SICCA

SICCA 900-3600
types GTC, GLC, SCC

SICCA 150-4500
types GTF, GLF, PCF

SICCA 150-600
types GTC, GLC, SCC

Point no.	Description	Page no.
1	**Declaration of conformity**	1
2	**General**	2
3	**Safety**	2
3.1	Safety symbols in this operating instructions	2
3.2	Qualification of personnel & training	2
3.3	Danger or nonobservance of the safety instructions	2
3.4	Safety consciousness	3
3.5	Safety instructions for the user/operator	3
3.6	Safety instructions for maintenance, inspection & installation work	3
3.7	Unauthorised modification and manufacturing of spare parts	3
3.8	Inadmissible modes of operation	3
4	**Transport & interim storage**	3
4.1	Visual Check / Inspection	3
4.2	Transport	3
4.3	Interim Storage	3
5	**Description / related documents**	4
5.1	Marking - for CE requirements	4
5.2	Design standards / related documents	4
5.2.1	Cast Gate, Globe and Check Valves - Design	4
5.3	Sectional drawing & functioning principle	4
5.3.1	Gate valves (Class 900, 1500, 2500)	4
5.3.2	Sectional drawing - Gate Valve	4
5.3.3	Gate valves (class 3100, 3600)	5
5.3.4	Sectional Drawing - Gate valve	5
5.3.5	Gate valves (Class 150, 300, 600)	6
5.3.6	Sectional Drawing - Gate valve	6
5.3.7	Globe valves (class 900, 1500, 2500)	7
5.3.8	Sectional Drawing - Globe valve	7
5.3.9	Globe valves (class 150, 300, 600)	8
5.3.10	Sectional Drawing - Check valve	8
5.3.11	Check Valves (class 900, 1500, 2500, 3100, 3600)	9
5.3.12	Check valves (Class 150, 300, 600)	9
5.3.13	Typical Sectional Drawing - Forged Gate, Globe & Check valves	9
5.3.14	Forged Gate, Globe and Check valves	11
5.3.15	Sectional Drawing - Forged, Globe & Check valves	12
5.3.16	Forged, Globe and Check valves (class 4500)	12
6	**Installation**	12
6.1	General	12
6.2	Installation position	12
6.2.1	Gate valves	13
6.2.2	Globe valves	13
6.2.3	Check valves	13
6.3	Pressure seal design	13
6.4	Welding instructions / installation of pipe	13
6.5	Actuated valves	13
6.6	Body safety arrangement	13
7	**Commissioning / Decommissioning**	16
7.1	Commissioning	16
7.1.1	General	16
7.1.2	Operation	16
7.1.3	Functional Check	16
7.1.4	Actuated valves	16
7.2	Decommissioning	16
8	**Maintenance / Repair**	16
8.1	Safety Instructions	16
8.1.1	Dismantling of valves	16
8.1.2	Removing Actuators	17
8.2	Maintenance	17
9	**Troubleshooting**	17
9.1	General	17
9.2	Faults & Remedies	17
10	**Valve weights**	18-21
Annexure I - Do's & Don'ts		22 - 23
Annexure II - Environment Protection - Product Disposal after useful life.		24

CE

KSB

1

EU Declaration of conformity

We,

KSB Limited, (Valves Division)

151, Mettupalayam Road, NSN Palayam (P.O), Coimbatore - 641031, Tamil Nadu, India.
Registered office: Office No. 601, Runwal R-Square, L.B.S. Marg, Mulund (West), Mumbai- 400 080,

declare that the valves listed below comply with the requirements of the Pressure Equipment Directive 2014/68/EU.

Customer P.O. No & Date	:	As applicable
Customer	:	As applicable
KSB Sales Order No	:	As applicable
Description of the Valve / Type / Quantity	:	GTF, GLF, PCF: Class 800 up to 4500 – ½" – 2 ½" GTC, SCC : Class 150 up to 3600 – 2" – 28" GLC : Class 150 up to 2500 – 2" – 10"
Material / Valve Serial Numbers	:	As applicable
Valves Inspection Certificate No.	:	As applicable
Suitable for	:	Fluid group 1 and 2
Conformity Assessment procedure	:	Module H
Name and address of the authorizing and Monitoring notified body	:	TUV NORD Systems & Co.KG D-22525 Hamburg, Germany
Notified body identification no.	:	CE 0045
Certificate No.	:	0045/202/9070/Z/10102/18/D/001(00)
Reference standards and codes	:	ASME B16.34, API 598, ASTM/ASME, API600, API 602, API 594, API 623, BS 1873, BS 1868

Valves with a nominal pipe size below and including ½" to 1" comply with Pressure Equipment Directive 2014/68/EU Article 4.3 (SOUND ENGINEERING PRACTICE). They need not bear either the CE Name plate or the identification number of the notified body.

SP. SANKARAN
Head - Quality Assurance

P. NIRMALRAJ
Head - Product Management

Dated: 24-Aug-2020

Place: Coimbatore

2 General

These operating instructions apply to KSB – Gate, Globe and Check valves (see section 4.1, 4.2).

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

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

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

ATTENTION The valves are marked to ASME B16.34 if required with an arrow indicating the flow direction, Nominal size, Class, material of body, manufacturer.

The valves must not be operated beyond the limits defined in the operating instructions/contractual documentation/type series booklet. Any use beyond the above conditions will lead to overload which the valves cannot 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.

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 type series, version and serial no. (Serial No. is punched at top flange of the valve on KSB letter side).

The specifications (operating data) of the valves are listed in the technical documentation & type series booklet 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 this 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

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'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 or 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/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 handwheel) that could pose a hazard must be protected by the user against accidental contact.

Leakage (e.g. at the stem seal) of hazardous substances (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 reinstalled and/or re-enabled.

Prior to recommissioning, refer to the points listed under section 6, Commissioning.

3.7 Unauthorised 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 1 "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 Visual Check / Inspection

Check - Upon delivery, the valves (and spares, if applicable), for damage during transit. Also prior to installation of valves (and spares, if applicable), check damage due to handling.

4.2 Transport

The valves in the as-supplied condition are ready for installation and operation, and if applicable, original spares are ready for assembly as per instructions. 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. end covers, plastic sheets, etc.) to prevent damage to the seats.

Only transport the valve in the specified position. Never suspend the valve from its handwheel or the actuator / gear operators, in case of actuator operated valves. Pay attention to the weight data, please refer to Section 10.

ATTENTION Observe the applicable local accident prevention regulations.

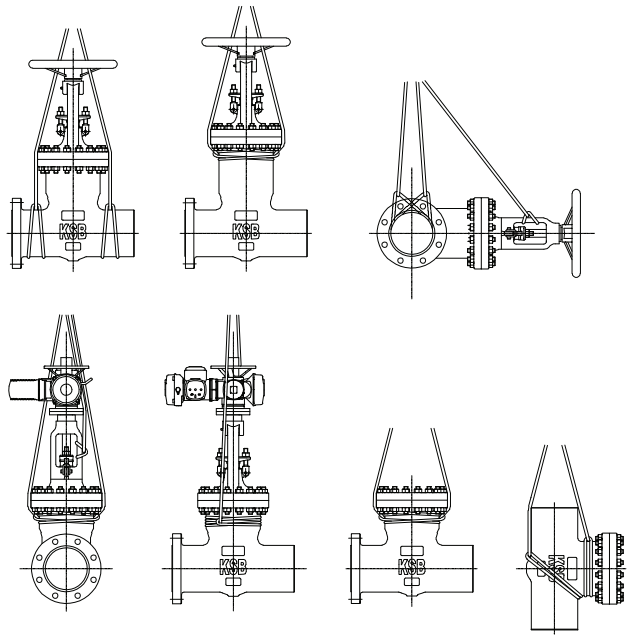


Fig: Transportation of valve

4.3 Interim storage

The valves must be stored in such a way that correct operation is assured even after prolonged storage. This comprises:

Storing in the closed position (to protect the seats from damage).

Suitable measures against contamination, frost and corrosion (e.g. by using plastic sheets or end covers).

If applicable, Spares, i.e., soft parts shall be stored separately in original packing.

5 Description / related documents

The sectional drawings shown on page no. 3 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 series booklet.

5.1 Marking - for CE requirements

The valves are marked to PED 2014/68/EU
In particular the marking contains at least following
- Manufacturer
- Year of production
- Valves type model or order no.
- NPS (DN) / (Inch)
- Pressure class

Class	PN	≤1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"
		≤ 25	32	40	50	65	80	100	125	150	≥ 200
150	10										
	16										
≥300	25										
	≥ 40										

5.2 Design standards / related documents

5.2.1 Cast Gate, Globe and Check Valves - Design

All cast valves have been designed according to the following standards and specifications :

ASME B16.34, API600, BS 1873, BS 1868, API623, API594

Gate GTC 150-600 : API 600
Gate GTC 900-3600 : ASME B 16.34
Gate GTF 800-1500 : API 602
Gate GTF 2500 : ASME B 16.34
Globe GLC 150-600 : BS 1873, API 623
Globe GLC 900-2500 : ASME B 16.34
Globe GLF 800-1500 : API 602
Globe GLF 2500-4500 : ASME B 16.34
Check SCC 150-600 : BS 1868, API 594
Check SCC 900-3600 : ASME B 16.34
Check PCF 800-1500 : API 602
Check PCF 2500-4500 : ASME B 16.34
Pr. Temperature rating : ASME B 16.34 / API 602

5.3 Sectional drawing & functioning principle

5.3.1 Gate valves (Class 900, 1500, 2500)

The valve consists mainly of body (100), bonnet (162), yoke (139) as well as wedge and stem (200) and the actuating unit.

