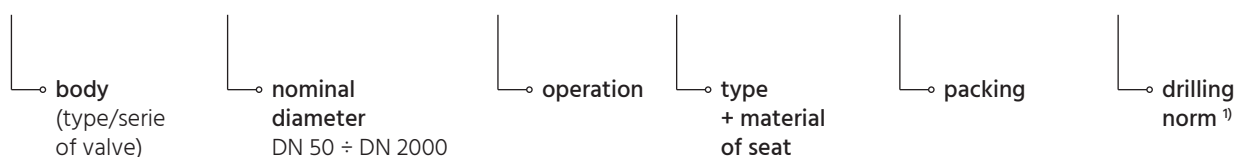


KNIFE GATE VALVES

GENERAL DATA

COMPOSITION OF VALVE CODE

A3 - 200 - V - 6E - SP / PN



¹⁾ Does not always mean maximum permissible operating pressure! The maximum working load of the individual types of knife gate valves is given in the respective data sheets.

BODY

Code	Type of body	DN	PN	Mat. of body/mat. of knife
A1	wafer	50-1200	10	cast iron EN GJL-250 ²⁾ /AISI304
A3	wafer	50-1200	10	stainless steel ASTM A351 CF8M/AISI316
AB1	wafer, bidirectional	50-600	10	cast iron EN GJL-250 ²⁾ /AISI304
AB3	wafer, bidirectional	50-600	10	stainless steel ASTM A351 CF8M/AISI316
C2	flanged, with square bore	125×125 to 1400×1400	-	carbon steel EN 10025 S275 JR ²⁾ /AISI304
C3	flanged, with square bore	125×125 to 1400×1400	-	stainless steel AISI316/ AISI316
D2	flanged, with bonnet	50-1200	6-100	carbon steel ASTM A216 WCB ²⁾ /AISI304
D3	flanged, with bonnet	50-1200	6-100	stainless steel ASTM A351 CF8M/AISI316
F1	wafer, under silo	50-1200	10	cast iron EN GJL-250 ²⁾ /AISI304
F3	wafer, under silo	50-1200	10	stainless steel ASTM A351 CF8M/AISI316
GL1	reinforced, bidirectional	50-1400	10	ductile iron EN GJS-500 ²⁾ /AISI304
GL3	reinforced, bidirectional	50-1400	10	stainless steel ASTM A351 CF8M/AISI316
K1	wafer, with bonnet	50-1400	10	cast iron EN GJL-250 ²⁾ /AISI304
K3	wafer, with bonnet	50-1400	10	stainless steel ASTM A351 CF8M/AISI316
L1	wafer, 2-PC body with through knife	50-1200	10	cast iron EN GJL-250 ²⁾ /AISI304
L3	wafer, 2-PC body with through knife	50-1200	10	stainless steel ASTM A351 CF8M/AISI316

