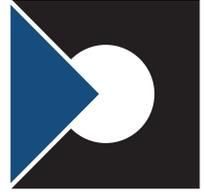


# watergates

knife-gate-valves - Stoffschieber



## ***Knife - Gate - Valves*** ***Operation and Installation Manual***



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## 1 Foreword

Dear customer,  
Dear assembler / user,

these operation and installation manuals are intended to give you the knowledge which is necessary for you to be able to carry out the mounting and adjustment of a knife-gate-valve rapidly and correctly.



**Please read these instructions carefully and pay particular attention to the advice and warning notes.**

Only instructed and qualified mechanic should mount, adjust or maintain the knife-gate-valves.

If you have any questions in relation to the knife-gate-valves we shall be pleased to answer them. The telephone number will be found on the inside cover of these operation and installation manual.

Yours  
**Watergates GmbH & Co. KG**

## 2 General advice

### 2.1 Validity

These mounting and installation manual is valid for the standard version of the knife-gate-valve WG.

### 2.2 Inward monitoring

Please check

- directly after delivery the knife-gate-valve for any transport damages and deficiencies.
- with reference to the accompanying delivery note the number of parts.

Do not leave any parts in the package.

### 2.3 Complaints

Claims for replacement or goods which relate to transport damage can only be considered valid if the delivery company is notified without delay.

In case of returns (because of transport damage / repairs), please make a damage protocol and send the parts back to the manufacturer, if possible in the original packaging.

In case of a return, please mention the following:

- Name and address of the consignee
- Stock-/ ordering-/ article-number
- Description of the defect

### 2.4 Guarantee

For our knife-gate-valve we give a guarantee period in accordance with the sales contract. The end of the normal duration of life of the wearing parts represents no defect.

The warrenty and guarantee rules of **Watergates GmbH & Co. KG** are applicable.

### 2.5 Symbols and their signification



Paragraphs which are identified with this symbol contain very important advices; this also includes advices for averting health risks. Observe these paragraphs without fail!



Paragraphs which are identified with this symbol contain very important advices, this also includes how to avoid damage to property. Observe these paragraphs without fail!



This symbol indicates paragraphs which contain comments / advices or tips.



This spanner identifies the description of actions which you should carry out.

## 3 Safety advice

Depending on the technical circumstances and the time under and at which the knife-gate-valve is mounted, adjusted and commissioned, you must in each case take into account particular safety aspects!

If, for example, the valve works in an operational chemical plant, the potential hazards of commissioning have another dimension from that when this is only being carried out for test purposes in a „dry“ part of the plant in the assembly room.

Since we do not know the circumstances at the time of the mounting / adjusting / commissioning you may find advice on hazards in the following description which are not relevant to you.

Please observe (only) the advice which applies to your situation!

### 3.1. Personal protection

#### 3.1.1. Safety advice for mounting



**We wish to point out expressly that the mounting, the electrical installation and the adjustment of the knife-gate-valves and the accessories must be carried out only by trained specialist personnel having mechanical and electrical knowledge!**



**At first switch off all the devices / machines / plant affected by mounting or repair!  
If appropriate, isolate the devices / machines / plant from the mains.**



**Check (for example in chemical plants) whether the switching off of devices / machines / plant will cause potential danger!**



**If appropriate, in the event of a fault in the knife-gate-valve valve (in a plant which is in operation) inform the shift foreman / safety engineer or the works manager without delay about the fault, in order, for example, to avoid an outflow / overflow of chemicals or the discharge of gases in good time by means of suitable measures!**



**Before mounting or repair, remove the pressure from pneumatic / hydraulic devices / machines / plant!**



**Empty the conduit from medium.**



**If necessary, set up warning signs in order to prevent the inadvertent starting up of the devices / machine / plant.**



**Observe the respective relevant professional safety and accident prevention regulations when carrying out the mounting / repair.**



**Check the correct functioning of the safety equipment (for example the emergency push off buttons / safety valves, etc.)!**

#### 3.1.2. Safety advice for adjustment and starting



**As a result of the starting of a knife-gate-valve the flow of gases, steam, liquids, etc. may be enabled or interrupted. Satisfy yourself that, as the result of the starting or the test adjustment of the knife-gate-valve, no potential hazard will be produced for the personnel or the environment!**

## Safety Advice

---

 If necessary, set up warning signs in order to prevent the inadvertent starting up or shutting down of the devices / machines / plant.

