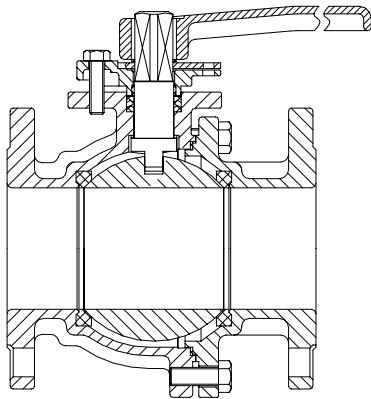
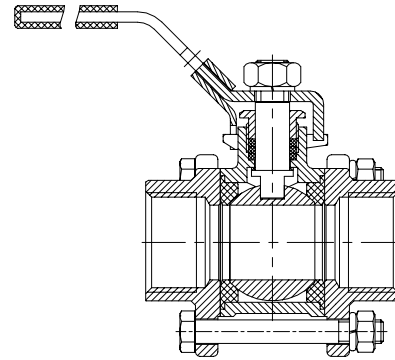


Two-Piece and Three-Piece Ball Valves
As per ASME B16.34



ECO-BLT 150 – 300



ECO-BLC 1000

1	Declaration of Conformity	2
2	General	3
3	Safety	3
	3.1 Safety symbols in these operating instructions	3
	3.2 Qualification and training of personnel	4
	3.3 Danger of nonobservance of the safety instructions	4
	3.4 Safety consciousness	4
	3.5 Safety instructions for the user / operator	4
	3.6 Safety instructions for maintenance, inspection, and installation work	4
	3.7 Unauthorized modification and manufacturing of spare parts	4
	3.8 Inadmissible modes of operation	4
4	Transport and Interim Storage	4
	4.1 Transport	4
	4.2 Interim storage	5
5	Description / Related Documents	5
	5.1 Marking	5
	5.2 Functioning principle: ECO-BLC 150 – 300	5
	5.3 Functioning principle: ECO-BLC 1000	6
	5.4 Related documents	7
6	Installation	7
	6.1 General	7
	6.2 Installation position	7
	6.3 Welding instructions / Installation of pipe	7
	6.4 Actuated valves	7
7	Commissioning / Decommissioning	8
	7.1 Commissioning	8
	7.2 Decommissioning	8
8	Maintenance / Repair	8
	8.1 Safety instructions	8
	8.2 Maintenance	9
9	Troubleshooting	9
	9.1 General	9
	9.2 Faults and remedies	10

1 Declaration of conformity

Herewith we, **KSB Aktiengesellschaft**
Bahnhof Platz 1
91257 Pegnitz
Registered Office: Frankenthal (Pfalz)
Germany

Declare that the valves listed below satisfy the requirements laid down in the Pressure Equipment Directive 97/23/EC (PED).

Description of the valve – Type **Two-Piece Ball Valves**
EcoLine Type ECO-BLT 150 -300
Class 150-300
2"-12" (DN 50 – DN 300)
ASTM A216 WCB, ASTM A351 CF8, ASTM A351 CF8M

Three-Piece Ball Valves
EcoLine Type ECO-BLC 1000
1000 WOG
1¼" – 4" (DN 32 – DN 100)
ASTM A216 WCB, ASTM A351 CF8M

Suitable for **Media Group 1**

Conformity Assessment Procedure **Module D1**

Name and address of the authorizing and monitoring notified body **TÜV Anlagentechnik GmbH**
Am Grauen Stein
51105 Köln
Germany

Notified body identification no. **0035**

Certificate no. **01 202 620/Q-02-0567/001**

Reference standards and codes **ASME B16.34**

Dr. Christopher Lange
Head – Product Management / Development Valves

(This document has been prepared electronically and is valid without signature.)

2 General

These operating instructions apply to KSB EcoLine BL ball valves: Eco-BLT 150 – 300 two-piece flanged and Eco-BLC 1000 three-piece socket weld or threaded (see Sections 5.2, 5.3).

Development and production of KSB valves are subject to QA system according to DIN/ISO 9001.

Correct installation, maintenance, and repair will ensure trouble free operation of the valves.

The manufacturer does not assume any liability for these valves in the operating instructions are not fully observed.

The valves are marked to ASME B16.34 as required.

Caution

The valves must not be operated beyond the limits defined in the operating instructions, contractual documentation, and type leaflets. Any use beyond the above conditions will lead to overload which the valves can not withstand.