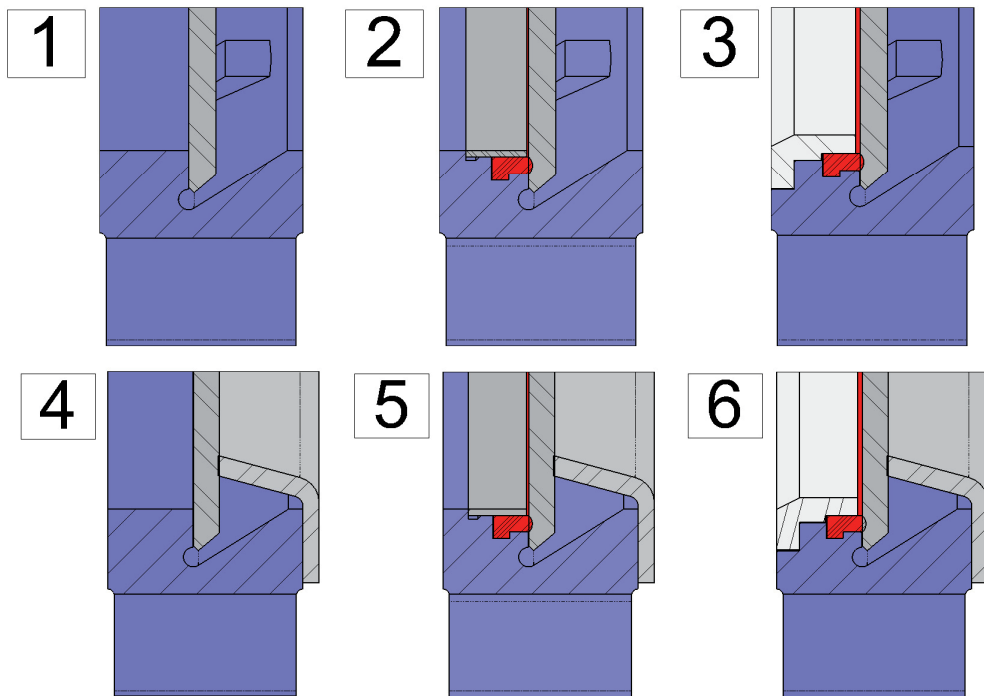
²⁾ Epoxy coated 80 µm, RAL 5015

Note:

Other body materials (AISI 316Ti, Duplex), other knife materials and their treatment (high mirror shine, coated (Stelit), with PTFE) on request.
 Other types of protective coatings, including heavy corrosion protection of cast iron elements in GSK water supply, on request.

SEAT

Fig. 1



Type of seat

- 1 metal-metal
- 2 metal-elastomer
- 3 metal-elastomer with scraper to protect the seat from abrasion
- 4 metal-metal with deflector to protect the body from abrasion
- 5 metal-elastomer with deflector to protect the body from abrasion
- 6 metal-elastomer with scraper to protect the seat from abrasion and with deflector to protect the body from abrasion

Tighttness (%)

- 98,8
- 100
- 100
- 98,8
- 100
- 100

Code of seat	Material of seat	Max. temperature (°C)
1M (metal-metal)	as material of body	≥ 250
2E (metal-EPDM)	ethylene propylene (EPDM)	90
3E (metal-EPDM, with scraper)	ethylene propylene (EPDM) + CF8M	90
4M (metal-metal, with deflector)	material of body + CF8M	≥ 250
5E (metal-EPDM, with deflector)	ethylene propylene (EPDM) + CF8M	90
6E (metal-EPDM, scraper + deflector)	ethylene propylene (EPDM) + CF8M	90

Code of seat	Deflector (15°)	Material	Other material variants
4,5,6	Deflector (15°)	CF8M	CA15, Ni-hard
3,6	Scraper	CF8M	CA15, Ni-hard

Other material variants:

Code	Material of seat	Max. temperature (°C)
N	nitril (NBR)	90
V	viton (FPM)	190
S	silikon (WVQ)	200
P	teflon (PTFE)*)	250

*) for pH = 2 to 12, 100% tightness cannot be guaranteed

Deflector (15 °), scraper: CA15, Ni-hard

PACKING

Code	Material of packing	Max. temperature (°C)
A	cotton	100
AP	cotton + PTFE	120
SP	syntetic fibre + PTFE	180
P	PTFE	250
G	graphite	650
CF	ceramic fibres	1400

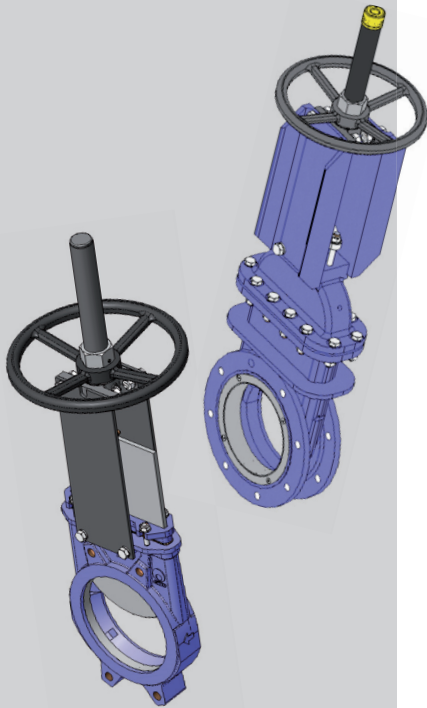
Note:
For a specific working medium, working pressure and industrial application, the maximum application temperature may be different from the tables (significantly lower). Therefore, please contact our sales department in order to select the appropriate type of seat and mterial of seat and packing.

OPERATING

Code	Type of operating
V	hand wheel
R	gear box with hand wheel
P	quick-closing lever
C	chain wheel
N	pneumatic actuator (min.pressure of control air = 6 bar)
M	electric actuator

KNIFE GATE VALVES

INSTALLATION AND MAINTENANCE INSTRUCTIONS



PRODUCT DESCRIPTION

The main purpose of the knife gate valves is to close the working fluid flow through the pipeline or under the silo (hopper).

