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## EC Declaration of Conformity

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Herewith we,

**KSB Italia S.p.A.**  
**Via M. D'Azeglio, 32**  
**20863 Concorezzo MB**  
**Italy**

Declare that the valves listed below satisfy the safety requirements laid down in the Pressure Equipment Directive 2014/34/EU (PED).

Description of valve types

**Globe, Non-return Valve and Strainer**

ECOLINE VA                      PN 40, DN 15-300

ECOLINE RA                      PN 40, DN 15-300

ECOLINE FY                      PN 40, DN 15-300

Suitable for

**Fluids in Groups 1 and 2**

Conformity assessment procedure

**Module H**

Name and address of the notified body

**TÜV Industrie Service GmbH**  
**Westenstrasse. 199**  
**80686 Munchen**

Identification number of the notified body

**No. 0036**

Certificate No.

**DGR-0036-QS-1066-14**

Reference standards and codes

**EN 10213-2:1999 EN 1661:2000, EN 1663-2000,**  
**EN 24017:1998, EN-ISO 898-1:2001, EN-ISO 3506-1:2001,**  
**EN 24032:1999, EN 20898-2:1998, DIN EN 1092-1:2002,**  
**EN 1092-2, , EN 1092-1, EN 13709, EN 12516, EN 12266-1**

Valves with a nominal pipe size below and including DN 25 fall under Article 4, section 3, of the Pressure Equipment Directive 2014/34/EU. They must bear neither the CE-label nor the number of the notified body.

**Oscar Bellotto**

Operations Manager

(this was prepared electrically and is valid without signature)



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Declaration for the purpose of EC Directive 2014/68/EU (ATEX)

Herewith, we declare that valves of the series:

ECOLINE VA 40  
ECOLINE RA 40  
ECOLINE FY 40

Without electric or pneumatic actuators, as described in the relevant type series booklets, do not have their own potential source of ignition and are thus not covered by article 1 of the EC Directive 2014/68/EU.

Components such as electric or pneumatic actuators as well as limit switches are, as a rule, covered by scope of the Directive described in Article 1, 2014/68/EU, and shall be subjected to a conformity assessment procedure. Evidence of conformity must be furnished (for ex. EC declaration of conformity).

Applied harmonized standards and EC Directives

EN 13463-1, EN 13463-5, EN 1127-1

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EC Directive 2016/68/EU

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Oscar Bellotto

Operations Manager

(this documents have been prepared electrically and is valid without signature)

## 2 General information

This operating manual applies to all KSB globe valves, non-return valve and strainers as described in section 5, unless reference is made to other operating manuals in individual cases.

Only correct installation, maintenance or repair will ensure smooth operation of the valves

The manufacturer shall not accept any liability if the instruction set forth in this manual is not complied with

The design, manufacturer and testing of KSB valves are subject to a QM system to DIN EN ISO 9001 as well as the European Pressure Equipment Directive 97/23/EC.

Compliance with these requirements, however, is based on normal, static loading, e.g.

- Flow velocities typical of the fluid handled
- Typical temperature gradients


Such measures may, for example, influence

- Material selection
- Wall thickness
- Seal selection
- Protection of valve areas prone to wear
- Prevention of excessive pressures and temperatures
- Special designs for control operation, etc.

Valves exposed to creep-rupture conditions have a limited service life and have to meet the applicable regulations stipulated in the technical codes. In case of corrosion or erosion or other circumstances that could result in a reduction of the valves' wall thickness, they must be substituted as to avoid the risk of leakage or structural failure

**Caution** The valves must not be operated outside the permissible operating range. The limits are indicated on the name plate or currently applicable type series booklet, the pressure-temperature ratings, in particular, must not be exceeded. Operation of valves outside the above-mentioned conditions may result in overloads which may damage the valves

The type series booklet can be found at [www.ksb.com](http://www.ksb.com) -- Product catalogue

 Non-observance of this warning may cause personal injury and damage to property, for example:

- Injuries resulting from fluid leakage (cold/hot, toxic Under pressure, etc.)

- Impairment of the valves' function or its destruction  
The descriptions and instructions set forth in this manual refer to the standard models but are also applicable to variants.

For actuated valves, the operating manual of the actuator must be adhered to without fail.

These operating instructions do not take into account:

- Any eventualities and events which might occur during installation, operation and maintenance.
- Local regulations; the operator must ensure that such regulations are strictly observed by persons dealing with the valve, including the personnel called in for installation.

