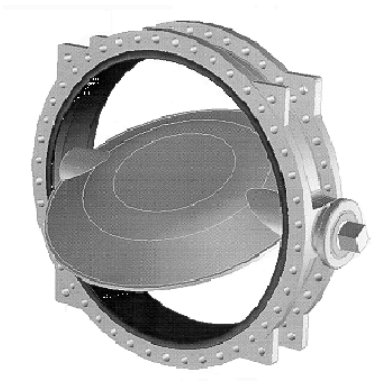




ISORIA 10, 16, 20, 25

MAMMOUTH 6, 10, 16, 20, 25

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CE UKCA

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KSB

1. Declaration of conformity

1.1. EU Declaration of conformity in accordance with PED for Butterfly Valves

Hereby we,

KSB S.A.S.
Zone industrielle Gagnaire Fonsèche
24490 LA ROCHE CHALAIS
Registered Office: 92635 – Gennevilliers
France

declare that the valves listed below comply:

– with the requirements of the Pressure Equipment Directive 2014/68/EU.

Description of the valve types:

Butterfly valves

– ISORIA 10	PS 10 bar	DN 40–1000
– ISORIA 16	PS 16 bar	DN 40–1000
– ISORIA 20	PS 20 bar	DN 32–600
– ISORIA 25	PS 25 bar	DN 32–1000
– MAMMOUTH 6, 10 16, 20, 25	PS 6/10/16/20/25 bar	DN 1050–4000

As per harmonized European standards: EN 10213; EN 12516-1; EN 12516-2; EN 12516-4

and other standards / directives: EN 1561; EN 1563; ASME B 16.34; ASME B16.42

Conformity Assessment Procedure: **Module H**

Suitable for fluids in groups 1 and 2

PED classification for each product type:

Butterfly valves	ISORIA 10				ISORIA 16				ISORIA 20			
Fluid	Liquids		Gas*		Liquids		Gas*		Liquids		Gas*	
Dangerous 1)	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Group	1	2	1	2	1	2	1	2	1	2	1	2
Table N° 2)	8	9	6	7	8	9	6	7	8	9	6	7
XV	✓	✓	✓	✓	●	✓	●	●	●	✓	●	●
XA	✓	✓	✓	✓	●	✓	●	●	●	✓	●	●
XC	✓	✓	✓	✓	●	✓	●	●	●	✓	●	●
K	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VC	✓	✓	✓	✓					✓	✓	✓	✓
EG	✓	✓	✓	✓					✓	✓	✓	✓
CC	✓	✓	✓	✓					✓	✓	✓	✓
NB	✓	✓	✓	✓					✓	✓	✓	✓
NH	✓	✓	✓	✓					✓	✓	✓	✓
SK	✓	✓	✓	✓					✓	✓	✓	✓
Y	✓	✓	●	●	✓	✓	✓	✓	✓	✓	✓	✓
CB	✓	✓	●	●					✓	✓	✓	✓

Butterfly valves	ISORIA 25				MAMMOUTH			
Fluid	Liquids		Gas*		Liquids		Gas*	
Dangerous 1)	Yes	No	Yes	No	Yes	No	Yes	No
Group	1	2	1	2	1	2	1	2
Table N° 2)	8	9	6	7	8	9	6	7
XV	●	✓	●	●	●	✓	●	●
XA	●	✓	●	●	●	✓	●	●
XC	●	✓	●	●	●	✓	●	●
K	●	✓	●	●	●	✓	●	●
VC	●	✓	●	●	●	✓	●	●
EG	●	✓	●	●	●	✓	●	●
CC	●	✓	●	●	●	✓	●	●
NB	●	✓	●	●	●	✓	●	●
NH	●	✓	●	●	●	✓	●	●
SK	●	✓	●	●	●	✓	●	●
Y	●	✓	●	●	●	✓	●	●
CB	●	✓	●	●	●	✓	●	●

1)	Definition in accordance with PED 2014/68/EU (from 07/19/2016)
✓	Compliant with PED
	Configuration not available
2)	Table in accordance with annex II of PED 2014/68/EU (from 07/19/2016)
•	Available on request to comply with PED

*: For unstable gas, consult us.

Production sites:
LA ROCHE CHALAIS / BURGOS

Name and address of the notified body for orders made from 01/10/2011:

Bureau Veritas Services SAS
8, cours du triangle
92800 Puteaux
FRANCE

Number of notified body: **0062**

Production site:
DALIAN

Name and address of the notified body for orders made from 01/01/2016:

Bureau Veritas Services SAS
8, cours du triangle
92800 Puteaux
FRANCE

Number of notified body: **0062**

- **Product information as per Regulation No. 1907/2006 (REACH)**

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see http://www.ksb.com/reach.

Leslie Labrousse
Integrated Management System Manager

Rév.2 - 05/23

This document was prepared electronically and is valid without signature. Its implementation in the public domain validates his condition.

1.2. UK Declaration of Conformity for Butterfly Valves

Hereby we

KSB S.A.S.
Zone industrielle Gagnaire Fonsèche
24490 LA ROCHE CHALAIS
Registered Office: 92635 - Gennevilliers
France

declare that the valves listed below comply:

- **to the safety requirements of the Pressure Equipment (Safety) Regulations 2016.**

Description of the valve types:

Butterfly valves

– ISORIA 10	PS 10 bar	DN 40–1000
– ISORIA 16	PS 16 bar	DN 40–1000
– ISORIA 20	PS 20 bar	DN 32–600
– ISORIA 25	PS 25 bar	DN 32–1000
– MAMMOUTH 6, 10, 16, 20, 25	PS 6/10/16/20/25 bar	DN 1050–4000

As per harmonized European standards:et les: EN 10213; EN 12516-1; EN 12516-2; EN 12516-4

and other standards / directives: EN 1561; EN 1563; ASME B16.34; ASME B16.42

Conformity Assessment Procedure: **Module H**

Suitable for fluids in groups 1 and 2

UKCA classification for each product type:

Butterfly valves	ISORIA 10				ISORIA 16				ISORIA 20			
Fluid	Liquids		Gas*		Liquids		Gas*		Liquids		Gas*	
Dangerous 1)	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Group	1	2	1	2	1	2	1	2	1	2	1	2
Table N° 2)	8	9	6	7	8	9	6	7	8	9	6	7
XV	✓	✓	✓	✓	●	✓	●	●	●	✓	●	●
XA	✓	✓	✓	✓	●	✓	●	●	●	✓	●	●
XC	✓	✓	✓	✓	●	✓	●	●	●	✓	●	●
K	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VC	✓	✓	✓	✓					✓	✓	✓	✓
EG	✓	✓	✓	✓					✓	✓	✓	✓
CC	✓	✓	✓	✓					✓	✓	✓	✓
NB	✓	✓	✓	✓					✓	✓	✓	✓
NH	✓	✓	✓	✓					✓	✓	✓	✓
SK	✓	✓	✓	✓					✓	✓	✓	✓
Y	✓	✓	●	●	✓	✓	✓	✓	✓	✓	✓	✓
CB	✓	✓	●	●					✓	✓	✓	✓

