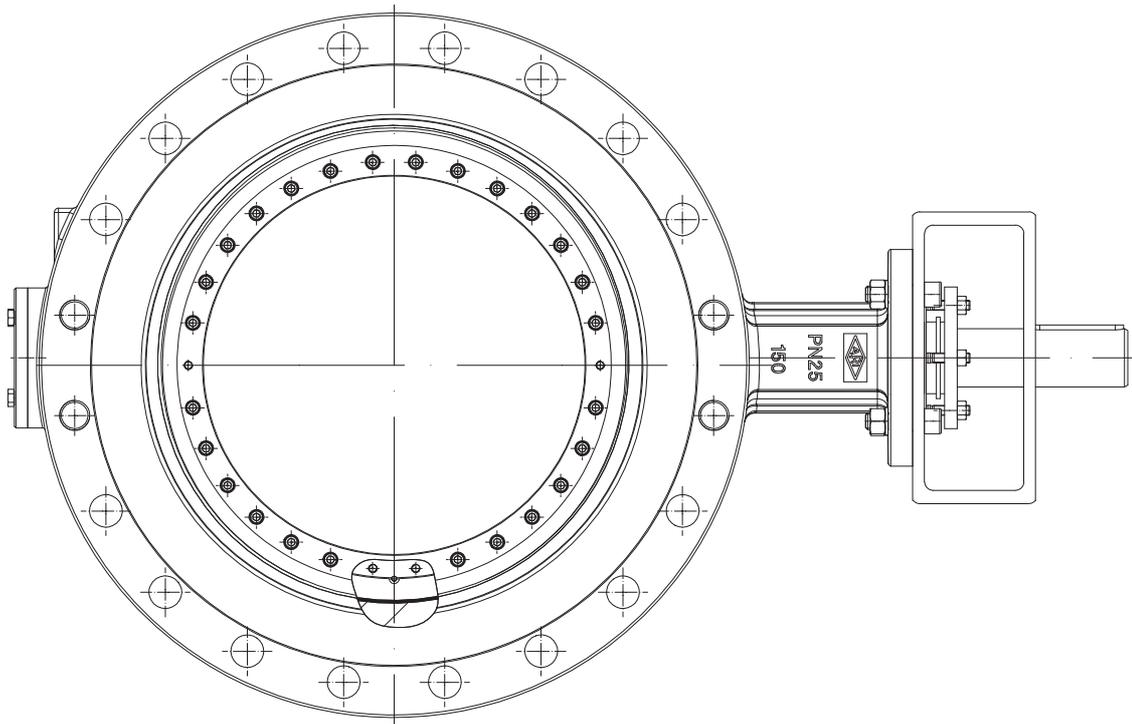


Operating and installation instructions

In accordance with EC Directive 97/23/EC on Pressure Equipment

In accordance with EC Directive 2006/42/EC on Machinery

Process valve ZETRIX®



BR 016 - ZETRIX®

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1.0 General information on operating instructions

These operating instructions provide information on safely mounting and maintaining the fittings. Please contact the supplier or the manufacturer in the case of problems which cannot be solved by reference to the operating instructions.

They are binding for transport, storage, installation, commissioning, operation, maintenance and repair.

You must read the operating instructions before commissioning the valve.

The notes and warnings must be observed and complied with.

- Handling and all other work must be carried out by specialist personnel, or all the activities must be supervised and inspected.

It is the owner's responsibility to define areas of responsibility and competence and to monitor the personnel.

- In addition, current regional safety requirements must be applied and observed when decommissioning, maintaining and repairing the valves.

The manufacturer reserves the right to make technical modifications at any time.

These Operating Instructions comply with the requirements of EU Directives.

2.0 Notes on possible dangers

2.1 Significance of symbols



Warning of general danger.

2.2 Explanatory notes on safety information

In these Operating and Installation Instructions dangers, risks and items of safety information are highlighted to attract special attention.