Knife gate valves are marked as follows:

- manufacturer identification (logo)
- Identification of the type / series of the knife gate valve
- nominal diameter DN (mm)
- nominal pressure (PN)
- Identification of way of operating
- material of the body, knife and seat
- CE marking (manufactured in accordance with PED 2014/68 / EC)
- marking the device in potentially explosive atmospheres (ATEX 94/9 / EC)
- production date (year, month)
- weight (kg)

TRANSPORT AND STORAGE

Store the knife gate valves in a well-ventilated room below 30 ° C and protect against dirt and mechanical damage.

It is not recommended to expose valves to direct negative effects of wind, rain, frost or sunlight. This recommendation is even more important in places with high humidity or in salty environments.

If outdoor storage cannot be avoided, always keep the sliding gate valves covered and ensure ventilation.

Store the valves with the knife in the slightly open position.

During long-term storage, it is important to keep the slide parts lubricated. For this reason, it is recommended to perform regular lubrication checks and, if necessary, lubricate the threads of stem and stem nut.

Observe the following when handling the knife slide:

Do not clamp the valve into the lifting device by the spindle, actuator, support plates or yoke.

These components are not designed to withstand the load and could therefore be damaged.

Do not clamp the valve into the lifting device beyond the flow port. There is a risk of damaging the body and seat surface.

When using a lifting device to handle of the knife gate valve, it is best to screw 2 or more bolts with eye into the threaded holes on the knife gate valve body and use them for handling the valve.

WARNING!!!

- Check that the lifting device has a sufficient capacity to handle of the valve
- Check that the threaded holes in the knife gate body and the eyebolts have the same thread and if they are secure.
- When lifting is during assembly, we recommend the fitting by the upper part of the body on belts made from soft material.

INSTALLATION INSTRUCTIONS

Prevention of personal injury and property damage caused by leakage of working fluids:

- the persons responsible for installation, operation and maintenance are qualified and trained in the installation and operation of the valve
- the workers use personal protective equipment (gloves, safety shoes, etc.)
- the piping connected to the valve is depressurized during assembly/ disassembly and the valve is without working medium

Before installation, check:

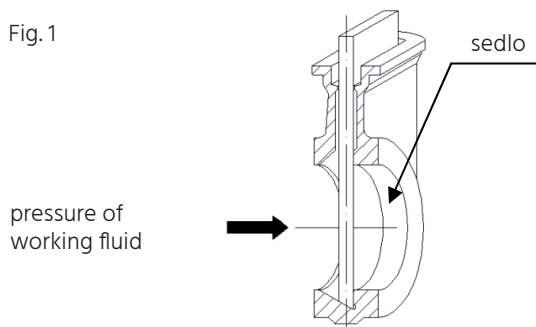
- that the body and other parts of the knife gate valve have not been damaged during transport and storage
- that the internal spaces of the valve, flange and pipe are clean
- that the marking on the valve corresponds to the design parameters of the equipment (eg DN, pressure, material, etc.) and the installation is according to the permissible flow direction
- that the speed of flow of the working fluid at the installation site is in recommended speed range

Weld the pipeline to the flanges at a sufficient distance to prevent heat damage.

Before fitting the valve between the flanges, both flanges must be sufficiently cooled after welding into the pipeline and without deformation.

Most of the knife gate valves are unidirectional (A, C, D, F) and are marked with an arrow on the body indicating the direction of flow of the working fluid.

There is also a SEAT marking on one side of the body, which means the side of the body on which the seat is placed. The inlet side is standard on the seat side (fig. 1)



In rare cases (especially type A), mounting in the opposite direction to that indicated by the arrow on the body is also possible.

