

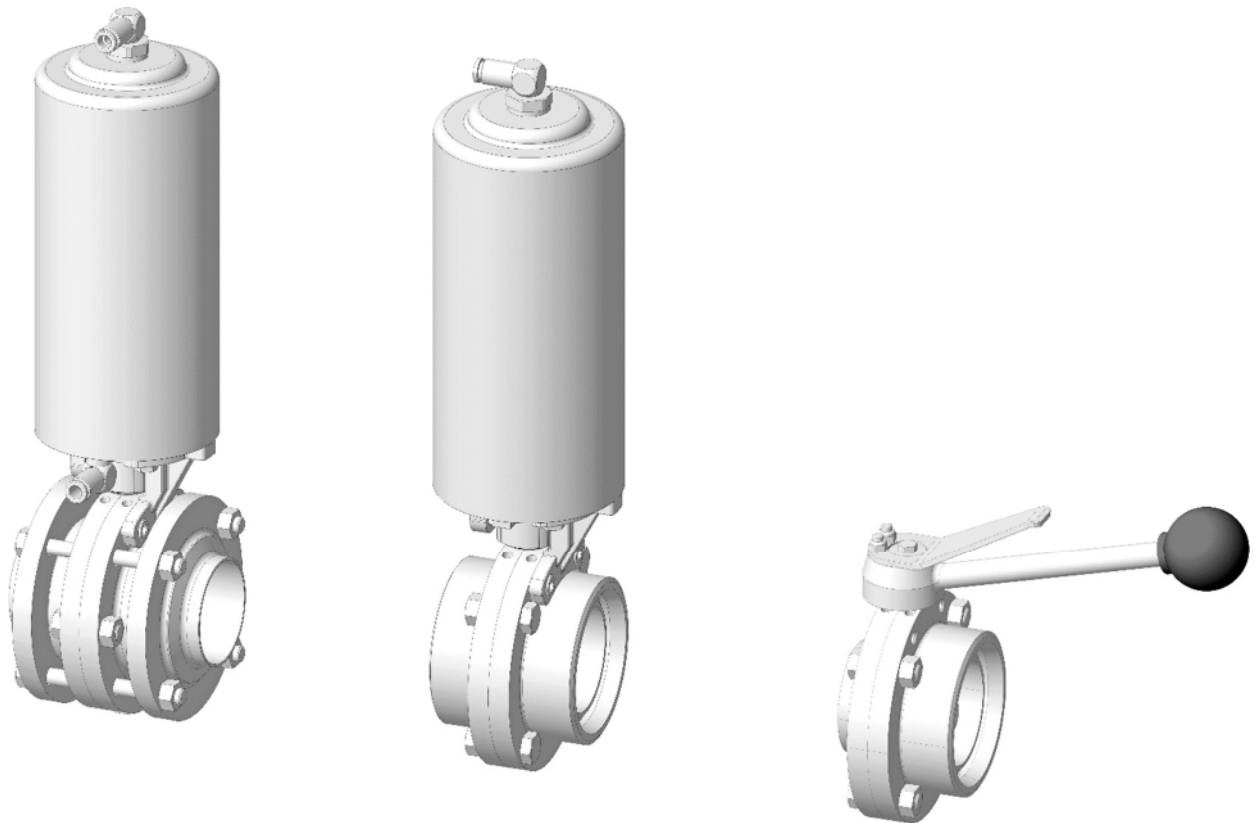
## Butterfly valve BV Perform series

Size:

DN 015 – 150, OD 1.00" – 6.00", ISO 025 – 150

### Part 1: General operating instructions

- Copy of the original operating instructions -



Version 1.02



en

## 1. Table of contents

<b>1.</b>	<b>Table of contents</b> .....	<b>2</b>
<b>2.</b>	<b>Safety notes and residual risks</b> .....	<b>4</b>
2.1.	Warning information.....	4
2.2.	Working with the butterfly valves.....	5
2.2.1.	General instructions, information and notes.....	5
2.2.2.	Measures to counter hazards that can be traced back to operating media.....	5
2.2.3.	Measures to counter pressure hazards .....	5
2.2.4.	Measures to counter thermal hazards .....	6
2.2.5.	Measures to counter mixed hazards .....	6
2.3.	Hygiene requirements.....	7
2.3.1.	Measures to counter risks to health while processing foods .....	7
2.4.	Danger areas, residual risks, warning symbols and information signs .....	7
2.4.1.	Injury hazards in relation to the improper disassembly of the pneumatic air/spring control heads mounted on the butterfly valves .....	7
2.4.2.	Injury hazards in the area of the butterfly valve closing unit .....	8
2.4.3.	Injury hazards in the area of the butterfly valve feedback systems .....	9
2.4.4.	Injury hazards in relation to the improper use of butterfly valves with regards to processing overheated media .....	12
2.4.5.	Health risks in relation to contamination while processing food .....	13
<b>3.</b>	<b>Description of butterfly valves</b> .....	<b>14</b>
3.1.	Scope.....	14
3.2.	Materials, construction, hygienic design .....	14
3.3.	Limits of butterfly valves .....	15
3.4.	Use, construction and operating mode .....	15
3.5.	Extensions, control and feedback systems .....	16
3.5.1.	Fittings with proximity switches .....	16
3.5.2.	Fittings with IntelliTop® 2.0 .....	16
3.5.3.	Fittings with SensoTop feedback heads.....	17
3.5.4.	Fittings with process controller type 8692 or 8694 .....	17
<b>4.</b>	<b>Proper Use</b> .....	<b>19</b>
4.1.	Areas and conditions of use .....	19
4.1.1.	Intended purpose and user groups.....	19
4.1.2.	Areas of use and environmental conditions .....	19
4.1.3.	Using the butterfly valves for their intended purpose in potentially explosive areas.....	20
4.1.4.	Operating media and limits .....	21
4.1.5.	Operating equipment and auxiliary media .....	23
4.1.6.	Limitation devices .....	24



4.2.	Handling butterfly valves .....	25
4.2.1.	Configuration, packaging, storage, transport.....	25
4.2.2.	Assembly, connection, disassembly .....	26
4.2.3.	Commissioning .....	31
4.2.4.	Cleaning, disinfection .....	33
4.2.5.	Management, operation .....	35
4.2.6.	Decommissioning .....	36
4.2.7.	Service life and disposal.....	37
5.	<b>Inspection, maintenance, overhaul, repair, spare parts .....</b>	<b>38</b>
6.	<b>Service address .....</b>	<b>40</b>

## 2. Safety notes and residual risks

All of the following safety notes and residual risks listed in these operating instructions result from the risk assessment for the butterfly valves in the BV Perform series.

### 2.1. Warning information

Butterfly valves in the BV Perform series – hereinafter also known as fittings – have been built according to state-of-the-art standards and recognised safety regulations.

However, these fittings can cause risks of danger to life for users or third parties if they are handled improperly or not used for their intended purpose.

It can also lead to function limitations and/or damage to the butterfly valves themselves, and other material assets.



#### DANGER



This symbol refers to an imminent threat to the life and health of persons.

Death, serious injuries or other serious impacts to health and/or significant property damage **will** occur if the warning notes associated with this symbol are not observed and/or the relevant precautionary measures are not taken.



#### WARNING



This symbol refers to an imminent threat to the life and health of persons.

Death, serious injuries or other serious impacts to health and/or significant property damage **may** occur if the warning notes associated with this symbol are not observed and/or the relevant precautionary measures are not taken.



#### CAUTION



This symbol refers to a possible threat to the health of persons.

Minor injuries and/or damage to property **may** occur if the warning notes associated with this symbol are not observed and/or the relevant precautionary measures are not taken.

#### Information/Note



This symbol refers to important information on the proper and safe use of the fittings, which must be observed.

Non-observance of this information **may** result in injuries and/or function disorders of the fittings, and damage to property.

## 2.2. Working with the butterfly valves

### 2.2.1. General instructions, information and notes

All work on the butterfly valves may only be performed by trained and qualified personnel.

For the purposes of these operating instructions, qualified personnel are:

- ⇒ People with training or instruction according to the current standards of the safety regulations
- ⇒ For systems intended to be used in potentially explosive areas, in keeping with Directive 2014/34/EU of the European Parliament and of the Council:  
People with training or instruction and/or authorisation to perform work on potentially explosive systems

#### Information/Note



All people who are involved with the transport, assembly, connection, disassembly, commissioning, management, operation, cleaning, disinfection, maintenance, decommissioning, repair, storage or disposal of butterfly valves must have read and understood these general operating instructions (Part 1).

Moreover, all of the aforementioned people must also have read and understood the type-specific assembly instructions (Part 2) for the specific butterfly valves they are handling.

### 2.2.2. Measures to counter hazards that can be traced back to operating media

The operators of the butterfly valves must ensure that all people entrusted with working on them,

- ⇒ are informed about the possible residual risks which may occur as a result of operating media residue remaining inside.
- ⇒ If applicable, the operators of the fittings must prescribe suitable protective measures, such as the wearing of personal protective equipment (safety gloves, safety goggles etc.), before work can be performed on them.

Examples of effective defensive measures against the occurrence of hazards from operating media include

- ⇒ sufficiently long flushing with water, followed by the complete emptying of the fittings and the surrounding pipeline sections.

### 2.2.3. Measures to counter pressure hazards

The operators of the butterfly valves must ensure,

- ⇒ that work on these may only be performed with the fittings and all connected pipeline sections in a depressurised state, and with the media supply shut off,
- ⇒ that the depressurised state of the fittings and/or the connected pipeline sections remains in place throughout the entire duration of the work and cannot be overridden by third parties, and
- ⇒ that it is visibly safe and clearly possible for all people involved with working on the fittings to recognise their full state and the state of the connected pipeline sections with regards to internal pressure, and that these people are qualified and in a position to do this.