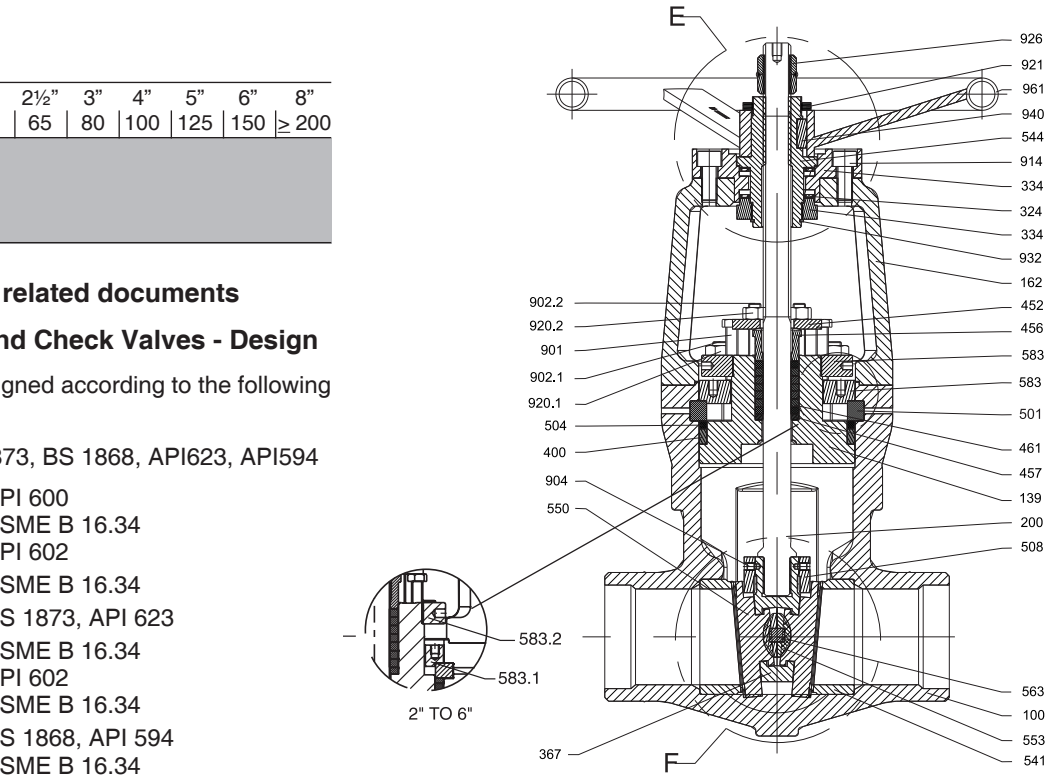
Stem seal area : The gland packing (461) which seals the stem (200) is tightened by the studs (902.2) and nuts (920.2) on the gland flange (452). The bonnet (166) is equipped with an integral, hard faced back seat, which seals the valve while stem is in upmost position.

Flow seal area : The seat rings (515) are seal welded into the body (100). The wedge unit consists of two hard faced discs (350) which can pivot on the disc holder (367). The discs are supported by replaceable thrust inserts held by a pin. The discs are secured from turning by a retaining element at the bottom of the stem (200). The double disc wedge unit is screwed on the stem (200) and guided by lateral rails in the body (100).

Bonnet seal area : The valve is equipped with a pressure seal bonnet. The bonnet (166) is pressed against the gasket (411) by the pressure in the valve body (100). The gasket is supported by the spacer ring (504) and the segmental thrust ring (501) which is seated in a groove of the body (100). The gasket is precompressed between disc thrust plate and bonnet (166) by means of the studs (902.1) and nuts (920.1).

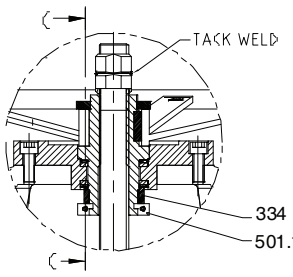
5.3.2 Sectional drawing - Gate Valve

GTC 900 - 2500

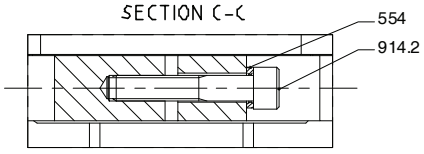


Bearing Holder - Split Ring Type

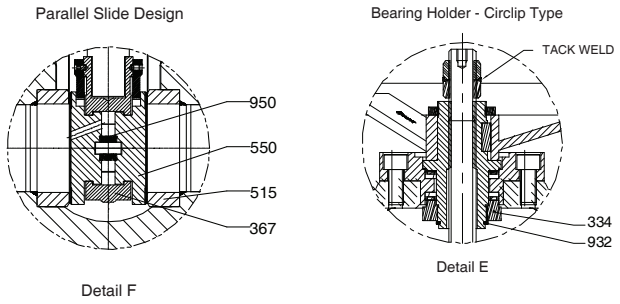
Detail E

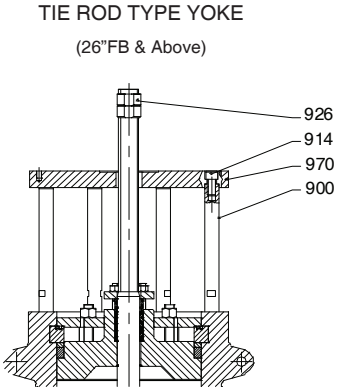


SECTION C-C



CLASS	FB	RB
#900	8" & ABOVE	10" & ABOVE
#1500/ #2500	6" & ABOVE	8" & ABOVE





5.3.3 Gate valves (class 3100, 3600)

The valve consists mainly of body (100), bonnet (139), tie rods (900), as well as wedge and stem (200) and the actuating unit for Gate valves, Gear box operation is a standard execution

Steam seal area : The gland packing (461) which seal the stem (200) is tightened by the studs (902) and nuts (920) on the gland flange (452). The bonnet (139) is equipped with an integral, hard faced back seat, which seals the valve while stem is in upmost position.

Flow seal area : The seat rings (515) are seal welded into the body (100). The wedge unit consists of two hard faced discs (550) which can pivot on the disc holder (367). The discs are supported by replaceable thrust inserts held by a pin. The discs are secured from turning by a retaining element at the bottom on the stem (200). The double disc wedge unit is screwed on the stem (200) and guided by lateral rails in the body (100).

Bonnet seal area : The valve is equipped with a pressure seal bonnet. The bonnet (139) is pressed against the gasket (411) by the pressure in the valve body (100). The gasket is supported by the spacer ring (504) and the segmental thrust ring (501) which is seated in a groove of the body (100). The gasket is precompressed between disc thrust plate and bonnet (139) by means of the studs (902) and nuts (920).

Related documents

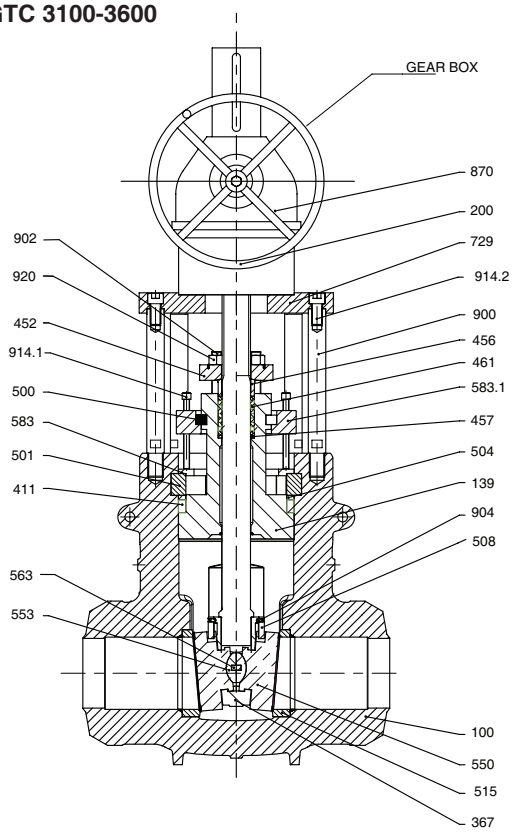
Type	Size	Class	Type leaflet no.
GTC 900-3600	2"- 28"	900-3600	7241.1/03-EN

Parallel Slide Gate valves

Note: The stacking sequence of Spring washers (950) and the number of such Spring washers varies from size to size, in case of overhauling maintenance of Parallel Slide Gate valves during assembly use of specified number of spring washer and in correct stacking sequence is essential for effective sealing performance, contact KSB Coimbatore for details.

5.3.4 Sectional Drawing - Gate valve

GTC 3100-3600



Part no.	Name	Part no.	Name
100	Body	563	Pin (Thrust insert)
139	Bonnet	583	Supporting plate / Bonnet retainer
162	Yoke		
162	Bonnet (L.P.)	583.1	Retaining ring
200	Spindle / Stem	636	Grease nipple
324	Thrust Bearing	729	Top plate
334	Bearing cover / Adapter plate	870	Gear Box
		900	Tie Rod
361	Wedge	901	Hex. screw
367	Disc holder	902.1	Stud-1
411	Gasket	902.2	Stud-2
450	Back Seat Bush		
452	Gland flange	904	Grub screw
456	Gland bush	914	Socket head cap screw
457	Packing Ring (Neck ring)	920.1	Nut-1 (Gland flange)
461	Moulded gland packing	920.2	Nut-2 (Retaining plate)
461	Braided gland packing	921	Shaft nut / Handwheel nut
501	Thrust ring		
501-1	Split Ring	926	Spindle head nut (Stem stop nut)
504	Spacer ring		
508	Wedge retaining ring	932	Circlip
514	Bonnet bush	940	Key
515	Seat ring	950	Spring Washer
544	Stem nut / Threaded bush	961	Handwheel
550	Disc	970	TOP Plate
553	Thrust plug / Thrust insert		
554	Spring Washer		
560	Pin (Disc holder)		

5.3.5 Gate valves (Class 150, 300, 600)

The valve consists mainly of body (100), bonnet (166) as well as wedge (361) and stem (200) and the actuating unit.

Stem seal area : The gland packing (461) which seals the stem (200) is tightened by gland bolts (900) and nuts (920.2) on the gland flange (452). The bonnet (166) is equipped with a back seat bushing (450) which seals the valve while stem is in upmost position.

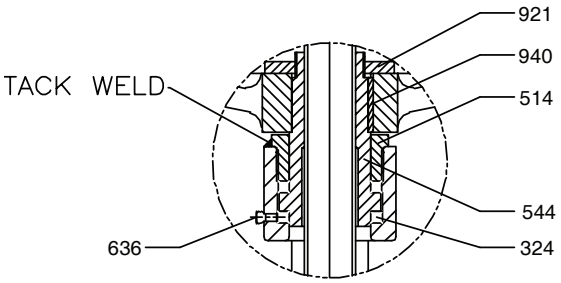
Flow seal area : The hard faced seat rings (515) are welded into the body (100). The seal faces of the flexible wedge (361) are hard faced. The wedge (361) is connected to the stem (200) by a “T” joint. The wedge is guided by lateral rails in the body (100).

Bonnet seal area : Body (100) and bonnet (166) are connected to each other by studs (902) and nuts (920.1). Tightness is assured by means of the gasket (411).

