

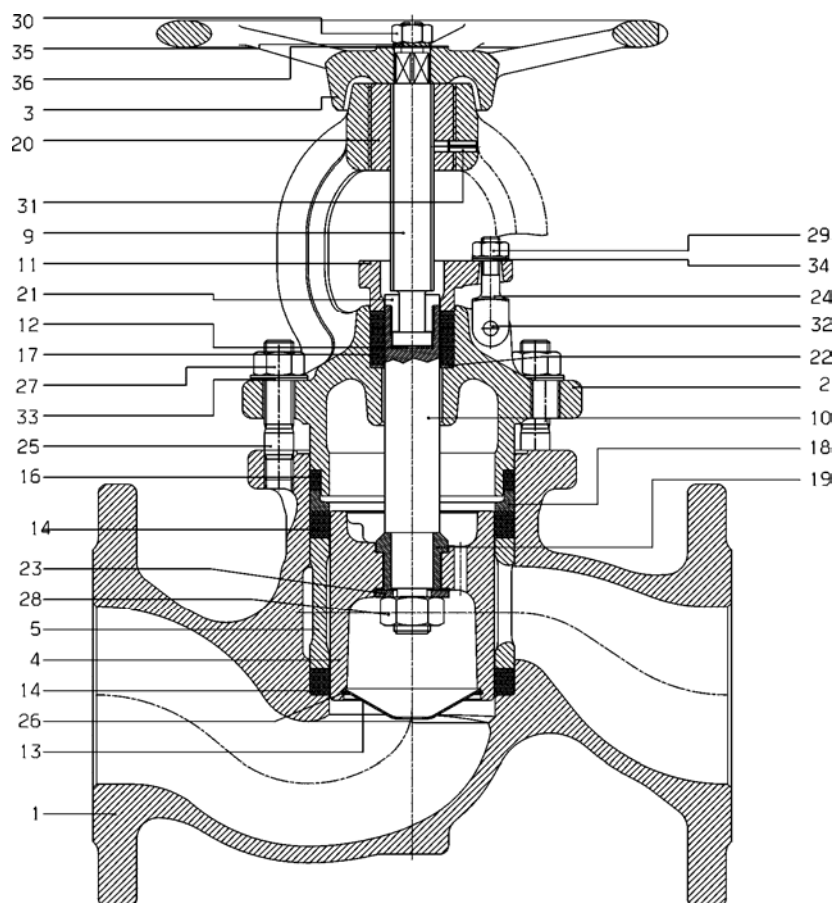
Assembly Instructions and Handling Regulations for

KLINGER

Piston Valves KVN DN 65 - 200 VI, VIII and
Regulating Piston KVRLN DN 65 - 200, PN 40 VI, VIII

„pressure released type“

with valve ring "KX-GT"



- 1 Body
- 2 Bonnet
- 3 Hand wheel
- 4 Piston
- 5 Lantern bush
- 9 Spindle
- 10 Piston shaft
- 11 Gland retainer
- 12 Disc
- 13 Piston nose cone
- 14 Valve ring KX-GT
- 16 Bonnet valve ring Graphite-L
- 17 Stuffing-box-ring-set KX-GT
- 18 Compression piece
- 19 Piston cone
- 20 Threaded bush
- 21 Two-part screwing
- 22 Spacer
- 23 Disc
- 24 Swing bolt
- 25 Stud bolt
- 26 Wire ring
- 27 Hexagon nut
- 28 Grooved hexagon nut
- 29 Hexagon nut
- 30 Hexagon nut
- 31 Tension pin
- 32 Straight grooved pin
- 33 Belleville washer
- 34 Belleville washer
- 35 Serrated lock washer
- 36 Type plate

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Contents

Page 3	<i>Storage Regulations, Installation and Commissioning</i>
Page 4	<i>Operating Instructions, Servicing and Important Information</i>
Page 5	<i>Notes on Hazardous Operating</i>
Page 5 to 8	<i>Errors and Sources of Danger Maintenance and Repair Instructions</i>
Page 9 to 10	<i>Illustrations for Assembly</i>
Page 11	<i>Data Sheet (Tightening Torques)</i>
Page 12 to 13	<i>Data Sheet Spare Parts</i>
Page 14	<i>Regulating Piston KVRLN</i>

Storage Regulations for KLINGER PISTON VALVES and Spare Parts

Store valves and spare parts in dry storerooms only.