Examples of effective defensive measures against the occurrence of pressure hazards during work on the butterfly valves include

- ⇒ the use of manometers in the pressure chambers concerned, and
- ⇒ opened leakage fittings in the pressure chambers concerned.

### 2.2.4. Measures to counter thermal hazards

The operators of the butterfly valves must ensure,

- ⇒ that work is only performed on them in a cooled state (1 °C – 35 °C; 34 °F – 95 °F) and with the media supply shut off,
- ⇒ that the above thermal state of the fittings remains in place throughout the entire duration of the work and cannot be overridden by third parties, and
- ⇒ that it is visibly safe and clearly possible for all people involved with working on the fittings to comprehensively recognise their thermal state, and that these people are qualified and in a position to do this.

Examples of effective defensive measures against the occurrence of thermal hazards during work on the butterfly valves include

- ⇒ the use of contact thermometers in association with a convergence test.
- ⇒ The operators of the butterfly valves must instruct all people involved with working on them,
- ⇒ to perform a temperature test on all areas of the fittings and the connected pipeline sections before starting work.

### 2.2.5. Measures to counter mixed hazards

The operators of the butterfly valves must ensure that throughout the entire period when work is being performed on them,

- ⇒ they cannot be accidentally switched on by third parties, and
- ⇒ the commissioning of systems in which the fittings are installed, if applicable, is excluded.
- ⇒ For certain work, it is beneficial or even essential to disassemble the butterfly valves and remove them from the systems in which they are integrated, if applicable.

Always make sure that before starting disassembly, the butterfly valves and all connected pipeline sections

- ⇒ have been cleaned and then flushed with cold water for a sufficiently long period, in order to ensure that there is no cleaning product, hot water or hot steam left inside,
- ⇒ have been emptied after flushing,
- ⇒ are sufficiently cool
- ⇒ and that the pressure build-up which may form in sealed pressure chambers or pipelines is countered.



#### WARNING



Non-observance of the instructions, information and notes listed in the chapter "Working on the butterfly valves" may result in serious impacts on health, including life-threatening injuries that may or may not end in death.

**2.3. Hygiene requirements****2.3.1. Measures to counter risks to health while processing foods**

If foods are processed in the butterfly valves, the operators must ensure,

- ⇒ that permitted operating media are exclusively used inside them, in accordance with the relevant specifications in the chapter "Operating media and limits",
- ⇒ that the permitted concentrations and temperatures of cleaning products and disinfectants are observed at all times in accordance with the specifications in Table 4.1.4, and
- ⇒ that contact between these and non-permitted media, in accordance with the specifications in the chapter "Operating media and limits", can be safely excluded.

Examples of effective defensive measures to minimise hygiene-related risks to health while processing foods include

- ⇒ regular fitting maintenance,
- ⇒ regular fitting "cleaning in place" ("CIP"),
- ⇒ and regular fitting "sanitisation in place" disinfection ("SIP").

Further, the operators of the fittings must create maintenance plans that ensure that the required hygiene statuses are maintained within set time intervals.

**WARNING**

Non-observance of the instructions, information and notes listed in the chapter "Hygiene requirements" may result in serious impacts to health, which may also become life-threatening in the circumstances.

**2.4. Danger areas, residual risks, warning symbols and information signs**

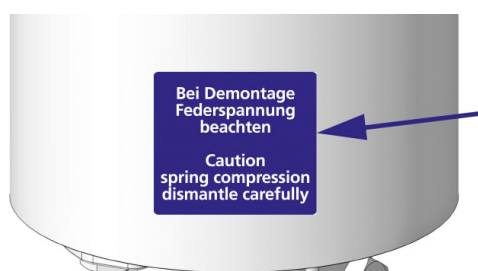
Butterfly valves by Pentair Südmo GmbH may cause typical injury risks, which are depicted in these operating instructions and are made recognisable with the aid of warning symbols and information signs on the fittings themselves. The most common hazard situations that may result from butterfly valves, and the measures for avoiding them, are displayed below.

**2.4.1. Injury hazards in relation to the improper disassembly of the pneumatic air/spring control heads mounted on the butterfly valves**


The pressure springs in the pneumatic control heads of the butterfly valves are fixed with locking rings.



These locking rings must be removed when changing the pressure springs. This can only be done when the pressure springs are pre-loaded.

The pressure springs must be pre-loaded in a way that ensures that the springs cannot be released while work is being performed on the control heads; e.g. with the aid of a press.



The assembly guidelines in the type-specific assembly instructions (Part 2) of the butterfly valves describe how to properly change the pressure springs.

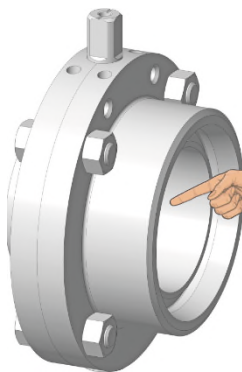
Information/Note	
	<p>The operators of the butterfly valves must ensure that all people entrusted with overhaul work on them are informed of these assembly guidelines, and that these people are obliged to follow the disassembly and assembly steps provided in these operating instructions.</p>



 <b>WARNING</b>	
	<p>As a consequence of improper disassembly of the pressure springs, and non-compliance with the instructions and information listed in the chapter "Injury hazards in relation to the improper disassembly of the pneumatic air/spring control heads mounted on the butterfly valves", the following hazards may occur, which may result in serious injuries, which could end in death in some circumstances.</p> <p>⇒ Impact from pressure springs suddenly emerging from the actuator housing at high speeds.</p>


#### 2.4.2. Injury hazards in the area of the butterfly valve closing unit

If the media connections of the butterfly valves are not fully integrated into the closed pipeline systems, there is a possibility of reaching from outside into these fittings, and therefore into the area of the fittings' closing unit as well, which may lead to an injury hazard.

For example, this may be the case for 'leakage fittings' for the purpose of draining media from pipeline systems.





 <b>WARNING</b>	
	<p>Do not reach into the valve openings!</p> <p>→ <b><u>Danger of accident.</u></b></p> <p>Risk of limbs being crushed or cut off.</p>

Information/Note	
	<p>The operators of the butterfly valves must ensure that any fittings with media connections that are not fully integrated into closed pipeline systems, and can consequently be reached into from the outside, are provided with equipment that reliably prevents any reaching during the commissioning and/or operation of the butterfly valves.</p> <p>The specifications from DIN EN ISO 13857, in which minimum distances from danger areas are defined, may be helpful as complying with them will minimise the risk of injury.</p>




Further, the above hazard situations may occur when the fittings are removed from the closed pipeline systems for the purpose of disassembly, maintenance or overhaul work.

Information/Note	
	<p>The operators of the butterfly valves must ensure that all people working on them are qualified and in a position to recognise whether the actuator systems are physically disconnected from all energy sources (usually control air), and if their closing units are located within the fittings in their immobile end positions. Never reach into the media connections of the fittings if this is not the case!</p> <p>It must also be ensured that power-driven switching operations can only be activated by people who are working directly on the fittings.</p> <p>The operators of the butterfly valves must ensure that all people involved with this work are qualified and in a position to recognise whether power-driven switching operations can still be initiated from the other side, by anyone other than themselves.</p>

WARNING	
	<p>Non-observance of the instructions, information and recommendations listed in the chapter "Injury hazards in the area of the butterfly valve closing unit" may result in serious impacts on health; limbs may be severely crushed, cut or cut off.</p>

#### 2.4.3. Injury hazards in the area of the butterfly valve feedback systems

Information/Note	
	<p>The operators of the butterfly valves must ensure that all people involved with working on them are informed of the following hazards, and that these people are qualified and in a position to recognise whether power-driven switching operations can still be triggered from the other side, by anyone other than themselves.</p>

#### **Injury hazards for fittings with IntelliTop® 2.0 process control heads**

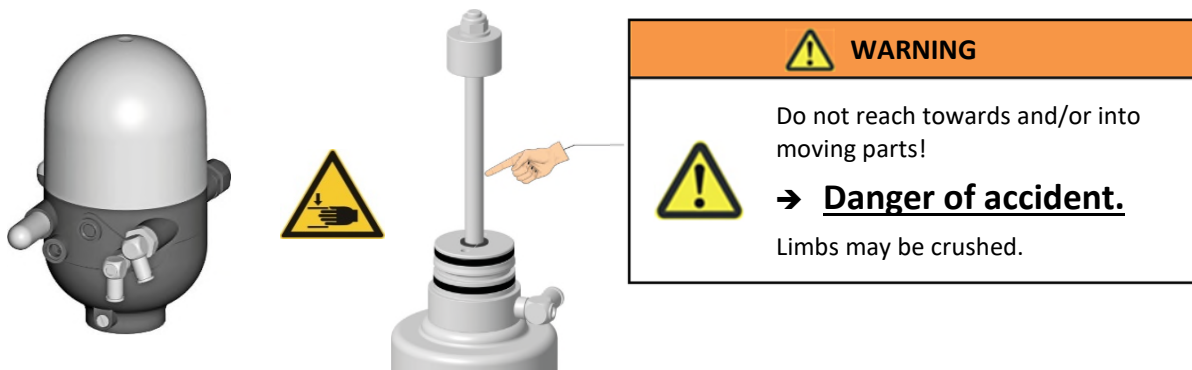
Butterfly valves can be equipped with IntelliTop® 2.0 process control heads to control the valves and provide position feedback (see example image on the next page).

These process control heads are either already pre-installed on the actuator cylinders of the fittings on delivery, or they can be installed on the fittings by the operators afterwards.

Should the process control heads already be pre-installed on delivery, the danger area in the feedback target area, consisting of a spindle with stop and contact button, must be identified with warning symbols (see example image on the next page).