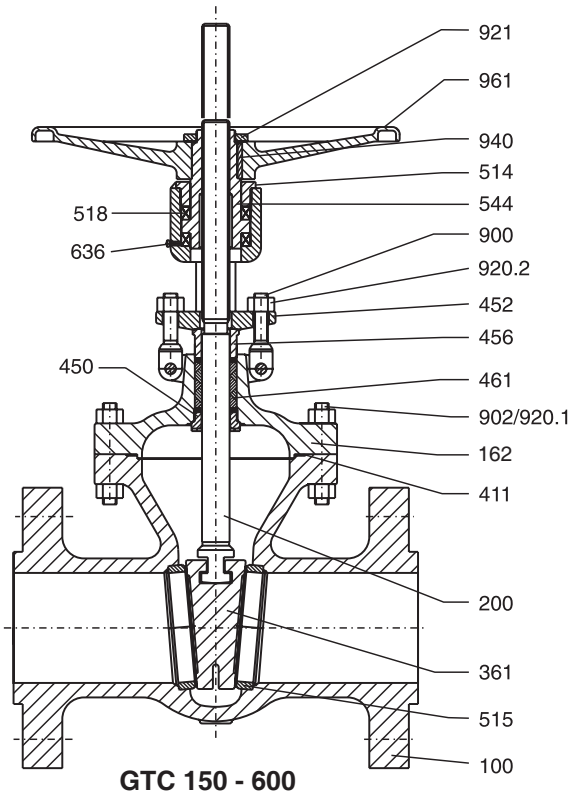
Related documents

Type	Size	Class	Type leaflet no.
GTC 150-600	2”-24”	150-600	7244.1/03-EN
GTC 900-3600	2”-28”	900-3600	7241.1/03-EN

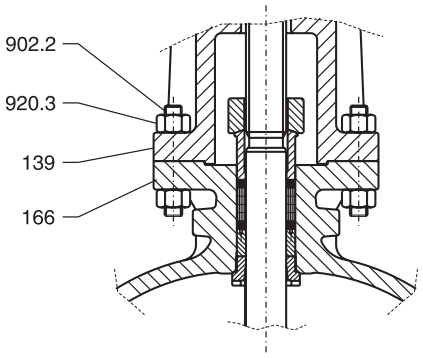
Thrust Bearing Arrangement for Sizes # 6” & above



5.3.6 Sectional Drawing - Gate valve



GTC 150 - 600



For Sizes 14" & Above

5.3.7 Globe valves (class 900, 1500, 2500)

The valve consists mainly of body (100) bonnet (166), yoke (139) as well as disc (350) and stem (200) and the actuating unit.

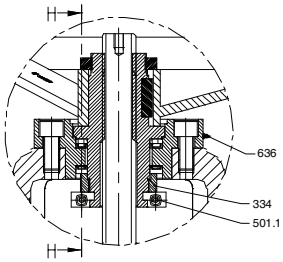
Stem seal area : The gland packing (461) which seals the stem (200) is tightened by the studs (902) and nuts (920.2) on the gland flange (452). The bonnet (166) is equipped with an integral, hard faced back seat, which seals the valve while stem is in upmost position.

Flow seal area : The seat rings (515) are seal welded into the body (100). The seal face of the tapered disc (350) and the seat ring are hard faced.

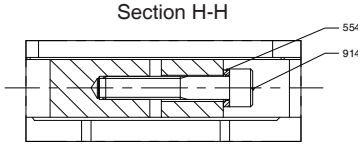
Bonnet seal area : The valve is equipped with a pressure seal bonnet. The bonnet (166) is pressed against the gasket (411) by the pressure in the valve body (100). The gasket is supported by the spacer ring (500) and the segmental thrust ring (501) which is seated in a groove of the body (100). The gasket is precompressed between disc thrust plate and bonnet (166) by means of the studs (902.1) and nuts (920.1)

Bearing Holder - Split Ring Type

Detail G



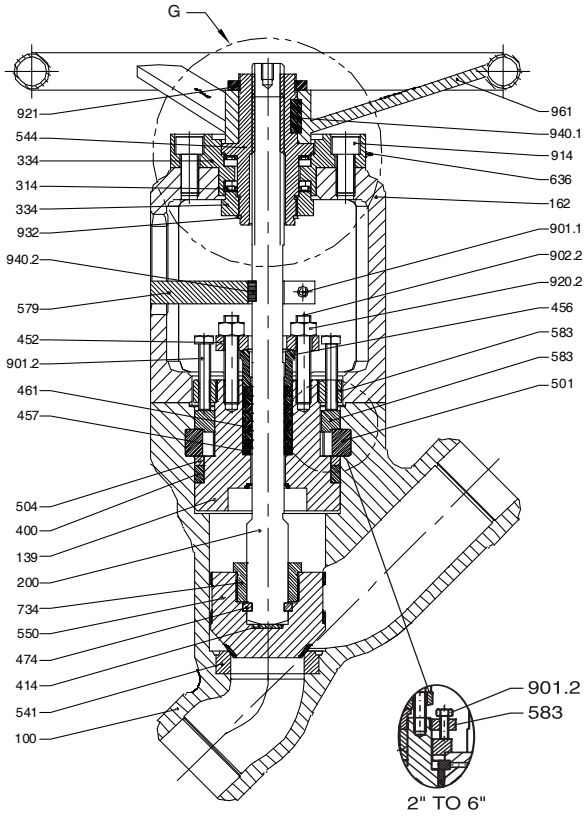
Section H-H



CLASS	SIZE
#900	4" & ABOVE
#1500 / #2500	3" & ABOVE

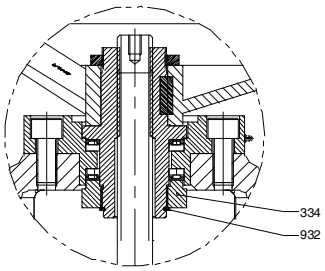
5.3.8 Sectional Drawing - Globe valve

GLC 900-2500



Bearing Holder - Circlip Type

Detail G



Part no.	Name	Part no.	Name	Part no.	Name	Part no.	Name
100	Body	456	Gland bush	554	Spring Washer	921	Shaft nut / Handwheel nut
139	Bonnet	457	Neck ring	561	Pin	932	Circlip
162	Yoke	461	Braided / Moulded gland packing	579	Stem lock	940.1	Key-1
162	Bonnet (L.P.)	501	Thrust ring	583	Retaining plate / Bonnet retainer	940.2	Key-2
200	Stem	501-1	Split ring	636	Grease nipple	961	Handwheel
324	Thrust Bearing	504	Spacer ring	734	Disc retainer		
334	Bearing retainer / Retainer plate	505	Stem coller	900	Gland bilt		
350	Disc	514	Bonnet bush	901	Hex. screw-1		
411	Gasket	515	Seat ring	902.0	Stud-1		
411	SW Gasket	544	Stem nut / Threaded bush	904	Grub screw		
414	Disc thrust plate	550	Disc	914	Socket head cap screw		
450	Back seat Bush	553	Disc thrust pad	920.1	Nut-1		
452	Gland flange			920.2	Nut-2		

5.3.9 Globe valves (class 150, 300, 600)

The valve consists mainly of body (100), bonnet (166) as well as disc (350) and stem (200) and the actuating unit.

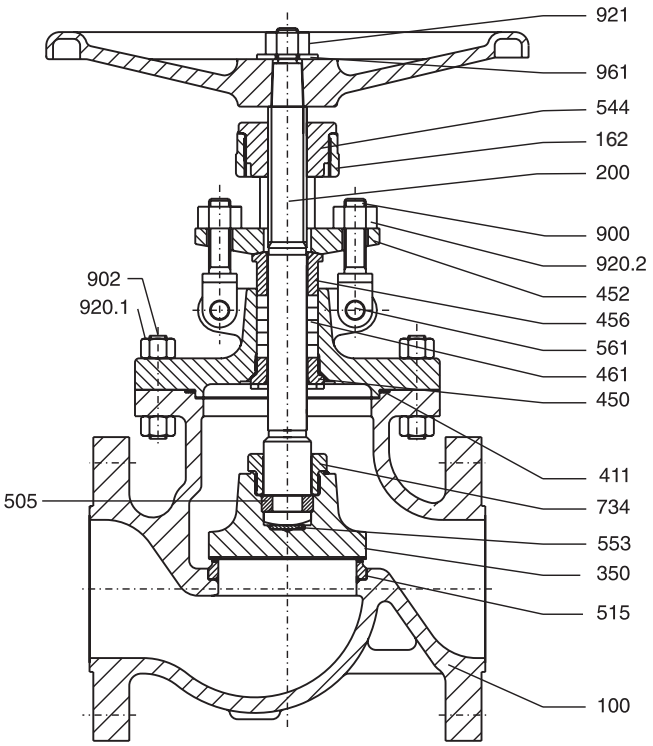
Stem seal area : The gland packing (461) which seals the stem (200) is tightened by gland bolts (900) and nuts (920.2) on the gland flange (452). The bonnet (166) is equipped with a back seat bushing (450), which seals the valve while stem is in upmost position.

Flow seal area : The hard faced seat ring (515) is welded into the body (100). The seat face of the flat disc is hard faced.

Bonnet seal area : Body (100) and bonnet (166) are connected to each other by studs (902) and nuts (920.1). Tightness is assured by means of the gasket (411).

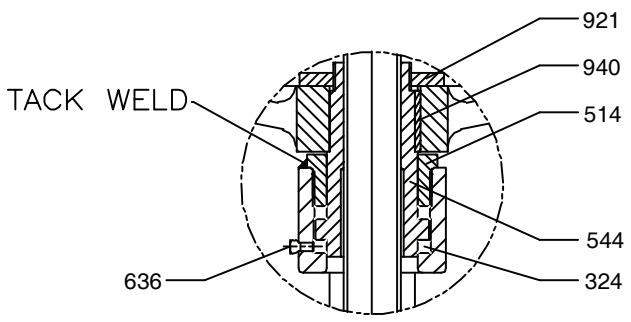
Related documents

Type	Size	Class	Type leaflet no.
GLC 150-600	2”-10”	150-600	7245.1/03-EN
GLC 900-2500	2”-8”	900-2500	7242.1/03-EN

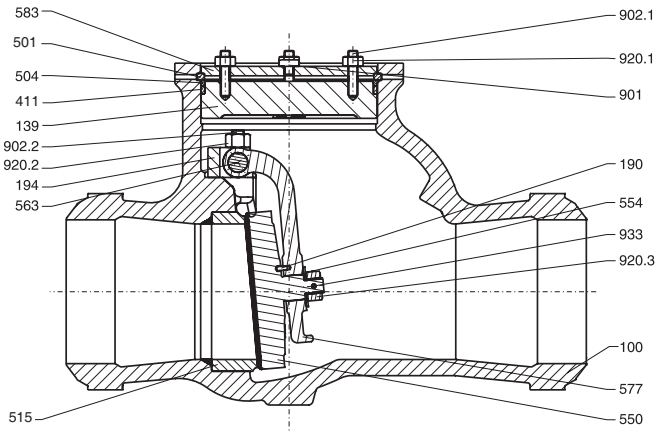


GLC 150-600

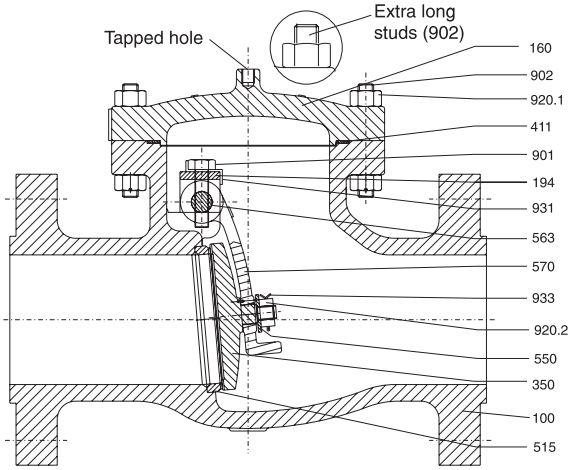
Thrust Bearing Arrangement for Sizes # 6” & above