**Caution** The valve must only be operator by qualified personnel.

Incorrect operation of the valve may have a substantial impact on the entire system, for example:

- Leakage of the fluid handled,
- System / machine brought to a standstill
- Impairment / reduction / increase of the system's/ machine's function / effect.

For any queries you may have or in the case of damage, please contact your nearest KSB sales office.

For any queries and repeat orders, in particular for purchasing spare parts, please specify the type series / variant details, the order number, as well as the year of construction, if possible.

The technical data (operating data) of the valves are specified in the product literature (type series booklet, valve characteristic, chemical resistance chart) of the respective valve (cf. section 5).

## 3 Safety

This operating manual contains fundamental information which must be complied with during installation, operation, service and maintenance.

Not only must the general safety information laid down in this chapter on "Safety" be complied with, but also the safety information outlined under specific headings.

### 3.1 Marking of instructions in the manual

The safety information contained in this manual whose non-observance might cause hazards to persons are specially marked with the general hazard sign, namely



Safety sign in accordance with DIN 4844--- W9), The electrical danger warning sign in is



Safety sign in accordance with DIN 4844--- W8)

The word

**Caution**

Is used to introduce safety information whose non-observance may lead to damage to the valve and its functions,

Instructions attached directly to the valve (e.g. nominal pressure) must always be complied with and be kept in a perfectly legible condition at all times

### 3.2 Non-compliance with safety information

Non-compliance with safety information can jeopardise the safety of personnel, the environment and the valve itself. Non-compliance with these safety instructions will also lead to forfeiture of any and all rights to claims for damages.

In particular, non-compliance can, for example, result in:

- Failure of important valve / system functions
- Failure of prescribed maintenance and servicing practices
- Hazard to persons by electrical, mechanical and chemical effects.
- Hazard to the environment due to leakage of hazardous substances.

### 3.3 safety awareness

It is imperative to comply with the safety information contained in this manual, the relevant national health and safety regulations and the operator's own internal work, operation and safety regulations.

### 3.4 safety information for the operator / user

Any hot or cold parts of the valve (e.g. body components or hand wheel) that could pose a hazard must be equipped with a guard by the operator

Guard which are fitted to prevent accidental contact with moving parts (e.g. coupling) must not be removed whilst the unit is operating.

KSB recommends that leakages (e.g. at the stem seal) of hazardous fluids (e.g. explosive, toxic, hot) be contained so as to avoid any danger to persons and the environment. All relevant laws must be heeded.

Electrical hazards must be eliminated. For details please refer to VDE regulations and the safety regulations laid down by the local energy supply companies, for instance.

### 3.5 safety information for maintenance, inspection And installation work

The operator is responsible for ensuring that all maintenance, inspection and installation work be performed by qualified personnel.

As a rule, work on the valve must only be carried out after the valve has temperature must be below the vaporisation temperature limit in all areas in contact with the fluid.

Work on (actuated) valve must be carried out only during standstill. The shutdown procedure described in the manual for taking the valve out of service must be adhered to without fail.

Immediately following completion of the work, all safety relevant and protective devices must be reinstalled and/or re-activated

Please observe all instructions set out in section 7, Commissioning / start-up, before returning the valve to service.

### 3.6 Unauthorized modification and manufacture of spare parts

Modifications or alterations of the valve supplied are only permitted after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts can invalidate any liability of the manufacturer for consequential damage.

### 3.7 Unauthorized modes of operation

The warranty relating to the operating reliability and safety of the valve supplied is only valid if the equipment is used in

accordance with its designated use as described in section 2 “General” of this manual. The limits stated in the technical literature must not be exceeded under any circumstances.

## 4 Transport and storage

The valves are delivered ready for operation, the obturator is in “closed” position and the line connection ports are closed with suitable material (caps, plugs, covers).

### 4.1 Transport

Suitable precautions shall be taken to prevent damage during transport

#### Caution

The valves must never be suspended by the hand wheel or by the actuator, if any

For transporting large valves, ropes shall be attached to the yoke arms or to the covers flange.

Valves with actuators shall be transported by means of ropes attached to the connection ports and yoke arms, taking into account the centre of gravity.

Use the lifting lugs provided

For the valve weights refer to the relevant manufacturer product literature (type series booklet-->section 5.2, order confirmation).

After delivery and prior to installation, check the valve for potential damage acquired in transit.