## Operating instructions


Part 1: General operating instructions  
 Butterfly valve; BV Perform series  
 DN 015 – 150, OD 1.00" – 6.00", ISO 025 – 150




During operation of the butterfly valves with installed process control heads, these act as protective equipment and reliably guarantee that the operator cannot reach into the moving feedback target.

Should the process control heads not yet be pre-installed when the butterfly valves are delivered, and need to be installed on the fittings by the operators, this installation work must be performed in accordance with the type-specific assembly instructions (Part 2) for the butterfly valves.

Should this be the case, the operators must also affix the relevant warning symbols, similar to the example shown in the top centre, in the danger area of the fittings concerned, indicating the hazard.

INFORMATION	
	<p>When working with butterfly valves which require the disassembling of the process control heads, it must be ensured that power-driven switching operations can only be activated by people who are working directly on the fittings.</p> <p>Work may only be performed on the process control heads when the actuator cylinders of the fittings have been physically disconnected from their air supply.</p>

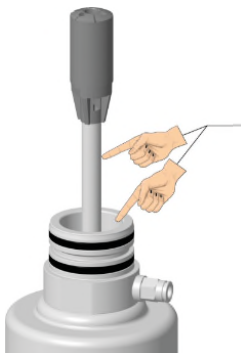
WARNING	
	<p>Never reach into the danger area unless all air hoses are disconnected from the actuator cylinders of the fittings!</p> <p>Limbs may be cut as a result of power-driven switching operations.</p>


### Injury hazards for fittings with SensoTop feedback heads

Butterfly valves can be equipped with SensoTop type feedback heads for position feedback (see example image at the bottom left).

These feedback heads are either already pre-installed on the actuator cylinders of the fittings on delivery, or they can be installed on the fittings by the operators afterwards.

Should the feedback heads already be pre-installed on delivery, the danger area in the feedback target area, consisting of a spindle with stop and contact button, must be identified with warning symbols (see example image on the next page).





WARNING	
	Do not reach towards and/or into moving parts!
	→ <b><u>Danger of accident.</u></b>
	Limbs may be crushed.

During operation of the fittings with installed feedback heads, these act as protective equipment and reliably guarantee that the operator cannot reach into the moving feedback target.

Should the feedback heads not yet be pre-installed when the butterfly valves are delivered, and need to be installed on the fittings by the operators, this installation work must be performed in accordance with the type-specific assembly instructions (Part 2) for the butterfly valves.

Should this be the case, the operators must also affix the relevant warning symbols, similar to the example shown in the top centre, in the danger area of the fittings concerned, indicating the hazard.

INFORMATION	
	<p>When working with butterfly valves which require the disassembling of the feedback heads, it must be ensured that power-driven switching operations can only be activated by people who are working directly on the fittings.</p> <p>Work may only be performed on the process control heads when the actuator cylinders of the fittings have been physically disconnected from their air supply.</p>

WARNING	
	<p>Never reach into the danger area unless all air hoses are disconnected from the actuator cylinders of the fittings!</p> <p>Limbs may be cut as a result of power-driven switching operations.</p>

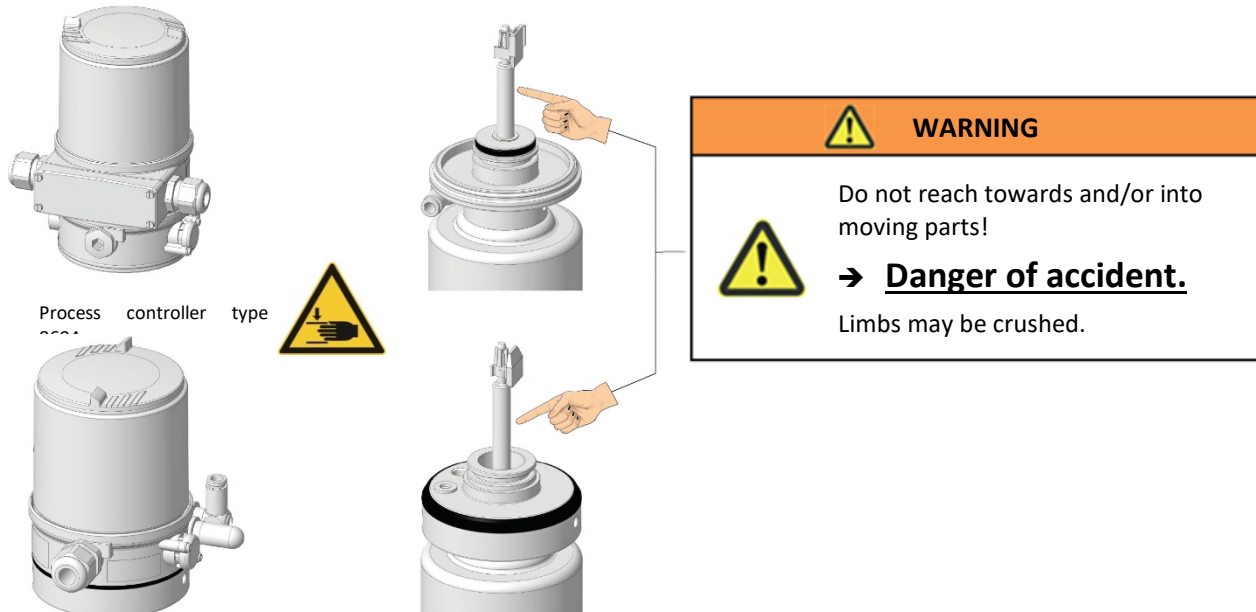
### **Injury hazards for fittings with process controllers type 8692 and 8694**

Butterfly valves can be equipped with process controllers type 8692 or 8694 to control the valves and provide position feedback (see example image on the next page).


These process controllers are already pre-installed on the actuator cylinders of the fittings on delivery.


Should the process controllers already be pre-installed on delivery, the danger area in the feedback target area, consisting of a spindle and a tappet, must be identified with warning symbols (see example image on the next page).

Process controller type 8692




During operation of the butterfly valves with installed process controllers, these act as protective equipment and reliably guarantee that the operator cannot reach into the moving feedback target.

INFORMATION	
	<p>When working with butterfly valves which require the disassembling of the process control heads, it must be ensured that power-driven switching operations can only be activated by people who are working directly on the fittings.</p> <p>Work may only be performed on the process control heads when the actuator cylinders of the fittings have been physically disconnected from their air supply.</p>

WARNING	
	<p>Never reach into the danger area unless all air hoses are disconnected from the actuator cylinders of the fittings!</p> <p>Limbs may be cut as a result of power-driven switching operations.</p>

#### 2.4.4. Injury hazards in relation to the improper use of butterfly valves with regards to processing overheated media

INFORMATION	
	<p>Never process overheated media in the butterfly valves!</p> <p>Overheated media are media at temperatures over their evaporation temperatures at atmospheric pressure.</p>

### WARNING



When processing overheated media, in the event of the protective sealing elements of the butterfly valves breaking (e.g. due to wear), there is a risk that large quantities of steam will emerge from the fittings when these media are released.

This can result in a sudden build-up of fog in the operating rooms.

Disorientation and risks of stumbling, falling and collision may be the consequences for the operating personnel.

#### 2.4.5. Health risks in relation to contamination while processing food

### WARNING



As the result of using non-permitted media and/or improper cleaning and/or improper disinfection, impurities and contamination may result, which in turn may have a negative impact on the foods located in the butterfly valves, which may significantly reduce their fitness for consumption.

Examples of this are:

- ⇒ Substances resulting from corrosion
- ⇒ Pathogens or other unwanted micro-organisms
- ⇒ Residues of cleaning products
- ⇒ Residues of disinfectants
- ⇒ Foreign bodies from different sources

The consumption of contaminated foods of this kind may result in serious health impairments, including death.

### 3. Description of butterfly valves

#### 3.1. Scope

These operating instructions apply to the following butterfly valve types in the BV Perform series:

- ⇒ K580..., K660..., K670... and K680...: Butterfly valves with connection 2 x external thread
- ⇒ K581..., K661..., K671... and K681...: Butterfly valves with connection 1 x external thread and 1 x slotted nut
- ⇒ K582..., K662..., K672... and K682...: Butterfly valves with connection 2 x welding end
- ⇒ K585..., K665..., K675... and K685...: Butterfly valves with connection 1 x external thread and 1 x welding end
- ⇒ K587..., K667..., K677... and K687...: Butterfly valves with connection in sandwich style
- ⇒ K588..., K668..., K678... and K688...: Butterfly valves with connection 2 x clamps

#### 3.2. Materials, construction, hygienic design

The construction materials used for constructing the butterfly valves in the BV Perform series are all durable, and can all be cleaned and disinfected.

Further, the construction materials do not demonstrate any breakages, are resistant to cracking, splitting, chipping and wear, and the absorption of unwanted substances, when the butterfly valves are used correctly, thereby fulfilling the requirements of Chapter 5.2.1 of DIN EN 1672-2.

The built-in construction materials in the food range of the fittings described here are all corrosion-proof, non-toxic and non-absorbent when they are used correctly, do not transmit unwanted smells, colours or flavourings, thereby fulfilling the requirements of Chapter 5.2.2 of DIN EN 1672-2.

In detail, they are:

- ⇒ Stainless steels: 1.4307, 1.4404, 1.4435 and other stainless steel materials with even higher corrosion resistance
- ⇒ Elastomers: EPDM, FKM, VMQ, HNBR (all in FDA quality)
- ⇒ Plastics: PTFE (in FDA quality)

The butterfly valves described here are constructed in accordance with the hygiene requirements of DIN EN 1672--2.