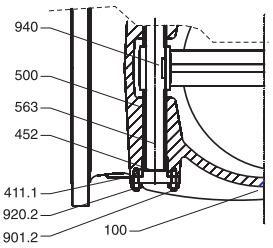
5.3.10 Sectional Drawing - Check valve



SCC 900-3600



SCC 150 - 600



For Sizes 14" & above

Part no.	Name	Part no.	Name
100	Body	563	Hinge pin
139	Bonnet	577	Disc carrier
160	Cover	583	Bonnet retainer
190	Parallel pin	901	Hex. screw
194	Hinge bracket	902.1	Stud-1
350	Disc	902.2	Stud-2
411.1	Gasket	920.1	Hex. nut-1
411	SW gasket	920.2	Hex. nut-2
501	Thrust ring	920.3	Hex. nut-3
504	Spacer ring	933	Split pin
515	Seat ring		
550	Disc		
554	Washer		
570	Disc carrier		

5.3.11 Check Valves (class 900, 1500, 2500, 3100, 3600)

The valve consists mainly of body (100), bonnet (139) as well as the disc (350).

Flow seal area : The seat ring (515) is seal welded into the body (100). The sealing faces of the disc (350) and the seat ring (515) are hard faced. The disc is connected with a disc carrier by means of a nut (920.2) and a cotter pin (933). The disc carrier is mounted to the body by means of a hinge pin (563).

Bonnet seal area : The valve is equipped with a pressure seal bonnet. The bonnet (139) is pressed against the gasket (411) by the pressure in the valve body (100). The gasket is supported by the spacer ring (500) and the segment thrust ring (501) which is seated in a groove on the body (100). The studs (902.1) and the hex. nut (920.1) which are supported by the retainer (734) hold the bonnet (139) against the gasket (411) even when there is no pressure in the body (100).

5.3.12 Check valves (Class 150, 300, 600)

The valve consists mainly of body (100), cover (160) as well as the disc (350).

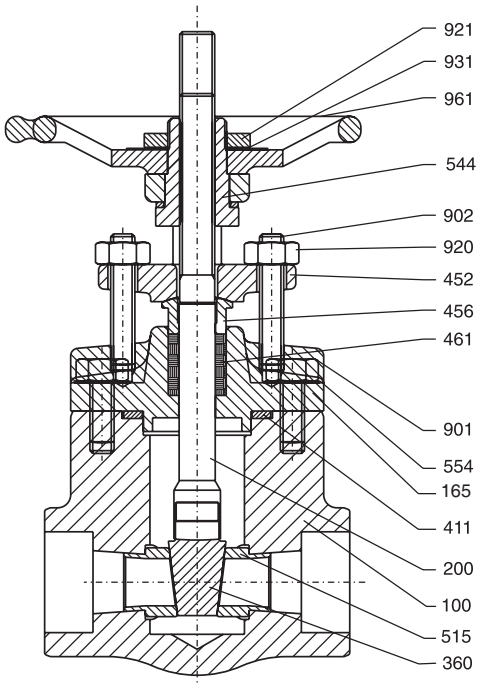
Flow seal area : The hard faced seat ring (515) is welded into the body (100). The disc (350) is hard faced. It is connected to a Disc Carrier (570) by means of a nut (920.2) and pin. The swinging lever is mounted to the body by means of an inside hinge pin (563).

Bonnet seat area : Body (100) and cover (160) are connected to each other by studs (902) and nuts (920.1). Tightness is assured by means of a gasket (411).

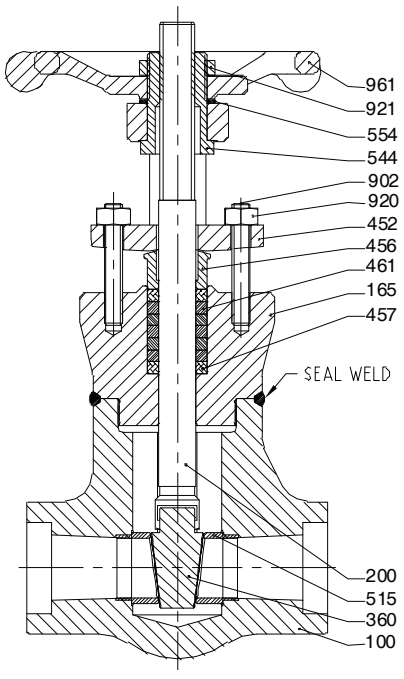
Related documents

Type	Size	Class	Type leaflet no.
SCC 150-600	2”-24”	150-600	7246.1/03-EN
SCC 900-3600	2”-28”	900-3600	7243.1/03-EN

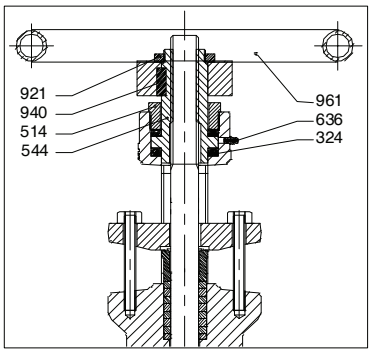
5.3.13 Typical Sectional Drawing - Forged Gate, Globe & Check valves



GTF 150-800

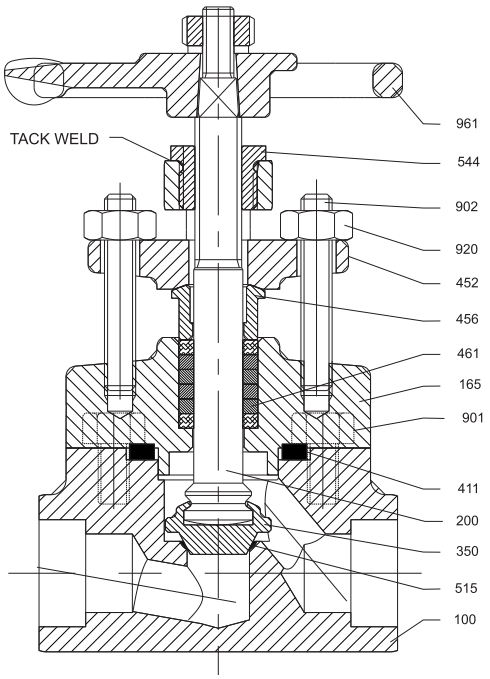


GTF 1500-2500

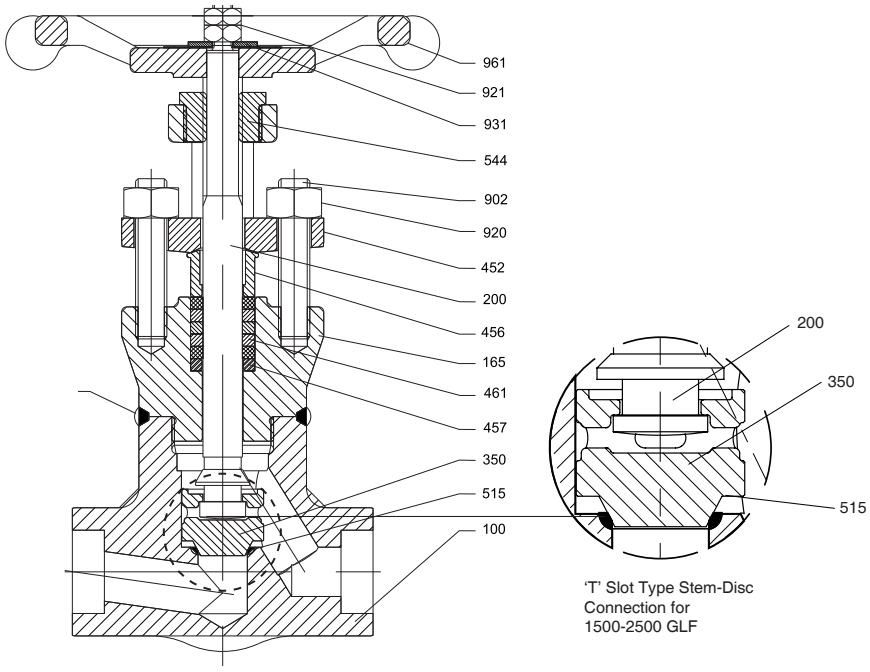


GTF 900/1500/2500

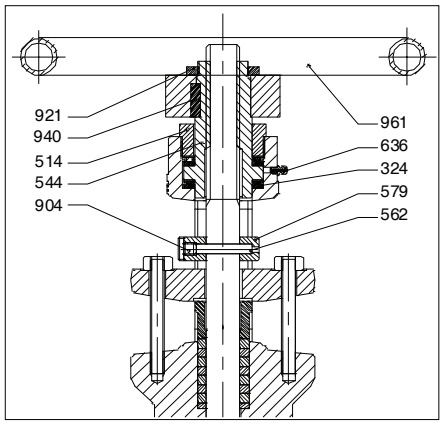
Only for Size 2 1/2”



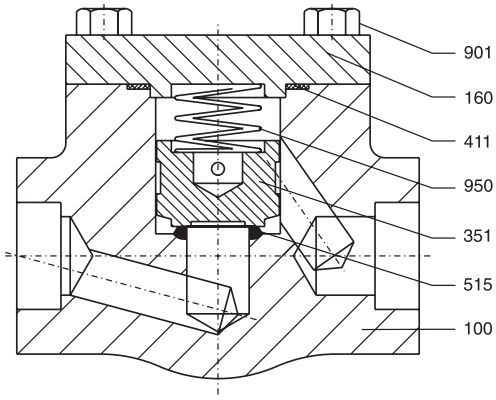
GLF 150-800



GLF 1500-2500

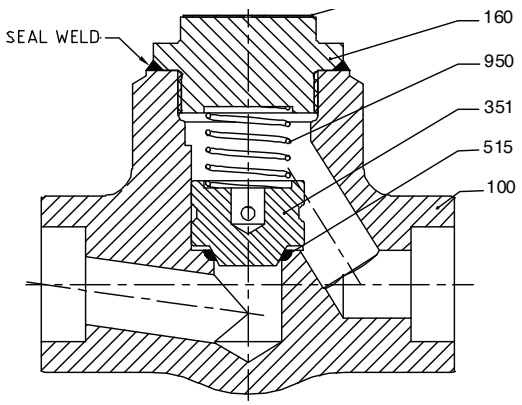


GLF 900/1500/2500 (only for size 2 1/2")



PCF 150-800

Part no.	Name	Part no.	Name
100	Body	544	Stem Nut
160	Cover	554	Washer
165	Bonnet	562	Parallel pin
200	Stem	579	Stem stop
324	Thrust Bearing	636	Grease nipple
350	Disc (GLF)	901	Hex Bolt
351	Disc (PCF)	902	Stud
360	Wedge	904	Grub Screw
411	SW Gasket	920	Hex. Nut
452	Gland Flange	921	Hand Wheel Nut
456	Gland Bush	931	Washer
457	Packing ring	940	Key
461	Gland Packing	950	Spring
514	Threaded Bush	961	Hand wheel
515	Seat Ring		



PCF 1500-2500

5.3.14 Forged Gate, Globe and Check valves

All forged valves have been designed according to the following standards and specifications : ASME B16.34. API 602.