Fully assembled valves must be stored in delivery condition (valve in closed position, end connections fitted with protective caps.)

Valve spare parts must be handled with care and should, if possible, be kept in their original packaging during storage.

If cover film or shrink wrapping is used, take the necessary steps to ensure that there is no condensation in the air inside the covering.

Appropriate measures must be taken to protect the equipment in dusty environments.

To avoid confusion, all parts stored must be labelled as on the delivery note and stored in the correct place.

Temperatures in the storeroom must not exceed the limit values of -20°C and $+50^{\circ}\text{C}$ and rapid changes in temperature (causing condensation and perspiration) should be avoided.

Handling Regulations and Operating Instructions are supplied with, and should always be stored with, the products to ensure that important information and documents are appropriately passed on.

There are special Components Technical Sheets (Page 12, 13) to aid identification of Klinger spare parts.

Our customers will be notified by circular letter of any modifications that affect storage requirements.

Klinger accepts no liability derived from guarantees, warranties and product liability legislation for damage suffered by products due to incorrect storage.

Installation and Commissioning Regulations for KLINGER PISTON VALVES (KVN Models)

Klinger piston valves can be installed in any position in the piping system. The preferred through flow direction (indicated by an arrow on the valve body) should, however, be observed.

KVN piston valves of DN 65 – 200 mat. code VI, VIII are equipped with pressure relieved pistons and therefore have no piston pump action.

After commissioning valves with the KX-GT module, no special maintenance is required since there is no setting as with conventional, soft-sealing valve rings.

KLINGER piston valves have a very rugged body. However it is still important to ensure that planeside connections lie parallel and true to axis.

Note: *If the line and valve are subsequently insulated, the insulation should only extend upto the head flange on the body side so that access to the bonnet hexagon nuts is not impeded.*

Since the valve body can remain in site for repairs and maintenance work, the valve insulation does not need to be removable.

Klinger accepts no liability relating to guarantees, warranties and product liability legislation for damage caused by incorrect installation and failure to observe the commissioning regulations.

Operating Instructions for KLINGER PISTON VALVES (KVN Model)

Klinger piston valves must be closed clockwise and opened anti-clockwise.

Especially when closing the valve, the hand wheel should be turned until it adjoins on the bonnet. Unlike globe valves, piston valves do not require increased final torque. Due to the design of piston valves, a seal may be achieved before the closed position is reached. To protect the valve rings, piston valves must always be closed as far as they will go.

Because Klinger piston valves can also be used to regulate and to throttle, the above does not apply when opening the valve or setting it to the open position for regulating or throttling purposes.

Through flow characteristics for valve throttle positions are available from Klinger on request.

*If a valve starts being untight, check the tightening torques of the bonnet fastening nuts (27) referring to the **table on page 11** and tighten if necessary.*

*The valve has to be in **CLOSED** position, except valves adjusted with **KX-GT valve rings** may remain also in **OPEN** position.*

Klinger accepts no liability relating to guarantees, warranties and product liability legislation for damage caused by failure to observe the operating instructions.

Recommended Preventative Maintenance to Obtain the Best Possible Service Life from KLINGER VALVES

As with all spindle-operated mechanisms, regular lubrication can substantially prolong the useful life of the spindle (9). In addition, less effort is required to operate the hand wheel when the spindle is well lubricated.