Butterfly valves	ISORIA 25				MAMMOUTH			
Fluid	Liquids		Gas*		Liquids		Gas*	
Dangerous 1)	Yes	No	Yes	No	Yes	No	Yes	No
Group	1	2	1	2	1	2	1	2
Table N° 2)	8	9	6	7	8	9	6	7
XV	●	✓	●	●	●	✓	●	●
XA	●	✓	●	●	●	✓	●	●
XC	●	✓	●	●	●	✓	●	●
K	●	✓	●	●	●	✓	●	●
VC	●	✓	●	●	●	✓	●	●
EG	●	✓	●	●	●	✓	●	●
CC	●	✓	●	●	●	✓	●	●
NB	●	✓	●	●	●	✓	●	●
NH	●	✓	●	●	●	✓	●	●
SK	●	✓	●	●	●	✓	●	●
Y	●	✓	●	●	●	✓	●	●
CB	●	✓	●	●	●	✓	●	●

1)	Definition in accordance with the UK Declaration of Conformity (Pressure Equipment (Safety) Regulations 2016)	2)	Table in accordance with annex II of the UK declaration of conformity (Pressure Equipment (Safety) Regulations 2016)
✓	Compliant to the UK declaration of conformity	●	Available on request to comply with the UK declaration of conformity
	Configuration not available		

*: For unstable gas, consult us.

Production sites:
LA ROCHE CHALAIS / BURGOS / DALIAN

Name and address of the notified body **Bureau Veritas UK Limited**
Atlantic House, Atlas Business Park,
Manchester, M22 5PR,
United Kingdom

Number of notified body: **0041**

Leslie Labrousse
Integrated Management System Manager

Rev.2 - 05/23

This document was prepared electronically and is valid without signature. Its implementation in the public domain validates his condition.

2. General

These operating instructions apply to KSB rubber lined butterfly valves (see section 6).

Design, manufacturing and testing of the KSB valves are subject to a Quality Assurance System according to EN ISO 9001 and to the European Pressure Equipment Directive 2014/68/EU (PED).
For a specific product configuration as an actuated valve, the aggregate can be considered as a partly completed machine according to the machinery directive 2006/42/EC and comply with the requirements of the directive.
Correct installation and maintenance or repair are mandatory to ensure trouble free operation of the valves.

The manufacturer cannot be made liable for these valves if operating instructions are not being observed.

ATTENTION The valves must not be operated outside the permissible operating range. The limits are indicated on the name plate or currently applicable type leaflet. The pressure-temperature ratings, in particular, must not be exceeded. Operation of the valves outside the above-mentioned conditions may result in overloads which may damage the valves.
The type leaflets can be found at www.ksb.com – product catalogue.

Nonobservance of this warning may lead to personal injury or property damage, e.g.:
- Injury caused by escaping fluids (cold/hot, toxic,flammable, corrosive or under pressure)
- Incorrect operation or destruction of the valve.

The descriptions and instructions in this manual refer to the standard versions but also apply to the related variants.

These operating instructions do not take into consideration:
- incidents which may occur during installation, operation and maintenance.
- the local safety regulations. It is the user's responsibility to ensure that these are also observed by the installation staff involved.

For actuated valves, the specified connection parameters and the installation and maintenance instructions - including the operating manual for the actuator - **must** be observed.

ATTENTION Handling a valve requires skilled and experienced personnel.

The personnel in charge of operation, maintenance and installation of this valve must be aware of the interaction between the valve and the plant.

Operator's errors concerning the valve may have serious consequences for the entire plant, e.g.:

- fluid may escape
- downtime of the plant/machine
- adverse effect/reduction/increase of the efficiency/function of a plant/machine.

For further questions or in case of damage to the valve, please contact your KSB Sales Office.

For further questions and supplementary orders, especially when ordering spare parts, please always state the indications of the marking plate.

The specifications (operating data) of the valves are listed in the technical documentation & type leaflet of the related valve (see also section 6).

When returning valves to the manufacturer, please refer to section 5.

3. Safety

This manual contains basic instructions to be complied with during operation and maintenance. It is therefore vital for the fitter and the operator/user to read this manual before installing/commissioning the valve. Also, this manual must always be available at the site where the valve is installed.

It is not enough to observe the general instructions listed in the section "safety", the specific safety instructions listed in the other sections should also be observed.

3.1 Safety Symbols in these Operating Instructions

Safety instructions put forth in this instruction manual, the nonobservance of which would involve the risk of personal injury, they are specially marked with the general hazard symbol:



in accordance with ISO 3864-B.3.1.
or with the electric voltage warning sign:



In accordance with ISO 3864-B.3.6.

Safety instructions the nonobservance of which would involve hazard to the valve and jeopardize its operation have been marked with the word

ATTENTION

Instructions directly attached to the valve, (e.g. nominal pressure) must be complied with and maintained in a legible condition.

3.2 Qualification of personnel and training

The personnel for operation, maintenance, Inspection and installation must be adequately qualified for the work involved. The personnel responsibility, competence and supervision must be clearly defined by the user. If the personnel in question is not already in possession of the required know-how, appropriate training and instructions must be provided. If deemed necessary, the manufacturer/supplier will provide such training and instructions at the user's request. In addition, the user is responsible for ensuring that the contents of these operating instructions are fully understood by the personnel involved.

3.3 Danger or nonobservance of the safety instructions

Nonobservance of the safety instructions may lead to personal injury and danger for both the environment and the valve itself. Nonobservance of these safety instructions will also forfeit the user's warranty.

Such noncompliance could result in for example :

- failure of essential functions of the valve/plant
- failure of prescribed maintenance and repair practices
- hazard to people by electrical, mechanical or chemical effects
- hazard to the environment due to leakage of hazardous substances

3.4 Safety Consciousness

The safety instructions contained in this manual, the applicable national accident prevention regulations and any of the user's own applicable internal work, operation or safety instructions must be fully complied with.

3.5 Safety Instructions for the User/Operator

Any hot or cold parts of the valve (e.g. body or handle or actuator) that could cause a hazard must be protected by the user against accidental contact.

Leakage of hazardous substance (e.g. flammable, corrosive, toxic, hot) must be drained so as to avoid all danger to people or the environment. All relevant laws must be observed.

Electrical hazards must be effectively prevented. (For details, please refer to the IEC 364 or equivalent national standard and/or local utility energy supply regulations).