Forged valves mainly consist of body, bonnet and the closing as well as the actuating unit (only gate and globe valves).

Stem seal area : The gland packing of gate and globe valves which seals the stem is tightened by the studs and nuts on the gland flange. The bonnet is equipped with an integral back seat, which seats the valve when stem is in upmost position.

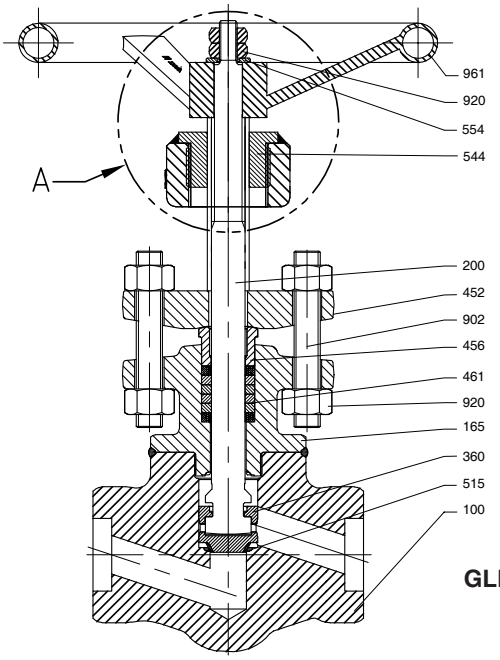
Related documents

Type	Size	Class	Type leaflet no.
GTF	1/4”-2”	800-2500	7235.1/04-EN
GLF	1/4”-2”	800-4500	7236.1/03-EN
PCF	1/4”-2”	800-4500	7237.1/03-EN

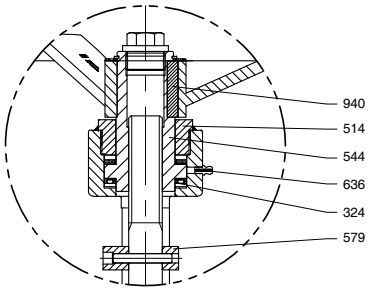
Flow seal area : The hard faced seat rings of gate valves are swagged into the body. The solid wedge is connected to the stem by a “T” joint. The integral seal faces of the body of globe and check valves are hard faced. The turning disc of globe valves is connected to the stem by caulking or T-slot disc according to respective pressure class.The disc of check valves is spring loaded.

Bonnet seal area : The bonnet/yoke of class 150-800 valves is bolted to the body. In the case of class 1500 & 2500 the bonnet is threaded and seal welded to the body.

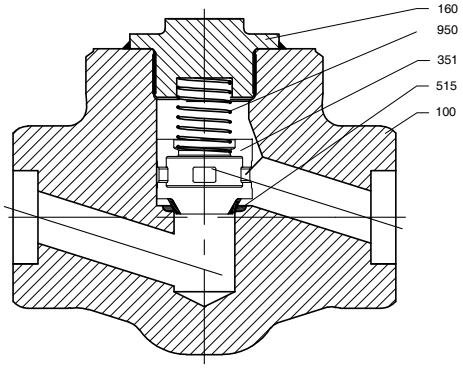
5.3.15 Sectional Drawing - Forged, Globe & Check valves



GLF 4500 without Thrust Bearing
(for Sizes 1"and below)



GLF 4500 with Thrust Bearing
(for Sizes 1 1/2"and 2")



PCF 4500

Part no.	Name	Part no.	Name
100	Body	554	Washer
165	Bonnet	561	Grooved pin
200	Stem	579	Stop
324	Thrust bearing	636	Grease Nipple
360	Disc	902	Stud (Gland flange)
452	Gland flange	920	Hex. nut (Gland flange)
456	Gland bush	940	Key
461	Gland packing	961	Handwheel
514	Threaded ring		
515	Seat (Integral)		
544	Stem nut		

Part no.	Name
100	Body
160	Cover
351	Disc
515	Seat (Integral)
950	Spring

5.3.16 Forged, Globe and Check valves (class 4500)

All forged valves have been designed according to the following standards and specifications : ASME B16.34.

Forged valves mainly consist of body, bonnet and the closing as well as the actuating unit (only globe valve).

Stem seal area : The gland packing of globe valve which seals the stem is tightened by the studs and nuts on the gland flange. The bonnet is equipped with an integral back seat, which seats the valve when stem is in upmost position.

Flow seal area : The integral seal faces of the body of globe and check valves are hard faced. The disc of globe valves is connected to the stem by T-head joint. The disc of check valves is spring loaded.

Bonnet seal area : The bonnet is threaded and seal welded to the body.

Related documents

Type	Size	Class	Type leaflet no.
GLF	1/4"-2"	800 - 4500	7236.1/03-EN
PCF	1/4"-2"	800 - 4500	7237.1/03-EN

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 (100) when they are installed and operational.

ATTENTION Only remove the covers from the connection ends just before installation. The sealing faces of the flanges must be clean and undamaged.

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 (200). 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!

Valves and pipes used for high (>50 ^{0}C) or low (<0 ^{0}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.

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.

6.2 Installation position

The valve bodies are marked with an arrow indicating the flow direction. Valves should always be installed in such a way that the actual flow direction of the medium matches the arrow on the body.

6.2.1 Gate valves

In general flow may pass a gate valve in either direction. However in high pressure valves with pressure relieving arrangement (refer clause 6.6, Execution ref. PR-01 to PR-06) valves are unidirectional. When installing a gate valve in a horizontal pipe, the stem should be vertical, i.e. the handwheel or actuator is on top. Inclined or horizontal stem position (e.g. in a vertical pipe) is also possible, in this case, however, the actuator must be supported by some suitable means.

6.2.2 Globe valves

Flow may pass a globe valve in either direction if not indicated otherwise. When installing a globe valve in a horizontal stem position (e.g. in a vertical pipe) is also possible, in this case, however, the actuator must be supported by some suitable means.

Forged Steel Globe Valves in High Pressure / Temperature Drain Service

In Start-up Vent / Drain application, the Globe valves are likely to accumulate foreign particles like scale or rust. During ‘‘rush’’ of the flow, these particles may erode Sealing Surfaces on Disc and Body Seat, when the flow is ‘‘Below the Disc’’.

KSB’s ‘‘Y’’ type Globe Valves can be installed individually or in tandem for improved life time of valves in the high differential drain service with good shutoff function, with ‘‘Flow over the Disc’’ orientation.

In such start-up / vent and drain applications, we recommended ‘‘Flow over the Disc’’ for following reasons :

- minimal Seat erosion due to occasionally flowing sediment / foreign particles
- using the differential pressure, acting on top side of the Disc, to assist effective sealing
- minimizing loads / stress in the Stem

This orientation of the valve i.e. ‘‘Flow over the Disc’’ will serve these purpose and the life cycle time of Globe Valves may be extended.

6.2.3 Check valves

Swing check valves should preferably be installed in horizontal pipes. When installing them in vertical pipes, make sure that the flow direction is upward, so that in the unpressurized condition, the disc will be closed by its own weight.

Check valves are provided with two extra long studs (902) or a tapped hole in the cover (refer sketch SCC 150-600) which serves a means of lifting lugs.

6.3 Pressure seal design (gate and swing check valves)

ATTENTION On gate valves with pressure seal bonnet (166) of fig. GTC 900-2500 & Pr. seal bonnet (139) of fig. GTC 3100-3600 where the medium trapped in the closed valve can heat up, the user must check whether a connection from the middle of the body to the upstream side of the gate valve (flow in only one direction) or a body safety device (flow in either direction) should be provided.

If a swing check valve and a gate valve with pressure seal bonnet (166) are connected in series over a short distance then the medium trapped when the valve is closed can cause a pressure rise at the pressure seal bonnet and the closing element. The user must fit a body safety device/valve on the pipe line to protect the Check valve body from being over pressurized due to entrapped fluid between closed elements of Gate & Check valve. If there is any doubt do not hesitate to contact KSB.

6.4 Welding instructions / installation of pipe

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

ATTENTION When welding valves on to 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 and or the valve stem.

ATTENTION When welding the valve into the pipeline, take special precautions, i.e. welding in several steps, to that the temperature in the middle of the body does not exceed the maximum permissible operating temperature. During the welding process, Gate / Globe valves must be kept in open position. Follow the guidelines from applicable codes for welding procedure / post weld procedures.

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

6.5 Actuated valves

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.

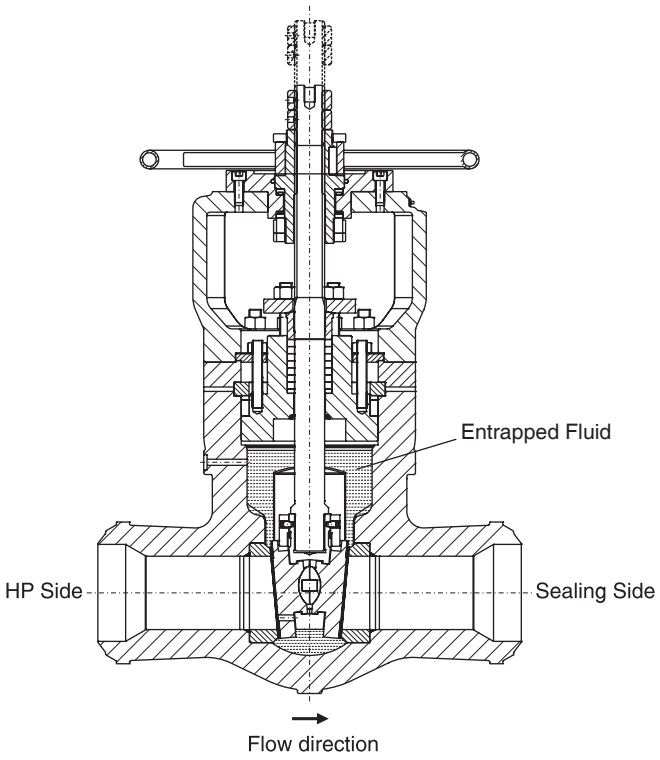
All electrical equipment such as actuator, switchboard, magnetic valve drive, limit switch etc. must be installed in floodproof dry locations.