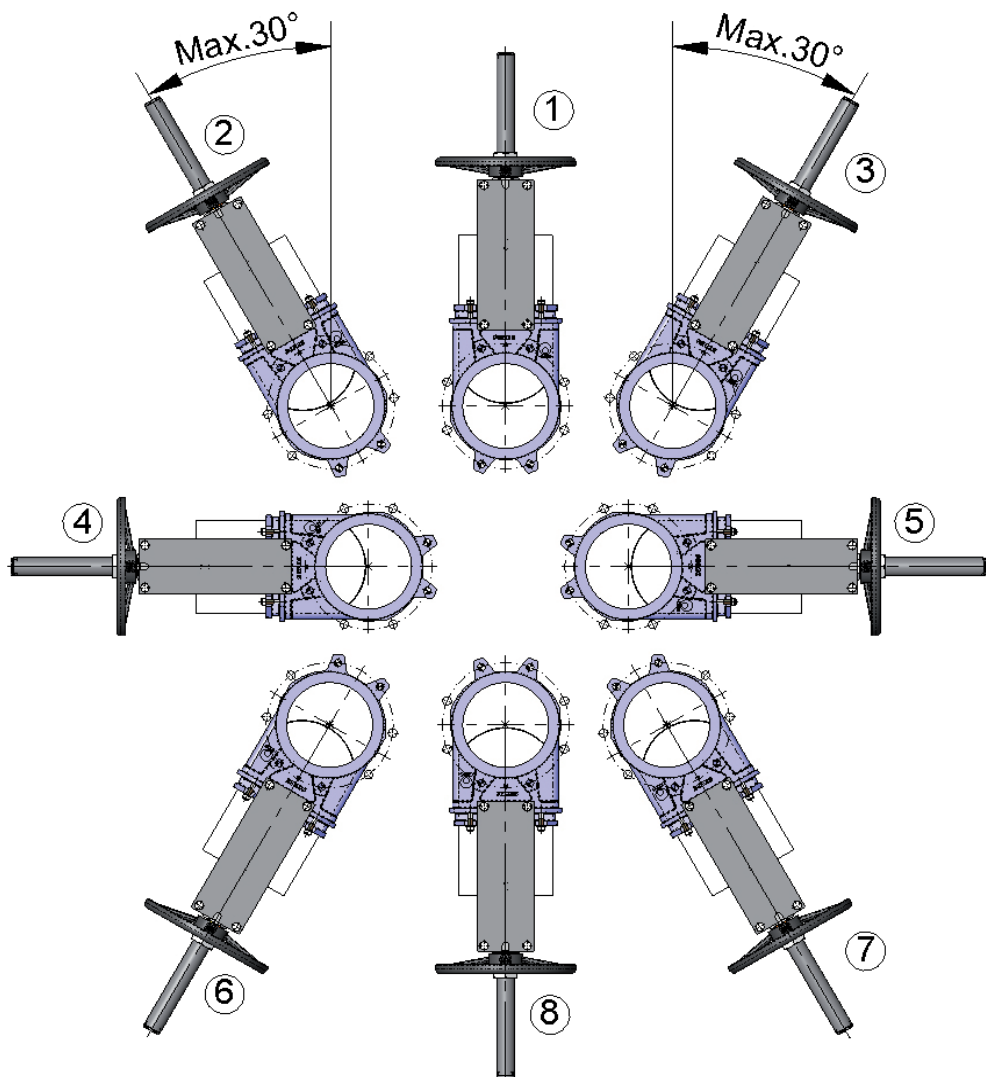
Knife gate valves type AB, GL and L (this type is equipped with two seats) do not have an arrow with direction of flow on the body and are mounted as bidirectional valves.

Note:

The operator of knife gate valve is responsible for the installation and correct orientation of the valve relative to the flow direction. In order to confirm the correct orientation of the valve, please contact our sales department.

Mounting position of the knife gate valve in horizontal piping

Fig. 2



The knife gate valves $DN \leq 200$ with manual operating can be installed in the horizontal piping in the positions shown in Fig. 2, but in the case of very dirty working media, positions 6, 7 and 8 are not suitable as the packing may be damaged by dirt from the working medium.

For $DN \geq 250$ operated by electric or pneumatic actuator, the mounting position 1 is recommended in which no additional load is applied to the knife.

If installation in position 1 is not possible, mounting positions 2 to 5 are usable, but it is necessary to provide suitable support of the actuator (props, hangers) and to support the knife (design adjustment, skids).

Standard installation position of GL knife gate valve is 1. If it is necessary to install this type in positions 2, 3, 4, 5, 6 or 7, please contact our sales department.