Nonobservance of this warning may lead to personal injury or property damage, e.g.:

- Injury caused by escaping fluids (cold/hot, toxic 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 consider:

- incidents which may occur during installation, operation and maintenance.
- the local safety regulations. It is the user's responsibility to ensure that they are observed, also 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.

Caution

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, or 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 type series version and, when applicable, the serial number. (The serial number is stamped on the outside diameter of the right end flange.)

The specifications (operating data) of the valves are listed in the technical documentation & type leaflet of the related valve (see also section 5).

When returning valves to the manufacturer, please refer to section 4.

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 whose nonobservance would involve the risk of personal injury are specially marked with the general hazard symbol:



in accordance with DIN 4844 (safety sign W9), or with the electric voltage warning sign:



in accordance with DIN 4844 (safety sign W 8).

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

Caution

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

3.2 Qualification and Training of Personnel

The personnel for operation, maintenance, inspection and installation must be adequately qualified for the work involved. The personnel's responsibilities, competence and supervision must be clearly defined by the user. If the personnel in question is not already in possession of the requisite 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 in question.

3.3 Danger of Nonobservance of the Safety Instructions

Nonobservance of the safety instructions may lead to personal injury and also to danger for the environment and the valve itself. Nonobservance of these safety instructions will also forfeit the user's warranty. Such noncompliance could, for example, result in:

- failure of essential functions of the valve.
- 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 or moving parts of the valve (e.g. body, lever, gear operator, etc.) that could pose a hazard must be protected by the user against accidental contact.

Leakage (e.g. at the stem seal) of hazardous substance (e.g. explosive, 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 VDE standards and/or the local energy supply utility regulations).

3.6 Safety Instructions for Maintenance, Inspection and Installation Work

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.

All work on a valve may only be performed when the valve is un-pressurized and has cooled down. This means that the temperature of the medium in all the valve's chambers must be lower than the vaporization point of the medium.

All work on actuated valves may only be done after 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 re-installed and/or re-enabled.

Prior to re-commissioning, refer to the points listed under Section 7.1 "Commissioning."

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 or changes in these parts.

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 & Interim Storage

4.1 Transport

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

For transport and storage, the valves must always be maintained in the closed position and the connection ends must be plugged using suitable means (e.g. covers, plastic sheets, etc.) to prevent damage to the seats.

To prevent damage, do not suspend the valve by its lever, stem or the 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 valves in a dry and well-ventilated warehouse.
- Storing in the closed position (to protect the seats from damage).
- Covering ends with caps or flange protectors to keep the valve interior free of dust and foreign material.
- Taking suitable measures against contamination, moisture, frost and corrosion.

When stored for a long period of time, valves shall be have anti-corrosive coating on outside machined surfaces and shall be regularly inspected to ensure they remain in good condition.

5 Description / Related Documents

The sectional drawings shown on pages 5 and 6 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 97/23/EC and ASME B16.34.

In particular the marking contains at least following:

- Manufacturer
- Year of production
- Valve type model or order no.
- Size (NPS or DN)
- Pressure class
- Material

By attaching a CE-marking to the valve the conformity with the European Pressure Equipment Directive 97/23/EC is explained. CE marking does not apply to valve of size 1" (DN 25) and smaller.

5.2 Functioning Principle: ECO-BLT 150 – 300

This valve is used in industrial piping systems as an on-off valve or a regulating valve.

The valve has a floating ball design. Its obturator is a ball, which can be rotated through an angle of 90° to realize the opening and closing of the valve.

Two seat rings (4) are installed in the body (1) and the cap (2), between which the ball (3) is secured. The stem (5) connects the ball to the lever (12). Applying force to the lever, the ball can be freely rotated between the seat rings.

When the valve is open, the ball hole and the valve ports are in the same line, so the medium can pass through with low flow resistance. When the stem rotates at an angle of 90°, the ball hole is

perpendicular to the valve ports. The ball is tightly pressed to the downstream seat ring by the preloading force of the seat ring and the pressure of the medium to ensure the full closure of the valve.

The seat ring material is PTFE, which has the advantages of low friction coefficient and excellent corrosion resistance.