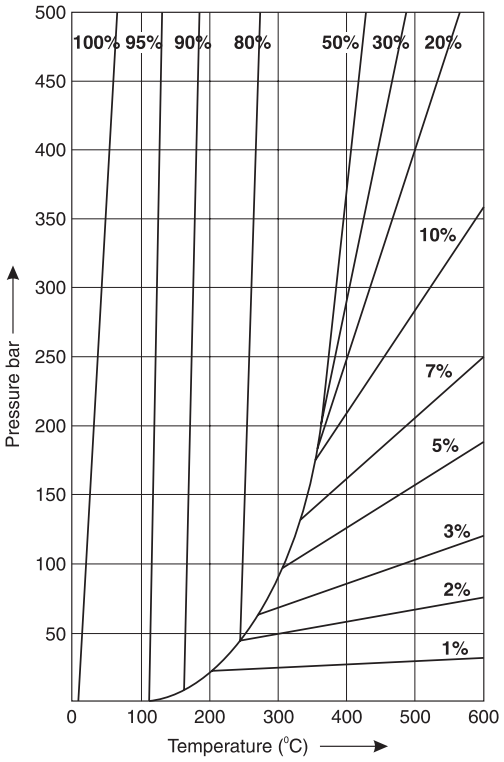
Voltage and frequency must match the valves stated on the name plate.

6.6 Body safety arrangement (pressure relief)

ATTENTION Heat buildup of trapped liquid volumes is a phenomenon which mainly affects gate valves.

If there are liquid residue in the valve body after the hydrostatic pressure test, for instance, or condensate has collected in the valve body due to a particular operating condition, there is a risk of an impermissible pressure rise when the body is heated up by hot water or steam in one or both of the adjoining pipes.





The potential pressure rise depends on the temperature and the degree to which the body is filled and may rapidly reach unallowable values for the body.

The problem of heat buildup of trapped liquid volumes is particularly dangerous when the gate valve is fitted with a pressure seal, as the cover seal will become even tighter as the pressure rise.

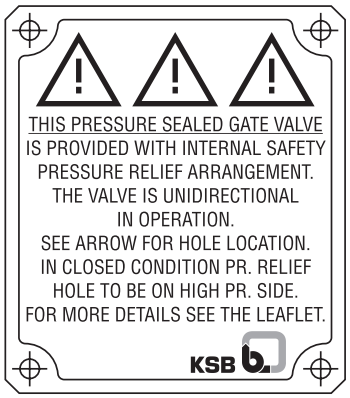
On gate valve with flanged covers, unallowable pressure rises are relieved through leaks developing at the cover gaskets.

Gate valves with pressure seal therefore have to be equipped with a body safety arrangement whenever there is a risk of trapped liquid volumes heating up. This prevents excessive loads on the valve body and potential deformation under all operating conditions and thus ensures safety.

This aspect has been addressed in ASME B16.34 which says……

ASME B 16.34 Cl 2.3.3 – Fluid Thermal Expansion. "….. A certain circumstance in which the center cavity is filled or partially filled with liquid and subjected to an increase in temperature can result in an excessive buildup of pressure in the center cavity that may lead to pressure boundary failure. An example is a piping system in which liquid from the condensing, cleaning, or testing fluids accumulates in the center cavity of a closed valve. Such accumulation may result from leakage past the upstream seat of the valve. If during subsequent start-up, the valve is not relieved of the liquid by partial opening of the valve or by some other method, the retained liquid may be heated during warm-up of the system. Where such a condition is possible, it is the responsibility of the user to provide, or requires to provide, means in design, installation, or operation procedure to ensure that the pressure in the valve will not exceed that allowed by this standard for attained temperature.

In the view of above KSB has standardized pressure relief arrangement by way of drilled hole on the upstream side disc in the absence of customer specification. However, this makes the Valve Uni-Directional.



Important Note : KSB standard Valves is provided with safety arrangement - internal relief through wedge disc Execution Ref. No. PR-03. It is specifically stated the valve is unidirectional.

The 'RED DOT' on the arrow plate indicates the location (Upstream/Downstream) of pressure relief arrangement.

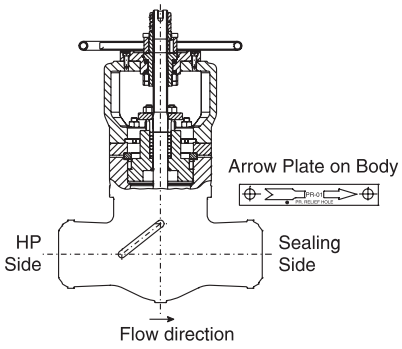
Caution plate indicating the above is tagged on the body.

Pressure relief arrangement may be provided either in Upstream or down stream side based on the Service requirements.

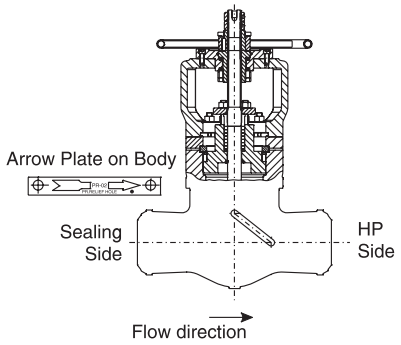
The other pressure relieving options offered by KSB are illustrated on page no. 10 (Identified by Execution Ref. No. PR-01 to PR-08).

KSB advice the user to select a suitable pressure relieving option and indicate the execution reference at the time of ordering.

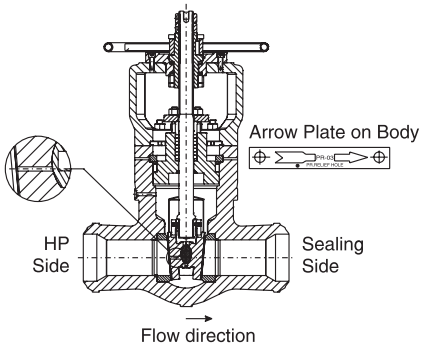
PR-01
External Pipe Connecting Bonnet cavity at 'K' side,
Valve - Unidirectional



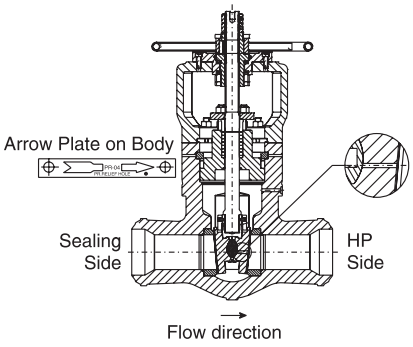
PR-02
External Pipe Connecting Bonnet cavity at 'B' side,
Valve - Unidirectional



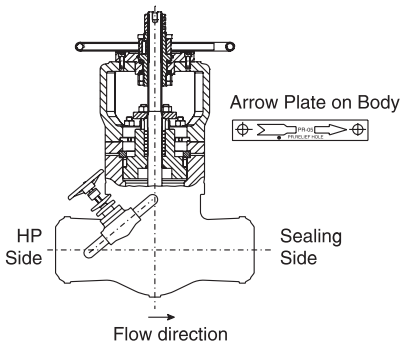
PR-03
Internal Pr. Relief Arrangement
Pr. Relief Hole on Disc at 'K' side,
Valve - Unidirectional



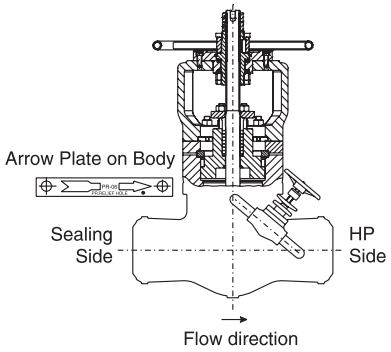
PR-04
Internal Pr. Relief Arrangement
Pr. Relief Hole on Disc at 'B' side,
Valve - Unidirectional



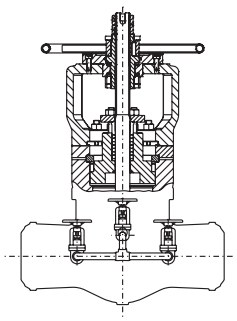
PR-05
External Pr. Relief pipe with interconnection valve at 'K' side,
Valve - Unidirectional



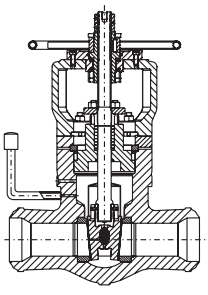
PR-06
External Pr. Relief pipe with interconnection valve at 'B' side,
Valve - Unidirectional



PR-07
External Pr. Relief Arrangement
Decompression system
Valve Bi-directional



PR-08
External Pr. Relief Arrangement with a Stub pipe at bonnet cavity for mounting Safety Valve
Valve - Bi-directional



Note : 'K' side & 'B' side indicated above are with respect to as cast ''KSB'' mark on the valve body.

ATTENTION Refer Page No. 9 “Important Note”

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 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.

ATTENTION Large size check valves >12” in low flow, low pressure and fluctuating flow conditions may cause chattering of disc with seat. KSB recommends use of appropriate means of balancing of disc.

7.1.2 Operation

The valves are closed by turning the handwheel in the clockwise direction (top view) and opened in the counterclockwise direction.

Using additional levers when turning the handwheel is not admissible, because excess force may damage 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 (461) should be checked when it is subjected to the full operating pressure and temperature for the first time. If necessary, retighten the nuts (920.2) at the gland flange (452) evenly.

On valves in pressure seal design, the nuts (920.1) of stud (902.1) which hold the bonnet (139) and the gaskets (411) under tension must be tightened so as to prevent leakage, due to the bonnet (139) sinking in to the body (100) when the pressure drops.

The cover flange connection (902.1/920.1) and the gasket (411) should be checked for tightness after the first temperature rise at the valves. In case of leakage at the gasket (411), the connection should be tightened crosswise, evenly and in a clockwise direction.

Open the gate and globe valve by one or two turns of the handwheel prior to retightening the nuts 920.1 to prevent jamming of the seat.