Mounting position of the knife gate valve in vertical or inclined piping

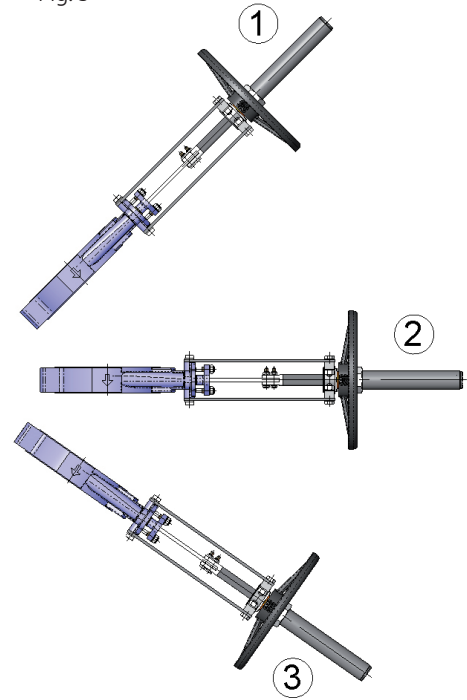
Fig. 3

Position 2 is the mounting position of the knife gate valve in the vertical pipe.

Standard mounting position for type F is position 1.

Appropriate support of the actuator must be provided for knife gate valves operated by electric or pneumatic actuator (props, hangers) to prevent additional load on the knife.

For mounting positions 1 and 3 in oblique piping, the actuator of the knife gate valve must be supported or suspended in a suitable way and the knife must also be supported by suitable adjustment. In position 3 in case of very dirty working media, the packing can be

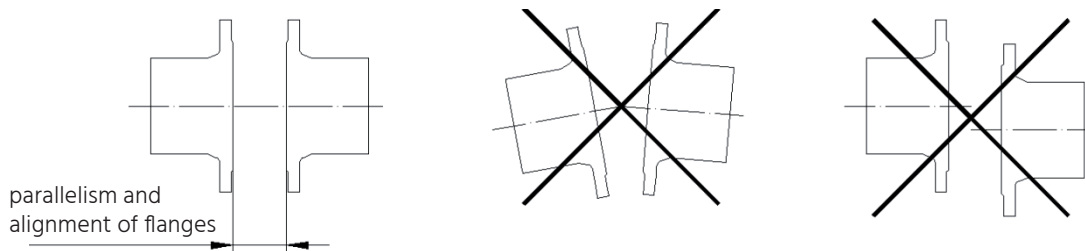


Mounting between flanges

The knife gate valves are mounted between the flanges with the knife in the **OPEN** position.

There must be the correct distance between the flanges and the flanges must be parallel to the body of valve (Fig. 4). Incorrect alignment of body and flanges can cause deformations that can lead to problems during operation.

Fig. 4



Mounting between flanges requires flat flange gaskets, bolts and studs (both of suitable lengths), washers and nuts.

For safe connection of the valve between the flanges, bolts are used along the circumference of the valve, studs are used in the upper part of the valve.

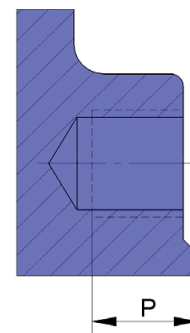
First install the valve with studs and place it together with the gasket between the flanges. The arrow on the body must match (except in the case of type A) the flow direction of the working substance.

Align the valve, insert the bolts through the holes in flanges and fit the nuts and gradually tighten (crosswise).

The following table 1 shows the maximum torque of the studs and the maximum depth (P) of the threaded holes in the body of knife gate valves type: A, AB, F, D, L, GL and C.

Table 1

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200
P (mm) type A	8	8	9	9	9	10	10	12	12	21	22	22	22	22	22	22	20	20	22
P (mm) type F	8	8	9	9	9	10	10	12	12	21	22	22	22	22	22	22	21	21	30
P (mm) type L	10	10	12	12	12	17	16	19	19	28	28	28	34	26	25	22	21	21	30
P (mm) type D	12	12	12	12	16	16	16	20	18	19	22	24	24	30	35	35	35	40	40
torque (Nm)	45	45	45	45	45	88	88	88	88	88	152	152	152	223	223	303	303	412	529



type GL																					
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1300	1400
P(mm)	14	14	14	14	15	15	17	17	20	21	23	24	25	26	26	26	26	27	29	29	30
torque (Nm)	45	45	45	45	45	88	88	88	88	88	152	152	152	223	223	303	303	412	529	529	685

type C																			
DN	125 x 125	150 x 150	200 x 200	250 x 250	300 x 300	350 x 350	400 x 400	450 x 450	500 x 500	550 x 550	600 x 600	650 x 650	700 x 700	750 x 750	800 x 800	900 x 900	1000 x 1000	1200 x 1200	1400 x 1400
P(mm)	8	8	8	8	8	8,5	8,5	8,5	8,5	8,5	8,5	8,5	9	9	9	10	10	10,5	10,5
torque (Nm)	20	20	20	20	20	25	25	25	25	25	25	25	30	30	30	30	30	30	30

THE SAFETY OF OPERATION IS ALWAYS DETERMINED BY THE QUALITY OF THE FITTING OF THE VALVE INTO THE PIPING SYSTEM.