Information marked with the symbol above and "ATTENTION!" describe practices, which if you fail to comply with them, can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasised such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.

3.0 Storage and transport



ATTENTION!

- Protect against external force (like impacts, vibrations, etc.)
- Valve mountings such as actuators, handwheels or hoods must not be used to take up external forces that they are not designed for, e.g. do not use them as climbing aids, or as connecting points for lifting gear.
- Suitable materials handling and lifting equipment must be used.
See catalogue sheet for weights.

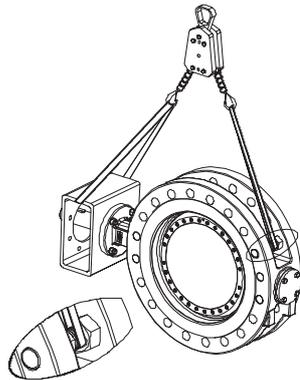


Figure 1

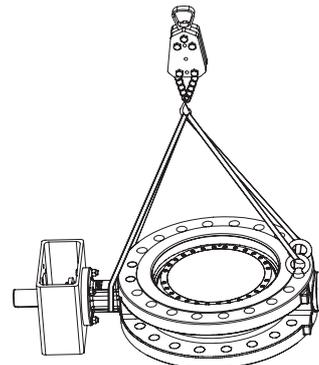


Figure 2

- At -20°C to +65°C.
- The paint is a base coat to protect against corrosion during transportation and storage. Do not damage paint protection.

4.0 Description

4.1 Area of application

Butterfly valves are used for the “shut-off and/or throttling of media”.



ATTENTION!

- Refer to the data sheet for applications, limits on use and possibilities.
In particular, you must check the material stability.
 - Certain media require or preclude the use of special materials.
 - The valves are designed for standard operating conditions. If conditions exceed these requirements, e.g. aggressive or abrasive media, the owner must state the higher requirements when ordering.
 - You must state whether the valves are to be used in an explosive atmosphere (ATEX) at ordering.
- Special design!**
- The standard design has been firesafe-tested. The necessary fire-protection measures depend on the medium and must be specified by the operator.

The information complies to the Pressure Equipment Directive 97/23/EC and Machine Guideline 2006/42 EC.

It is the responsibility of the system planner to ensure compliance.

The special markings on the valve must be taken into account.

Refer to the catalogue sheet to see which materials are used in standard versions.

Please contact the supplier or the manufacturer if you have any questions.

4.2 Operating principles

The valve is closed by turning the disc stem clockwise.
The stem moves through 90°.



ATTENTION!

- The drive stem is partially open and there is a **crushing hazard**

4.3 Diagram

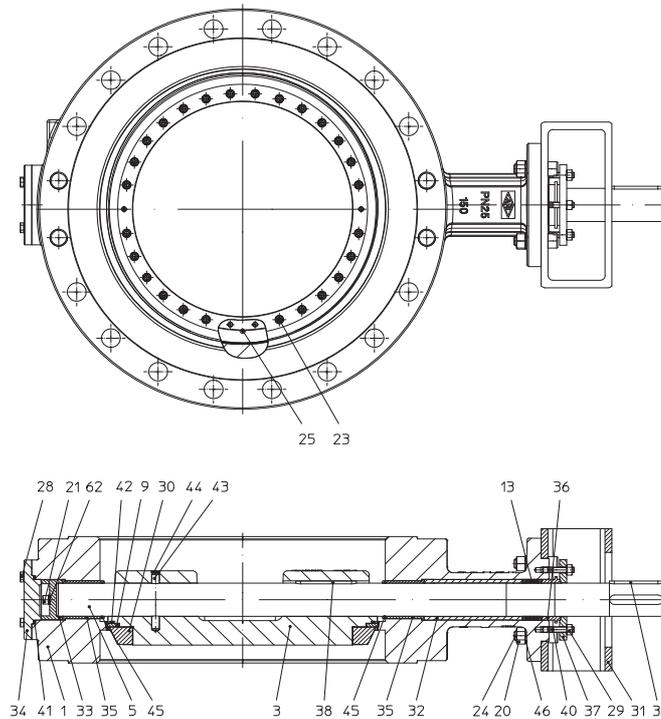


Figure 3: Process valve ZETRIX®

Refer to the data sheet for information about materials with designations and figure numbers.