The following attributes apply to the constructive arrangement of the existing food areas (internal surfaces):

- ⇒ The surfaces are smooth ( $R_a = 0.8 \mu\text{m}$  or better) and gap-free, and can therefore be cleaned.
- ⇒ The surfaces can be disinfected.
- ⇒ Fixed connections within the fittings described here are sealed with welding technology - without undercuts, gaps, cracks, protruding edges, inner projections or dead space.  
Detachable connections sit flush and are sealed with elastomers or plastics.
- ⇒ No connection elements are present in the food area of the fittings described here.
- ⇒ If the fittings described here are used correctly, it is guaranteed that liquids therein can drain freely, including adhesive quantities.  
Inner angles and corners can be effectively cleaned and disinfected.
- ⇒ The food areas of the fittings described here do not display any dead space.

The following attributes apply to the constructive arrangement of the non-food areas (external surfaces) of the butterfly valves described here:

- ⇒ The surfaces consist of corrosion-proof materials.
- ⇒ The surfaces can be cleaned and disinfected if the fittings are used properly.

The following measures have been and are taken during manufacturing to check that hygiene requirements have been fulfilled:

- ⇒ General quality assurance actions, such as incoming goods inspections, drawing tests, factory worker inspections, visual tests, function tests and other tests were performed in accordance with the Pentair SÜDMO QM system specifications.
- ⇒ The stainless steels used have been awarded material test certificates.
- ⇒ Surface roughness is determined in accordance with the specifications of DIN EN ISO 4288.
- ⇒ The food compatibility of the elastomers and plastics used in the food area is certified by manufacturer declarations.

### 3.3. Limits of butterfly valves

The spatial expansions of the butterfly valves in the BV Perform series generally range as far as their pipe connections. Welded-on process connections and system parts are not added to the calculations of the capacities of the fittings, or calculations of their weights.

Schematic diagrams of the fittings, and essential dimensions and weights, are contained in the type-specific assembly instructions (Part 2) for the types of butterfly valves in the BV Perform series concerned.

### 3.4. Use, construction and operating mode

The butterfly valves in the BV Perform series are for securing pipelines and containers, controlling material flows within pipeline systems, and controlling material flows into or out of containers.

A butterfly valve is characterised by the use of a radially moving closing unit ("valve disc") within an elastomer moulded seal and/or within a plastic-coated elastomer moulded seal.

The valve disc possesses two guide shafts that are fed through the seal. This serves to store the valve disc within the seal.

The moulded seal and the valve disc are clamped between two flanges that possess a corresponding recess and semi-circular guide slots to support the seal and/or guide shafts.

The flanges are connected to each other with the aid of through bolts. This generates an axial force which pre-loads the moulded seal accordingly. This then seals the system from the outside.

The butterfly valve is closed and/or opened by a 90° rotation movement on the guide shaft of the valve disc.

At intermediate positions, throttling can be achieved to regulate the volume flows.

There are butterfly valves in the BV Perform series with 2 different actuator variants,

- ⇒ a manual version with a lockable stainless steel hand lever, and
- ⇒ an automatic version with a pneumatically activated stainless steel rotary actuator.

The rotary actuators of the automatic version may operate using the

- ⇒ air opening – air closing,
- ⇒ air opening – spring closing and
- ⇒ spring opening - air closing
- ⇒ air opening - spring closing with three-position drive
- ⇒ spring opening - air closing with three-position drive

function methods.

The metal cylinders of the rotary actuators possess ventilation holes, so that excess pressure cannot build up in the cylinder spaces impinged with control air when the actuators are driven, as this may impair the undisturbed function of the actuators.

These ventilation holes lead into the atmosphere for the air/spring actuators and into angle screw-in fittings for the air/air actuators, which are set up for attaching air hoses.

More diagrams of the construction and operating mode of the butterfly valves in the BV Perform series are contained in the type-specific assembly instructions (Part 2) for the types concerned.

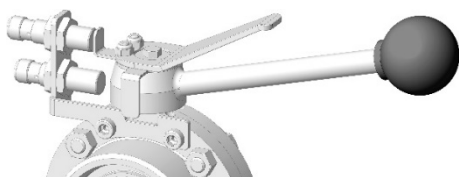
### 3.5. Extensions, control and feedback systems

#### 3.5.1. Fittings with proximity switches

The butterfly valves in the BV Perform series can be equipped with proximity switches for position feedback of the closing unit.

These proximity switches are either already pre-installed on the feedback brackets of the fittings on delivery, or they can be installed on them by the operators of the butterfly valves afterwards.

##### Butterfly valve, manual - Single and double feedback



- ⇒ Inductive feedback unit  
Feedback unit data - see data sheet of the feedback unit manufacturer
- ⇒ Attachment kit (hand lever incl. feedback units) for feedback (standard M12 feedback unit)

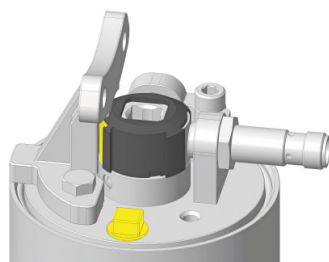
DN 020 – 040 – Order no. 2335632  
 DN 015 (Intermediate clamp)  
 OD 1.00" – 1.50"  
 ISO 015 – 040

DN 050 – 100 – Order no. 2335633  
 OD 2.00" – 4.00"  
 ISO 050 – 100

DN 125 – 150 – Order no. 2335634  
 OD 6.00"

##### Pneumatic butterfly valve - Single and double feedback

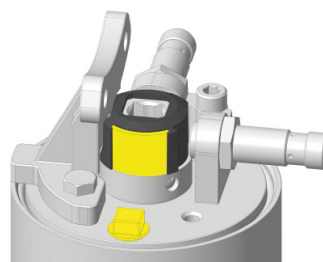
Feedback: Open



Feedback: Closed



Feedback: Open and Closed



Figures: Spring-closing actuator

- ⇒ Feedback: valve position "Open" or "Closed"
- ⇒ Inductive feedback unit  
Feedback unit data - see data sheet of the feedback unit manufacturer

#### 3.5.2. Fittings with IntelliTop® 2.0

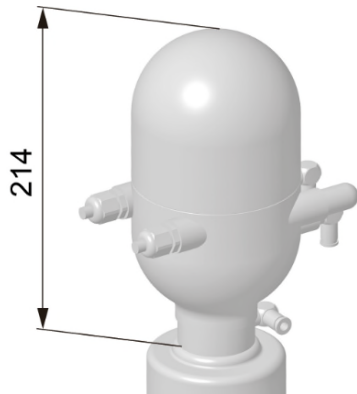
The butterfly valves in the BV Perform series can be equipped with Pentair-Südmo process control heads of the type IntelliTop® 2.0 for position feedback of the closing unit and controlling the automatically functioning actuators.

The process control heads are either already pre-installed on the actuator cylinders of the fittings on delivery, with the aid of attachment kits, or they can be installed on the fittings by the operators afterwards, together with the attachment kits.



The position of the closing unit in the butterfly valve housing can be detected when the feedback target mounted on the attachment kit induces a position signal in the process control head.

Further, the automatically functioning actuators can be decentrally impinged with control air with the aid of the IntelliTop® 2.0 process control heads.



#### IntelliTop® 2.0

Technical data

see IntelliTop 2.0 operating instructions BA

Pneumatic connections

see IntelliTop 2.0 operating instructions BA

Electrical connections

see IntelliTop 2.0 operating instructions BA

Maintenance

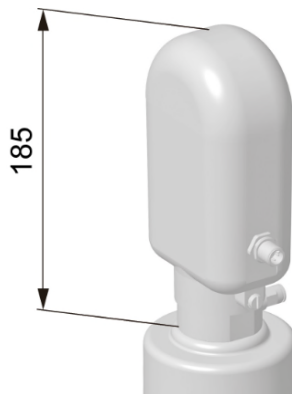
see IntelliTop 2.0 operating instructions BA

#### 3.5.3. Fittings with SensoTop feedback heads

The butterfly valves in the BV Perform series can be equipped with Pentair-Südmö feedback heads of the type SensoTop for position feedback of the closing unit.

The feedback heads are either already pre-installed on the actuator cylinders of the fittings on delivery, with the aid of attachment kits, or they can be installed on the fittings by the operators afterwards, together with the attachment kits.

The position of the closing unit in the butterfly valve housing can be detected when the feedback target mounted on the attachment kit induces a position signal in the feedback head.



#### SensoTop

Technical data

see SensoTop operating instructions BA

Pneumatic connections

see SensoTop operating instructions BA

Electrical connections

see SensoTop operating instructions BA

Maintenance

see SensoTop operating instructions BA

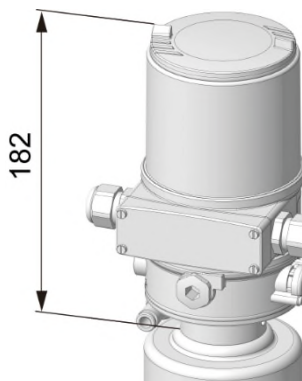
#### 3.5.4. Fittings with process controller type 8692 or 8694

The butterfly valves in the BV Perform series can be equipped with process controllers of the type 8692 and 8694 for position feedback of the closing unit and controlling the automatically functioning actuators.

The process controllers are already pre-installed on the actuator cylinders of the fittings on delivery, with the aid of attachment kits.

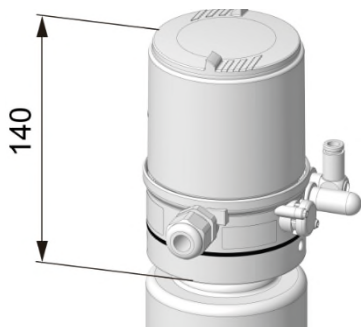
The position of the closing unit in the butterfly valve housing can be detected when the feedback target mounted on the attachment kit induces a position signal in the process control head.

Further, the automatically functioning actuators can be decentrally impinged with control air with the aid of the process controllers of the type 8692 and 8694.



