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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

- Working on the valve is principally allowed only in depressurized and cooled condition
- 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
- 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 | 145 psi | 43.5 psi |
| | -60°C to +110°C | 10 bar | 3 bar |
| PTFE +15% Peek (optional) | -76°F to +320°F | 232 psi | 43.5 psi |
| | -60°C to +160°C | 16 bar | 3 bar |
| Tecapeek (optional) | -76°F to +392°F | 290 psi | 43.5 psi |
| | -60°C to +200°C | 20 bar | 3 bar |

- Bearing bushing:

| | 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: DIN1185
Clamp connection: Tri-Clamp

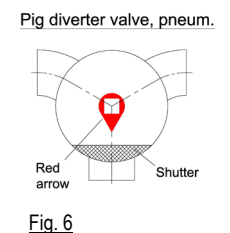
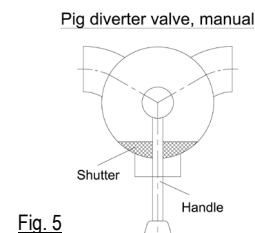
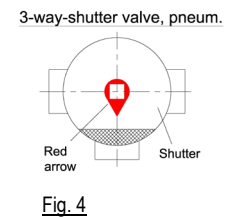
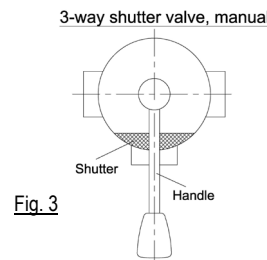
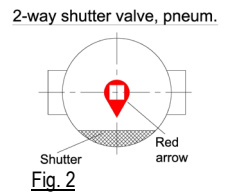
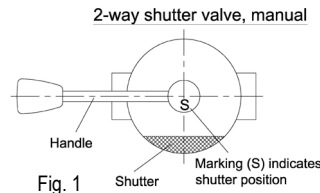
Functional Description

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)



4) Parts and Spare Parts List

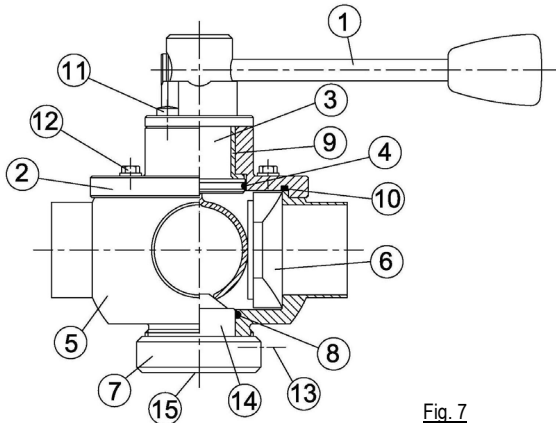


Fig. 7

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 | O-ring to the pivoted axle | 1 |
| 5 | Valve casing | 1 |
| 6 | Shutter | 1 |
| 7 | Pinch nut | 1 |
| 8 | O-ring to the cone | 1 |
| 9 | Bearing bushing | 1 |
| 10 | O-ring to the bearing cap | 1 |
| 11 | Fixing screw for handle (actuator) | 2 |
| 12 | Fixing screws for bearing cap | 4 |
| 13 | Allen 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)

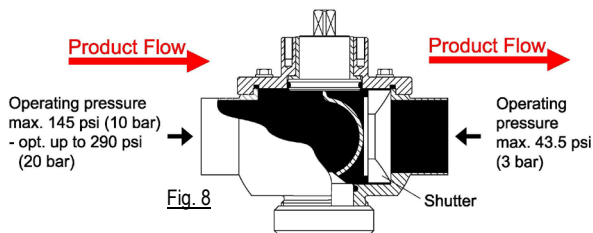


Fig. 8

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 allen 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 bushing (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 accurate.
- 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 bushing (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 bushing (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 prestress damages on the plastic surface.

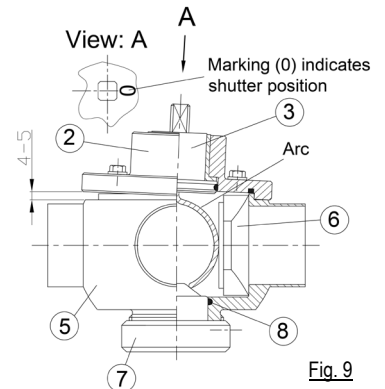


Fig. 9

- Fasten the handle (1) in the desired position.
- Note:**
For shutter / pig diverter valves with pneumatic actuator proceed as follows: before assembly of the actuator, turn the square pin of the pivoted axle (3) into the desired shutter position by means of a jaw spanner and the marking (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 (without a tool) into the valve casing (5), just past the o-ring (8). Switch valve several times (~5x), then slightly tighten the pinch nut 90° more by hand or with face spanner.
- Secure pinch nut (7) with allen screw (13).