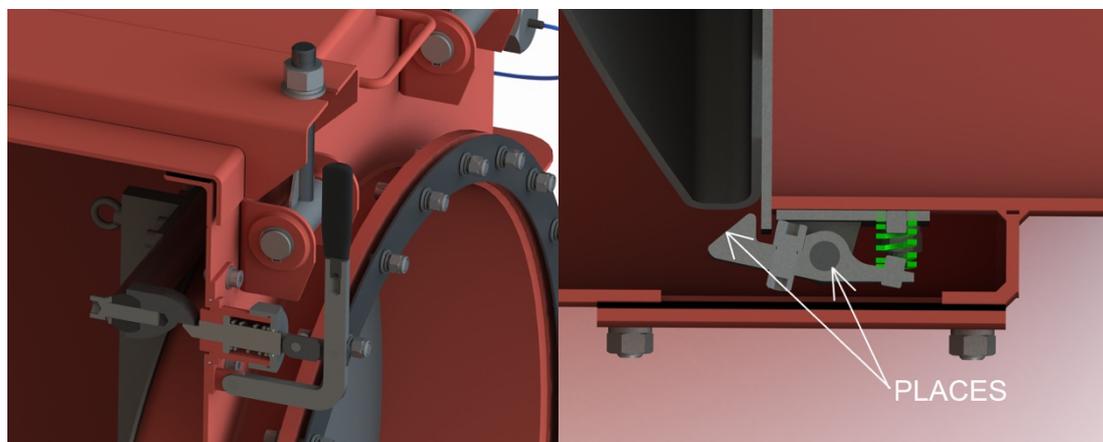


Figure 30 – Locking mechanism of B-FLAP DN 710 and 800 (main lock with lever on the left side, additional lock on the right side)

Apply lubricant (Mogul LV 2-3 or equivalent) to the indicator pin and spring.

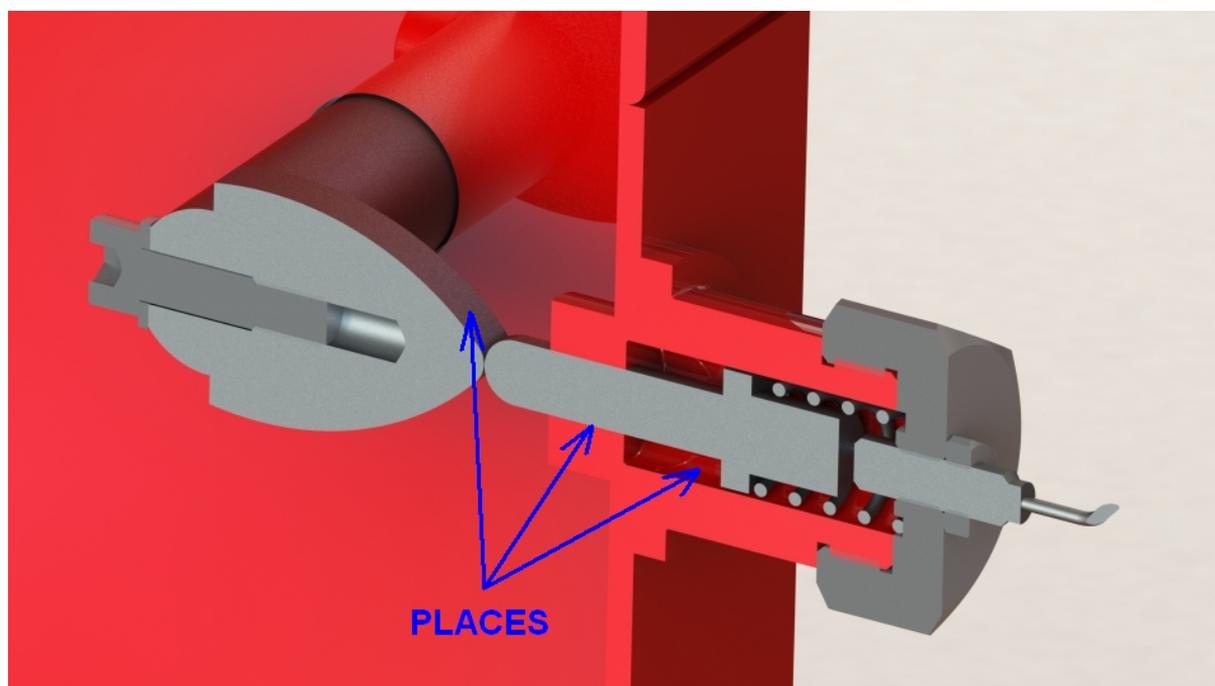


Figure 31 – Section through indicator mechanism

Servicing the indicator (if installed):

- ✓ Check the wiring of the inductive sensor and power supply.
- ✓ Set the inductive sensor to the correct position (the B-FLAP must be closed) until the indicator “B-FLAP closed” is given.
- ✓ Secure the inductive sensor in the correct position with the lock screw.
- ✓ Test – if the B-FLAP is open, the active output signal is “B-FLAP open”.