 By ending mounting check the correct function and the tightness of the valve.

 Check the right position and correct function of mounted limit switches(option).

 Through suitable measures, prevent actuating links being trapped by moving actuating elements!

 Check the right function of all safety devices (for example emergency off push buttons / safety valves, etc. )!

 Carry out the starting and the adjustments only in accordance with the instructions described in this documentation!

 When adjustments are being carried out on an opened and switch on (operational) limit switches or pilot valves, there is the risk that live parts(230V AC~) can be touched!

Therefore the adjustment must be carried out only by the electrician or a person having adequate training, who is aware of the potential hazard.

### 3.1.3 Safety advice for adjustment / starting

 Never try to repair or maintain a knife-gate-valve under pressure.

Before disassembling the knife-gate-valve some essential points should be clarified!



- Will the valve to be disassembled be replaced immediately by another?
- Could the valve remain in the pipe?
- If appropriate, does the production process of the plant need to be stopped?
- Is it necessary to inform specific personnel about the disassembly? etc.

 If necessary, inform the shift foreman / safety engineer or the manager about the disturbance without delay in order, for example, to avoid an outflow / overflow of chemicals or a discharge of gases in good time by means of suitable measures!

 Switch off the power and pilot media supply of the device / machine / plant.



If necessary, set up warning signs in order to prevent

- the inadvertent starting up of the devices / machines / plants, or
- the switching on of the pilot media supply, or
- the switching on of the medium.

 In case of a defect in the solenoid valve make contact to the supplier. The telephone number will be found on the back cover of these operation and installation manual.



If you determine that there is a damage to the knife-gate-valve, isolate it from the device/machine. However before doing this, it is essential to refer to the safety advice.



Don't mount the knife-gate-valve, start the knife-gate-valve or carry out any adjustments on it if the knife-gate-valve, the supply lines or the part of the plant on which it is mounted is damaged!



After a repair / maintenance check the right function of the knife-gate-valve and the tightness of all connections.



Also check the function of perhaps mounted accessories.

### 3.2 Device Safety

The knife-gate-valve

- is a quality product which is produced in accordance with the recognized industrial regulations.
- left the manufacturer's work in a perfect condition!



**In order to maintain this condition, as installer / user you must carry out your task in accordance with the descriptions in these instructions, technically correctly and with the greatest possible precision!**

We assume that you have, as a trained specialist, sound mechanical and electrical knowledge!



The knife-gate-valve must be used only for a purpose corresponding to its construction!



The knife-gate-valve must be used within the values specified in the technical data.



**Operate the knife-gate-valve inside the allowed temperature range.**

**Don't operate the knife-gate-valve with a pressure as higher as the nominal pressure.**

**Never remove the bonnet or other parts from the knife-gate-valve if it is under pressure.**



**Don't mount the knife-gate-valve, start the knife-gate-valve or carry out any adjustments on it if the knife-gate-valve, the supply lines or the part of the plant on which it is flange-mounted is damaged!**

By ending mounting check the correct function and the tightness of the solenoid valve und check the correct function.

# Name-plate

## 4 Name-plate

The knife-gate-valves will be provided with a name-plate, which permits a definite identification of the valves and shows the most important technical data to you. The name-plate should not be displaced or changed.



Fig. 4.1 - name-plate

<b>Art.No.</b>	article number of the valve
<b>Serial</b>	order- or production-number
<b>Pressure range (PS)</b>	max. admissible working pressure of the valve [bar]
<b>Temperature (TS)</b>	temperature range of the valve
<b>G / DN</b>	connecting size of the valve
<b>Testing pressure (PT)</b>	testing pressure of body
<b>Fluidgroup</b>	allowed fluid group of the valve
<b>Date of manufacturing</b>	month and year of manufacturing

## 5 Knife-Gate-valve

### 5.1 General

Before unpacking , mounting or using the knife-gate-valve you have to read the



→ safety advice

**If you have not read the safety advices until now please read these important advices now and turn back to this point.**

### 5.2 Corresponding use

Knife-gate-valves will be used to controll and to cut off medium flow.