Process controllers type 8692

Technical data	see operating instructions Process controller type 8692
Pneumatic Connections	see operating instructions Process controller type 8692
Electrical connections	see operating instructions Process controller type 8692
Maintenance	see operating instructions Process controller type 8692



Process controllers type 8694

Technical data	see operating instructions Process controller type 8694
Pneumatic Connections	see operating instructions Process controller type 8694
Electrical connections	see operating instructions Process controller type 8694
Maintenance	see operating instructions Process controller type 8692

## 4. Proper Use

The intended use of the butterfly valves in the BV Perform series includes

- ⇒ compliance with all safety notes in these operating instructions, and the type-specific assembly instructions (Part 2) for the types concerned.
- ⇒ compliance with all national and international laws, ordinances, specifications, guidelines and other regulations that are in force at the installation location,
- ⇒ in-house work and safety regulations, and
- ⇒ performing regular inspection and maintenance work.

### Information/Note



Changes to the butterfly valves are not permitted!  
Pentair Südmo GmbH bears no liability for any damage – to materials or health – resulting from unauthorised changes to the fittings or improper use.

### 4.1. Areas and conditions of use

#### 4.1.1. Intended purpose and user groups

The butterfly valves in the BV Perform series are exclusively intended for commercial use.  
Private use is not permitted.

The fittings may only be packed, transported, assembled, constructed, connected, commissioned, operated, maintained, overhauled, disassembled, decommissioned, stored and disposed of by qualified personnel.

Qualified personnel in this sense are people who are entrusted with the above mentioned activities and possess the relevant qualifications.

#### 4.1.2. Areas of use and environmental conditions

Typical areas of use for butterfly valves include businesses in


- ⇒ the brewing and beverage industry,
- ⇒ the food industry,
- ⇒ the pharmaceutical industry,
- ⇒ the chemical industry and
- ⇒ the cosmetics industry.

The following requirements for operating rooms where the fittings may be used must be fulfilled:


- ⇒ The operating rooms must be equipped with acid and alkali-proof floors.
- ⇒ The operating rooms must be equipped with normal room lighting, so that labels, warning symbols and information on the fittings can be easily recognised at all times.
- ⇒ Permitted ambient temperature in the operating rooms: 0 °C (32 °F) ... 55 °C (131 °F).
- ⇒ The atmospheric conditions in the operating rooms (air temperature, humidity and movement) must not cause the moving parts of the fittings to freeze.
- ⇒ The operating rooms must be free from dust.


### 4.1.3. Using the butterfly valves for their intended purpose in potentially explosive areas


- ⇒ Butterfly valves in the BV Perform series meet the specifications of Directive 2014/34/EU of the European Parliament and of the Council, and are suitable in principle for use in potentially explosive areas.
- ⇒ The butterfly valves may not be operated outdoors if their location is classified as an explosive area within the meaning of Directive 2014/34/EU of the European Parliament and of the Council.
- ⇒ Using the butterfly valves <<underground>> is not permitted.
- ⇒ The operating rooms must be free from dust.  
Dust deposits on the fittings must be avoided.
- ⇒ The system into which the butterfly valves are integrated must be earthed.
- ⇒ The ignition temperatures of existing explosive media must not be exceeded by hot media inside the fittings or by hot surface temperatures of the fittings.
- ⇒ The butterfly valves, consisting of housings and actuators (manual or pneumatic) – without the installation of proximity switches or process control heads – have a fitting marking that corresponds to both Directive 2014/34/EU of the European Parliament and of the Council as well as the standard DIN EN 80079 36:2016 12.
- ⇒ The valve housings individually do not represent a complete machine and therefore do not fall under Directive 2014/34/EU. A corresponding marking is therefore not relevant.
- ⇒ Pentair Súdmo valve housings may only be operated with the permitted original actuators (manual or pneumatic) from Pentair Súdmo. Only in this composition do the butterfly valves represent a complete machine and may be operated and marked in accordance with Directive 2014/34/EU.
- ⇒ Conversely, original actuators from Pentair Súdmo (manual or pneumatic) may only and exclusively be used on valve housings from Pentair Súdmo in accordance with Directive 2014/34/EU. The installation of original Pentair Súdmo actuators (manual or pneumatic) on valve housings of other manufacturers or other types is not permitted.
- ⇒ It is therefore also permissible to install new original actuators from Pentair Súdmo (manual or pneumatic) e.g. as spare parts on older valve housings - provided that the housings are identical in construction and function - and to mark them in accordance with Directive 2014/34/EU.
- ⇒ The information on the respective type plate applies to the respective butterfly valve.

	⇒ For gases: II 2 G Ex h IIB 80 °C ... 150 °C Gb
	⇒ For dusts: II 2 D Ex h IIIC T150 °C Db


- ⇒ Butterfly valves with installed proximity switches or process control heads may be subject to different categories and may be marked differently. More detailed information on this can be found in the corresponding operating instructions and the markings of these components. It should be noted that the usability of valves with installed proximity switches or process control heads in potentially explosive areas is limited by the component of the fitting or by the component on the fitting with the worst categorisation in terms of explosion protection.


Information/Note	
	<p>It must be noted at this point that the usability of butterfly valves with installed proximity switches or process control heads is limited in potentially explosive areas, due to any components with the worst categorisation with regards to explosion safety.</p>

Information/Note	
	<p>If the butterfly valves in the BV Perform series are used in potentially explosive areas, the operators of the fittings must ensure that</p> <ul style="list-style-type: none"> <li>⇒ using them outdoors is excluded,</li> <li>⇒ dust deposits on the fittings are avoided,</li> <li>⇒ the systems into which the fittings are integrated are earthed,</li> <li>⇒ the ignition temperatures of any potentially explosive media present are not exceeded by hot media within the fittings, and moreover,</li> <li>⇒ the maximum permitted surface temperatures of the fittings are not exceeded.</li> </ul>

WARNING	
	<p>Non-observance of the above instructions, information and notes may result in serious damage to health, including life-threatening injuries or death.</p>

#### 4.1.4. Operating media and limits

Information/Note	
	<p>Only operate the butterfly valves with permitted and suitable media!          Only operate the butterfly valves at the permitted operating temperature and operating pressure!</p>

WARNING	
	<p>Using excluded or unsuitable operating media or applying non-permitted operating temperatures or pressures – even if it is only temporary (e. g. pressure surges!) – can cause the fittings and/or parts to break.          Non-observance of these warning note may result in serious damage to health, including life-threatening injuries or death.</p>


#### Permitted operating media



##### Confirmed suitable product media:

- ⇒ Liquids such as water, beverages etc.
- ⇒ Non-condensable gases such as air, oxygen, nitrogen etc.
- ⇒ Emulsions that can flow or be pumped, such as milk, cream, cosmetic creams, other cosmetics etc.
- ⇒ Foams that can flow or be pumped, such as desserts, ice creams etc.
- ⇒ Non-abrasive suspensions that can flow or be pumped, such as fruit preparations etc.

##### Confirmed suitable cleaning products and disinfectants:

- ⇒ Aqueous cleaning solvents (with sodium hydroxide base)
- ⇒ Aqueous cleaning acids (with nitric acid base)
- ⇒ Aqueous disinfectant media (with peracetic acid base)
- ⇒ Culinary steam, pure steam, ultrapure steam (depending on requirements)

Information/Note	
	<p>Ensure that the operating media are compatible with the butterfly valve materials (stainless steels, sealing materials) that come into contact with the product!</p> <p>When using prefabricated cleaning media and/or other aggressive media, make sure that these are suitable for the stainless steels and sealing materials used, and will not damage these materials.</p> <p>Contact the fittings manufacturer in case of doubt.</p>

 <b>CAUTION</b>	
	<p>Operating the butterfly valves with incompatible media may cause damage to them.</p>

### Permitted minimum temperatures for operating media

- ⇒ > -5.0 °C (23 °F) for gases and liquid media with freezing points ≤ -6.0 °C (21 °F)  
 (for butterfly valves with EPDM sealing material)
- ⇒ > +1.0 °C (34 °F) for gases and liquid media with freezing points ≤ 0.0 °C (32 °F)  
 (except for butterfly valves with EPDM sealing material)
- ⇒ > 1.0 K (2 °F) over the freezing point for liquid media with freezing points > 0.0 °C (32 °F)

### Permitted operating pressures in association with operating media and temperatures and sealing materials

The maximum permitted operating pressures in association with the permitted operating media, the maximum permitted operating temperatures and the sealing materials to be used for the BV Perform series butterfly valves are displayed in Table 4.1.4.

Essential influential factors on the sealing materials used, and the subsequent maintenance intervals to be observed, are – observing the operating limits described in Table 4.1.4, such as pressures and temperatures -

- ⇒ the types of sealing materials,
- ⇒ the compositions and qualities of the product media processed in the fittings (fat concentration, flavours, acids etc.),
- ⇒ the overall service lives of the fittings,
- ⇒ the number of switching operations for the fittings,
- ⇒ the actual predominant process parameters, such as operating pressures and temperatures,
- ⇒ the duration and frequency of the cleaning and sterilisation processes used,
- ⇒ the actual media used for the cleaning and sterilisation processes (chemical types, chemical concentrations)
- ⇒ and the actual process parameters used during the cleaning and sterilisation processes (operating pressures, operating temperatures).