Hazardous Operating Errors and Possible Sources of Danger

Piston valves provide a particularly good seal. During Temperature changes, process fluid captured between two piston valves can cause considerable changes in pressure which may exceed the pressure category of the valve. In such cases, appropriate volume compensation (expansion tank) is necessary.

Always ensure that the correct tightening torque specified in the Technical Data Sheet on Page 11 is applied to the bonnet hexagon nuts.

Do not loosen or undo these nuts while the valves are under pressure.

The valves must not be subjected to pressure shock in excess of one and a half times their rated pressure.

When the spindle thread becomes so worn out that its stability seems endangered, release the pressure and carry out the necessary maintenance.

Whatever the application, always consult the operating limits diagram (pressure-temperature) and also consider the suitability of the materials for various process fluids.

Maintenance and Repair Instructions for KLINGER – PISTON - VALVES (KVN Models)

*Klinger piston valves are easy to repair using simple assembly and dismantling tools. The valve does **not have to be removed**, but the line system must be **depressurised** and **emptied**.*

We recommend the following procedure for dismantling:

- *Depressurise and empty the system*
 - *Open the valve fully*
 - *Unscrew the stud bolt (25), then unmeant Belleville washers (33)*
 - *Turn the hand wheel (3) clockwise (closing direction), at the same time bonnet (2) rises out of body*
 - *Turn bonnet slightly until the flange adjoin against the stud bolt faces (25) and turn hand wheel anti-clockwise (opening direction) until the piston (4) is completely free of the top valve ring (14), (see Fig. 1)*
-

- Remove upper block with hand wheel, piston, piston shaft (10) and spindle (9)
- Remove compression piece (18) and top valve ring using ring extractor hook, (see Fig. 2) *)
- Remove lantern gear using lantern bush (5) extractor, (see Fig. 3) *)
- Remove bottom valve ring (14) with ring extractor hook *)
- ***) Be careful not to damage the housing bore of the valve body**
- Clean the valve body and the valve ring seat, if necessary with fine sandpaper
- Remove bonnet valve ring (16) from bonnet neck
- Loose hexagon nut (30), remove serrated lock washer (35) and hand wheel (3)
- Unscrew hexagon nuts (29), remove Belleville washer (34) and lift off gland retainer (11)
- Unscrew the spindle downwards out of the threaded bush (20)
- Pull the piston shaft with the spindle down till it is out of the stuffing box ring (17)
- Tap the spacer (22) to remove the stuffing box ring set

Attention: Whenever the valve ring is replaced, always check at the same time that the piston/spindle/bonnet assembly is functioning properly. Check that:

- a) the outer cylinder surface of the piston and piston shaft is smooth and unmarked.
- b) the spindle head moves freely in the two-part screwing
- c) the trapezoid thread of the spindle is not unduly worn and
- d) there is no excessive play between spindle and nut threads (in the bonnet and threaded bush)

If none of the above components needs replacing, lubricate the trapezoid thread and the neck of the bonnet with a suitable lubricate, such as Metaflux Lubricating Metal Paste 70-85 before reassembling the valve.

If the spindle needs to be replaced we suggest to change always spindle and threaded bush as well. If the above mentioned parts need replacement, proceed as follows:

- Tap the tension pin (31) out of the bonnet (inwards)
- Detach the wire ring (26) and Piston nose cone (13) from the piston
- Clamp the piston shaft in a vice

Attention: Imperatively use soft clamping jaws

- Unscrew hexagon nut (28) **Attention:** left-hand thread) and disc (23) remove piston and piston cone(19).
- Clamp the bonnet in the vice and unscrew the threaded bush using spindle, piston shaft and hand wheel (see Fig.4)
- Clamp the piston shaft in the vice

Attention: Imperatively use soft clamping jaws

- Undo the two-part screwing (21)