3.6 Safety Instructions for Maintenance, Inspection and Installation work

3.6.1. General

On an actuated valve the operating instructions of the valve must be strictly followed as well as those of the operating instructions of the actuators, the limit switch or automation boxes.
The user is responsible for ensuring that all maintenance, inspection and installation work is carried out by authorized, adequately qualified staff who are thoroughly familiar with this instruction manual.
Any work on a valve may only be performed when the valve is un-pressurized and has cooled down to 60 ° C.
Any work on actuated valves may only be done after that the actuator has been disconnected from its energy supply.
The procedure described in the operating instructions to shut down the actuator must be observed.Valves in contact with hazardous media must be decontaminated. Immediately following completion of the work, all safety relevant and protective devices must be reinstalled and/or re-enabled. Prior to recommissioning, refer to the points listed under section 7 Commissioning.

3.6.2. End of line installation

Use as end of line and downstream dismantling at ambient temperature of standard range
End of line and downstream dismantling not authorized for bodies type 1 (annular shape).
End of line of installation is forbidden for the valves subject to PE(S)R 2016.

NB: A valve fitted at the end of a pipe with a blind flange downstream is not to be considered as an end of pipe service.

Valves	Gas ou liquids *		Liquids	
	Hazardous (Group1)	Non hazardous (Group 2)	Hazardous (Group 1)	Non hazardous (Group 2)
ISORIA 10	All sizes: non authorized	DN ≤500: Liners: XA, XC, XV, K,Y, NH,VC, CB, EG ΔPS = 7 bar max Liners: CC, SK, NB ΔPS = 4.5 bar max Greater sizes: on request	Liners: XA-XV-K-XC-Y-CB-EG-NH(1)-VC(2) ΔPS = 7 bar max Liners: CC, SK, NB, NH(3) -VC(4) ΔPS = 4.5 bar max	Liners: XA-XV-K-XC-Y-CB-EG NH(1)-VC(2) ΔPS = 7 bar max Liners: CC, SK, NB, NH(3)-VC(4) ΔPS = 4.5 bar max
ISORIA 16	All sizes: non authorized	DN ≤350 ΔPS = 12 bar max Greater sizes: on request	Liners: XA-XV-XC-K-Y(2) ΔPS = 12 bar maxi Liners: Y(4) ΔPS = 7 bar max	Liners: XA-XV-XC-K-Y(2) ΔPS = 12 bar max Liners: Y(4) ΔPS = 7 bar max
ISORIA 20	All sizes: non authorized	DN ≤125: Liners: XA-XV-XC-K ΔPS=15 bar max Liners: VC-Y-CB ΔPS = 12 bar max Liners: EG-NH ΔPS= 7 bar max Greater sizes: on request	DN ≤125: Liners: XA-XV-XC-K ΔPS=15 bar max Liners: VC-Y-CB ΔPS=12 bar max Liners: EG-NH ΔPS= 7 bar max Greater sizes: on request	Liners: XA-XV-XC-K ΔPS = 15 bar max Liners: VC-Y-CB ΔPS = 12 bar max Liners: EG-NH ΔPS= 7 bar max
ISORIA 25	non applicable	non applicable	All sizes: non authorized	All sizes: ΔPS = 17 bar max
MAMMOUTH	All sizes: non authorized	on request	All sizes: MAMMOUTH 16/20/25 : ΔPS = 16 bar max MAMMOUTH 10 : ΔPS = 7 bar max MAMMOUTH 6 : ΔPS = 4 bar max	All sizes: MAMMOUTH 16/20/25 : ΔPS = 16 bar max MAMMOUTH 10 : ΔPS = 7 bar max MAMMOUTH 6 : ΔPS = 4 bar max

ΔPS: Differential pressure (1) DN</=300 (2) DN</= 600 (3) DN>/= 350 (4) DN>600

* Liquids whose vapour pressure at the maximum allowable temperature is greater than 0.5 bar above normal atmospheric pressure (1013mbar)

3.7. Unauthorized Modification and Manufacturing of Spare Parts

The equipment shall not be altered or modified in any way prior to consultation with the manufacturer. Genuine spare parts and accessories authorized by the manufacturer will ensure operational safety. The manufacturer cannot be held responsible for damage resulting from the use of non-genuine parts or accessories.

3.8. Inadmissible Modes of Operation

Operational safety and reliability of the valve supplied is only warranted for its designated use as defined in section 2 ”General” of the operating instructions.The limits stated in the technical documentation must not be exceeded under any circumstances.

4. Transport and Interim Storage

4.1. Transport

The valves in the as-supplied condition are ready for operation.

ATTENTION For transport and storage, the valves must always be maintained in the semi--closed position and be packed in cardboard, crate or case with suitable protection (dessicant, thermowelded barrier).

ATTENTION To prevent damage, do not hang the valve by its handle or actuator. After delivery or prior to installation, the valve should be checked for damage during transit.

4.2 Interim Storage

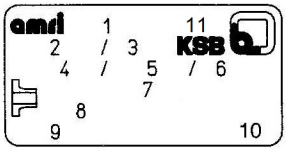
The valves must be stored in such a way that correct operation is assured even after prolonged storage.
This comprises: - Storing at 5° from the closed position
- Suitable measures against contamination, frost and corrosion (e.g. by using thermowelded plastic bags with dessicant, protection caps and plugs onto threaded holes).

5 Description of valves

The sectional drawings shown hereafter are examples for the general design of our valves. For drawings and other information pertaining to a specific valve series, please refer to the relevant type leaflets.

5.1 Marking

The valves are marked to PED 2014/68/EU and UKCA.



Marking of the identity plate



Example for PED



Example for UKCA

1 - Valve type model
2 - Internal material code
3 - Valve PN /Class designation
4 - Maximum allowable pressure
5 - Maximum allowable pressure at end of line or for downstream dismantling
6 - Maximum allowable temperature
7 - Pipe flange drilling pattern (if known)
8 - Month and year of production
9 - Equipment serial number
10 - CE marking with notified body identification number
11 - Nominal valve diameter '+' = Square valve shaft end in accordance to ISO 5211

ISORIA 25

PS	DN ≤32	40	50	65	80	100	125	150	200	250	300	>300
3												
10												
16												
25												

Valves for non hazardous fluids (group 2) according to table 7 of annex II (PED)

PS	DN ≤32	40	50	65	80	100	125	150	200	250	300	>300
3												
10												
16												
25												

Valves for non hazardous fluids (group 2) according to table 7 of annex II (UKCA)