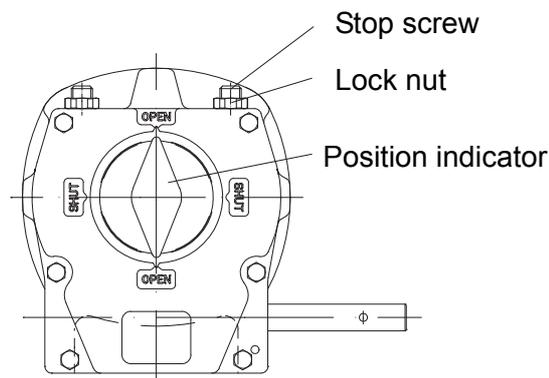


Figure 4: Worm gear ZETRIX®

- Worm gear (operated using handwheel, clockwise rotation closes)
The closed position can be adjusted to $\pm 5^\circ$ using an adjustable stop screw.
The stop screws are self-sealing and self-locking.
- Refer to the separate operating and maintenance manual for drives (electric, pneumatic or hydraulic)

4.4 Technical data – remarks

For example

- **Principal dimensions,**
- **Pressure-temperature-ratings, etc.,** refer to data sheet.

4.5 Marking

Details of the CE marking on the valve:

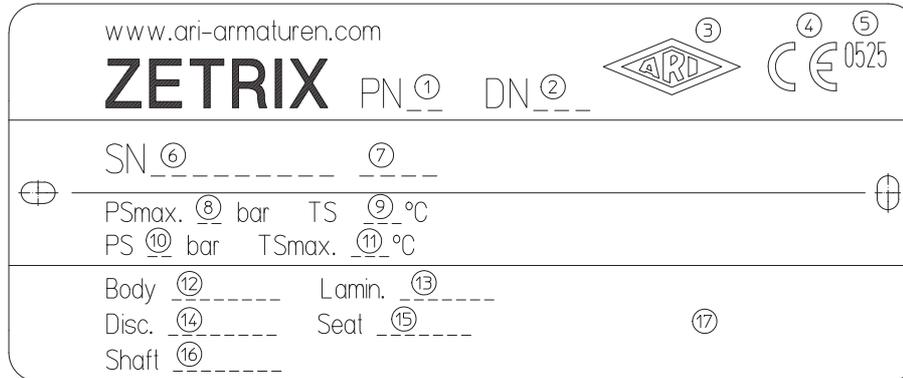


Figure 5

No.	Text	Description
1	PN	Nominal pressure
2	DN	Nominal diameter
3		Manufactured by ARI-Armaturen
4		CE marking
5	0525	Notified body
6	SN	Serial number
7	Date	Year of manufacture
8	PSmax.	Max. permissible pressure
9	TS	Permissible temperature at maximum pressure
10	PS	Permissible pressure at maximum temperature
11	TSmax.	Max. permissible temperature
12	Body	Material of the body
13	Lamin.	Material of the laminated sealing ring
14	Disc	Material of the disc
15	Seat	Material of the seat
16	Shaft	Material of the stem
17		Marking at approval

For address of manufacturer, refer to Point 11.0 Warranty / Guarantee ARI-Armaturen

5.0 Installation

5.1 General remarks on installation

The following points should be taken into account in addition to the general principles governing installation work:



ATTENTION!