### 4.2 Storage

Storage / interim storage of the valves must ensure that even after a prolonged period of storage the valves function is not impaired. The following requirements must be met:

- Storage is performed with valve in the closed position (to protect the seat / disc contact faces against damage)
- Measure are taken to protect the valves against dirt, humidity, frost and corrosion (e.g.by using foils or caps, indoor storage)

## 5 Description / Related documents

### 5.1 Marking

The valves are marked in accordance with the Pressure Equipment Directive 97/23/EC and the pertinent standards on valve types/design, as well as TRD 110 (German Steam

Boiler Regulations) and TRB 801 No.45 (German Pressure Vessel Regulations)

Marking includes as a minimum:

- Manufacturer
- Year of construction
- Type or order No.
- DN
- PN or max. permissible pressure / temperature
- Material

The CE marking on the valve means it is in conformity with the European Pressure Equipment Directive 2014/34/EU

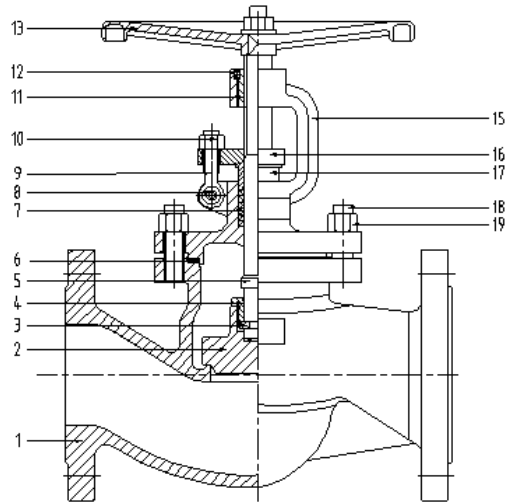
PN	DN									
	≤25	32	40	50	65	80	100	125	>150	
10	<b>N.A.</b>	<b>CE</b>								
16										
25										
40										

### 5.2 Drawing / product literature

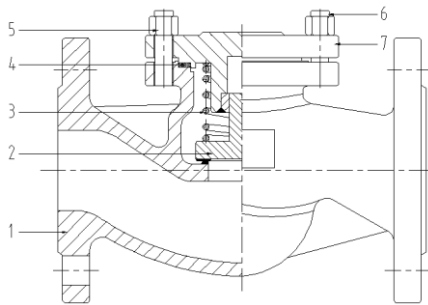
The sectional drawings below provide examples of the general design / configuration of the valves. For illustrations relating to specific valve series and further information please refer to the respective type series booklets.

Type	DN	PN	Material	Type series booklet No.	Description
ECOLINE VA	15-300	10-40	1.0619	V-707090	Globe valve with packing seal
ECOLINE RA	15-300	10-40	1.0619	V-807090	Non-return valve
ECOLINE FY	15-300	10-40	1.0619	V-317090	Strainer

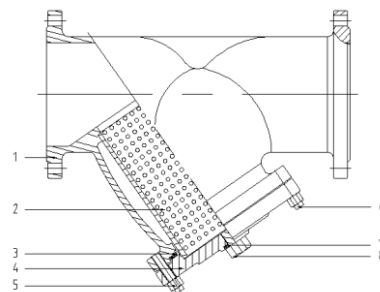
### Sectional drawings



**ECOLINE VA**



**ECOLINE RA**



**ECOLINE FY**

### 5.3 List of components

Part no.	Part Name		
	ECOLIEN VA	ECOLINE RA	ECOLINE FY
1	Body	Body	Body
2	Disc	Disc	Screen
3	Retaining ring	Spring	Gasket
4	Disc nut	Gasket	Cover
5	Stem	Nut	Nut
6	Gasket	Stud	Stud
7	Packing	Cover	Washer
8	Pin		Plug
9	Eyebolt		
10	Nut		
11	Stem nut		



12	Screw		
13	Hand wheel		
15	Bonnet		
16	Gland follower		
17	Gland		
18	Stud		
19	Nut		

## 5.4 Function

### 5.4.1 ECOLINE VA

The valves consist of the pressure-retaining parts, i.e. body (1) and bonnet (15), and the functional unit.

The body (1) and bonnet (15) are connected by stud (18) and nut (19), and joint is sealed off by the gasket (6). The trim mainly consists of the valves disc (2), stem (5) and disc nut (4), the actuating element is a hand wheel (13) or actuator.

The stem (5) passage in the bonnet (15) is sealed by the packing (7) which is tightened by means of two nuts (10) on the top of gland follower (16).