ISORIA 10, 16, 20 / MAMMOUTH 10, 16, 20, 25

PS	DN 32	40	50	65	80	100	125	150	≥200
10									
16									
20									
25									

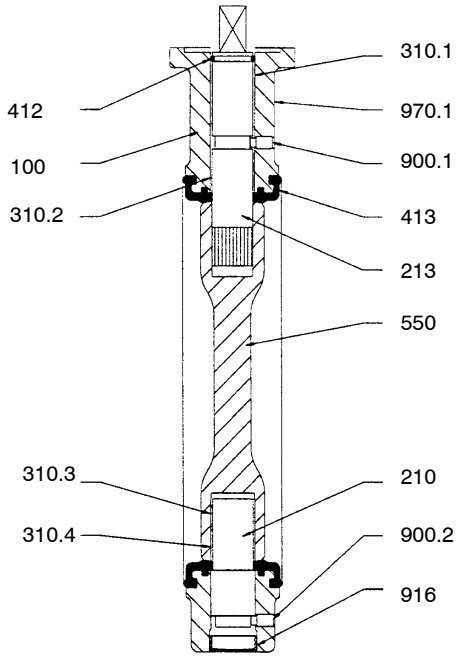
Valves for liquids and dangerous gas (group 1) according to table 6 of annex II (PED)

PS	DN 32	40	50	65	80	100	125	150	≥200
10									
16									
20									
25									

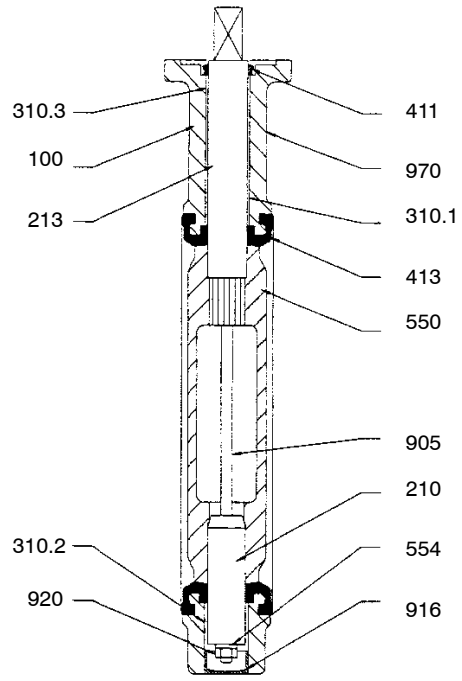
Valves for liquids and dangerous gas (group 1) according to table 6 of annex II (UKCA)

5.2. Drawings and documents

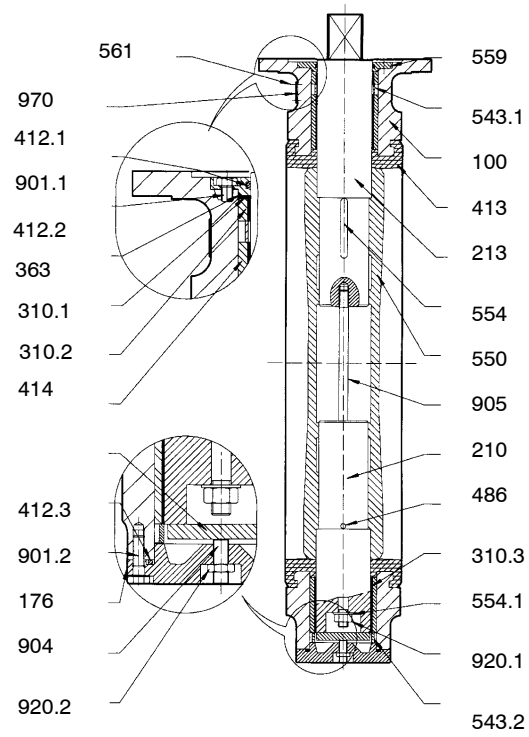
Type	DN (mm)	PS (bar)	Leaflet no.
ISORIA 10	40 – 1000	10	8445.5
ISORIA 16	40 – 1000	16	8445.5



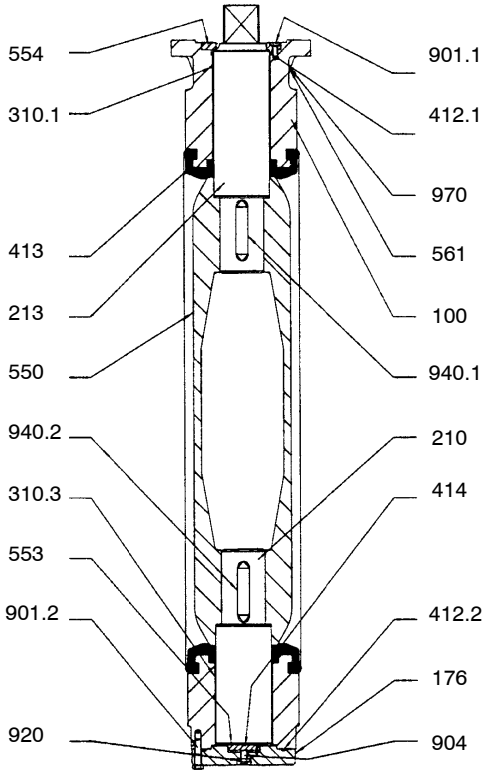
Type	DN (mm)	PS (bar)	Leaflet no.
ISORIA 20	32 – 600	20	8447.5



Type	DN (mm)	PS (bar)	Leaflet no.
ISORIA 25	32 – 1000	25	8447.5



Type	DN (mm)	PS (bar)	Leaflet no.
MAMMOUTH 6/10/16/20/25	1050 – 4000	6/10/16/25	8612.12



5.3 List of Components

Part No.	Name of Parts
100	Body
176	Bottom
210	Shaft
213	Operating shaft
310.*	Plain bearing
363	Wedge
411	Gasket
412.*	O-ring
413	Liner
414	Disc thrust plate
486	Ball
543.*	Spacer bush
550	Disc
553	Lubricating thrust insert
554	Washer
559	Gasket holder
560	Elastic pin
561	Grooved nail
900.*	Anti blow-out screw
901.*	Hexagon head screw
904	Adjusting screw
905	Tie rod
916	Plug
920.*	Nut
932	Self locking ring
940.*	Key
970	Identity plate
*	Repetitive part

5.4 Functioning principle

Description

The valve consists mainly of a body (100), operating shaft (213), shaft (210), disc (550) and rubber liner (413).

The in-house designed formulated and manufactured rubber liner achieves the leak tightness at shaft passages, pipe flanges and downstream/upstream around the disc.

Disc-shaft connection: The disc (550) is connected to the operating shaft by key (s), or splines.

Anti blow-out device: Every valve is fitted with an anti blow-out device which prevents the shaft to burst off the body in case of shaft failure. This function is achieved by additional parts.

Operation: The valves are quarter-turn operated manually by handles or gear box or hydraulic, pneumatic or electric actuators mounted on the valve top plate (as per ISO 5211 standard).

5.5. Antistatic construction option

Manual version valves are excluded from the scope of the 2014/34/EU ATEX directive.
However, if they have to be installed in ATEX zones, they must not be able to trigger an explosion.
For this, you must choose the “antistatic construction” option.
This option comprises:
- Electrical continuity between body and trim, Earth terminal for connecting the valve to earth,
- Paint thickness limited to 200 µm,
- Specific “antistatic construction” wording on self-adhesive label or riveted plate.
- An electrical continuity test between body and butterfly is carried out at the factory on 100% of valves.

