

- 1) Manufacturer's Declaration
- 2) General Safety Guidelines
- 3) Technical Data and Functional Description
- 4) Parts and Spare Parts List

- 5) Installation Instructions
- 6) Dismantling
- 7) Maintenance
- 8) Assembly

1) Manufacturer's Declaration

We hereby declare that shutter valves are 'partly completed machines' according of 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:

- Tank Outlet valves: Inch 1"– 4"

Versions:

- Manual by handle 0° - 90°
- 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
PTFE 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	+284°F
	-50°C to +110°C	+140°C
PTFE TFM1600	-76°F to +392°F	+446°F
	-60°C to +200°C	+230°C

Surfaces:

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

Valve connections:

Welded ends: Inch
Clamp connection: Tri-Clamp

Functional Description

A radially rotatable shutter permits various positions of shutter valves. Integrated into a product tank, LIAG's 2-way flush-bottom valve acts as a tank outlet valve.

Optical position indication of the shutter:

- With the manual Flush Bottom Tank Outlet 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 pneumatic Flush Bottom Tank Outlet 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 Figure 2).

Fig. 1

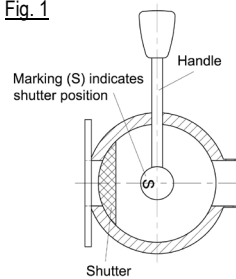
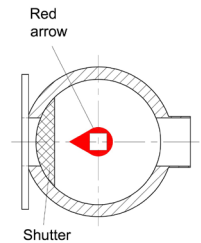
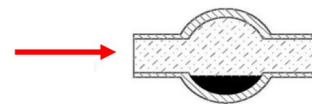


Fig. 2



Flow Rate

Flush Bottom Tank Outlet Valve		
1"	264.17gpm	60m³/h
1.5"	616.40gpm	140m³/h
2"	1496.97gpm	340m³/h
2.5"	1805.18gpm	410m³/h
3"	1981.19gpm	450m³/h
4"	4358.84gpm	990m³/h



4) Parts and Spare Parts List

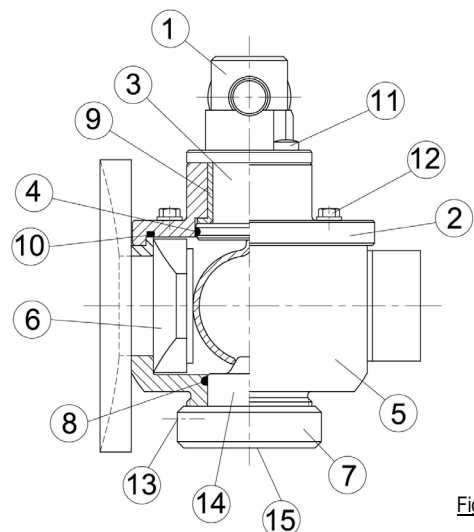


Fig. 7

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 (4)
12	Fixing screws for bearing cap	4
13	Allen screw	1
14	Cone	1
15	Snap ring	1

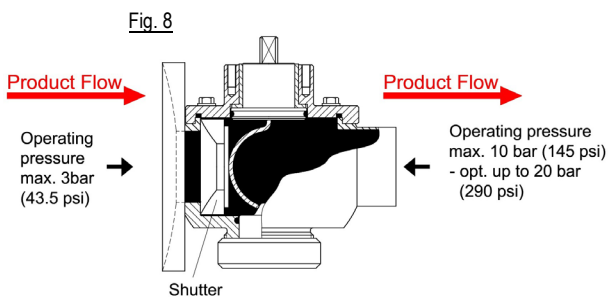
5) Installation Instructions

General

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

Welding Guidelines

- In order to avoid damage to O-ring, steering and slip ring, dismantle the swivel joint fitting before welding it in place in a piping system
- Thoroughly clean outer and inner pipe after welding (and before assembly), since possible impurities could damage the O-ring, steering and slip ring
- Welding to be performed using the TIG method and only by qualified personnel according to DIN EN 287-1
- Detailed recommendations on proper hygienic welding are described in EHEDG document no. 35 or American Welding Society AWS D18.1/D18.1M:2009



6) Dismantling

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



7) Maintenance

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

Lubricants

- For shutter 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 valve while flushing (CIP).

8) Assembly

1. Check all components for cleanliness and proper condition prior to shutter valve assembly.
 2. Insert bearing bushing (9) into bearing cap (2).
 3. Insert O-rings (4), (8) and (10).
 4. 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).
 5. Insert shutter (6) into valve casing (5).
 6. Fit the pivoted axle with the arc (3) together with bearing cap (2) to the valve casing (5) as follows:
 - a) 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).
 - b) **The shutter should be positioned to the inner casing wall to prestress damages on the plastic surface.**
 - c) Fasten the handle (1) in the desired position.
- Note:**
For shutter 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).
-
- View: A
- Marking (0) indicates shutter position
- Fig. 9
7. Put in place and tighten the bearing cap fixing screws (12).
 8. 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.
 9. Secure pinch nut (7) with allen screw (13).