- Remove flange covers if present.
- The interior of the valve and the pipeline must be free of foreign particles.
- The direction of flow does not need to be taken into account. The preferred direction of inflow is stated on the body and is carried out onto the stem side of the disc.
- Steam line systems should be designed to prevent water accumulation.
- Lay pipelines such that damaging transverse, bending and torsional forces are avoided.
- Protect valves from dirt during construction work.
- Connection flanges must mate exactly.
- Valve mountings such as actuators, handwheels or hoods must not be used to take up external forces that they are not designed for, e.g. do not use them as climbing aids, or as connecting points for lifting gear, etc.
- Flooding of the butterfly valve is not permissible.
- Suitable materials handling and lifting equipment should be used for assembly work. During assembly work, ensure that the valve is fixed adequately. See catalogue sheet for weights.
- The preferred installation location relative to the stem direction is horizontal.
- The butterfly valve must be installed opened if possible, but the disc should not protrude beyond the body.
- You must only operate the unmounted valve while observing all the safety measures. **Crushing hazard!**
- When installed vertically, large actuators must be supported.
- Avoid mechanical damage to the seat during handling, storage and installation.
- Protect actuators from excessive ambient temperatures; refer to the operating instructions for the actuators.
- When using the valve as an end seal, the employers' liability insurance association of the gas and waterworks specifies the use of a safety precaution such as a plug-in disc, blind flange etc. (observe the information in DIN EN 13857). With a medium jet that freely exits, you must secure the exit area. Before starting maintenance work on an end valve with a free stem end, you must mount a blind flange.
- With actuators mounted, you must disconnect the energy supply before starting work.

- Planners / construction companies or the owner are responsible for positioning and installing products.
- The valves are designed for deployment in systems that are not affected by the weather.
- For applications out of doors or in adverse environments like corrosion-promoting conditions (sea water, chemical vapours, etc.), special designs or protective measures are recommended.
- **The valves are not permitted for subsurface installation.**

5.2 Assembling additional modules

Optional accessories (limit switches, etc.) that are supplied with valves must be fitted as required for their functions as shown in the system plan.

5.3 Requirements at the place of installation

The place of installation should be easily accessible and provide ample space for maintenance and removing the actuators. The valve should preferably be installed horizontally with the actuator vertical to the side. Inclined to vertical installation without supports is permissible only with light actuators.

Permissible actuator weights for valves installed horizontally relative to the stem without provided support:

- 35 kg for DN 80 - 100
- 40 kg for DN 125 - 150
- 55 kg for DN 200 - 250
- 65 kg for DN 300 - 600

The pipes must be lagged to protect the actuators from excessive heat. When doing this, sufficient space must be left for the maintenance of the stem packing.

5.4 Assembly requirements for setting up and dismantling actuators

Normally, butterfly valves are supplied complete with the actuator fitted. It is not permitted to set up/dismantle actuators with valves operating at the service temperature and pressure. The actuators must be assembled as described in the operating instructions during conversion and maintenance.

When connecting the electrical actuators, you must comply with the specifications of the Low Voltage Directive. Connection (grounding) of electrical actuators must only be carried out by qualified personnel.

6.0 Commissioning



ATTENTION!

- *Before commissioning the valve, check the material, pressure, temperature and direction of flow.*
 - *Regional safety instructions must be adhered to.*
 - *Residues in piping and valves (dirt, weld beads, etc.) inevitably lead to leakage.*
 - *Touching the valve when it is operating at high or low media temperatures (50°C or 0°C respectively) can cause injury.*
Attach warning notices or protective insulation as appropriate!
 - *To prevent hydraulic jerks with a liquid medium, you must not slam butterfly valves closed. If necessary, chokes or dampers must be fitted.*
- Before commissioning a new plant or restarting it after repairs or modification, always ensure that:*
- *All work has been completed correctly!*
 - *The valve is in the correct position for its function.*
 - *Safety devices have been attached.*

At commissioning, check that the packing (pos. 13) is tight. If there are leaks on the stem (pos. 5), evenly tighten the packing (pos. 13) step-by-step using hexagon nuts (pos. 29) until it is tight (see also point 7.0 Care and maintenance).