Attention: Left-hand thread

- Remove the disc (12) from the piston shaft

Assembling Spindel Piston Shaft Piston

- Clamp the piston shaft (10) in the vice

Attention: Imperatively use soft clamping jaws

- Place the disc (12) and mount the spindle (9) into the piston shaft (after thoroughly lubricating the spindle head with suitable lubricant) with the two-part screwing (21)
- Mount the piston cone (19) into the piston and then mount on the piston shaft after thoroughly lubricating the piston cone
- Place disc (23) and tighten hexagon nut (28)
- Place piston nose cone (13) and mount wire ring (26)

Assembling Bonnet Unit

- Screw threaded bush (20) into bonnet (2), and pin together with tension pin (31)
- Clean stuffing box bore and neck of bonnet
- Place spacer (22) in stuffing box bore and position stuffing box rings (17) on stuffing box bore. Mount stuffing box rings in use of the gland retainer (11) (see Fig..5)

Attention: Particular care should be taken to ensure that the stuffing box rings are inserted correctly with the gland retainer

- Mount gland retainer (11) and secure with swing bolt (24) and hexagon nuts (29) and Belleville washer (34)

Attention: Do not tighten hexagon nuts!

- *Insert spindle (9), piston shaft (10) and piston (4) from underneath into the stuffing box ring set thoroughly lubricate the spindle with Metaflux Lubricating Metal Paste 70-85 or a comparable lubricant and screw it into the threaded bush*
- *Tighten hexagon nut (29) with torque wrench to specified torque*
- **See technical data sheet page 11**
- *Mount the hand wheel (3) and the serrated lock washer (35), screw on the hexagon nut (30)*

Assembling Body and Bonnet Unit

- *Mount the bottom valve ring (14) with the mounting tool (for DN 65 – 200 see fig.6 for DN 100 – 200 see Fig. 7)*
- *Insert the cleaned lantern bush (5), ensuring that no teeth are on the valve outlet side (optimised Kv value)*
- *Mount the top valve ring (14) with the mounting tool*
- *Place compression piece (18)*
- *Press the bonnet valve ring (16) into the body bore with mounting tool*

Attention: *The bonnet valve ring must under no circumstances be pulled over the bonnet*

Attention: *Take particular care to ensure that the valve rings (14) are inserted correctly with the Mounting tool. Do not use grease or lubricant when mounting the valve ring .*

- *Screw spindle (9) with piston (4) into bonnet as far as it will go (turn hand wheel (3) anti-clockwise)*
- *After thoroughly lubricating the bonnet neck with a suitable lubricant, position bonnet (2) on valve body and tap into the body with a plastic hammer until the stud bolts (25) protrude far enough out of the bonnet block flange (about two threads) for the hexagon nuts (27) to be screwed on*
- *Screw on hexagon nuts (27)*
- *Now close valve completely and open it again (when it opens, the bonnet withdraws into the valve body)*
- *Position Bellville washer (33) and tighten hexagon nuts*
- *Close valve completely (turn hand wheel clockwise)*
- *Tighten hexagon nuts with torque wrench in diagonal order to specified torque*