After installing of the knife gate valve in the pipeline check that:

- all bolts and nuts (flange connection, gland packing, control connection) are properly tightened
- all electric or pneumatic connections are safe

If the knife gate valve has the electrical accessories or is in ATEX explosion-proof zone, check that the valve is conductively connected to the pipeline and ground the pipeline before operating it.

Operating:

- **handwheel** - the most used and easy way of operation, can be used with rising or non-rising stem, opening (closing) is done by turning the handwheel to the left (right)
- **quick-closing lever** - it is necessary to loosen the lock wing nut, after opening (closing) it is necessary to secure the spindle against movement using the wing nut again
- **pneumatic actuator** - knife gate valves are supplied with double-acting or single-acting pneumatic actuator, the control air pressure has to be min. 5-6 bar, the air must be dry, free of mechanical impurities and lubricated
- **electric actuator** - depending on the type of electric actuator, the wiring diagram with relevant assembly instructions are supplied with the valve

WARNING!!!

Before pressure test of the pipeline or valve always take into account the assumed maximum differential pressure.

TIGHTENING OF THE PACKING

Checking of tightness of packing is very important after pressurizing of the pipeline. In case of leakage (leakage of media through the packing!), tighten the packing gland screws. However, too tight a torque can lead to problems, such as increasing of control torque of the valve, reducing of service life of packing, damage of packing gland or body of valve.

Table 2 shows the recommended tightening torques for screws of packing gland of knife gate valve types: A, AB, F, L, D, GL and C.

Table 2

Type A, AB, D, F, L, GL		Tightening torque (Nm)
DN 50 - 125		25
DN 150 - 300		30
DN 350 - DN 1200		35
Type C		Tightening torque (Nm)
125 × 125 až 750 × 750		5
800 × 800 až 1400 × 1400		11

OPERATION AND MAINTENANCE

The service life of knife gate valves depends primarily on the working conditions - pressure, temperature and chemical composition of the medium and the suitably chosen type of knife gate valve design.

Regular maintenance consists of tightening the bolts of packing gland (depending on the operating cycles open - close), lubrication of the stem, lubrication of the stem nut by means of a stuffing box and lubrication of the knife for its smoother movement.

Maintenance schedule and schedule of lubrication of knife depending on the number of operating cycles (open-close) for the most common applications (eg. in wastewater treatment technology)

Number of cycles open-closed/day	Inspection interval - action	Stem lubrication interval	Nut bearing lubrication interval
0 - 10	1× per month check, tighten of packing	1× per month check, lubricate the thread if necessary	1× per month lubricate using a hand press
10 - 20	1× per week check, tighten of packing	1× per month check, lubricate the thread if necessary	1× per month lubricate using a hand press
30 - 50	1× per week check, tighten of packing	2× per month check, lubricate the thread if necessary	2× per month lubricate using a hand press
50 - 100	1× per week check, tighten of packing	1× per week check, lubricate the thread if necessary	1× per week lubricate using a hand press
100 - 200	2× per week check, tighten of packing	2× per week check, lubricate the thread if necessary	2× per week lubricate using a hand press

STEM LUBRICATION

The knife must be in the OPEN position. After removing the protective cover of the stem, apply suitable lubricant on the part of the thread that extends beyond the stem nut. It is also advisable to apply lubricant to both sides of the knife, close the knife and remove excess grease from the stem nut and packing gland.

Furthermore, when valve is fully closed, apply the lubricant appropriately to the thread (in the case of mounted knife support plates, it is necessary to dismantle them), open the valve and remove the excess lubricant from the stem nut.

After lubrication, it is advisable to perform one open-close cycle and visually check the condition of the stem after passing through the stem nut (uniform color over the entire thread surface).

Stem nut lubrication

For lubrication of the stem nut use a suitable lubricant and press one through the stuffing box located in the stem nut bearing. If the knife remains in one position for a longer period of time, it is advisable to perform open - closed cycle at least four times a year.

Recommended lubricant: Klüberplex BE 31-502

The data in the catalog are informative and the supplier reserves the right to make technical changes.