7.0 Care and maintenance

The operator must define maintenance and maintenance-intervals to meet requirements.



ATTENTION!

- We recommend actuating the valve at least once a month.
- When using the valve as an end seal, the employers' liability insurance association of the gas and waterworks specifies the use of a safety precaution such as a plug-in disc, blind flange etc.



ATTENTION!

- Always ensure that the lubricant is compatible with the medium.
- You are only allowed to replace the lamellar seal ring (pos. 9) when the system has cooled down and is depressurized.
- For safety reasons, it is advisable to only replace the lamellar seal ring (pos. 9) when the valve has been dismantled.
- Before disassembling the butterfly valve, note points 10.0 and 11.0.
- When the butterfly valve is operated, there is a crushing hazard between the valve disc and the body.
- Only carry out maintenance work in the pipework when the butterfly valve has been secured from operation (the actuator has been disconnected from the mains supply and secured from reactivation.)

7.1 Replacing the sealing ring

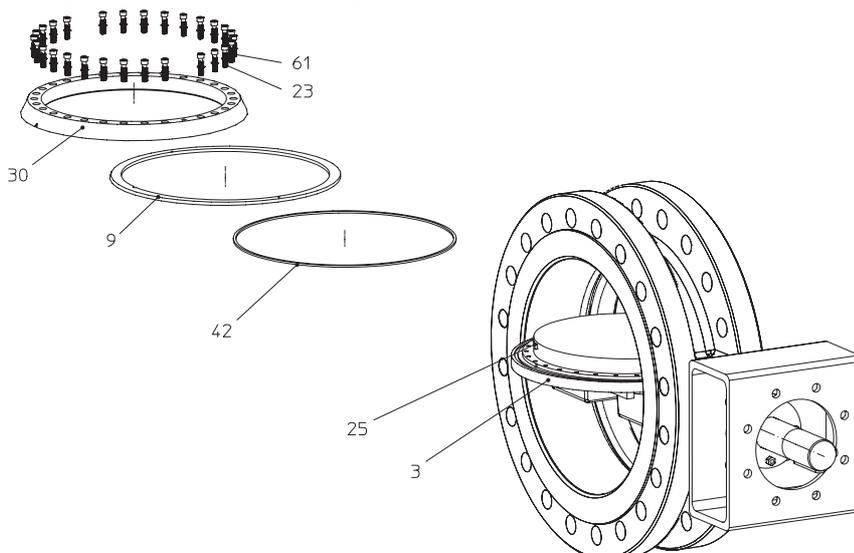


Figure 6



ATTENTION!

- Before starting maintenance work, you must depressurize the piping system. Ignoring these regulations can put your life at risk and can damage the piping system.

Working steps:

- Remove the valve from the pipe; when doing this, the disc (pos. 3) should be closed.
- In the body of valves with a free stem end, you must secure the disc from accidental swivelling.
- With the disc slightly open, loosen the cheese head screws (pos. 23).
- Open the disc completely, remove the cheese head screws (pos. 23) and the locking rings (pos. 61); after this remove the retaining ring (pos. 30).
- Take off the lamellar seal ring (pos. 9) and the spiral wounded gasket (pos. 42).
- Clean the disc in the area of the sealing ring contact area and the spiral wounded gasket groove; also clean the seat in the body.
- Apply a thin film of oil to the disc in the area of the sealing ring contact area.
- Insert a new spiral wounded gasket (pos. 42) into the provided spiral gasket groove.
- Lay the new sealing ring onto the disc from the stem side. When doing this, align the semi-circle on the inside of the sealing ring to the cheese head screw (pos. 25) in the disc.
- Clean the retaining ring and apply a thin film of oil to the bottom; after this, replace it back on the disc.
- Apply fitting grease to the cheese head screws (pos. 23), clean the locking rings and insert them. After this, tighten them slightly such that the sealing ring still moves slightly on the disc.
- Apply a thin film of oil to the outside edge of the sealing ring; also do this to the seat in the body.
- Carefully insert and retract the disc with very low torque in the seat.
- Using very little force, insert the disc into the seat and then tighten two oppositely cheese head screws (pos. 23) to fix the position of the sealing ring.
- Slightly open the disc again and then tighten all the screws in diagonally opposite sequence at the specified torque. (For tightening torques, see point 7.4)