It should only be used clean liquids and gases, on which the material of the knife-gate-valve will be resistant. It should also be used for pulverised and pasterised media and pouring goods if it suited to the knife-gate-valve. Pollution or using outside the nominal pressure range and/or the nominal temperature range should causes damages on the knife-gate-valve especially on the seals.

### 5.3 Operation

The knife-gate-valve will be opened or closed by actuating a hand wheel, handle or actuator.



**During the operation of the knife-gate-valve take care that there won't be insert any objects or limbs into the armature. If it is necessary you have to install a protective device. A lengthening of the control elements, e.g. by a handle, is not allowed**

### 5.4 Ambient conditions

Knife Gate Valves are conceived for rough operating conditions.

Nevertheless you have to observe something special by mounting and operating the knife gate valve.

Take care, that

- the knife gate valve will be mounted in accordance to the following advices.
- the knife gate valve will only be used within the values specified in the technical data.

The non-observance of the mounting instruction and/or the use outside the the specified technical values can affected the function of the knife gate valve.

## 6 Mounting / Disassembly

The mounting of a knife gate valve restricts to

- the installation of a hand wheel (only knife gate valves with hand wheel)
- the mounting into a conduit
- the pneumatic connection of the pilot cylinder at the pilot port (only at knife gate valves with pneumatic actuator)
- the mechanical and electrical mounting of accessories, e.g. pilot valve or limit switch



**In the following description we assume, that you have read the former chapters attentive. We also assume that you will observe the the safety advices and warnings form chapter 3. "safety advice" during the mounting / disassembly.**

**If you have not read chapter 3. "safety advices" until now, read these important advices now and turn back to this page.**

**The mounting and the electrical installation must be carried out only by trained speciaest personnel having mechanical and electrical knowledge.**

### 6.1 Installation of a handwheel

The handwheel of manual actuated knife gate valves especially for the bigger dimensions comes dismantels with the delivery, please assemble before installation (please refer to Fig. 6.1)

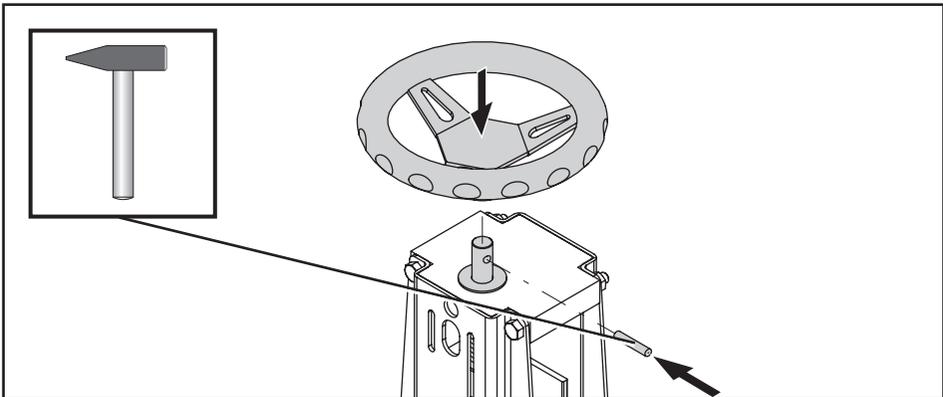


Fig. 6.1 - Knife-gate-valve, mounting a hand wheel

### 6.2 Mounting into conduit



Knife gate valves have to be installed between DIN- flanges (Ansi on request).



Please remove all packing material or e.g. protection caps from the knife-gate-valve.



Before mounting clean the pipes. Pollution will impair the duration of life of the knife-gate-valve.



The flanges have to be align parallel and centrally, must have carefully worked surfaces and have to be installed stress free.



The sealing takes place with suited flange sealings. Other sealing compounds are not allowed. Take care that there won't be insert any rest of sealing compounds or other pollutions into the knife-gate-valve.



The flanges should not be welded with the pipes if they are mounted at the knife-gate-valve. The high temperatures would destroy the sealings of the knife-gate-valve.