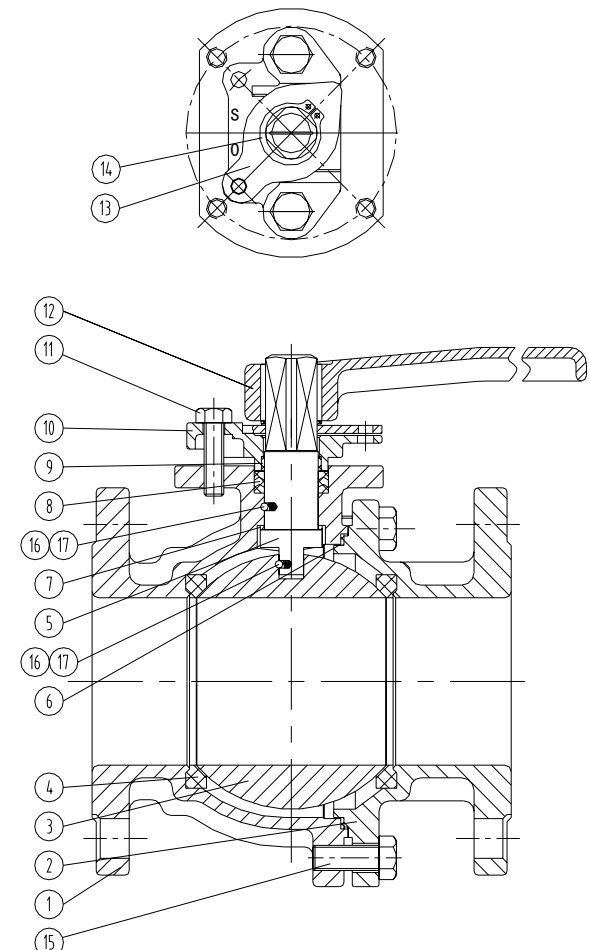
Anti-static design: Springs (16) and ball bearings (17) at the body/stem interface and the stem/ball interface keeps the stem and the ball in contact with the body, which prevents the buildup of electrical charge.

Blow-out proof stem: The stem is assembled from inside of the body, so the stem can't blow out even when the gland and packing both are completely loosened.

Locking-device: As the requirement of the customer, there can be designed a locking aperture on the stopper to control the position of opened and closed.

Position indicator: A groove on the stem indicates the position of the valve. When the groove is parallel to the pipe, the valve is in the complete open position. When the groove is perpendicular to the pipe, the valve is in the complete closed position.

5.2.1 Sectional Drawing: ECO-BLT 150 – 300



5.2.2 List of Components: ECO-BLT 150 – 300

Part No.	Part Name
1	Body
2	Cap
3	Ball
4	Seat
5	Stem
6	Gasket
7	Thrust Washer
8	Packing
9	Stem Packing
10	Gland
11	Gland Bolt
12	Handle
13	Stopper
14	Snap Ring
15	Body Bolt
16	Antistatic Spring
17	Antistatic Ball

5.3 Functioning Principle: ECO-BLC 1000

This valve is used in industrial piping systems as an on-off valve or a regulating valve.

The valve has a floating ball design. Its obturator is a ball, which can be rotated through an angle of 90° to realize the opening and closing of the valve.

Two seat rings (4) are installed in the body (1) and the caps (2), between which the ball (3) is secured. The stem (5) connects the ball to the lever (12). Applying force to the lever, the ball can be freely rotated between the seat rings.

When the valve is open, the ball hole and the valve ports are in the same line, so the medium can pass through with low flow resistance. When the stem rotates at an angle of 90°, the ball hole is perpendicular to the valve ports. The ball is tightly pressed to the downstream seat ring by the preloading force of the seat ring and the pressure of the medium to ensure the full closure of the valve.