Retightening of the nuts (920.1) of the cover bolting especially applies to valves used in heat transfer systems to DIN 4754.

7.1.4 Actuated valves

On valves with electric/pneumatic/hydraulic actuator, the strokes/forces must be limited.

Electric actuators should be wired as follows:

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

Valve type	Open	Close
GTC - #150 - 600	Limit	Torque[1)]
GTC - # 900 - 3600	Limit	Limit[2)]
GLC - # 150 - 2500	Limit	Torque
GTF/GLF - # 1500/2500/4500	Limit	Torque

1) Motor trips by torque switch followed by limit switch

2) Motor trips by limit switch followed by torque switch

ATTENTION Switches are factory set. Do not tamper with settings. To readjust settings refer instruction manual of actuator manufacturer and / or contact your nearest KSB office.

For setting of actuator, please refer instruction manual which will be kept in the wiring side compartment/cover of actuator.

During setting ensure torque setting for open position must be 10% more than closed position.

7.2 Decommissioning

During extended shutdowns 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, because 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, i.e.

- before removing cover/yoke or pressure seal bonnet from the body
- before removing/unscrewing vent or drain plugs
- before removing the gland cover to replace packing rings
- before removing an actuator bolted directly to the yoke head

The entire valve must be unpressurized and must have cooled down sufficiently so that the temperature of the medium in all the valve’s chambers is lower than the vaporization point of the medium, to prevent scalding.

Opening pressurized valves 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.

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.

8.1.2 Removing Actuators

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 and the instructions in the sections 3, 8.1.1 and the operating instructions of the actuator must be observed.

Valve actuators with integrated spring-loading feature cannot be removed.

Caution : Springs under tension!

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

8.2 Maintenance

Our valves are largely maintenance free, materials of sliding parts were selected to keep wear to a minimum. 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 non-maintenance-free valves can be extended by :

- lubricating movable parts such as stem (200) and gland bolts (not for oxygen valves) and through grease nipple provided in the case of gate valve using suitable lubricants to DIN 51825 / equivalent
- timely changing of the packing rings
- timely replacing of the cover gasket (411)

The safety instructions in sections 3, 8.1 and the notes in section 9 must be observed.

9 Troubleshooting

9.1 General

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

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

9.2 Faults & Remedies

Fault **- Leakage at the seat**

Remedy - Remachine the seat on wedge/disc and body using suitable regrinding equipment after dismantling the valve. Re-grinding of body and cone seats should be continued until the seats show a smooth and even ring.

Fault **- Leakage at the cover Gasket**

Remedy - Retighten the cover flange connection Remedy - Replace the gasket (411) after removing the cover bolting (902/920.1). Clean the surfaces carefully before inserting a new gasket.

ATTENTION On asbestos-free gaskets, no additional sealing agents may be used. When using anti-adhesive coatings, use sealing agents explicitly recommended by the manufacturer of the sealing material.

If you have any further questions please contact nearest KSB Sales office.

Fault **- Leakage of the Stuffing Box**

Remedy - Retighten the stuffing box with the nuts (920.1) at the gland flange (452). Make sure that the friction forces at the stem do not increase too much.

Remedy - Replace the packing rings of the stuffing box; Unscrew the nuts (920.2) and lift the gland flange (452). Clean the stuffing box chamber thoroughly before inserting new packing rings. Split packing rings should be inserted in such a way that the slots are offset by 120^0 to 180^0.

10 Valve weights

SICCA 150 - 600 (Approx. in kg)

Size	Class	GATE (GTC)		GLOBE (GLC)		CHECK (SCC)	
		RF	BW	RF	BW	RF	BW
2	150	15	15	25	20	20	15
	300	30	25	35	25	25	20
	600	35	30	45	40	30	25
2 1/2	150	25	20	35	30	20	15
	300	40	30	45	40	30	20
	600	-	-	-	-	-	-
3	150	25	25	40	40	35	35
	300	45	40	50	45	45	40
	600	60	50	75	70	55	50
4	150	40	35	60	55	50	45
	300	65	55	75	65	65	50
	600	105	90	110	100	100	70
5	150	60	55	75	65	50	40
	300	105	85	75	65	80	60
	600	-	-	-	-	-	-
6	150	70	65	120	90	80	65
	300	135	110	135	120	120	100
	600	210	170	215	165	160	130
8	150	125	115	145	130	125	105
	300	235	185	305	260	265	225
	600	400	330	540	500	310	235
10	150	200	180	260	240	220	190
	300	335	280	375	315	280	235
	600	600	520	790	720	490	440
12	150	280	245	-	-	345	300
	300	470	390	-	-	390	350
	600	820	660	-	-	640	575
14	150	425	405	-	-	440	415
	300	685	575	-	-	680	620
	600	1190	1045	-	-	890	755
16	150	550	555	-	-	590	555
	300	1110	1030	-	-	890	815
	600	1630	1425	-	-	-	-
18	150	675	680	-	-	765	730
	300	-	-	-	-	-	-
	600	-	-	-	-	-	-
20	150	815	820	-	-	955	910
	300	-	-	-	-	-	-
	600	-	-	-	-	-	-
24	150	1220	1220	-	-	1410	1340
	300	-	-	-	-	-	-
	600	-	-	-	-	-	-

SICCA 900 - 3600 (Approx. in kg)

Size	Class	GATE (GTC)		GLOBE (GLC)	CHECK (SCC)
		FB	RB	BW	BW
2	900	40	-	40	20
	1500	45	-	75	20
	2500	65	-	85	30
2 1/2	900	-	40	40	20
	1500	-	45	75	20
	2500	-	70	90	35
3	900	80	40	75	35
	1500	80	45	95	35
	2500	110	70	145	50
	3100	165	145	-	70
4	3600	365	240	-	80
	900	110	80	105	40
	1500	125	80	170	60
	2500	155	110	210	80
	3100	250	170	-	95
	3600	410	370	-	115
5	900	-	110	110	45
	1500	-	135	185	65
	2500	-	170	235	95
6	900	175	110	230	90
	1500	250	140	380	130
	2500	395	170	485	180
	3100	405	265	-	270
	3600	610	435	-	350
8	900	275	170	380	145
	1500	380	225	-	210
	2500	580	385	1085	300
	3100	755	430	-	475
	3600	1055	650	-	605
10	900	460	285	-	245
	1500	665	415	-	365
	2500	990	660	-	540
	3100	1090	815	-	790
	3600	1500	1115	-	940
12	900	730	470	-	380
	1500	1005	730	-	570
	2500	1510	1090	-	850
	3100	1820	1140	-	1330
	3600	2410	1575	-	1610
14	1500	1370	1080	-	750
	2500	2060	1620	-	1075
	3100	2300	1850	-	1600
	3600	2995	2455	-	2120

SICCA 900 - 3600 (Approx. in kg)

Size	Class	GATE (GTC)		GLOBE (GLC)	CHECK (SCC)
		FB	RB	BW	BW
16	900	-	1070	-	-
	1500	1845	1445	-	1070
	2500	2715	2085	-	1475
	3100	3100	2370	-	2290
	3600	3945	3090	-	2815
18	1500	2535	1925	-	1415
	2500	3700	2850	-	2035
	3100	4075	3190	-	3000
	3600	5310	4055	-	3745
20	900	2470	-	-	1480
	1500	3340	2665	-	1895
	2500	4900	3875	-	2650
	3100	5290	4155	-	3815
	3600	7100	5420	-	4950
22	3100	6870	5385	-	4885
	3600	9120	7230	-	6140
24	1500	5050	3625	-	2940
	2500	7295	5505	-	4170
	3100	8630	6980	-	6025
	3600	11385	9275	-	7745
26	3100	10475	8755	-	7475
	3600	14100	11575	-	9940
28	2500	10910	-	-	-
	3100	13000	10625	-	8885
	3600	17195	14325	-	11380
32	2500	20680	-	-	-

SICCA 150 - 4500 F

(Approx. in kg)

Size	Class	GATE (GTF)	GLOBE (GLF)	CHECK (PCF)
1/4	800	2	2	1
	1500	3	3	1
	2500	5	4	2
3/8	800	2	2	1
	1500	3	3	1
	2500	5	4	2
1/2	150	3	3	2.5
	300	3.5	3.5	3
	600	4	3.5	3
	800	2	2	1
	1500	3	3	1
	2500	5	4	2
	4500	NA	12	5
3/4	150	4	3.5	3.5
	300	5.5	5	5
	600	6	5.5	5
	800	3	2	2
	1500	4	5	2
	2500	5	5	2
	4500	NA	12	5
1	150	5	5	4
	300	6.5	7	6
	600	7.5	7.5	6.5
	800	3	3	2
	1500	6	6	3
	2500	10	7	3
	4500	NA	17	8
1 1/2	150	10	10	8.5
	300	13	14	12.5
	600	15	15	14
	800	7	7	5
	1500	11	12	8
	2500	14	13	7
	4500	NA	29	15
2	150	-	15	14.5
	300	15.8	-	-
	600	21.4	-	-
	800	10	11	9
	1500	14	15	10
	2500	20	16	10
	4500	NA	41	20
2 (FB)	800	16.5	16	11.7
2 1/2 (FB)	900	37.4	35.8	17.4
	1500	37.4	35.8	17.4
	2500	43.3	39.7	20.7

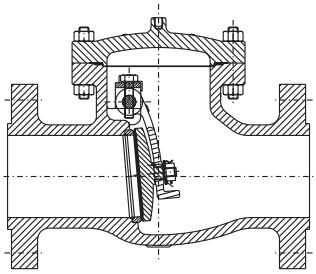
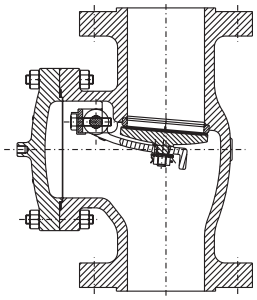
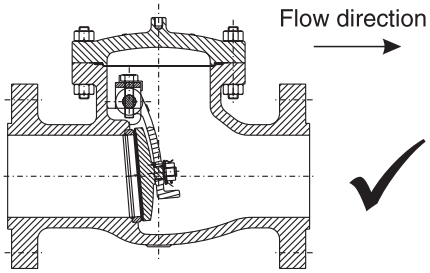
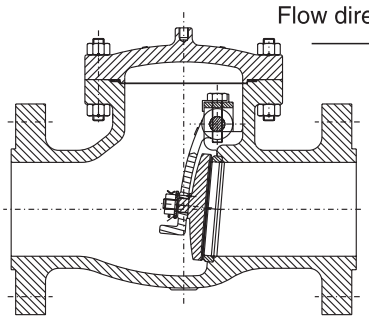
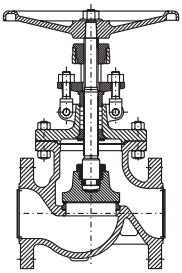
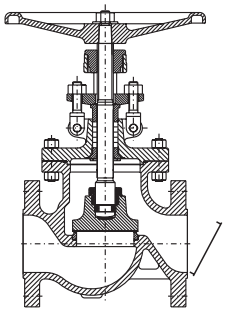
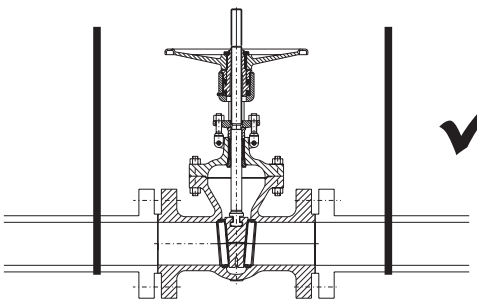
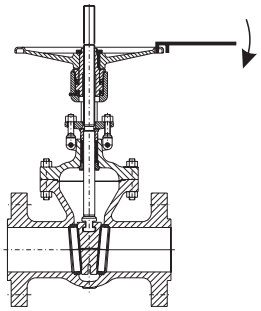
Annexure I