All knife-gate-valves should be installed vertically. For other installation positions e.g. horizontally it is necessary to ensure that especially for larger diameters adn actuators no bending stress appear at the stem/top- bridges, piston- stem etc., otherwise the function of the actuator and the tightness of the valve is not guaranteed.

In such cases protective features are definitely needed.(Please refer to Fig. 6.2)

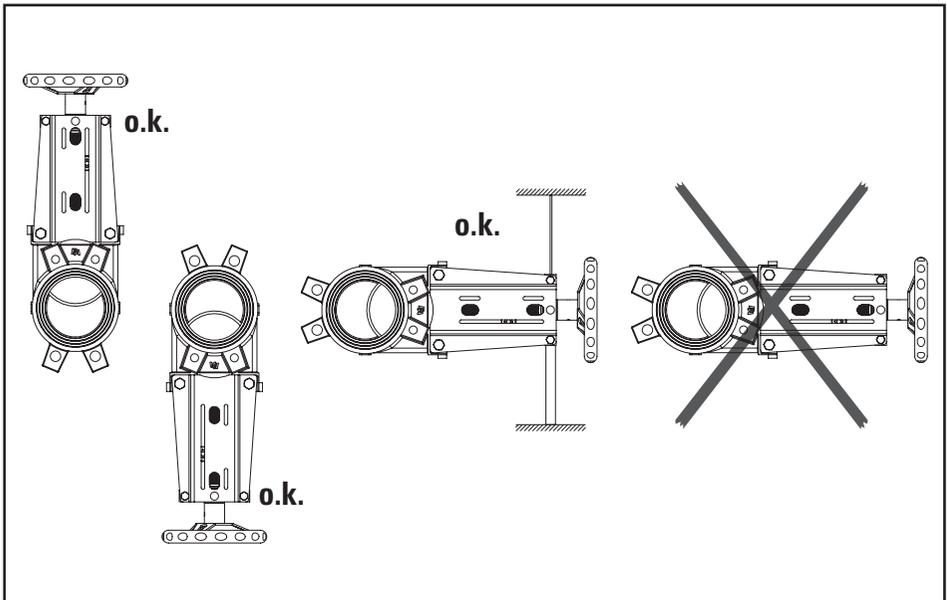


Fig. 6.2 - knife-gate-valve, installation positions

### 6.2.1 Mounting between two flanges



In the following discription we assume that you have mounted the flanges at the of the pipes and the ball valve (welded flanges) and they are cooled down.



The pressure discharge of the knife-gate-valve will be one-sided. The direction of the pressure discharge will be shown by an arrow on the body of the armature. Observe that the flow direction will not correspond with the direction of the pressure discharge in each case.



Push the knife-gate-valve between the flanges by using the appropriate sealings. This process must happen easily to avoid the damage of the sealings.(Please refer to Fig. 6.3)



Align the borings of the flanges and the knife-gate-valve and put some fit screws through the holes. Observe that the holes on the top of the armature`s flange are blind holes.



Screw the fit nuts onto the screws and tighten them up crosswise.



Fasten all screws crosswise and check the function of the knife-gate-valve, . Observe the maximum torque of the screws.



Check the tightness of all connections.

