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## 1) Manufacturer's Declaration

We hereby declare that shutter- and pig diverter valves are 'partly completed machines' according to Article 2g of the EC Machinery Directive 2006/42.

## 2) General Safety Guidelines

- a) Working on the valve is principally allowed only in depressurized and cooled condition
- b) Observe the following when demounting the valve from the piping system:
  - Potential risk of injury from escaping liquid or gas
  - Remove the control line prior to any assembly activity on pneumatic valves
    - Do not put your hand/fingers into the valve casing; hazard of crush or severance of limbs
- c) Do not operate the valve under dry conditions



## 3) Technical Data

### Nominal sizes:

- Shutter valves: Inch 1" – 6" / DIN DN25 – DN150
- Pig diverter valves: Inch 1.5" - 4" / DIN DN40 - DN100

### Versions:

- Shutter valves: 2- / 3- / 4-way (upon request):
- Pig diverter valves: 3-way (3 x 120°)
- Manual
- Pneumatic or electric actuation with interface per Namur NE14 and DIN EN ISO5211 (F05 / F07)

### Materials:

- Inox parts in contact with product: AISI 316L (1.4404 / 1.4435)
- Other Inox parts: AISI 304 (1.4301)
- O-ring seals:

	Temperature	Short-term temp.
EPDM (Standard)	-40°F to +230°F -40°C to +110°C	+284°F +140°C
FPM (Viton®) (optional)	-4°F to +320°F -20°C to +160°C	+356°F +180°C
FEP (optional)	-76°F to +392°F -60°C to +200°C	+446°F +230°C

- Shutter:

	Temperature	Pressure max (see Figure 8).	
		Prod. flow direction	Against shutter
Dyneon™ TFM1600 (Standard)	-76°F to +230°F -60°C to +110°C	145 psi 10 bar	43.5 psi 3 bar
PTFE +15% Peek (optional)	-76°F to +320°F -60°C to +160°C	232 psi 16 bar	43.5 psi 3 bar
Tecapeek (optional)	-76°F to +392°F -60°C to +200°C	290 psi 20 bar	43.5 psi 3 bar

- Bearing bush:

	Temperature	Short-term temp.
POM (Standard)	-58°F to +230°F -50°C to +110°C	+284°F +140°C
Dyneon™ TFM1600	-76°F to +392°F -60°C to +200°C	+446°F +230°C

### Surfaces:

In contact with product: Ra ≤ 32µm (Ra ≤ 0.8µm)

### Valve connections:

Welded ends: Inch, DIN  
Male ends: DIN11851  
Clamp connection: Tri-Clamp

## Functional Description

A radially rotatable shutter permits various positions of shutter- and pig diverter valves. Integrated in a piping system, the 2-way shutter valve acts as a on/off valve and the 3-way shutter valve as a manifold valve.

The outlets of the pig diverter valve are orientated in a 120° angle, which allows the pig to pass the valves in all directions.

### Optical position indication of the shutter:

- With the manual 2-way shutter valve, the parallel position of the handle to the valve ports indicates that the valve is open for product flow; the marking (S) on the handle base indicates the shutter position (see Figure 1)
- With the manual 3-way shutter / pig diverter valve, the handle direction indicates the shutter position (see Figure 3 and Figure 5)
- With the pneumatic shutter / pig diverter valve, an optical position indication in the form of a red arrow on the square of the pivoted axle, indicates the current shutter position (see Figures 2 / 4 and 6)