7.2 Replacing the packing of the stuffing box

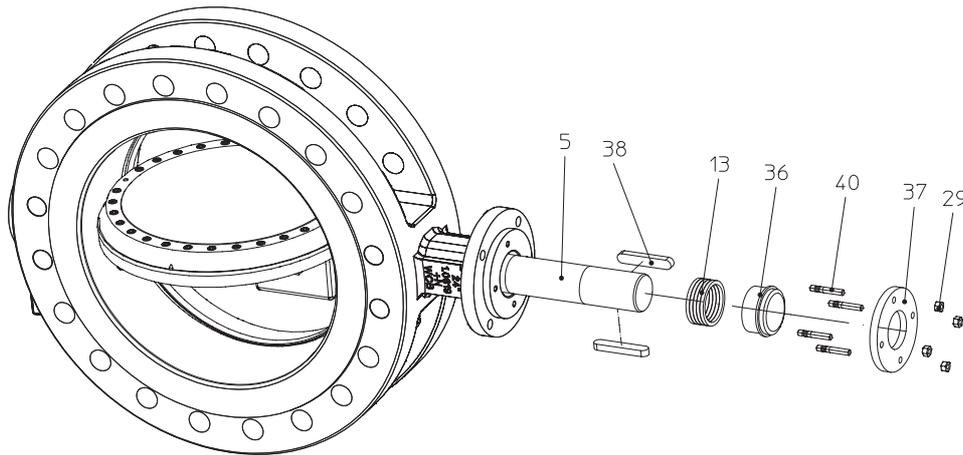


Figure 7



ATTENTION!

- Before starting maintenance work, you must depressurize the piping system. Ignoring these regulations can put your life at risk and can damage the piping system.

Working steps:

- Dismount the actuator, gear, splines (pos. 38) and actuator console. For remounting on a separate basis, mark the position of the actuator unit on the head flange.
- Remove the hexagon nuts (pos. 29), take off the packing gland (pos. 37) and the stuffing box sleeve (pos. 36).
- Remove the old packing (pos. 13); when doing this, avoid any damage to the stem (pos. 5).
- Carefully clean the packing chamber and the top stem shoulder.
- Insert the new packing set (pos. 13); when doing this, apply a thin film of oil to the individual packing rings and press them into the packing chamber. The joints of the packing rings that are on top of one another must be offset from one another by 180° in each body.
- Remount the packing gland and the stuffing box sleeve. Lightly oil the studs (pos. 40) and tighten the hexagon nuts (pos. 29) hand-tight.
- Remount the actuator unit, console and splines. When doing this, press the individual packing rings into the packing chamber.
- Tighten the hexagon nuts (pos. 29) evenly.
- Open and close the disc several times.
- Apply pressure to the valve.
- If there is leakage on the packing (pos. 13), tighten the hexagon nuts (pos. 29) slowly and evenly by a quarter turn until there is no more leakage.

7.3 Replacing the bottom flange gasket

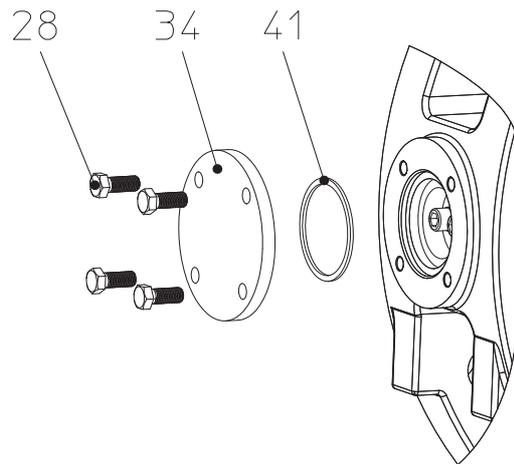


Figure 8



ATTENTION!