For torque specification, see **Technical data sheet page 11**

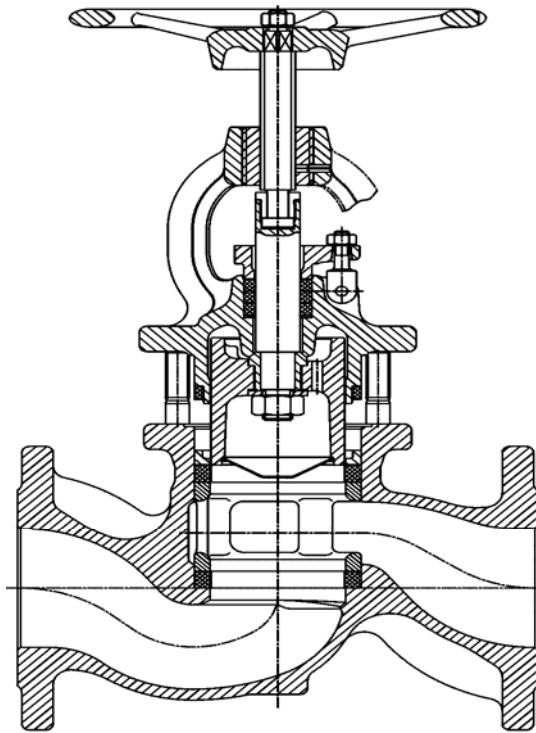


Fig. 1

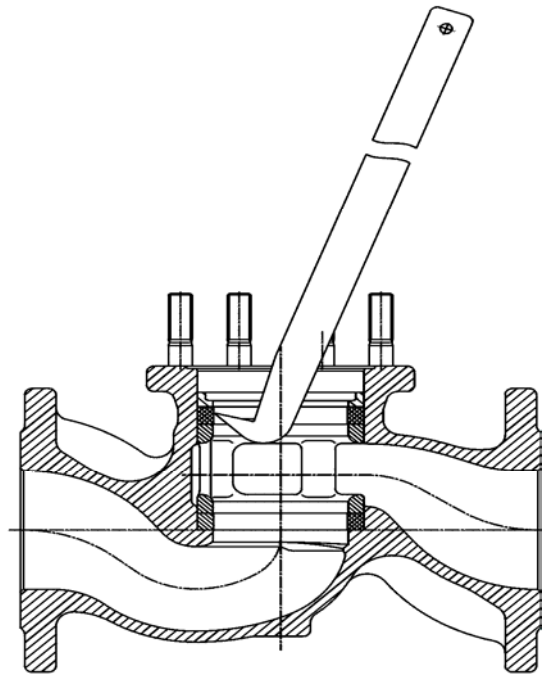


Fig. 2

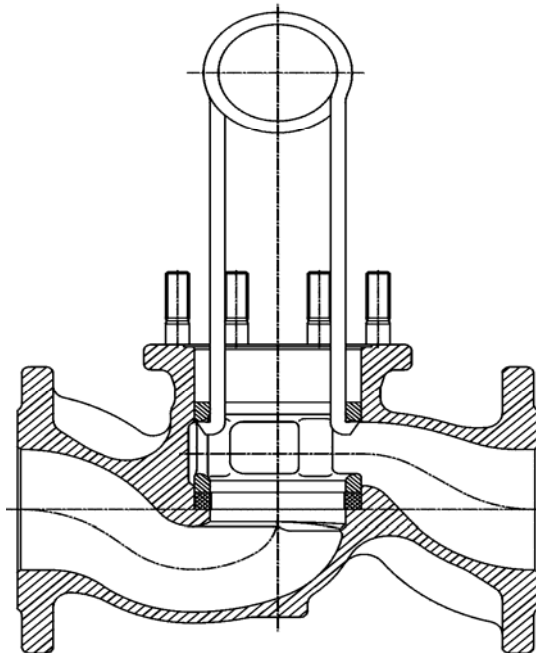


Fig. 3

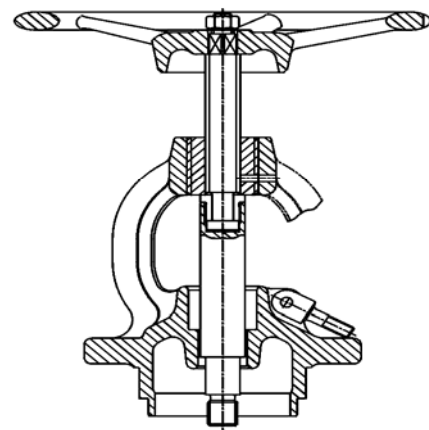


Fig. 4

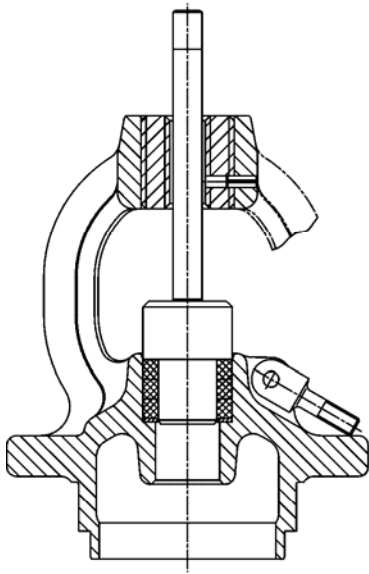


Fig. 5

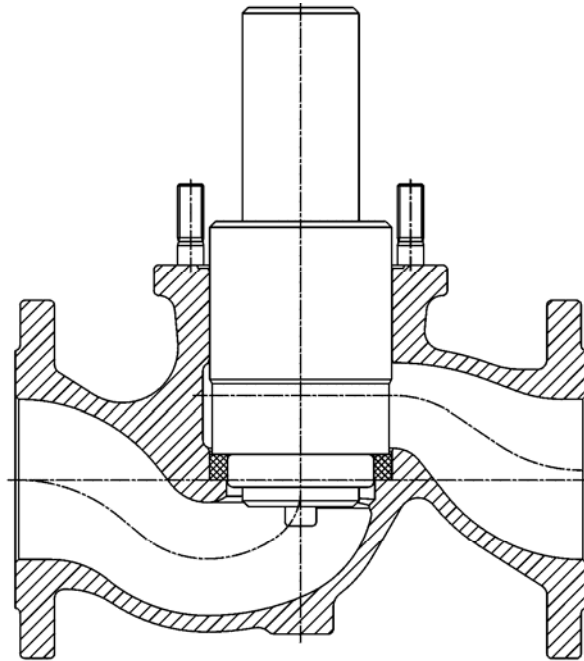


Fig. 6

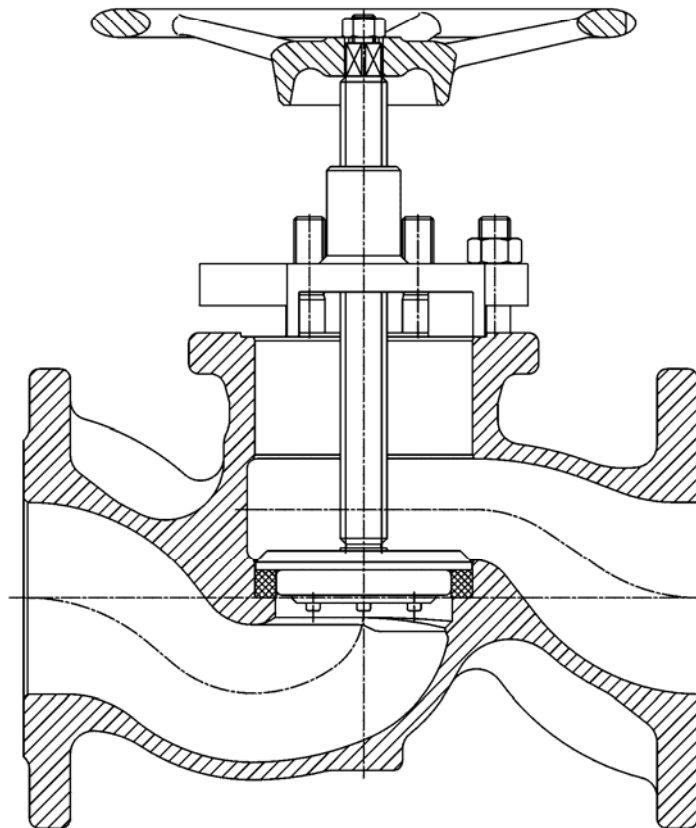


Fig. 7

Tightening Torques

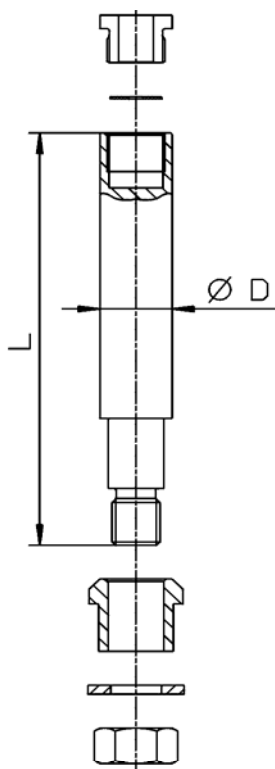
Connections: Body-bonnet			
	Stud bolt		Tightening Torque [Nm]
DN	Dimension	piece	KX -GT
65	M 16 x 55	4	20
80	M 16 x 55	6	15