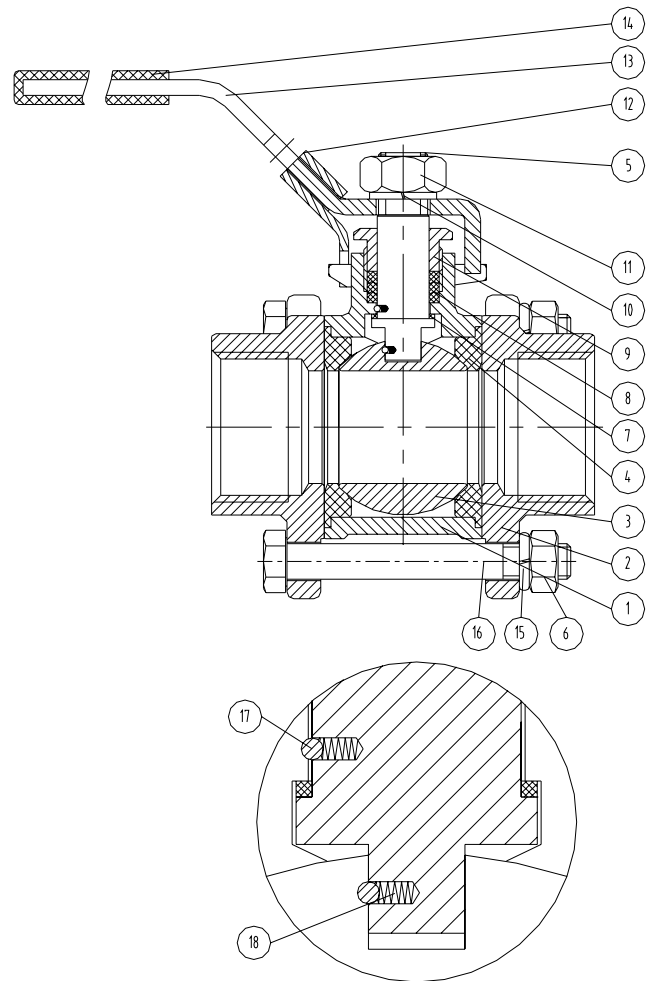
The seat ring material is PTFE, which has the advantages of low friction coefficient and excellent corrosion resistance.

Anti-static design: Springs (16) and ball bearings (17) at the body/stem interface and the stem/ball interface keeps the stem and the ball in contact with the body, which prevents the buildup of electrical charge.

Blow-out proof stem: The stem is assembled from inside of the body, so the stem can't blow out even when the gland and packing both are completely loosened.

Locking-device: As the requirement of the customer, there can be designed a locking aperture on the stopper to control the position of opened and closed.

Position indicator: A groove on the stem indicates the position of the valve. When the groove is parallel to the pipe, the valve is in the complete open position. When the groove is perpendicular to the pipe, the valve is in the complete closed position.

5.3.1 Sectional Drawing: ECO-BLC 1000


5.3.2 List of Components: ECO-BLC 1000

Part No.	Part Name
1	Body
2	Cap
3	Ball
4	Seat
5	Stem
6	Hex Nut
7	Thrust Washer
8	Packing
9	Gland
10	Spring Washer
11	Stem Nut
12	Locking Device
13	Handle
14	Plastic Cover
15	Bolt Washer
16	Bolt
17	Antistatic Ball
18	Antistatic Spring

5.4 Related Documents

Type	Type Series Leaflet No.
ECO-BLT 150 – 300	8222.51
ECO-BLC 1000	8222.53

6 Installation
6.1 General
Caution

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 when they are installed and operational.

Caution

Only remove the covers from the connection ends just before installation. The sealing faces of the flanges, the pipe threads, or the socket weld counterbore surfaces must be clean and undamaged.



For flanged valves: the gaskets at the connecting flanges must be precisely entered. Use only joints and gaskets of approved materials. All holes provided in the flanges must be used for the flange connection.



When painting the pipes, do not apply paint to bolts and stem. If construction work is still in progress, the valves must be protected against dust, sand and building material, etc. (cover by suitable means).



Do not use valves, levers, or gear operators as footholds!



Valves and pipes used for high (> 50 deg. C) or low (< 0 deg. C) temperatures must either be fitted with a protective insulation, or there must be warning signs installed showing that it is dangerous to touch these valves.



Valves with external moving elements must be fitted with protective covers, or other suitable measures must be taken to prevent accidents.



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

The valve's identification and nameplate shall be checked before installation to ensure the valve is suitable for the application.

6.2 Installation position

Flow may pass through a ball valve in either direction. Ball valves may be installed in horizontal, inclined, or vertical pipe. When actuated valves are installed in horizontal or inclined pipe, the actuator must be supported by some suitable means.

6.3 Welding Instructions (Type ECO-BLC 1000 socket weld)

Responsibility for welding the connecting pipes lies with the piping installation contractor.

When welding valves into the piping or when welding pipes after the valves have been installed, the welder

must make sure that no foreign particles, e.g. weld beads, enter the valve body and remain there, because these will cause damage to the valve seats or the stem.

The insertion depth as per Technical Rules must be complied with. A gap between the pipe end and the base of the socket will prevent inadmissible tensions in the weld.