- Before starting maintenance work, you must depressurize the piping system. Ignoring these regulations can put your life at risk and can damage the piping system.

Working steps:

- Loosen the hexagon screws (pos. 28) and dismount the bottom flange (pos. 34).
- Remove the spiral wound gasket (pos. 41)
- Clean the spiral gasket groove and check it for damage.
- Apply a thin film of oil to the new spiral wound gasket and insert it in the intended groove in the body.
- Clean the hexagon screws (pos. 28) and apply fitting grease (e.g. Klüberpaste Hel 46-450); after this, insert them in the bottom flange and tighten them to the specified torque. (For tightening torques, see point 7.4)

7.4 Tightening torques

M 8	=	20 (± 5) Nm
M 10	=	25 (± 5) Nm
M 12	=	45 (± 5) Nm
M 16	=	100 (± 5) Nm

8.0 Troubleshooting

In the event of malfunction or faulty operating performance check that the installation and adjustment work has been carried out and completed in accordance with these operating Instructions.



ATTENTION!

- It is essential that the safety regulations are observed when identifying faults.

If malfunctions cannot be eliminated with the help of the following table “**9.0 Troubleshooting table**”, the supplier or manufacturer should be consulted.

9.0 Troubleshooting table

	<p>ATTENTION!</p> <p>- read points 10.0 and 11.0 before carrying out installation and repair work! - read point 6.0 before recommissioning!</p>
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Fault	Possible cause	Corrective measures
No flow	Valve closed.	Open the valve.
Little flow	Valve not sufficiently open	Open the valve.
	Strainer screen clogged	Clean / replace the screen
	Piping system clogged	Check the piping system
Valve is impossible or difficult to open or close	Service conditions (e.g. medium, temperature) may be outside the specified limits.	Replace the valve. Consult the supplier or manufacturer.
	Power failure	Check the power supply
	Actuator fault	Overhaul the actuator or replace it
	Wrong direction of rotation	Turn in the correct direction (anti-clockwise for opening).
	Packing (pos. 13) is too tight	Loosen the hexagon nuts (pos. 29)
	Solid matter is blocking the valve disc	Rinse or clean the butterfly valve
	The parallel key (pos. 38) on the stem has sheered off	Determine the cause and replace the parallel key (pos. 38)
	Liquid has solidified between the bearings	If possible, flush the bearings and the stem via the flushing connections
Valve is leaking	The disc is not completely closed	Put the disc into the closed position
	Solid matter is being deposited inside	Move the disc and flush the valve in the open position
	The mechanical end stop for closing is set wrong	Readjust the end stop
	The lamellar seal ring (pos. 9) is damaged	Replace the lamellar seal ring (pos. 9) – see point 7.1
The packing (stem packing) is leaking	The hexagon nuts of the packing (Pos. 13) are loose	Tighten the hexagon nuts (pos. 29) evenly in small steps
	The packing (pos. 13) is damaged	Replace the packing (pos. 13) – see point 7.2
Leakage at the bottom flange gasket	Hexagon screws (pos. 28) are loose	Tighten the hexagon screws (pos. 28)
	The spiral wounded gasket (pos. 41) is damaged	Replace the spiral wounded gasket (pos. 41)

10.0 Dismantling the valve or the top part



ATTENTION !

The following points must be observed:

- *Pressureless pipe system.*
- *Medium must be cool.*
- *Plant must be drained.*
- *Purge piping systems in case of caustic, inflammable, aggressive or toxic media.*

11.0 Warranty / Guarantee

The extent and period of warranty cover are specified in the "Standard Terms and Conditions of Albert Richter GmbH & Co. KG" valid at the time of delivery or, by way of departure, in the contract of sale itself.