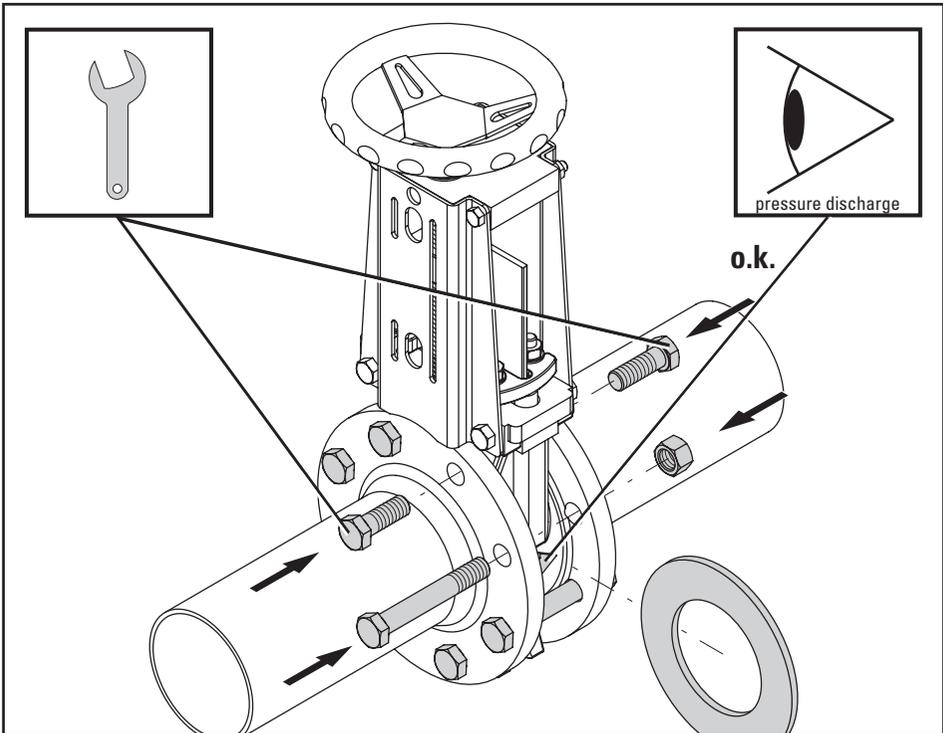


Fig. 6.3 - knife-gate-valve, mounting between two flanges

### 6.3 Pneumatical Installation



**The installation of the air supply have to take place with great care. Especially the threaded connections, fittings and sealings have to been cleaned and free of pollution. Pollution which attains inside the actuator, wil causes hasten wear and the damage of the sealings and the treads.**

The pneumatic actuator is available in two operation variants:

- function double acting, or
- function single acting with spring return.

Observe the descriptions to the name plate in chapter 4.



Use only the correct hose and pneumatic fittings for your application.



**By laying the hose take care, that the hose will not be creased, squeezed or shared or that the hose won't be layed over edges. Also take care that there will be no tension or stress in the hose.**



If appropriate lay the hoses in conduits or cable ducts.



As a alternative to the shown variant the control of the actuator could take place by a directly mounted pilot valve. In this case see the enclosed operation and installation manual of the pilot valve.

### 6.3.1 Function „double acting“

-  First remove the caps from the air supply ports P1 and P2.
-  Screw pneumatic fittings (e.g. Art C12xx or R12xx) with a fit sealing material into the supply ports and tighten them.
-  Insert the hose into the pneumatic fitting at port P1, this port will be under pressure by opening the knife gate valve.
-  Insert the hose into the pneumatic fitting at port P2, this port will be under pressure by closing the knife gate valve.
-  Fix the hoses into the fittings in such a way according to your choised pneumatic fittings.
-  Check the tightness of all the connections.