100	M 16 x 60	8	20
125	M 20 x 75	6	20
150	M 20 x 75	8	20
200	M 24 x 75	8	40

Notes upon Torques:

The values specified are guide values and apply to lubricated nuts and bolts.
With valves that have been in service for a long time and already are worn-out on the sealing surface or in the case of gaseous medium , where leakage is detected under high pressure, the tightening torques can be increased by max. 40 %.

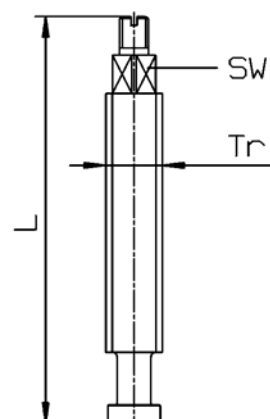
Connection: Bonnet-Gland retainer			
	Stud bolt		Tightening Torque [Nm]
DN	Dimension	piece	KX - GT
65	M 10 x 50	2	8
80			8
100			15
125			15
150			15
200			15

piston shaft complet



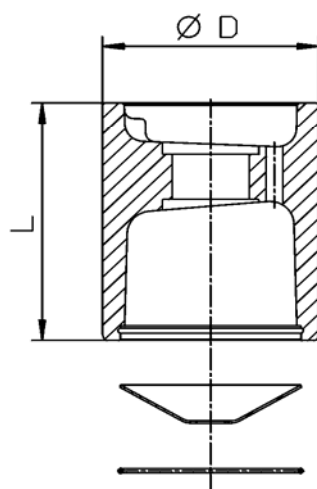
DN	D	L
65	24	130,5
80	24	142,5
100	30	183
125	30	206
150	30	206
200	30	240

spindle



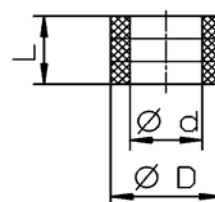
DN	Tr	L	SW
65	22 x 5	163	14
80	22 x 5	163	14
100	24 x 5	180	14
125	24 x 5	218	14
150	24 x 5	218	14
200	24 x 5	247	14

piston complet



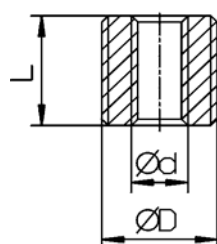
DN	D	L
65	60	77,5
80	70	88,5
100	90	105,5
125	110	125,5
150	130	139,5
200	170	168,5

stuffing-box-ring-set KX - GT



DN	D	d	L
65	36	24	24
80	36	24	24
100	46	30	30
125	46	30	30
150	46	30	30
200	46	30	30