We guarantee freedom of faults in compliance with state-of-the-art technology and the confirmed application.

No warranty claims can be made for any damage caused as the result of incorrect handling or disregard of operating and installation instructions, datasheets and relevant regulations.

This warranty also does not cover any damage which occurs during operation under conditions deviating from those laid down by specifications or other agreements.

Justified complaints will be eliminated by repair carried out by us or by a specialist appointed by us.

No claims will be accepted beyond the scope of this warranty. The right to replacement delivery is excluded.

The warranty shall not cover maintenance work, installation of external parts, design modifications or natural wear.

Any damage incurred during transport should not be reported to us but *rather* to the competent cargo-handling depot, the railway company or carrier company immediately or else claims for replacements from these companies will be invalidated.



Technology for the Future.

GERMAN QUALITY VALVES

ARI-Armaturen Albert Richter GmbH & Co. KG, D-33756 Schloß Holte-Stukenbrock

Telephone (+49 5207) 994-0 Telefax (+49 5207) 994-158 or 159

Internet: <http://www.ari-armaturen.com> E-mail: info.vertrieb@ari-armaturen.com

12.0 Declaration of Conformity / Declaration of Incorporation

Declaration of Conformity according to Directive 97/23/EC on Pressure Equipment

We,

**ARI-Armaturen Albert Richter GmbH & Co. KG,
Mergelheide 56-60, D-33756 Schloß Holte-Stukenbrock**

hereby declare that the products listed below comply with the following requirements.

Description of valve series:

Butterfly valve with double flange ARI-ZETRIX®016							
Type	Nominal pressure	Nominal diameter	Material	Assessment		Certificate No.	Applied standards
016	PN 10-40	DN 80-600	1.0619+N	Module H	Annex II, Diagram 6	50003/1	DIN 12516-2 AD2000 leaflet A4
			1.4408				
016 ANSI	ANSI 150-300	NPS 3" - 24"	SA216WCB				
			SA351CF8M				

Name and address of the notified licensing and monitoring agency:

**Lloyd's Register Quality Assurance GmbH
Am Sandtorkai 41, D-20457 Hamburg**

Number of the named agency

0525

Translated Declaration of Incorporation for partly completed machinery according to EC Directive 2006/42/EC on Machinery

for the products mentioned above:

As the manufacturer, ARI-Armaturen GmbH & Co. KG hereby declares that the products mentioned above comply with the following basic requirements of the **Machinery Directive (2006/42/EC)**.

Annex I, Clauses 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.3.9, 1.5.1, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.7, 1.5.15, 1.6.1, 1.7.1, 1.7.2, 1.7.3, 1.7.4

The following harmonised standards were used:

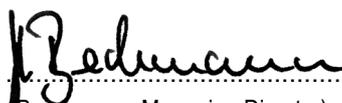
E DIN EN ISO 12100: 03/2009

ARI products are specified for assembly with electrical, pneumatic and hydraulic actuators. Commissioning must not be carried out until it has been ensured that the entire machine into which the ARI products are to be installed complies with the stipulations of EC Directive 2006/42/EC.

The manufacturer undertakes to submit in electronic form the relevant documentation of the partly completed machinery in response to a duly reasoned request by the competent national authorities. The special technical documentation associated with the machine has been drawn up in accordance with Annex VII Part B.

Authorised representative for the technical documentation: Dieter Richter

Schloß Holte-Stukenbrock, 26.05.2014


 (Brechmann, Managing Director)

The declaration certifies compliance with the stated Directive; it does not, however, represent any assurance of features in the sense of product liability legislation. The safety information in the supplied product documentation must be observed. This declaration is invalidated if modifications that the manufacturer did not authorize are made to the device or if the safety information is not complied with.