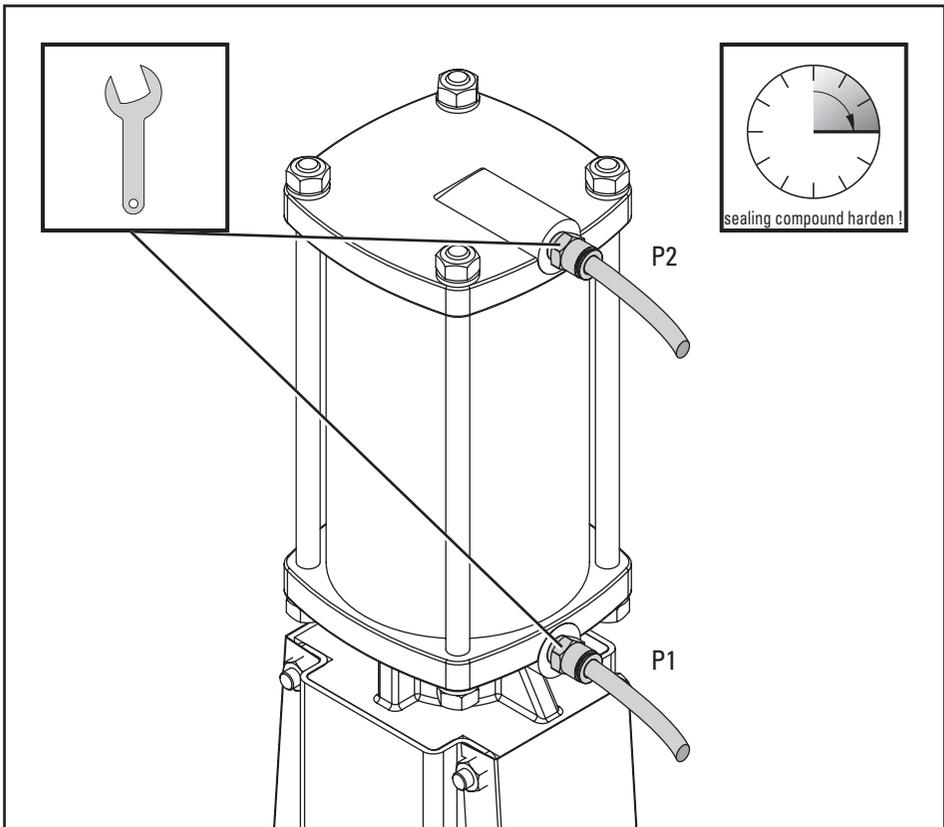


Fig. 6.4 - mounting / disassembly, pneumatic installation - function: double acting

## 6.4 Disassembly

The disassembly of a knife gate valve in principle proceeds in the reverse sequence to the mounting, but some essential points should be clarified:

- Will the knife gate valve to be disassembled be replaced immediately by another ?
- If appropriate, does the production process or the plant need to be stopped?
- Is it necessary to inform specific personnel about the disassembly? etc.

**Stop the medium flow. Never remove the knife gate valve under pressure.**

**If necessary, set up warning signs in order to prevent**

- the in inadvertent starting up of the device / machines / plants, or
- the switching on of the pilot media supply, or
- the switching on of the medium.



Kepp ready some fit tanks to catch up leaking lequids.

### 6.4.1 Pneumatically disassembly

**Switch off the supply of the compressed air and the control unit of the actuator!**

**If necessary, set up warning signs in order to prevent**

- the inadvertent starting up of the device / machine / plant or
- the switch on of the power supply / control unit of the pneumatic actuator!



Loosen the pneumatic fittings and pull off the hoses.



Close the hose of the pilot air if the hose is not also being disassembled or is not to be reconnected to another device.

### 6.4.2 Mechanical disassembly



**Switch off the media flow, release the pressure in the pipes and take care to prevent the inadvertent switching on.**



Prevent the drop down off the knife gate valve be qualified measures e.g. with a suspension or by supporting the knife gate valve.



Loose the flange connection and pull out the knife gate valve between the flanges.



Close the pipe, if the pipe is not also being disassembled or is not immediately reconnected to another knife gate valve.



Herewith the disassembly of the knife gate valve will be finished.

## 7 Maintenance

Before you maintain or shut down the knife gate valve you have to read the



→ Safety advice

If you have not read the safety advices until now, read this important advices now and turn back to this page.

The controlling of the function and the tightness should happen in periodical turns:



- Check the tightness of the gland packing
- resp. readjusting of the gland packing
- Lubrication of the stem
- Check the tightness of the pipe connections
- Check the tightness of the pilot cylinder (only at pneumatic actuator)



By maintaining the knife-gate-valve you are allowed to remove the protection devices after the part of the plant at which the knife-gate-valve is mounted will be without pressure. At knife-gate-valves with a pneumatic or electric actuator you have to switch off the pressure and power supply and to prevent the inadvertent starting of the plant.



In case of a defect of the knife-gate-valve make a contact to the supplier. The telephone number will be found on the back or these operation and installation manual.

If you determine that there is a damage to the knife-gate-valve switch off the device/ machine/ plant! However before doing this, it is essential to refer to the

→ Safety advice.

### 7.1 Lubrication



Manual operating knife-gate-valves will be equipped with a lubrication nipple on the top of the top bridge. A lubrication should happen in periodical turns by using a fit grease.