The contact faces of body (1) and / or valve disc (2) are made of rust-proof materials.

### 5.4.2 ECOLINE RA

Non-return valves are check valves which close automatically if fluid flow is reversed. Non-return valves with separate cover consist of the pressure-retaining components of body (1) and cover (7), as well as the functional unit.

The body (1) and cover (7) are connected by studs (6) and nuts (5), and the joint is sealed off by the gasket (4).

The check valves disc (2) is guided in the cover (7). The position of the check valve disc (2) is determined both by the flow conditions and by the spring (3) if any.

### 5.4.3 ECOLINE FY

Strainers feature the same pressure-retaining components and sealing design as non-return valves with separate cover (4). The strainer insert (2) is clamped between the body seat and the cover, where it removes particles from the flow, depending on the mesh size selected.

## 6 Installation

### 6.1 General

As a rule, the engineering contractor, construction company or operator/user are responsible for the positioning and installation of the valves.

Planning and installation errors may impair the reliable function of the valves and pose a substantial safety hazard. Compliance with the following requirements is of particular importance.

#### Caution

The piping must be laid such that detrimental thrust and torsional forces are kept away from the valve body during installation and operation to avoid both leakage and damage to the body

#### Caution

The caps on the connection ports shall be removed immediately prior to installation.



When painting the pipes and valves, do not apply paint to bolts, stem and plastic components (valve function will impair), if construction work is still in progress, the valves must be protected against dust, sand and building material etc. (cover with suitable means).

Do not use valve hand-wheels as footholds!



For safety reasons, Valves and pipes system operated at high (>50°C) or low (<0°C) temperatures must be insulated, or a warning sign must point out the risk of personal injury involved when touching the hot or cold components

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



Valves used as end-valve in a pipeline should be protected against unauthorized or unintentional opening to prevent damage to property and/or personal injury.

### 6.2 Installation position

The valve bodies are marked with an arrow indicating the flow direction. if necessary. The valves must be installed in

such that the flow direction of the fluid corresponds to the direction shown by the arrow cast on the valve body. If no directional arrow is cast on the valve body, the valve can be installed in any position.

### 6.2.1 Shut-off valves

Shut-off valves can be installed in any position; however, the best installation position is with the stem pointing vertically upwards. Valves with bellows should not be installed with the stem pointing downwards, if possible, to prevent dirt deposits between the folds of the bellows.

Shut-off valves must be installed in the line so as to ensure that the fluid enter the valve beneath the disc and flows out above the disc. However, they can also be installed in lines with alternating flow. If the valves are to be used for throttling applications, a throttling plug must be used. For flow incidence on throttling plugs please refer to the respective type series booklets. If in doubt, please contact the KSB factory.

### 6.2.2 Non-return valves

To ensure proper operation, non-return valves must always be installed in such a way that the fluid enters the valve beneath the check valves disc. When equipped with a spring, they can be used in both pipe with upward flow and pipes with downward flow.

Non-return valves without closing spring shall only be installed in horizontal position with the cover pointing upwards in horizontal pipes.

### 6.2.3 Strainers

Strainers shall always be installed in such a way that the fluid flow through the strainer insert from the inside towards the outside (cage effect of the strainer insert)

We recommend fitting shut-off valves in the pipeline on both side of the strainer, so that the strainer can be replaced or cleaned without having to drain the entire system. Strainers shall be installed with sufficient clearance for removing the strainer insert, In both horizontal and vertical pipes, we recommend to install the strainer with the strainer insert hanging downwards to facilitate cleaning. compliance with the directional arrow is essential. On strainers with magnetic

insert we recommend to remove the entire cover to clean the magnet.

Please note: When replacing the strainer insert make sure that the weld of the insert is not located in the strainer outlet port, so as to attain an optimum (high) Kv valve.

### 6.2.4 Special designs

Valves with separate throttling plug shall always be installed in such a way that the pressure to be sealed off lies beneath the disc, to ensure a reliable throttling effect.

For higher differential pressures integral throttling plug/stem connections are required. In such cases we recommend to install the valves so that the pressure lies above the disc.

If you have questions concerning optimum valve selection or permissible differential pressures for valves with throttling plugs, please contact the valve manufacturer.

Drainage, vent or manual start-up pipes are normally fitted with valve combinations consisting of a shut-off valve (pressure beneath the disc) and a throttling valve (integral throttling plug /stem connection, pressure above the disc)



Valves with pilot plug are always installed so that the pressure to sealed off lies above the plug

If the valves are to be used as dead-end valves, double shut-off should be ensured for safety reasons.