DO's

1. Observe the safety instructions.
2. Employ skilled, trained and experienced personnel to handle the valve.
3. Align the pipe correctly in position before mounting a valve on line.
4. Use a correct type of flange gasket.
5. Ensure the correct direction of flow on the valve.
6. Ensure the valve is un-pressurised before any work is carried out.
7. Decontaminate the valves in contact with hazardous fluids, before any work is carried out.
8. Lubricate the valves periodically.
9. Protect the threads with a metal/leather jacket if the working conditions are abrasive.
10. Allow clearance for raising stem type valve to open fully.
11. Flush the valves in fully open condition to remove foreign material like welding flux, spatter, slag, dust etc. to avoid damage of seats.
12. Check shut-off function by repeatedly opening and closing before commissioning.
13. Check the frequency and voltage of actuators to match with the line voltage and frequency.
14. If gasket leak is observed, tighten gasket bolts crosswise evenly in a clock wise direction.
15. After attaining the full operating pressure and temperature, check and if necessary, tighten the gland nut / Body-bonnet nuts.
16. When a gate valve is fully opened, screw it down 1/4 turn to prevent sticking.
17. During storage position the valve such that the stem is upright.
18. For globe valve follow the instructions carefully for direction of installation.

DON'Ts

1. Don't expose the valves to dust, sand, building material etc. during storage.
2. Don't use unauthorised spares.
3. Don't remove end protective covers before installation.
4. Don't use valve hand-wheels as foot holds.
5. Don't exceed the limits stated in technical documentation.
6. Don't store the valve in open condition.
7. Don't attempt to dismantle the pressurised valve.
8. Don't use a valve to pull an unsupported and badly aligned pipes into position.
9. Don't leave a gate valve in crack open condition.
10. Don't use a gate valve for throttling.
11. Don't force a gate valve closed with a wrench.
12. Don't use a flat disc globe valve for start-up / vent application.
13. Once the valve is installed and commissioned do not tamper the torque & limit switches in case of valve with electrical actuator.

Do's	Don'ts
 ✓ Read instruction manual carefully before and after installation	 ✗ Do not allow unauthorised person for installation & service
 ✓ Check valve shell be mounted horizontally where ever possible	 ✗ Check valve should not be mounted vertically
 ✓ While storing the valve should be in fully closed position and with end covers	 ✗
 ✓ While storing the valve should be in fully closed position and covered with end covers	 ✗
 ✓ Adequate support for the pipe is to be ensured to avoid possible extra strain on valve body	 ✗ Do not over torque for full close

Annexure II - Environment Protection - Product Disposal after useful life.

Products manufactured by KSB are designed with utmost care for environment protection. Innovative designs and wide product range takes care of specific customer requirements reducing consumption of material. Product materials are recyclable. Our customers are instructed with environment friendly methods of disposing used components of valves at the end of their useful life as indicated in the table below :

Sr.	Product	Ingredients	Disposal Methods
1	Valves	**Non ferrous parts :** a) Al.bronze Stem nut	To be disposed through authorized re-processor.
		Plastic Parts a) End Covers	
		Valve actuator motors **(only for Acutator operated Valves)** a) Copper sticks & Stampings b) Winding wire & varnish c) Oil seals d) Grease / Oil	

KSB Limited

Manufacturing Plants

Head Office & Pimpri :
Irrigation & Process Division
Mumbai-Pune Road, Pimpri,
Pune - 411 018.
Tel.: 020-2710 1000 Fax : 020-2742 6000

Chinchwad :
Power Projects Division
D-II Block, MIDC Chinchwad,
Pune - 411 019.
Tel.: 020-2740 9100 Fax : 020-2747 0890

Khandala :
Energy Pumps Division
A1, MIDC Khandala Phase II,
Village Kesurdi, Tal. Khandala,
Satara - 412 802.
Tel. : 02169 -246800

Coimbatore :
Valves Division
151, Mettupalayam Road,
NSN Palayam Post,
Coimbatore - 641 031.
Tel.: 0422-2468222, 2468547-9
Fax : 0422-2468232

Sinnar :
Standard Pumps Division
Plot No. E-3 & E-4, MIDC Sinnar,
Nashik - 422 113.
Tel.: 02551-230252 / 53, 229700
Fax : 02551-230254

Vambori :
Foundry Division
Vambori, Ahmednagar - 413 704.
Tel.: 02426-272534, 272550, 272463
Fax : 02426-272043

Regd. Office :

Office No. 601, Runwal R-Square,
L.B.S. Marg, Mulund (West),
Mumbai- 400 080, Tel.: 022-2168 1300

Zonal Offices :

East :
30, Circus Avenue, 2nd Floor,
Kolkata - 700 017.
Tel.: 033-2287 0473, 2290 0117
Fax : 033-2287 0588

West :
Office No. 601, Runwal R-Square,
L.B.S. Marg, Mulund (West),
Mumbai- 400 080, Tel.: 022-2168 1300

North :
KSB House, A-96, Sector IV, NOIDA, Dist.
Gautam Budh Nagar - 201 301.
Tel.: 0120-254 1091 Fax : 0120-255 0567

South :
Guindy House, II Floor, # 92 Anna Salai,
Chennai - 600 032.
Tel.: 044-2235 2571-2, 2235 5673
Fax : 044-2235 2749

Service Stations :

Chennai :
6, Self-help Industrial Estate,
Keelkattalai, Near Keelkattalai - Palla-
varam Radial Road Signal junction,
Chennai 600 117
Tel. 044-22681159

Howrah :
Sadananda Industrial Estate
Howrah Amta Road, Balitikuri, Bakultala
Howrah - 711 113, West Bengal

NOIDA :
KSB House, A-96, Sector IV, NOIDA,
Dist. Gautam Budh Nagar - 201 301.
Tel.: 0120-2471 600
Fax : 0120-255 0567

Odhav :
Shed No. 22, Gujarat Vepari
Mahamandal, Odhav,
Ahmedabad - 382 410.
Tel.: 079-2290 0372
Fax : 079-2290 0749

Chinchwad :
Power Projects Division
D-II Block, MIDC Chinchwad,
Pune - 411 019.
Tel.: 020-2740 9100 Fax : 020-2747 0890

Branch Offices :

Ahmedabad :
Shed No. 22, Gujarat Vepari
Mahamandal, Odhav,
Ahmedabad - 382 410.
Tel.: 079-2290 0707, 2290 0717

Aurangabad :
Plot No. P-204, Shivshankar Colony,
Near Hotel Sayli,
Aurangabad - 431 005.
Tel.: 0240-235 1440, 234 2447
Fax : 0240-235 1440

Bangalore :
191, 1st Floor, West Of Chord Road,
II Stage, Bangalore - 560 086.
Tel.: 080-2349 1806, 2349 3925
Fax : 080-2349 6036

Baroda :
4-B, Ramkrishna Chamber,
Productivity Road, Baroda - 390 005.
Tel.: 0265-233 0532, 233 3226
Fax : 0265-235 0002

Bhubaneswar :
N5/39,1st Floor, IRC Village, Nayapalli,
Bhubaneswar - 751 015.
Tel.: 0674-255 8497
Fax : 0674-255 8499

Chandigarh :
SCO - 189, 2nd Floor, Sector - 7C,
Chandigarh - 160 019.
Tel. / Fax : 0172-279 0072, 279 0062

Indore :
B-14, Ratlam Kothi, Kanchan Baug Road,
Indore - 452 001.
Tel.: 0731-252 9478, 252 9704
Fax : 0731-252 9704

Jaipur :
Anjali Chambers, 2nd Floor, Block C,
10, Rajbhawan Road, Civil Lines,
Jaipur - 302 001.
Tel.: 0141-222 4554, 222 4904
Fax : 0141-222 4904

Jamshedpur :
Flat No: 3/1, 3rd Floor, Plot No: 20,
Road No: 2, Sonari West Layout,
Jamshedpur - 831011.
Tel.: 0657-231 4012, 231 4011
Fax : 0657-231 7128

Lucknow :
309, Chintels House, 16, Station Road,
Lucknow - 226 001.
Tel.: 0522-263 5203, 263 5597
Fax : 0522-263 5597

Mumbai :
Office No. 601, Runwal R-Square,
L.B.S. Marg, Mulund (West),
Mumbai- 400 080, Tel.: 022-2168 1300

Nagpur :
203, Suryakiran Complex, Bajaj Nagar,
Nagpur - 440 010.
Tel.: 0712-223 6889, 222 9148
Fax : 0712-222 9148

Pune :
Mumbai-Pune Road, Pimpri,
Pune - 411 018.
Tel.: 020-2710 1000 Fax : 020-2742 6000

Raipur :
1 floor, E-5, Sector-5, Devender Nagar,
Raipur, Chhattisgarh - 492009
Tel.: 0771-258 3658, 258 3921
Fax : 0771-258 3921

Secunderabad :
D. No. 12-13-197, 198,
Flat No. 103 & 104, 1st Floor,
Pavani Anusuya Towers, Tarnaka,
Secunderabad - 500 017.
Tel.: 040-2700 1724, 2700 3696
Fax : 040-2700 1725

Ernakulam :
Ground Floor, D/No 22/241 (S),
Tamrind Rajadhani, Pulinchode,
Aluva, Ernakulam - 683 101 (India)
Tel.: 62353 55500

KSB Limited
151, Mettupalayam Road, NSN Palayam Post, Coimbatore - 641 031. India.
Tel.: +91 422 2468222 Fax : +91 422 2468232 www.ksbindia.co.in

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