Do not attach the welding cable (opposite pole) to movable parts of the valve, otherwise these parts may be scorched.

6.4 Actuated valves
Caution

Read the instruction manual of the actuator before installation.



Electrical cables may only be connected by qualified personnel.



The applicable electrical regulations (e.g. VDE), 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 flood-proof dry locations.

Voltage and frequency must match the values stated on the name 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 exceed the highest admissible pressure of the valve. Adequate precautions should be taken.

In new pipe systems and especially after repair work, the system should be flushed with the valves fully open to remove solids, e.g. weld beads, which may damage the seats.



Venting the valve by loosening connecting bolting or the gland packing is dangerous and therefore not permitted.

7.1.2 Operation

The valves are closed by turning the lever perpendicular to the flow and opened by turning the lever ¼ rotation so the lever is parallel to the flow.

Operating torques are published in the Type Series booklets.

Caution

As the valve can be damaged by applying excessive forces, it is not allowed to use additional levers to operate the valve.

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.

The gland packing should be checked when it is subjected to the full operating pressure and temperature for the first time. If necessary, retighten the packing evenly and carefully.

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 all maintenance and repair work, the safety instructions listed below and also the general notes in section 3 must be observed.

Always use suitable spare parts and tools, even in emergencies, otherwise correct operation of the valves can not be assured.

8.1.1 Dismantling of valves

Before removing the complete valve from the pipe, or before repair or maintenance work on the valve itself, the entire valve must be un-pressurized and must have cooled down sufficiently so that the temperature of the medium in all the valve chambers is lower than the vaporization point of the medium, to prevent scalding.

Caution

Dismantling a pressurized valve will cause danger to life and limb!

If toxic or highly inflammable 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.



Wear appropriate safety clothing and eye protection or 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.

8.1.2 Removing Actuators

If actuators powered by an external source of energy (electric, pneumatic, hydraulic) need to be removed from the valve or dismantled, the energy supply must be shut down prior to starting any repair work and the instructions in Sections 3 and 8.1 and the operating instructions of the actuator must be observed.

Actuators with integrated spring mechanism contain pre-loaded springs and shall only be dismantled with extreme care, using the requisite locking devices.



Springs under tension!

If you have any questions please contact your KSB Sales Office.

8.2 Maintenance

Our valves are largely maintenance free. To ensure reliable operation and to reduce repair costs, all valves, especially those which are seldom operated or where access is difficult, should be checked periodically.

The user is responsible for defining appropriate intervals for checks and maintenance, depending on the application of the valve.

The service life of valves can be extended by:

- lubricating movable parts (not for oxygen valves) using suitable lubricants (to DIN 51825 / equivalent).
- timely changing of the packing rings.
- timely replacing of the seat rings.

The safety instructions in Sections 3, 8.1 and the notes in Section 9 must be observed.

8.3 Valve Reassembly

Valve reassembly shall be effected in reverse order to dismantling.

To maintain functional reliability, new packing shall be used whenever the valve is reassembled.

After reassembly and prior to commissioning / start-up, the valve shall be subjected to a leak test in accordance with API 598 and ASME B16.34.

9 Troubleshooting

9.1 General

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

Caution

We recommend having this work performed by our service personnel.



The safety instructions in Sections 3 and 8 must be observed.

9.2 Faults & Remedies

Problem	Possible Cause	Solution
Leakage from the flange between the body and cap(s)	The bolts are not tightened evenly or sufficiently.	Re-tighten bolts evenly using a cross-over pattern.
	Gasket failure.	Replace the gasket.
	Gasket pocket surfaces are damaged.	Repair
Packing Leakage	The packing is too loose or unevenly compressed.	Evenly tighten each packing ring one by one.
	Worn or damaged packing.	Replace the packing.
Seat Leakage	The seating surface is worn out.	Replace the seat ring and/or re-grind the ball.
	There is dirt or foreign material between the seating surfaces.	Clean the seating surfaces.
	The ball is clamped too loosely.	Re-tighten bolts evenly using a cross-over pattern.
The stem does not operate smoothly	The gland is pressed unevenly or too tightly.	Evenly tighten each packing ring one by one.
	There is dirt or foreign material between the seating surfaces.	Clean the seating surfaces.

If you have any questions please contact your KSB Sales Office.



Do not replace packing while the valve is pressurized. The back seat bushing is not intended to maintain a seal during packing replacement.