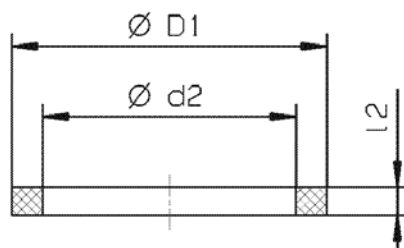
threaded-bush



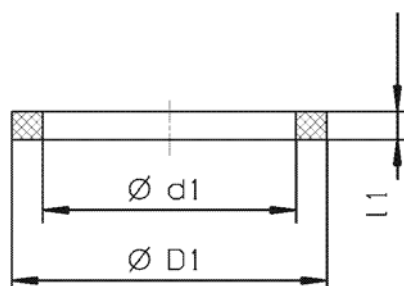
DN	D	d	L
65	M 40 x 1,5	Tr 22 x 5	40
80	M 40 x 1,5	Tr 22 x 5	40
100	M 48 x 1,5	Tr 24 x 5	48
125	M 48 x 1,5	Tr 24 x 5	53
150	M 48 x 1,5	Tr 24 x 5	53
200	M 48 x 1,5	Tr 24 x 5	53

Valve ring KX - GT

Bonnet valve ring (Pos. 16)



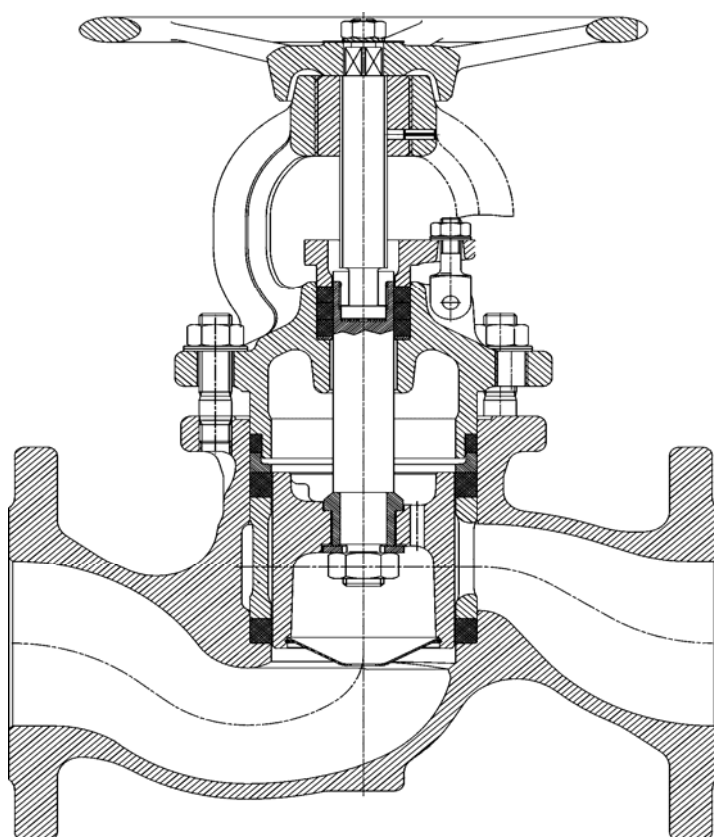
Valve ring top/ bottom (Pos. 14)



DN	D ₁	D ₁	l ₁	d ₂	l ₂
65	82	60	13,3	69	10
80	94	70	14,6	80	10
100	112	90	14,6	100	11
125	135	110	16,0	121	13
150	155	130	17,3	141	13
200	200	170	18,6	184	15

Operating instructions for the rebuilding of a piston valve Type KVN to a regulating piston valve KVRLN

Klinger-regulating piston valves KVRLN are adjusted with a regulating lantern. Therefore the throughflow direction is almost linear which facilitates the regulation of the media flow. The sealing system correspond to the piston valve principle. The Closing function can be applied same as with the normal piston valve.



For the rebuilding of a piston valve KVN to a regulation piston valve KVRLN please refer to this KLINGER mounting and operating instruction .

The lantern (KVN-Standard) has to be replaced by a regulating lantern.

After that the valve can be assembled again according the mounting instructions.

See catalogue for fitting dimensions, pressure ratings, materials and application limits.