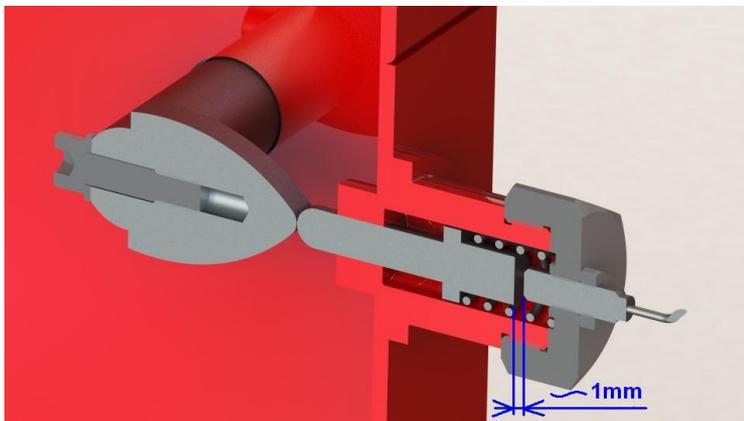


Figure 32 – Section through indicator mechanism – setting of sensor

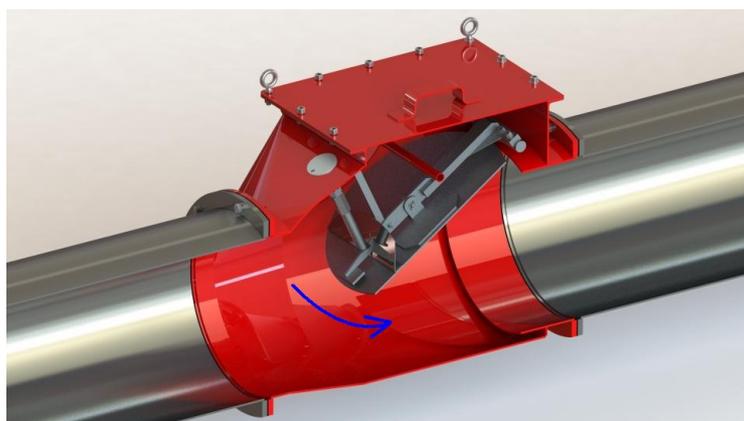


Figure 33 – Section through B-FLAP - closure test



Service on the power supply (fuse breaker and power cabling) and on the indicator cabling is normally performed by the User.



Producer is not liable for defects and wear caused by operation of the technology (abrasive material, high speed of material etc.).



Visually inspect the sealing points.

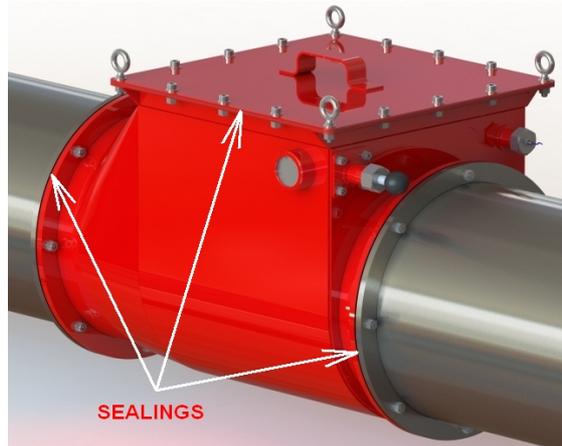


Figure 34 – B-FLAP in the pipe – flange and lid gaskets

Check the proper torque of the screws (for tightening torques, see Chapter 4.2.4).

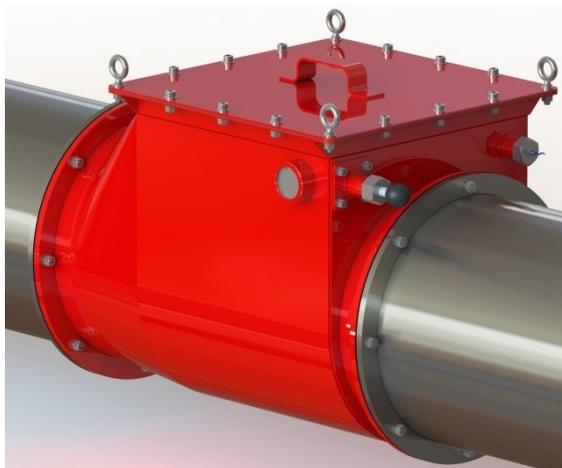


Figure 35 – B-FLAP in the pipe



A log of the activities undertaken in this chapter shall always be made by qualified personal. The entry is an assessment of the condition of the protected system; any troubleshooting suggestions shall be done by the manufacturer only. All activities carried out on this product must be recorded in the operational log.



Service interventions to correct any faults shall be performed by the manufacturer only.



Operational log must be properly kept, maintained and stored by a specific responsible person of the operator. Such person must be stated in the operational log.



The Operational log and this User manual are integral part of the explosion isolation valve B-FLAP.