Connecting the valve to earth remains the customer’s responsibility.

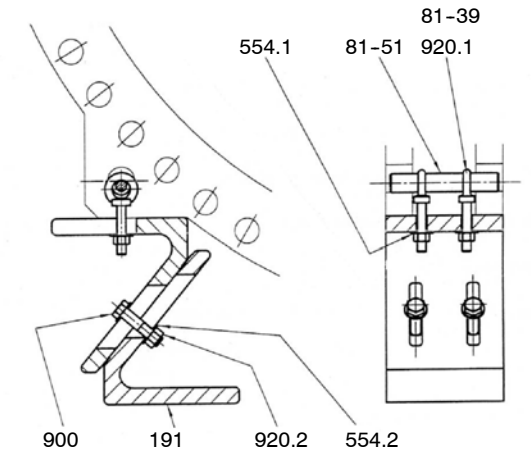


5.6 Optional accessories

Body support

Caution: Supporting legs must not be fixed to the ground.They must remain free to move.

- Assemble separately, the four identical parts as shown hereunder, with the screws (900), the nuts (920.2) and the washers (554.2).
- Assemble the body supports onto the valve.
  Depending on lifting means, place the valve either in vertical or horizontal position, sling with lifting and/or supporting means.
  Assemble every support onto the valve using connecting rods (81.51), eye bolts (81-39) + (920.1) and washers (554.1).



6 Installation

6.1 General

ATTENTION To avoid leakage, deformation or rupture of the body, the piping should be laid out in such a way that no thrust or bending forces act on the valve bodies (Part Nr. 100) when they are installed and operational.

ATTENTION The sealing faces of the flanges must be clean and undamaged (Ra ≤ 25µm).

⚠ It is prohibited to add any additional gasket (except electric insulation gasket, please consult us) between body and piping flanges. To insert the valve between flanges, pull apart the two pipes flanges to obtain sufficient clearance between flange face and valve seat cheeks. All holes provided in the flanges must be used for the flange connection.

⚠ If construction work is still in progress, non-mounted valves must be protected against dust, sand and building material etc.(cover with suitable means).
Do not use valve handles and gear handwheels as footholds!

⚠ Valves and pipes used for high (> 60 °C) or low (< 0 °C) temperatures must either be fitted with a protective insulation, or there must be warning signs fitted showing that it is dangerous to touch these valves.

⚠ If a valve is used as end-valve in a pipe, this valve should be protected against unauthorized or unintentional opening to prevent personal injury or damage to property.

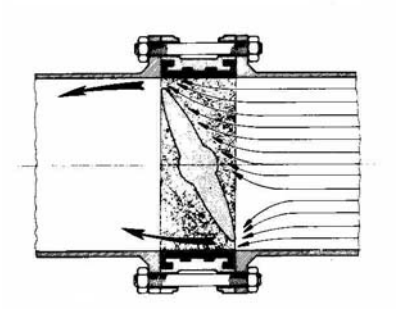
The valves, used for oxygen applications are delivered free from grease, oil and demolding agent,with a severe cleaning procedure.
The valves must be touch only with clean and dry gloves.
It is prohibited to use any grease or oil on any surface of the valves.

⚠

Valves sizes DN ≤ 600 may be installed in any position.

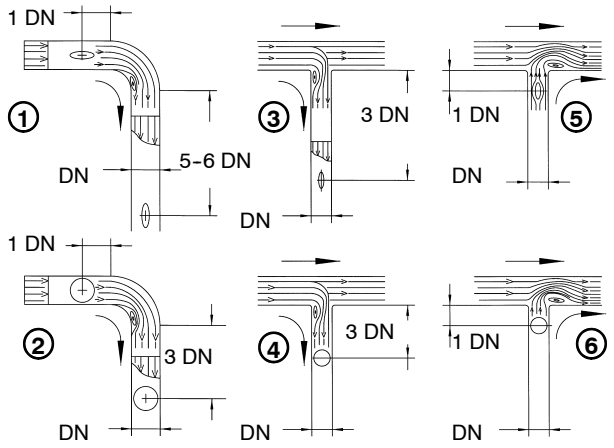
Valves sizes DN > 600 have a mountung preferential direction horizontal shaft following the figure hereafter. This is the most favourable position because:
- The weight of the disc and shafts is borne by the two bearings,
- the pivot bearing is relieved,
- it is a guarantee of long valve life, specially in the case of fluids containing solids, where sold particles tend to accumultate on the bottom of the pipe (during the closing, the reduction in cross-section causes a local increase in velocity which results in a “sweeping” or “cleaning” of the liner).

The mounting, vertical shaft, actuators ace upwards is allowable.



6.2 Installation conditions

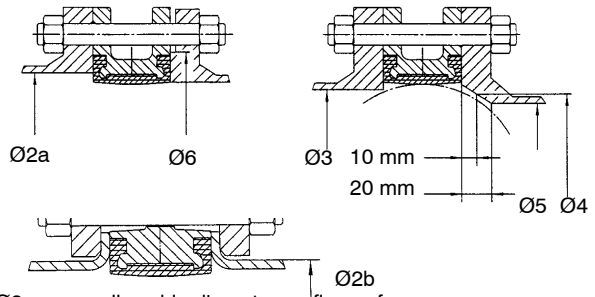
6.2.1 Recommended minimum distances between the position of the valve and of the T-piece or elbow.



If the actual distances are shorter than the minimum distances in drawings 1, 2, 3 and 4, the valve disc must be positioned at an opening angle of 70°.
Upstream and downstream stabilisation distances are also required for valves installed on the pump discharge side.

6.2.2 Flanging dimensions

Connection to the piping.
Piping flanges must match the following dimensions.



Ø2a: max. allowable diameter on flange face
Ø2b: external diameter of the pipe when fitting loose plate flange with lapped pipe end
Ø3: allowed minimum diameter on flange face
Ø4: minimum diameter at 10mm from the flange face
Ø5: minimum diameter at 20mm from the flange face
Ø6: allowed minimum diameter of raised face

ISORIA 10, ISORIA 16

DN	NPS	ø2a	ø2b	ø3	ø4	ø5	ø6
20	¾	44	43				64
25	1	44	43				64
32	1 ¼	54	49	32			77
40	1 ½	54	49	32			77
50	2	63	61	33			86
65	2 ½	80	77	55	13		107
80	3	93	89	71	50		121
100	4	116	115	90	74	40	141
125	5	141,5	140	119	107	87	171
150	6	170,5*	169	144	134	120	196
200	8	222*	220	196	189	178	250
250	10	276,5*	273	249	243	234	306
300	12	327,5*	324	297	291	283	358
350	14	361	356	326	321	314	399
400	16	412	407	370	366	358	452
450	18	463	457	422	416	409	505
500	20	515	508	470	464	457	558
550	22	568	561	522	516	509	625
600	24	617	610	566	560	554	664
650	26	668		620	614	608	723
700	28	718		671	666	660	773
750	30	770		717	711	705	830
800	32	820		769	764	758	880
900	36	924		869	864	859	987
1000	40	1027		970	965	960	1094