### Excluded operating media

- ⇒ Hazardous gaseous media, in keeping with Directive 2014/68/EU of the European Parliament and of the Council (Pressure Equipment Directive)
- ⇒ Radioactive media
- ⇒ Toxic and very toxic media
- ⇒ Environmentally hazardous media
- ⇒ Abrasive media  
 (liquid media with hard, solid components causes increased wear on the seals.)
- ⇒ Plant steam, unpurified steam or steam containing particles

- ⇒ Overheated media  
(liquid media – liquids, emulsions or suspensions – over their evaporation temperatures at atmospheric pressure)


<b>WARNING</b>	
	<p>Never operate the butterfly valves with overheated media!</p> <p>If there is liquid media in the butterfly valves with temperatures over their evaporation temperatures at atmospheric pressure, this may cause sudden evaporation - of the entire contents of the pipeline and/or system - in the operating rooms, in the event of leakages due to seal wear or breakages.</p> <p>As a result, injury hazards for the people located in the operating rooms may occur (scalds, breathlessness, hazards due to disorientation etc.).</p>

Table 4.1.4: Maximum permitted operating pressures in association with the permitted operating media, the maximum permitted operating temperatures and the sealing materials to be used for the BV Perform series butterfly valves

Usage and operating conditions (maximum values)		Maximum permissible operating pressure PS				Maximum permissible operating temperature TS Maximum permissible media concentration C (dilution of the concentrate)																					
						Permissible fluids		Fluids and non-condensable gases		Water vapor in continuous operation		Water vapor in short-term operation (max. 20 min/day)		Fluid product <sup>1</sup>		Non-condensable gases		Water vapor in continuous operation		Water vapor in short-term operation (max. 20 min/day)		Liquid cleaning base (based on sodium hydroxide)		Liquid cleaning acid (based on nitric acid)		Liquid disinfection fluids (based on peracetic acid)	
																						C	TS	C	TS	C	TS
Sealant	Symbols	PS		PS		PS		TS		TS		TS		TS		C		TS		C		TS					
	Unit	Over pressure	PSIG	Over pressure	PSIG	Over pressure	PSIG	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	%	°C	°F	%	°C	°F				
EPDM	All evaluated valve types	10,0	145	1,7	25	2,6	38	95,0	203	95,0	203	130,0	266	140,0	284	5,0	80,0	176	3,0	40,0	104	0,7	30,0	86			
HNBR	All evaluated valve types	10,0	145	1,0	15	1,7	25	90,0	194	90,0	194	121,1	250	130,0	266	3,0	80,0	176	1,5	40,0	104	NA	NA	NA			
VMQ	All evaluated valve types	10,0	145	NA	NA	NA	NA	90,0	194	90,0	194	NA	NA	NA	NA	2,5	60,0	140	1,2	60,0	140	0,7	30,0	86			
FKM <sup>2</sup>	All evaluated valve types	10,0	145	NA	NA	NA	NA	80,0	176	80,0	176	NA	NA	NA	NA	2,5	60,0	140	1,5	60,0	140	0,2	30,0	86			
PTFE- <sup>3</sup> laminate	All evaluated valve types	6,0	87	NA	NA	NA	NA	80,0	176	80,0	176	NA	NA	NA	NA	!!	80,0	176	!!	80,0	176	!!	80,0	176			

<sup>1</sup> The maximum permissible temperature should be at least 1 K below the evaporation temperature of the fluid at atmospheric pressure!

<sup>2</sup> The temperature values presented for the sealing material FKM are assumptions that can be classified as "probably suitable".

!! Check compatibilities; in case of doubt, please consult the manufacturer!

<sup>3</sup> The maximum concentrations of chemicals are limited by the resistance of the metallic substances.

#### 4.1.5. Operating equipment and auxiliary media

#### Control air at the installation site (compressed air suitable for operating the pneumatic actuators of the butterfly valves)

##### Pressure:

⇒ 6.0 bar ... 8.0 bar (87 PSIG ... 116 PSIG)

⇒ See IntelliTop® 2.0 process control heads

for direct connection to the fitting actuators  
operating instructions for connection to the IntelliTop® 2.0 pro-


##### Temperature:


⇒ -10 °C ... +50 °C (14 °F ... 122 °F)




### Quality:


- ⇒ Solids materials: maximum particle size 40 µm; maximum particle density 10 mg/m<sup>3</sup>
- ⇒ Water: immersion point ≤ -20.0 °C (-4 °F)  
or more than 10.0 K (18 °F) below the lowest ambient temperature
- ⇒ Oil: preferably oil-free; maximum 25 mg oil at 1 m<sup>3</sup> air

Information/Note	
	Only operate the actuators of the butterfly valves with the intended control air with regards to pressure, temperature and quality!

! CAUTION	
	Operating the actuators of the butterfly valves with improper control air may lead to function disorders when switching on the fittings and cause damage to them.

### External cleaners (foam, gel and/or spray cleaners)

Information/Note	
	Ensure that the external cleaners used are compatible with the butterfly valve surface materials (stainless steels, plastics)!

! CAUTION	
	Using unsuitable external cleaners may cause damage to the butterfly valves.

### 4.1.6. Limitation devices

To prevent the operating limits described above and in Table 4.1.4, such as pressures and temperatures, from being exceeded or falling short, the systems in which the BV Perform series butterfly valves are integrated must be equipped with the following limitation devices:

#### Control devices:

- ⇒ Suitable, manually operated or automatically functioning control and regulation devices to keep operating parameters within the permitted limits

#### Monitoring devices:

- ⇒ Suitable monitoring devices that enable acceptable manual or automatic intervention, corrective measures and/or trigger shutdown and/or locking, in order to keep operating parameters within the permitted limits

#### Safety devices:

- ⇒ Suitable safety devices, such as safety valves or burst disc protection, that ensure that the permitted operating pressures described in Table 4.1.4 are not exceeded as a final defensive measure against danger



## 4.2. Handling butterfly valves

### Information/Note



The handling of butterfly valves in the BV Perform series, i.e. all activities associated with transport, assembly, connection, disassembly, commissioning, management, operation, cleaning, disinfection, maintenance, decommissioning, repair, storage or disposal, may only be performed by trained and qualified personnel.

The operators of the butterfly valves must create operating instructions, so that the people concerned have all the information on handling contained in the following sub-chapters to hand.

The operators of the butterfly valves must ensure that all people who have access to them are informed of any potential hazard situations that may occur.

### Information/Note



All people performing work on or in the environment of the BV Perform series butterfly valves must observe and follow the safety notes described in the chapter "Safety notes and residual risks" of these operating instructions when performing any work described in the following chapters.

In particular, this includes

- ⇒ familiarising themselves with the existing danger areas on the valves and in their environment,
- ⇒ observing all information and warning notes for handling the fittings,
- ⇒ following all instructions for handling the fittings,
- ⇒ taking all suitable measures to counter any possible hazards and minimise risks to health,
- ⇒ observing all warning symbols and information on the fittings and in their environment
- ⇒ and familiarising themselves with all residual risks and minimising them as much as possible with appropriate conduct.

### WARNING



Non-observance of the above instructions, information and notes may result in serious damage to health, including life-threatening injuries or death.

### 4.2.1. Configuration, packaging, storage, transport

#### Delivery condition

The butterfly valves in the BV Perform series have been tested at the factory before delivery.

#### Storage, transport

Store the butterfly valves in a dry area, protected from external influences.

- ⇒ Storage temperature: 10 °C (50 °F) ... 35 °C (95 °F)
- ⇒ Relative humidity: 20% ... 80%

Do not expose the butterfly valves to direct sunlight.

The fittings must be stored for at least 24 hours at a room temperature  $\geq 5.0$  °C (41 °F), as dry as possible, before performing assembly work on the butterfly valves and before activating the actuators.

### Information/Note



⇒ The butterfly valves must only be transported in a depressurised state.

### WARNING



Improper or careless handling may cause personal damage and/or damage to property.

#### 4.2.2. Assembly, connection, disassembly

##### Safety measures

The operators of the butterfly valves must ensure before assembly, connection and disassembly work that the fittings and system areas connected to them have been emptied and depressurised, and cannot be filled or refilled with media and/or pressurised for the entire duration of the work.

The operators of the butterfly valves must ensure before assembly, connection and disassembly work that the fittings cannot be accidentally automatically switched on by third parties at any point during the duration of the work.

The operators of the butterfly valves must ensure that the areas in which assembly, connection and disassembly work is taking place are secured against access by unauthorised people, and that the barriers are maintained throughout the entire duration of the work.

Before starting disassembly work, the butterfly valves must be flushed with cold water for a sufficiently long period, in order to ensure that there is no cleaning media or hot water left inside. The fittings must then be emptied.

### WARNING



Ignoring the above safety measures may result in serious damage to health, including life-threatening injuries or death.


##### Inserting the butterfly valves into systems and pipeline systems



###### Housing assembly:

The housings of the BV Perform series butterfly valves can be equipped with different process connections for connection to pipelines or tanks, such as:

- ⇒ Pipe welding ends
- ⇒ Flange connections
- ⇒ Clamp connections


When inserting butterfly valves into systems or pipeline systems, make sure that no additional forces or bending torque from these systems or pipeline systems can be transmitted to the fittings.

Information/Note	
	<p>When welding the housing into systems or pipeline systems, the following must be observed:</p> <ul style="list-style-type: none"> <li>⇒ Only weld housing flanges without seals or actuators!</li> <li>⇒ If required, remove the actuators from the housings beforehand, in accordance with the disassembly guidelines below!</li> <li>⇒ When welding the housing, make sure that weld delay does not occur there!</li> </ul>

 CAUTION	
	<p>Non-observance of the above instructions, information and notes may result in damage to the butterfly valves.</p>

### Welding and assembly notes

#### General Notes

Information/Note	
	<p>Welding work may only be performed by trained staff (DIN EN ISO 9606--1 W8).</p>


Pentair Südmo accepts no liability for damage as a result of improper conduct.

#### Welding guidelines

Area of application:	Welding connections of welded-on fittings
Welding procedure:	WIG (tungsten inert gas welding)
Welding seam:	<ul style="list-style-type: none"> <li>⇒ Seam preparation according to DIN 2559 (joint shape I / for I-seams)</li> <li>⇒ Welding seams conform to DIN EN ISO 5817</li> <li>→ Rating group B (high)</li> </ul>

#### Welding seam preparation

- ⇒ Saw off and deburr pipe ends flat and at a right angle.
- ⇒ Radially and axially align housing welding ends to make sure they are level (centring device).