## 6.3 Installation instructions

### 6.3.1 Flanged valves

The mating flange faces must be clean and undamaged.



The gaskets on the mating flanges must be properly centred. Only fasteners and sealing elements made of approved.

Materials shall be used. For the flange connection between valve and pipe use all flange bolt holes provided.

Use suitable tools to tighten the bolts evenly and crosswise at the permissible torques.

### 6.4 Valves with actuator

Valves with transmission gear and /or actuators must be installed with the stem in vertical position, if possible, if this

requirement cannot be met, adequately support the actuator on site or consult the manufacturer.



Electrical connection shall be effected by suitably trained personnel only

## 6.5 Insulation

If the valve is to be insulated, make sure that the insulation does not impair the function of the valve. KSB recommends to make sure that the sealing areas at the cover/bonnet joints and at the stem passage (gland packing) are easily accessible and visible.

## 7 Commissioning / start-up / shut down

(Please also refer to section 6 installation)

### 7.1 Commissioning / start-up

#### 7.1.1 General

Prior to commissioning /start-up compare the material, pressure and temperature data on the valves with the operating conditions of the piping to check the material's chemical resistance and stability under load.

Surge pressure (water hammer), which might occur, must not exceed the max. permissible pressure. Safety measures are requirement to be taken.

In new systems and particularly after repair, the complete piping system must be thoroughly flushed with the valve fully opened so that particles and /or welding beads that might damage the seat/disc interface are removed.

If the piping system is cleaned by means of a pickling procedure, responsibility for the compatibility of the pickling media used and the pickling procedure itself lies with the pickling company.

Venting the valve by undoing the bonnet/cover bolting or removing gland packing is dangerous and therefore not permitted.

To prevent damage to the valve material or joint seals, the usual start-up and shutdown velocities must be adhered to.

#### 7.1.2 Valve actuation

The valves are closed by turning the hand wheel in clockwise direction and opened by turning it in counter-clockwise direction (top view); Direction symbols are found on the top of the hand wheel.

#### Caution

Valves with hand wheels may only be actuated by hand, As the valve can be damaged by applying excessive forces, it is not allowed to use additional levers to move the hand wheel.

Shut-off valves are normally used in such a way that they are either fully open or fully closed.

For control functions in continuous operation, throttling plugs should be fitted.

#### Caution

Performing throttling operations without a throttling plug may result in an excessive noise level, excessive wear or even destruction of the valve by cavitation.

### 7.1.3 Functional test

KSB recommends checking the following functions:

Check the shut-off function of the installed valves prior to commissioning /start up by opening and closing them several times.

Check the gland packing for leakage when it is subjected to full operating pressure and temperature for the first time.

Re-tighten the nuts at the gland follower evenly, if necessary. The bonnet/cover bolting with the joint ring shall be gradually tightened crosswise, evenly and in clockwise direction after the first loading or heating up of the valves and in the event of leakage at the joint ring. For tightening torques please contact the manufacturer, if necessary.

#### Caution

Open the valve by two full hand wheel turns before re-tightening nuts, to prevent jamming of the seat.

Re-tightening the nuts of the bonnet/cover bolting is particularly important for valves installed in heat transfer systems to DIN 4754

### 7.1.4 Valves with actuator

On valves with electric, pneumatic or hydraulic actuators, the strokes and actuating forces must be limited

Electrical actuators are factory-set ready for operation. They shall be wired as follows:

Globe valve "CLOSE" torque-dependent

Globe valve "OPEN" travel-dependent

The wiring diagrams are given in the terminal boxes.

For pneumatic and hydraulic actuators, the control pressures specified in the order shall be complied with.

Non-observance may damage the actuator.

Closing and opening torques or actuating forces shall be enquired from the manufacturer, if necessary.

## 7.2 Shutdown



In the event of prolonged shutdowns, KSB recommends to drain fluids which change their physical condition due to changes in concentration, polymerisation, crystallisation, solidification, etc., from the piping. If required, flush the piping with the valves fully opened.

## 8 Servicing / maintenance

### 8.1 Safety instructions

Repair and maintenance work must only be performed by qualified personnel taking into account the relevant health and safety regulations.

It is imperative that the before safety information and the general information on safety as per section 2, Safety be observed whenever servicing and maintenance work is performed.



Always use suitable spare parts and tools, even in emergencies, to ensure proper functioning of the valves.