* Please check that the body is well centered between the tie-rods

ISORIA 20

DN	NPS	ø2a	ø2b	ø3	ø4	ø5	ø6
32	1 ¼	44	43				64
40	1 ½	50	49	33			73
50	2	63	61	38			89
65	2 ½	78	77	55			104
80	3	92	89	74	53		124
100	4	117	115	92	77	48	147
125	5	145	140	117	107	88	177
150	6	172	169	143	137	123	202
200	8	223	220	191	183	173	251
250	10	278	273	241	234	226	305
300	12	329	324	290	284	276	358
350	14	361	356	326	321	314	399
400	16	412	407	370	366	358	452
450	18	463	457	422	416	409	505
500	20	515	508	470	464	457	558
550	22	568	561	522	516	509	625
600	24	617	610	566	560	554	664

ISORIA 25

DN	NPS	ø2a	ø3	ø4	ø5	ø6
32	1 ¼	33				64
40	1 ½	41	33			73
50	2	51	38			89
65	2 ½	66	55			104
80	3	81	74	53		124
100	4	101	92	77	48	147
125	5	126	117	107	88	177
150	6	151	143	137	123	202
200	8	201	191	183	173	251
250	10	251	241	234	226	305
300	12	302	290	284	276	358
350	14	337	326	321	314	399
400	16	387	370	366	358	452
450	18	438	422	416	409	505
500	20	488	470	464	457	558
550	22	549	522	516	509	625
600	24	589	566	560	554	664
700	28	700	683	668	661	Flat flange face
800	32	799	782	766	760	
900	36	900	880	860	854	
1000	40	1000	976	958	952	

MAMMOUTH 6, 10, 16, 20, 25

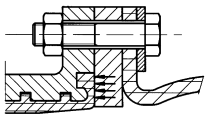
DN	NPS	ø2a face to face ISO	ø3 face to face ISO	ø4 face to face ISO	ø5 face to face ISO	ø6
1050	42	1067	1010	1006	1005	1135
1100	44	1117	1063	1058	1053	1187
1200	48	1222	1158	1152	1147	1307

DN	NPS	ø2a face to face		ø3 face to face		ø4 face to face		ø5 face to face		ø6
		280	400	280	400	280	400	280	400	
1100	44	1130		1057		1045		1039		1220
1200	48	1226		1152		1148		1143		1320
1300	52	1330		1259		1252		1247		1420
1350	54	1380		1310		1303		1298		1470
1400	56	1430	1430	1361	1320	1354	1312	1349	1305	1530
1500	60	1530	1530	1463	1424	1459	1416	1454	1410	1630
1600		1625		1560		1556		1552		1730
	66	1690		1626		1623		1619		1810
1800	72	1830	1830	1768	1734	1765	1730	1761	1722	1930
	78	1990	1990	1930	1888	1926	1894	1923	1889	2090
2000		2034	2034	1974	1943	1971	1935	1968	1931	2130
	84	2140	2140	2081	2051	2078	2047	2075	2043	2240
2200		2234	2234	2176	2147	2173	2149	2171	2145	2340
	90		2330		2244	2224	2240	2221	2235	2430
2400	96		2440		2356		2355		2351	2540
2500			2540		2456		2456		2453	2640
2600	102		2640		2564		2555		2552	2740
	108		2740		2665		2658		2654	2890
2800			2840		2766		2760		2756	2940
	114		2940		2867		2860		2856	3040
3000			3040		2968		2962		2959	3140
	120		3060		2988		2972		2967	3160

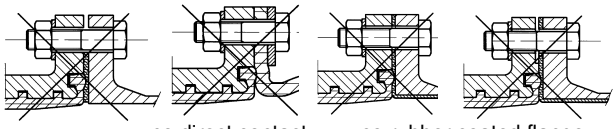
DN 3000 < DN ≤ 4000 : please consult us

6.2.3 Interface between valve and pipe flanges

Correct fitting except T6 bodies



Metallic intermediate insertion flange



no gasket

no direct contact with the expansion joint

no rubber coated flange T5 type body

T6 type body

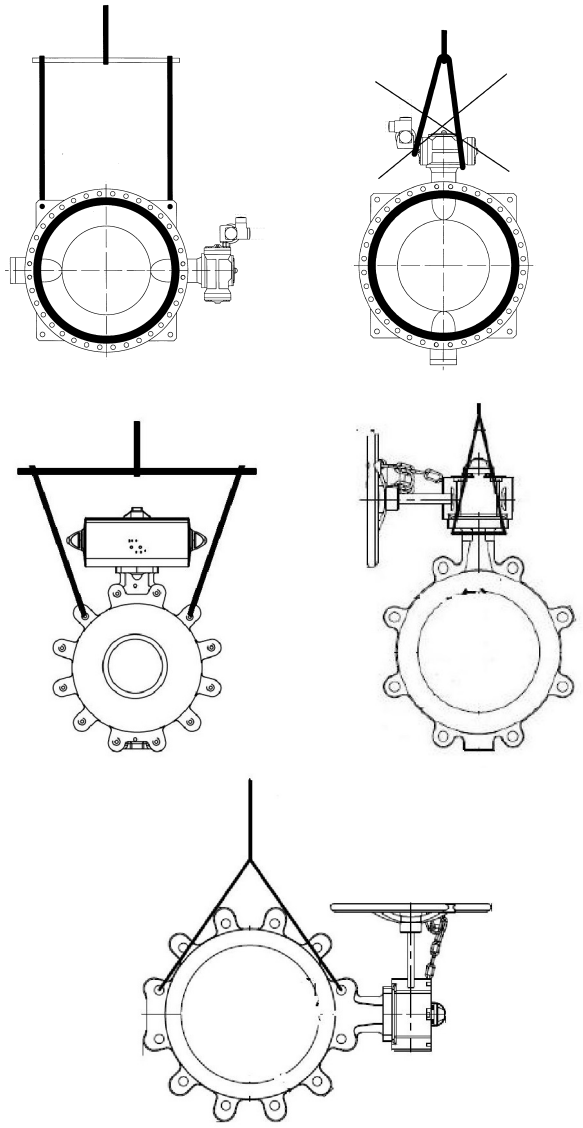
In case of coated pipe (hard rubber, concrete or Teflon for example), coating hardness and flanges detailed dimensions shall be given to KSB for acceptance.
In case of fitting between polyethylene flanges:
- Authorized fitting between flanges with flat faces
- Not authorized fitting between flanges with grooved faces

6.3 Handling

Handling means may be necessary to install large sizes valves.
They must be used as shown.