Information/Note	
	<ul style="list-style-type: none"> <li>⇒ Make sure that the gap between the aligned welding ends is not too wide.</li> <li>⇒ Make sure that there is sufficient forming gas at the welding seam.</li> </ul>

#### Welding

- ⇒ Connect forming gas.
- ⇒ Tack at 3 – 4 tacking sites.
- ⇒ Weld valve → WIG manual or orbital welding type (automatic welding).

### Welding filler material

Material assignment

Material welded parts	Suitable welding filler material		
	1.4430	1.4440	1.4519
1.4404	X		
1.4435	X	X	X
1.4571	X	X	

### Welding seam treatment

Interior:

Depending on requirements, e.g.

- ⇒ untreated.
- ⇒ Scotch pad (accessible points).

Exterior:

Follow-up treatment procedure


- ⇒ Pickle - dispose of pickling paste appropriately
- ⇒ Brush
- ⇒ Sand
- ⇒ Grind

### Assembling and disassembling the actuators:

Attaching the actuators to the housing, and disassembly of the actuators from the housing, must be performed in accordance with the procedures in the type-specific assembly instructions (Part 2) for the types of butterfly valves in the BV Perform series concerned.

### Positioning and aligning the butterfly valves:

The butterfly valves must be positioned in such a way that no hazards for people can result from them.

Information/Note	
	<p>The butterfly valves, including their actuators in particular, must be positioned in such a way,</p> <ul style="list-style-type: none"> <li>⇒ that people working on them or third parties are not at risk,</li> <li>⇒ that they are protected from interventions by unauthorised people,</li> <li>⇒ that they are protected against external mechanical impact, e.g. from vehicles, so that no damage can be expected,</li> <li>⇒ that they can be easily accessed from all sides for inspection and maintenance purposes,</li> <li>⇒ that their factory plates are easily recognised</li> <li>⇒ and that it is possible to operate the fittings from a safe position.</li> </ul>

### Electrical connections for control and feedback systems

The electrical connections to the control and feedback systems used must be made in accordance with the relevant operating instructions and documents.

- ⇒ Connection plans for the proximity switches
- ⇒ IntelliTop® 2.0 operating instructions
- ⇒ SensoTop operating instructions
- ⇒ Operating instructions for process controllers type 8692
- ⇒ Operating instructions for process controllers type 8694


### Pneumatic connections


#### Pneumatic connections for the actuator cylinder:


For the pneumatic connections of the actuator cylinders for the butterfly valve, suitable air hoses must be attached to the pre-fitted angle screw connections, which must either be connected to the corresponding air connections of process control heads or self-ventilating pilot valves, e.g. in control cabinets.

The following angle screw-in connection is built in:



- ⇒ Angle screw-in connection
  - Thread: G 1/8
  - Use: air hose OP 6.0/OP 6.35 (1/4")
- ⇒ Air hose specification - recommendation
  - Air hose black                      6/4-part hose
  - 8/6-part hose
  - Material:                                Polyamide 12
  - Linear coefficient of expansion: 15x10-5
  - Design as per DIN73378 soft
  - Max. operating pressure:        AD 6/ ID 4 = 27 bar
  - AD 8/ ID 6 = 19 bar
  - all pressure information at 20°C (68° F), higher temperatures will have a negative impact on the max. operating pressure

Information/Note	
	<p>The angle screw connections pre-fitted on the actuator cylinders cannot lead into the open environment during commissioning, during cleaning and disinfection and during operation of fittings.</p>

Information/Note	
	<ul style="list-style-type: none"> <li>⇒ For pneumatic actuators with spring reset function, aeration/ventilation of the spring chamber is necessary in order to counter an unwanted build-up of pressure during the switching operation.</li> <li>⇒ The system operator must always ensure that no liquids, such as external cleaning and disinfection chemicals, penetrate the actuator via the ventilation screw.</li> </ul>



Bleed screw

 <b>CAUTION</b>	
	<p>If liquids penetrate the actuator, this can impair its ability to function. In some cases, this may also result in the safety position of the valve no longer being capable of being reached during a pressure outage.</p>

**Optional**

If penetration of moisture or liquid through the ventilation screws in the pneumatic actuator of the valve cannot be excluded, the following equipment options are recommended:

- ⇒ **The valve is equipped with single or double feedback:**  
**Retrofitting angle-swivelling screw fitting with pipe bend ID: 2333194**

The ventilation screw is replaced by an angle swivelling screw fitting with pipe bend. Make sure that the associated pipe bend is always installed perpendicular to the floor, regardless of the installation position of the valve. Also make sure not to spray directly into the pipe bend during external cleaning.



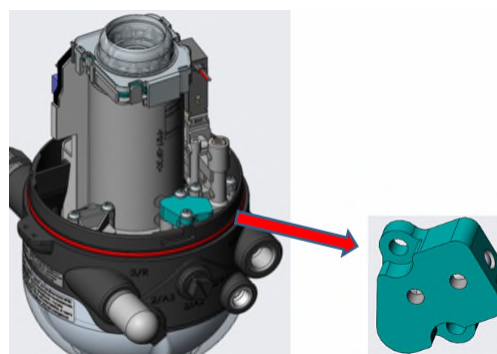
- ⇒ **The valve is equipped with an IntelliTop 2.0 process control head:**  
**Retrofitting cover plate with internal airflow ID: 2333187**

The ventilation screw is replaced by a standard Südmo air connection ID: 2116513, which is connected to one of the free connections of the IntelliTop 2.0. The pneumatic actuator can then be ventilated via the process control head. Conversion to this working method can be carried out with the aid of some simple working steps:

1. Remove the ventilation screw from the pneumatic actuator, as well as one of the blind screws from the IntelliTop 2.0.
2. For each air connection ID mount: 2116513 on the ventilation opening of the pneumatic actuator, and on the now open connection to the IntelliTop 2.0. Connect both air connections to a piece of air hose.
3. Open the IntelliTop 2.0 by removing the cover hood.
4. Remove the corresponding blind cover of the internal airflow to which you have attached the additional air connection.

Make sure that the white check valve under the blind cover does not fall out after removing it.


5. Install the cover plate for the internal airflow.
6. Conversion is complete. Put the cover hood back on the IntelliTop 2.0.




### Connecting the IntelliTop® 2.0 process control heads:


The pneumatic connections of the process control heads of the type IntelliTop® 2.0 to suitable control air supplies must be made in accordance with the specifications of the IntelliTop® 2.0 operating instructions.

### Dismantling


Information/Note	
	Before starting disassembly, the butterfly valves must be flushed with cold water for a sufficiently long period, in order to ensure that there is no cleaning or disinfection media or hot water left inside, as this may injure the assembly personnel.

WARNING	
	If this does not happen, it may cause serious injuries to assembly personnel, including death.

Before starting disassembly, the butterfly valves must be completely emptied.

Information/Note	
	<p>Before starting disassembly, make sure that the butterfly valves, and the supply and discharge lines, are depressurised.</p> <p>Before starting disassembly, make sure that the butterfly valves are in the deactivated end position.</p> <p>Before starting disassembly, make sure that the butterfly valves are disconnected from the compressed air supply, and that all air lines are depressurised.</p>

At the beginning of mechanical disassembly, it must be ensured that any existing electrical and all existing pneumatic connections between the butterfly valves and the other parts of systems in which they are integrated, if applicable, are removed.

WARNING	
	If this does not happen, it may cause serious injuries to assembly personnel, including death.

The other disassembly steps (disconnecting the butterfly valves from the pipelines leading in and out) can then be performed in any order.

### 4.2.3. Commissioning

#### General instructions

The operators of the butterfly valves must ensure that the necessary safety and limitation devices in the environment of the fittings, described in the chapter "Operating equipment and auxiliary media", are permanently capable of functioning, and that they cannot be overridden or altered against their intended use during commissioning.

The operators of the butterfly valves must arrange tests before commissioning, and they must be performed in accordance with the applicable national guidelines for testing before commissioning in the countries of installation.

Commissioning may only occur when the butterfly valves

- ⇒ have been assembled and connected in accordance with guidelines,
- ⇒ the relevant limitation devices are present and configured, and
- ⇒ assembly and limitation devices have been checked to ensure that they are functioning safely.

The commissioning of the butterfly valves includes

- ⇒ inspecting switching functions, valve positions and, if applicable, position feedback,
- ⇒ filling the fittings for the first time,
- ⇒ a wet test, including a pressure and tightness test,
- ⇒ and basic cleaning of the butterfly valves if they are intended for processing foods.

During commissioning of the butterfly valves, it is forbidden to enter areas of the system where they are integrated, if applicable.

### WARNING



During commissioning of the butterfly valves, there is an injury hazard when working in interior areas of systems where they are integrated, if applicable.

If work must be performed on the butterfly valves during commissioning, it must be ensured that

- ⇒ switching operations (opening, closing) and
  - ⇒ the initiation of automatically running programme steps
- can only be activated by people who are working directly on the fittings.

### WARNING



If accidental switching operations occur, or automatically running programme steps are accidentally started during the commissioning of the butterfly valves while people are performing work on the fittings, mechanical, chemical and thermal hazard situations may occur.

Accidental switching operations can cause limbs to be crushed, cut or cut off if they enter the danger areas of the fittings (see also the warning information in the chapter "Danger areas, residual risks, warning symbols and information signs").

Splashing, sometimes hot and/or aggressive media may cause damage to people due to burns and/or scalds, if the above safety measures are not taken.

### **Testing switching functions, valve positions and position feedback**

For the switching functions of the butterfly valves to be tested, they must be depressurised and must not be filled with liquids.

The possible valve positions, and the correlated controls of the actuators, are described in the type-specific assembly instructions (Part 2) for the types concerned.