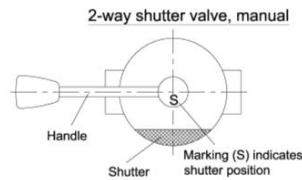


Fig. 1



Fig. 2

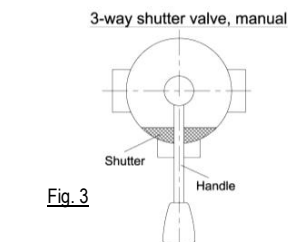


Fig. 3

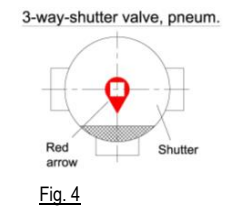


Fig. 4

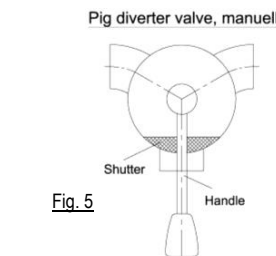


Fig. 5

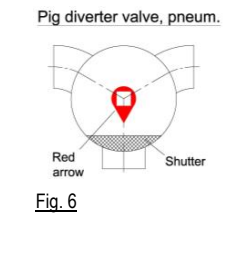


Fig. 6



## 4) Parts and Spare Parts List

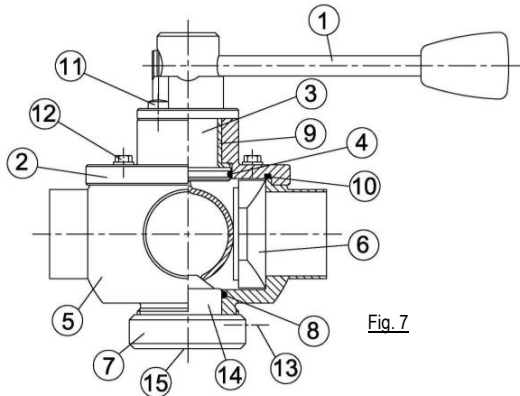


Fig. 7

### Parts and Spare Parts List (spares in bold and italic type):

Item	Designation	Qty.
1	Handle or pneumatic actuator	1
2	Bearing cap	1
3	Pivoted axle with arc	1
4	<b>O-ring to the pivoted axle</b>	1
5	Valve casing	1
6	<b>Shutter</b>	1
7	Pinch nut	1
8	<b>O-ring to the cone</b>	1
9	<b>Bearing bush</b>	1
10	<b>O-ring to the bearing cap</b>	1
11	Fixing screw for handle (actuator)	2
12	Fixing screws for bearing cap	4
13	Grub screw	1
14	Cone	1
15	Snap ring	1

## 5) Installation Instructions

- The shutter / pig diverter valve is suitable for any installation position
- For self drainage the valve outlet has to point downward**
- In order to avoid damage, the shutter / pig diverter valve has to be dismantled before being welded in place in a piping system**
- Recommended installation (see Figure 8)
- Do not operate the valve under dry conditions**

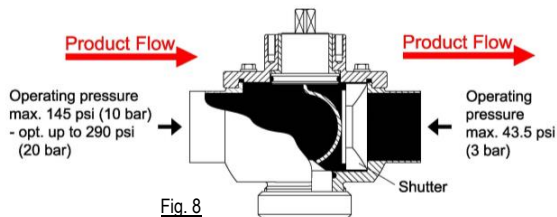


Fig. 8

## 6) Dismantling

- Never demount a pressurized shutter / pig diverter valve.**
- Loosen the fixing screws (11) on the handle to remove the handle (1).
- Loosen the grub screw (13) on the pinch nut (7) which is connected to the cone (14) by a snap ring (15).
- Use a face pin spanner wrench to loosen the pinch nut (7).
- Loosen the fixing screws (12) to remove the bearing cap (2) incl. pivoted axle (3) and bearing bush (9).
- Remove the shutter (6) from the valve casing (5).
- Pull out the pivoted axle (3) from the bearing cap (2).
- Take out all O-rings.



## 7) Maintenance

- Check functional surfaces in the valve casing (5) for their condition and clean them accurately.
- Replace all O-rings: O-ring to the pivoted axle (4), O-ring to the cone (8), O-ring to the bearing cap (10).
- Prior to assembly, lubricate O-rings with food-safe grease "Klüber Paraliq GTE 703".
- Check proper working order of the bearing bush (9) and replace as necessary.
- Clean shutter (6) and check for proper working and wear; replace as necessary.



### Lubricants

- For shutter / pig diverter valve O-ring seals in contact with product (EPDM / FPM / FEP):
  - Klüber Paraliq GTE 703 NFS H1
- For Inox screws DIN912 and DIN933:
  - Klüber lubricating paste UH1 84-201

### Recommendation for cleaning (CIP)

Optimal cleaning results will be accomplished with switching of the shutter / pig diverter valve while flushing (CIP).

## 8) Assembly

- Check all components for cleanliness and proper condition prior to shutter / pig diverter valve assembly.
- Insert bearing bush (9) into bearing cap (2).
- Insert O-rings (4), (8) and (10).
- Assemble pivoted axle with arc (3) and bearing cap (2). Pay attention to the marking (0) on the square pin of the pivoted axle (3) → indicates the shutter position (6) (see Figure 9).
- Insert shutter (6) into valve casing (5).
- Fit the pivoted axle with the arc (3) together with bearing cap (2) to the valve casing (5) as follows:
  - The pivoted axle with arc (3) is designed that it exerts a defined pressure on the shutter (6) during assembly. On account of the preload characteristics, the bearing cap (2) declines approx. 0.16-0.20in (4-5mm) off the valve casing (5) on the opposite side of the shutter (see Figure 9).
  - The shutter should be positioned to the inner casing wall to prevent damages on the plastic surface.**
  - Fasten the handle (1) in the desired position.
 

**Note:**  
For shutter / pig diverter valve with pneumatic actuator, proceed as follows: before attaching actuator to valve, use a jaw spanner wrench to turn the square axle pin (3) to the desired shutter position. Shutter position denoted with (0).
- Put in place and tighten the bearing cap fixing screws (12).
- Assemble the pinch nut (7) to the valve casing (5) by using a face pin spanner and a torque wrench: Torque 4Nm  
**Alternative:** Screw pinch nut (7) by hand as far as possible (without using a tool) to the valve casing (5). Switch valve several times (approx. 5 x) and then slightly retighten pinch nut (7) by hand and / or with face spanner (approx. 90°).
- Secure pinch nut (7) with grub screw (13).

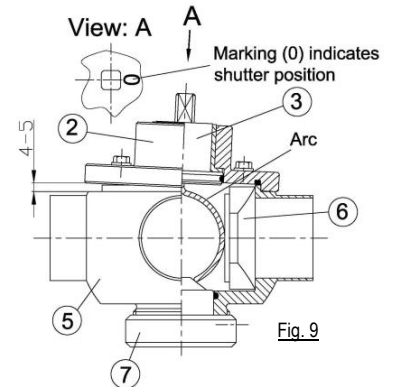


Fig. 9