#### 8.1.1 Removing valves

Before removing the complete valve from the pipeline or before repair or maintenance work to the valve itself. i.e.

- prior to undoing the flange bolting between valve and pipe
- prior to undoing the cover/yoke or pressure seal bonnet/cover from the body
- prior to removing any drain or vent plugs
- prior to undoing the gland follower to replace packing rings.
- prior to removing and an actuator bolted directly to the yoke head.
- prior to opening to yoke head for maintenance work to the bearing and threaded bush.



valve pressure must be released and the valve must be allowed to cool down such that the temperature is below the fluid's vaporisation temperature in all areas in contact with the fluid in order to effectively prevent any risk of scalding.

Danger of death when opening a valve under pressure, if the valve has been used for handling toxic or easily inflammable fluids or fluids whose residues could cause corrosion in conjunction with humidity, drain the valve and flush or vent it. If required, wear safety clothing and a protective mask.

Depending on the installation position, fluid residues may be left in the valve; these must be collected and properly disposed of.

Prior to any transport, flush and drain the valve thoroughly. If you have any questions, please contact the manufacturer.

#### 8.1.2 Removing actuators



If actuators powered by an external source of energy (electric, pneumatic, hydraulic) need to be remove from the valves or dismantled, the energy supply must be shut down prior to starting any work and the instruction in sections 3,8.1.1 and operating manual of the actuator must be observed.



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

If you have any questions, please contact the manufacturer.

### 8.2 Maintenance

All valve components have been designed to be largely maintenance –free. The materials of the moving parts have been selected for minimum wear.

The operator / user is responsible for fixing appropriate inspection and servicing life of valves can be prolonged by:

- Actuating the valve (open-close) at least once or twice a year.
- Lubricating the movable parts such as stem (3) and gland bolt (not for oxygen valves) with standardized lubricants to DIN 51825,
- Adding or replacing packing rings in the packing (7) in time.
- Re-tightening or replacing the cover gasket (21) in time

The safety instructions are sections 3,8 and the instructions in sections 9 must be complied with.

### 8.3 Valve reassembly

Valve reassembly shall be effected in reverse order to dismantling. To maintain functional reliability, new gaskets

and gland packing shall be used whenever the valve is reassembled.

After reassembly and prior to commissioning / start-up, the valves shall be subjected to a leak test in accordance with DIN 3230, Part 3.

## 9 Trouble – shooting

### 9.1 General

KSB valves are robust in design, Nevertheless, malfunctions, e.g. caused by disoperation, lack of maintenance or improper use cannot be ruled out completely.

All repair and maintenance work shall be performed by qualified personnel using suitable tools and original spare parts.

We recommend having this work performed by our service personnel. The safety information in section 3 and 8 must be complied with.

### 9.2 – Faults > Remedy

#### - Leakage at the seat

Possible causes:

- Contamination / solids in the fluid
- Erosion, corrosion. Abrasion
- Excessive loads from pipeline forces or thermal stresses.

>Rework the seat /disc contact faces at the valve disc and body using a suitable reseating tool after the valve has been dismantled. The re-seating process of the seat/disc contact face shall be continuing until the contact faces exhibit a uniform bright surface.

#### - Leakage at the cover gasket

Possible causes:

- Gasket has settled as a result of high temperature fluctuations
- Impermissible pressure loads
- Poor maintenance
- Poor gasket resistance to temperature and fluid handled

#### - Bolted bonnet / cover

>Re-tighten the bonnet / cover bolting

>Replace the gasket

After have removed the bonnet / cover bolting (4-5). Clean the sealing surfaces carefully before inserting a new gasket

#### - Leakage at the gland packing

Possible causes:

- |                |   |                       |
|----------------|---|-----------------------|
| <b>Caution</b> | - | Worn packing material |
|                | - | Poor maintenance      |
- Poor packing resistance to temperature and fluid handled

>Re-tighten the gland packing at the nuts of the gland follower. Make sure that the friction forces at the stem do not increase too much.

>Replace the packing rings of the packing: undo the nuts and lift off the gland follower.

Clean the gland packing chamber carefully before inserting new packing rings. Split packing rings shall be inserted in such a way that the cut edges are offset by 120°-180°

Do not use additional sealing agent for non-asbestos gaskets and packing rings. With anti-adhesive coatings, only use agents explicitly recommended by the sealing element manufacturer.

If you have any questions, please contact the manufacturer

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