- ⇒ Set the desired valve positions (e.g. opened, closed, partially opened) by activating the actuators accordingly.
- ⇒ Repeat the process several times.





- ⇒ Check with a visual inspection whether the desired valve positions have been set.
- ⇒ Should this not be the case, inspect control air pressure and connections to the pneumatic actuators and correct if necessary.
- ⇒ If applicable, check whether the applied feedback systems (proximity switches or control heads) detect the valve positions correctly.
- ⇒ Should this not be the case, adjust the feedback systems and ensure that they are functioning as intended.

### **Filling for the first time**

The valves must be filled for the first time with cold water.

When filling the valves for the first time, make sure that the water enters the fittings slowly at first in order to avoid damage from pressure surges.

 <b>CAUTION</b>	
	When the water is supplied too quickly to the empty pressure chambers, this may cause pressure surges that may result in damage to the butterfly valves.

### **Perform wet test with pressure and tightness test**

A wet test may only then be performed if it can be ensured that all switching functions of the butterfly valves are functioning as intended.

The tightness of the butterfly valves must be tested during the first water travel.

- ⇒ Fill fittings with cold water.
- ⇒ Pressurise fittings.
- ⇒ Check the tightness of the butterfly valves in all valve positions with a visual inspection.
- ⇒ If the fittings are not tight, depressurise, empty and disassemble them in accordance with the relevant type-specific assembly instructions (Part 2) for the types concerned.
- ⇒ Inspect the appearance and assembly condition of the seals; replace the seals if necessary.
- ⇒ Perform another pressure and tightness test.
- ⇒ Repeat the process until no more leakages occur.

### **Basic cleaning/disinfection**

If the butterfly valves come into contact with foods, the operators must perform basic cleaning and, if applicable, disinfection as well of the interior surfaces before food can be processed in them.

See also the following chapter "Cleaning, disinfection"

#### **4.2.4. Cleaning, disinfection**


If the butterfly valves come into contact with foods, the operators must create maintenance plans that contain a system of measures that ensure that the required hygiene statuses of the fittings are maintained within set time intervals.


These measures include regular cleaning-in-place ("CIP") of the inner chambers of the fittings.

A regular sanitisation-in-place disinfection "SIP") of the inner chambers of the fittings.

The maintenance plans for cleaning and/or disinfection must be validated by the operators of the butterfly valves in accordance with their requirements.

What is characteristic for CIP and SIP is the fact that these processes must be performed when fittings are installed, e.g. together with pipeline cleaning and/or disinfection, or in some cases, together with the cleaning and/or disinfection of the procedural systems in which the butterfly valves are installed, if applicable.

Information/Note	
	<p>The butterfly valves must not be removed from the pipeline systems in which they are integrated for cleaning and disinfection purposes.</p> <p>Operating and maintenance personnel must be instructed to wear the appropriate protective clothing (e.g. gloves, safety goggles) during the automatic CIP and SIP processes.</p>

WARNING	
	<p>Chemical and thermal hazard situations may occur during the automatically running CIP and SIP processes.</p> <p>Hot surfaces and/or splashing, sometimes hot and/or aggressive media may cause damage to people due to burns and/or scalds and/or chemical burns, if the above measures are not taken and/or the above instructions are not followed.</p>

### Recommended process sequences for cleaning and disinfecting the inner chambers of butterfly valves

#### Recommended cleaning sequence

⇒ Pre-flushing (water) → Alkali cleaning → Intermediate flushing (water) → Acid cleaning → Post-flushing (water)


#### Recommended sequence for chemical disinfection (only disinfect fittings that have been cleaned beforehand)


⇒ Pre-flushing (water) → Disinfection (chemical disinfection medium) → Post-flushing (sterile water)

#### Recommended sequence for thermal disinfection (only disinfect fittings that have been cleaned beforehand)

⇒ Pre-flushing (water) → Emptying → Disinfection (steam) → Condensation → Post-flushing (sterile water)

### Recommended cleaning and disinfection parameters for the inner chambers of butterfly valves (temperatures, media, media concentrations, times, flow speeds)

Information/Note	
	<p>Only use permitted cleaning and disinfection media described in the chapter "Operating media and limits", and the operating limits described in Table 4.1.4 (temperatures, pressures, media concentrations)!</p>

CAUTION	
	<p>When the water is supplied too quickly to the empty pressure chambers, this may cause pressure surges that may result in damage to the butterfly valves.</p>

### Flow speed in the butterfly valves

⇒ > 1.5 m/s (in relation to the internal diameter of the fittings) for all liquid cleaning and disinfection media

### Media, media concentrations and temperatures

⇒ Depending on the type and extent of contamination, sealing materials in the butterfly valves and the frequency of cleaning and/or disinfection processes

### Cleaning and disinfection times

⇒ Depending on the type and extent of contamination, sealing materials in the butterfly valves and the frequency of cleaning and/or disinfection processes

### Notes on cleaning the exteriors of the butterfly valves

While cleaning the exteriors of the butterfly valves, e.g. with foam, gel or spray cleaners, the fittings must not be switched on and care must be taken to ensure that the ventilation holes in the actuators are not directly impinged by jets of liquid.



#### CAUTION



If this still happens nonetheless, there is a risk that cleaning and/or disinfectant chemicals will be sucked into the actuator cylinders and/or be forced into the actuator cylinders by the jet effect, and damage or destroy the fittings inside.

This may cause essential functions of the butterfly valves, such as the closing of the fittings via spring force, to no longer be performed as intended, which may cause damage to property within their environment.

#### 4.2.5. Management, operation

### General instructions

The operators of the butterfly valves must ensure that the necessary safety and limitation devices in the environment of the fittings, described in the chapter "Limitation devices", are permanently capable of functioning, and that they cannot be overridden or altered against their intended use during the operation and management of the butterfly valves.

#### Information/Note



Do not touch or manipulate automatically switching butterfly valves in any other way during operation and/or the operation of the systems in which they are integrated, if applicable!  
Operating and maintenance personnel must wear the appropriate protective clothing (gloves and safety goggles) while cleaning, rinsing and/or sterilisation processes are taking place!

### WARNING



Mechanical and thermal hazard situations may occur if the butterfly valves are touched during operation.

Accidental switching operations of automatically functioning fittings can cause limbs to be crushed, cut or cut off if they enter the danger areas (see also the warning information in the chapter "Danger areas, residual risks, warning symbols and information signs")

Hot surfaces and/or splashing, sometimes hot and/or aggressive media may cause damage to people due to burns and/or scalds and/or chemical burns, if the above measures are not taken and/or the above instructions are not followed.

#### 4.2.6. Decommissioning

The butterfly valves can be decommissioned with or without disassembly.

For decommissioning with disassembly, all the disassembly steps described in the chapter "Assembly, connection, disassembly", and the relevant type-specific assembly instructions (Part 2) for the types concerned, must also be observed.

Before decommissioning, the butterfly valves must be flushed with cold water for a sufficiently long period, in order to ensure that there is no cleaning product residue, hot water or any other media that is hazardous to health left inside.

The fittings must then be emptied.

The butterfly valve personnel must ensure before decommissioning without disassembly that they permanently remain depressurised, cannot be automatically switched on and permanently cannot be refilled with media and/or pressurised.

### Information/Note



Physically disconnect the butterfly valves from the air supply and the supply of electrical energy before decommissioning!

Physically disconnect the fittings from all lines capable of supplying unwanted media before decommissioning!

### WARNING



If media that is hazardous to health is still inside the butterfly valves after decommissioning, or the fittings are still pressurised, or the valves are refilled with media that is hazardous to health or repressurised, this can lead to dangerous situations and may result in a risk of injury to people within range of the fittings.

**4.2.7. Service life and disposal**

The probable service life of the butterfly valves in the BV Perform series is 15 years.

The maximum number of switching cycles for the fittings is 500,000.

Before disposing of the butterfly valves, they must be disassembled in accordance with the disassembly steps described in the chapter "Assembly, connection, disassembly", and the relevant type-specific assembly instructions (Part 2) for the types concerned.

**Information/Note**

Dispose of butterfly valves in accordance with the relevant local legislation, and the legal conditions of the country of use!

**5. Inspection, maintenance, overhaul, repair, spare parts**

The operators of the butterfly valves must ensure before any inspection, maintenance, overhaul and repair work that the fittings and the system in which they are installed, if applicable, are always decommissioned and that neither the butterfly valves, nor the system in which they are installed, if applicable, are recommissioned by third parties.

See also the actions and instructions in the chapter "Decommissioning".

The operators of the butterfly valves must ensure before the beginning of the inspection, maintenance, overhaul or repair work that they cannot be accidentally automatically switched on by third parties at any point during the duration of the work.

The operators of the butterfly valves must ensure that the areas in which inspection, maintenance, overhaul and repair work is taking place are secured against access by unauthorised people, and that the barriers are maintained throughout the entire duration of the work.

**Information/Note**

Only use original spare parts.

- ⇒ For original spare parts, see the list of spare parts for each butterfly valve.
- ⇒ Perfect function of the butterfly valve is only guaranteed when using original spare parts.

## Operating instructions

Part 1: General operating instructions

Butterfly valve; BV Perform series

DN 015 – 150, OD 1.00" – 6.00", ISO 025 – 150

---

### 6. Service address



**Pentair Suedmo GmbH**

**Industriestraße 7  
73469 Riesbürg - Germany**

**T ++49 (0) 9081-803-0  
F ++49 (0) 9081-803-158  
E [info.suedmo@pentair.com](mailto:info.suedmo@pentair.com)  
I [www.suedmo.de](http://www.suedmo.de)**

Technical changes reserved.

All stated brands and logos of Pentair are the property of Pentair. Registered and non-registered brands and logos of third parties are the property of their respective owners.

© 2023 Pentair Suedmo GmbH. All rights reserved.