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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

- 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:

- 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
FKM (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 (Teflon) (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)
PTFE (Teflon)	-76°F to +392°F -60°C to +200°C	+446°F +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

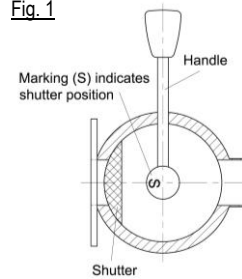
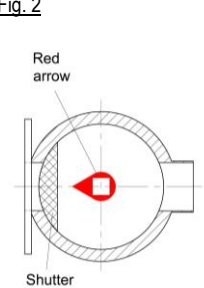
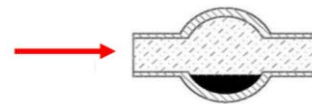


Fig. 2



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

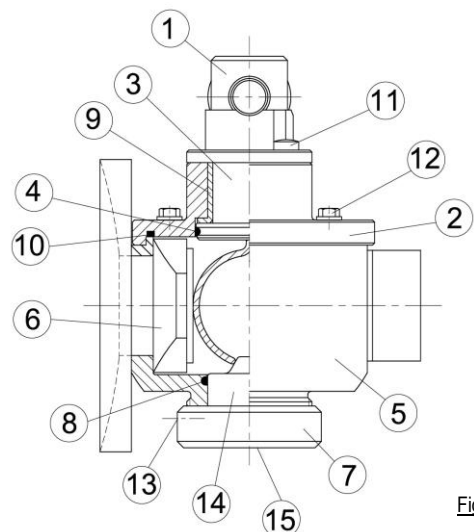


Fig. 7

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

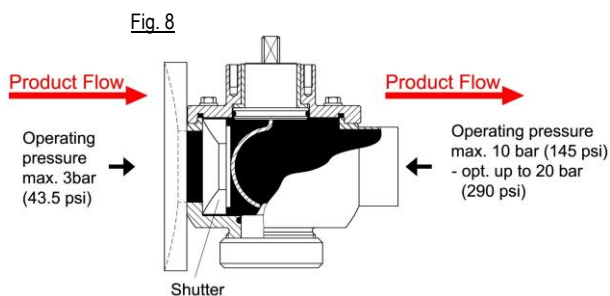
5) Installation Instructions

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-rings, shutter, and bushing, dismantle the valve completely before welding it in place in a piping system
- Thoroughly clean tank and valve after welding (and before re-assembly), since possible impurities could damage the O-rings, shutter, and bushing
- 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

- Never demount a pressurized shutter 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 valve O-ring seals in contact with product (EPDM / FKM / 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

- Check all components for cleanliness and proper condition prior to shutter 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.**
 - 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).
- 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).

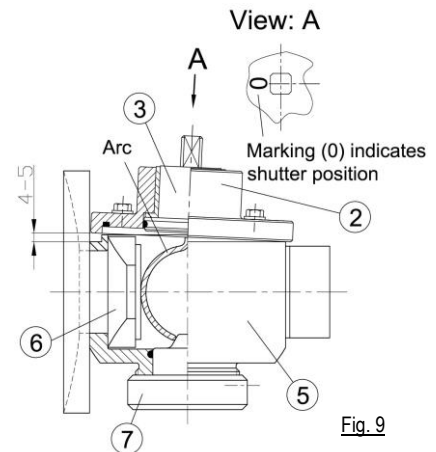


Fig. 9