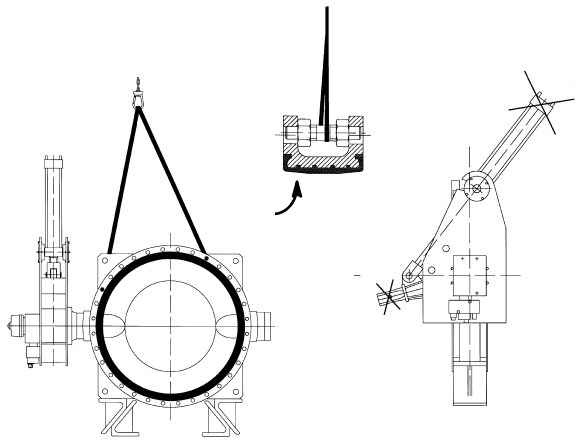
VALVE WITH MOTORIZATION

CORRECT FORBIDDEN



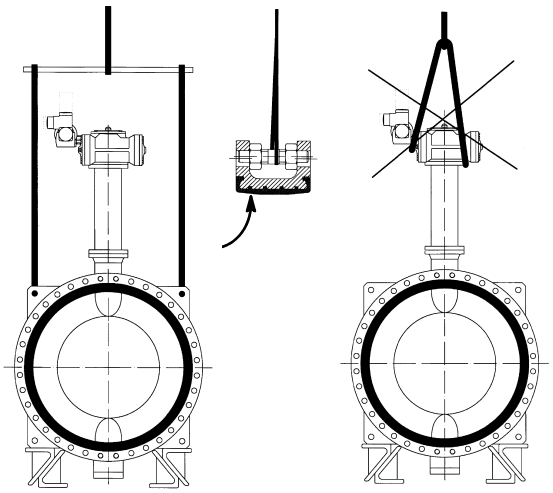
VALVE WITH COUNTERWEIGHT

CORRECT FORBIDDEN

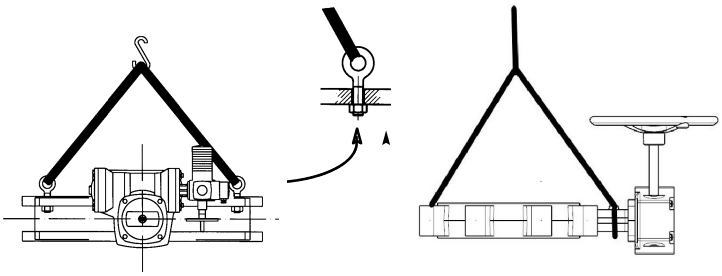


VALVE WITH NECK EXTENSION

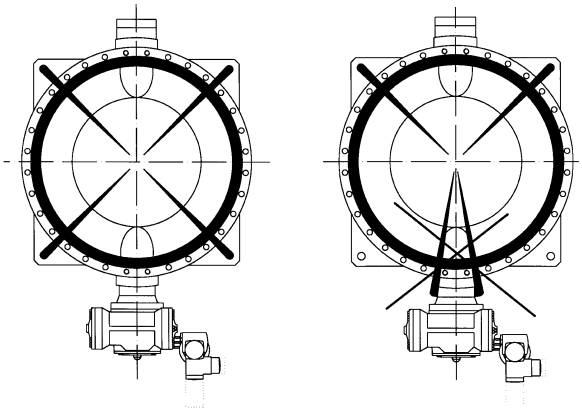
CORRECT FORBIDDEN



HORIZONTAL VALVE



CORRECT FORBIDDEN



Neck extension and body supports may have been delivered separately from the valve. They must be mounted onto the valve before fitting it between flanges

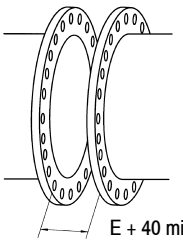
6.4 Recommendations for installation

Before assembly

- Verify that pipeline flanges are free from metallic chips and weld splatter.
- Verify that pipeline flanges are located on the same centreline and are parallel.
- Verify that inside diameter of pipeline flange is in accordance with the minimum and maximum diameters given by the manufacturer.
- Verify that nothing hinders the complete moving of the disc during opening or closing, in particular at the internal weld seams or at the pipe ends.
- Pull apart the pipeline flanges to allow valve insertion without damaging the elastomer liner of the valve.

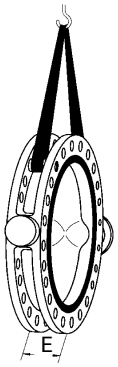
During assembly

- Place the disc as spaced apart as possible from the closing position, but without that disc protrudes past the valve's body.
- Spread the two pipe flanges to obtain sufficient clearance between flange face and valve seat cheeks.



Minimum clearance : E + 40mm

E : Face to face valve
(refer to the type series booklet)



- Insert valve between pipeflanges and center using several tie-rods.
- Screw up progressively the nuts until metal to metal contact is achieved between the valve body and pipeline flanges, by making sure the good centering of the body compared with the flange is maintained.
- Operate the valve several times to ensure no valve disc obstruction.

6.5 Actuated valves

Electrical cables may only be connected by qualified personnel.

The applicable electrical regulations (e.g. IEC and national standards), also for equipment in hazardous locations, must be observed.All electrical equipment such as actuator, switchboard, magnetic valve drive, limit switch etc. must be installed in floodproof dry locations.Voltage and frequency must match the valves stated on the identity plate.

7 Commissioning/Decommissioning

7.1 Commissioning

7.1.1 General

Prior to commissioning the valve, the pressure, temperature and material data stated on the valve should be compared to the actual operating conditions in the piping system to check whether the valve can withstand the loads occurring in the system.

Possible pressure surges (water hammer) must not be exceed the highest admissible pressure. Adequate precautions should bet aken.In new pipe systems and especially after repair work, thes ystem should be flushed with the valves fully open to remove solids, e.g. weld beads, which may damage the seats.

Valves used for oxygen service shall not be removed from the original packaging until immediately before installation into the system to avoid any contamination.

7.1.2 Operation

The position of the disc is indicated by the pointer of the actuator or by handle lever. The valves are closed by turning in the clockwise direction (top view) and opened in the counterclockwise direction.

7.1.3 Functional Check

The following functions should be checked:Before commissioning, the shut-off-function of the valves should be checked by repeated opening and closing.

7.1.4 Actuated valves

Adjustable end stops and torque limiter are pre-adjusted in factory. The customer may have to complete the adjustment on site during the commissioning, if necessary.

7.2 Decommissioning

During extended shutdown periods, liquids liable to change their condition due to polymerization, crystallization, solidification etc. must be drained from the piping system. If necessary, the piping system should be flushed with the valves fully open.

8. Maintenance/Repair

8.1 Safety Instructions

Maintenance and repair work may only be carried out by skilled and qualified personnel.

For valves used for oxygen service, take care that here is no chemical reaction between cleaning agents and residues of the medium into the valves.

For all maintenance and repair work, the safety instructions listed below and also the general notes in section 2 must be observed.Always use suitable spare parts and tools, even in case of emergency, otherwise correct operation of the valves cannot be assured.

8.2 Valve removal from piping and actuator disconnecting

Identify the valve by identity plate.

Please check what is the relevant spare kit.
Place the disc at 10 ° opening.

The entire valve must be unpressurized and must have cooled down sufficiently so that the temperature of the medium is lower than 60 ° C, to prevent scalding.

Opening pressurized valves will cause danger to life and limb!If toxic or highly flammable substances or liquids whose residues may cause corrosion by interaction with the air humidity were handled by the valve, then the valve should be drained and flushed or vented.If necessary, wear safety clothing and a face guard/mask.Depending on the installation position, any liquid remaining in the valve may have to be removed.

Prior to possible transport, the valves must be flushed and drained carefully.If you have any questions please contact your KSB Sales Office.

If actuators powered by an external source of energy (electric, pneumatic, hydraulic) need to be removed from the valves or dismantled, the energy supply must be shut down prior to starting any repair work.

Remove the valve from the piping with its actuator. Do not damage the liner during removal the valve from the pipe. Therefore, pull apart the pipe flanges to allow sufficient clearance.

Identify the mounting position of the actuator

Disconnect the actuator and take care of all bolting parts.

8.3 Spares, list of tools, Consummables

8.3.1 Spares

Use the relevant spare parts included in the liner kit or disc kit or shaft kit. Please refer to leaflets.
All constitutive parts of kits must be replaced.

For valves used for oxygen service, only original spare parts shall be used for non-metallic parts. They must be compatible with the oxygen service pressure and temperature.

⚠ During the mounting /dismantling of the valve, the order of operations given in § 8.4.1. must be respected to prevent injuries and material damages.

During the tests, while closing and opening valves, care must be taken that no operator interferes with the disc travel.

8.3.2 List of tools for mounting/dismantling

Pneumatic screwing machine, open ended spanner, ring spanner, box spanner, screwdrivers, hammer, pneumatic polisher, wedges, crow bar and silicon grease if authorized.

8.3.3 Consummables

Use only the silicon grease enclosed in the kit (Molykote type 111). The use of mechanical grease is strictly prohibited.

8.4 Valve disassembly and re-assembly

8.4.1 Valve disassembly

Remove the plug (916) or bottom (176) , the spring retaining ring (932) if any.

Remove the anti blow-out screws (900.*) and gasket holder (559) if any.

Extract the operating shaft (213) and lower shaft (210)

Remove the disc (550) and dismantle the liner (413)

⚠ Take care to prevent disc edge, liner and paint from any damage.

Change O-rings 412.* using silicon grease. Put grease onto the liner at shaft passages.

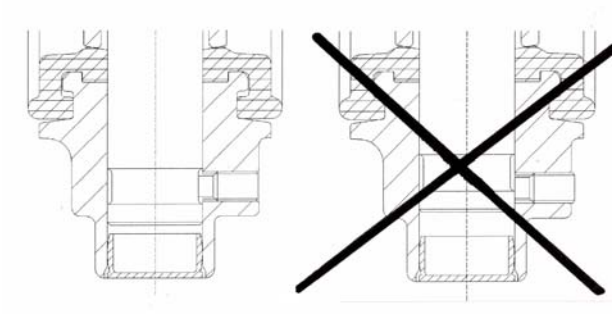
8.4.2 Valve re-assembly

For valves used for oxygen service, before re-assembly, all parts must be absolutely free of grease, oil and demolding agents, and must be touch only with clean and dry gloves.
KSB cleaning procedure must be applied.

Put in place the liner (413) into the body (100) so that shaft passages are correctly aligned with the bores of the body.

Insert the disc (550) in open position and check correct alignment of shaft passages.

Mount the shaft (210) with the ball (486) / keys (940.*) or spring retaining ring (932), the washer (554) and screw (901.*) if any.
ISORIA 10,16 DN 250 to 600 : check that the groove of the shaft and operating shaft are in front of the anti blow-out screws (900.1) and (900.2) as shown below:



CORRECT FORBIDDEN

Mount the operating shaft (213) with keys (940.*) if any. Check the correct indexation with the disc edge (550)

Adjust the anti blow-out screws (900.*)

Mount the plug (916) or bottom (176) and gasket holder (559) if any.

Valves with a bottom (176) must be put in a horizontal position tost adjust screw (904) which is to be locked with nut (920).

8.5 Test and re-installation

Reassemble the actuator (check the N or M position)

Open the valve at 10 ° opening.

Pull apart the pipeline flanges to allow valve insertion without damaging the elastomer liner of the valve.

Connect the power supply if necessary.

Check that the valve can be fully operated by the actuator.

Connect the valve to the pipe and follow assembling instructions.

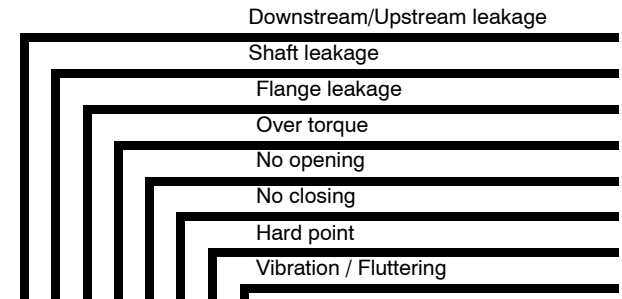
9 Trouble shooting

9.1 General

All repair and service work must be carried out by qualified personnel using suitable tools and genuine spare parts.

The previous safety instructions must be observed.

9.2 Faults & Remedies



Foreign particles in the valve	Actuator on safe position - Open the valve, line without fluid or flow, remove the particle - inspect liner/disc - replace liner/disc
Broken body	Defect due to water hammer Search for the reasons. Replace / Repair the valve
Broken or warped disc	Defect due to water hammer Search the reasons. Replace / Repair the valve
Damaged disc, corroded disc Adjusting bottom screws	Disc : check flanging dimensions and replace using the disc kit Adjust bottom screws
Broken shaft, twisted shaft	Analyse the defect / research of causes / replace shaft
Worn out liner	Replacement liner (liner kit)
Receding liner, damaged liner	If the liner is undamaged : separate the pipe flanges / remove valve / put it back between the pipe flanges / check operations.
Wrong flanging	Check type and flange bolting torque
Wrong flanging size	Follow instructions given in KSB technical leaflet
Wrong face to face, non parallel flanges	Flanging has to be modified in accordance with KSB technical leaflet requirements.
Flow conditions Wrong operating conditions	Check the technical offer versus service conditions
Damaged actuator	Check sizing versus operating conditions (see KSB)

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27.04.2023

8449.8/24-EN

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