(Please refer to Fig. 7.1)

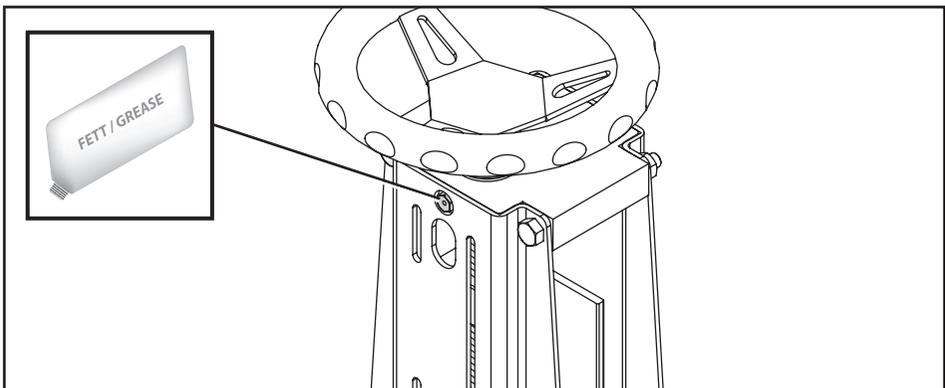


Fig. 7.1 - knife-gate-valve, lubrication

7.2 Stuffingbox



All valves are tested before shipment. The packing gland may require some adjustment after line pressure is up to normal. Tighten just enough to stop leakage. overtightening may cause undue pressure against the knife making the valve difficult to operate and cause rapide wear.

If possible stroke the valve a few times before setting packing.



Take care that no actuating of the knife-gate-valve will happen. At knife-gate-valves with a pneumatic or electric actuator you have to switch off the pressure and power supply and to prevent the inadvertent starting of the device.



By keeping the nominal pressure you have to tighten up the screws of the gland equally and cross-wise until the tightness of the gland will be restored.(Please refer to Fig. 7.2)



After the readjusting the slide of the knife-gate-valve must be able to move slightly.

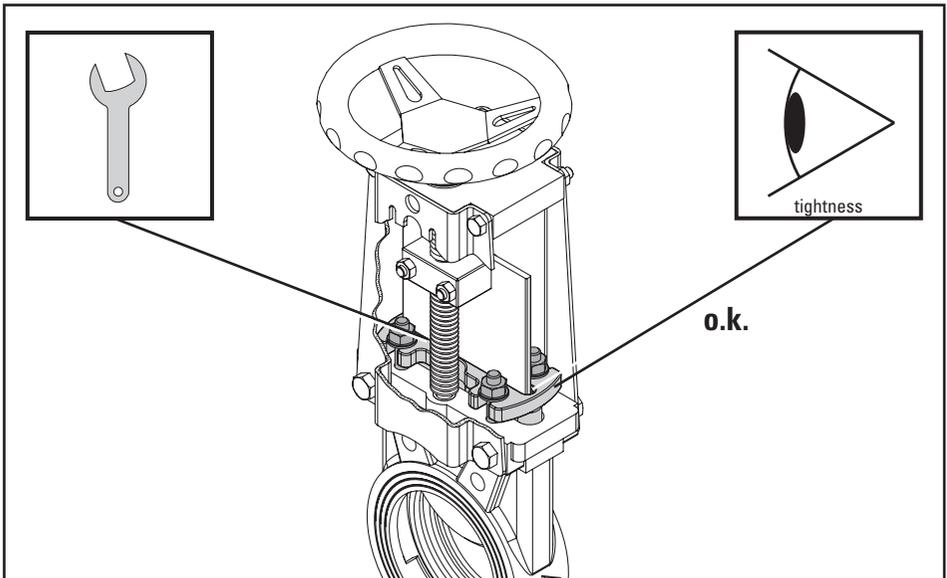


Fig. 7.2 - knife-gate-valve, readjusting of the gland

## 7.3 To repack the stuffing box

Before you maintain or shut down the knife gate valve you have to read the



→ Safety advice

**If you have not read the safety advices until now, read this important advices now and turn back to this page.**

-  The Knife-Gate-Valve does not have to be dismantled from the pipeline for repack the stuffing box
-  Relieve the pressure on the inside of the valve body and prevent the valve from cycling before repacking to avoid injury
-  Close the Knife-Gate-Valve completely
-  Dismount the blue mounting bridges
-  Remove the stem nut screws.

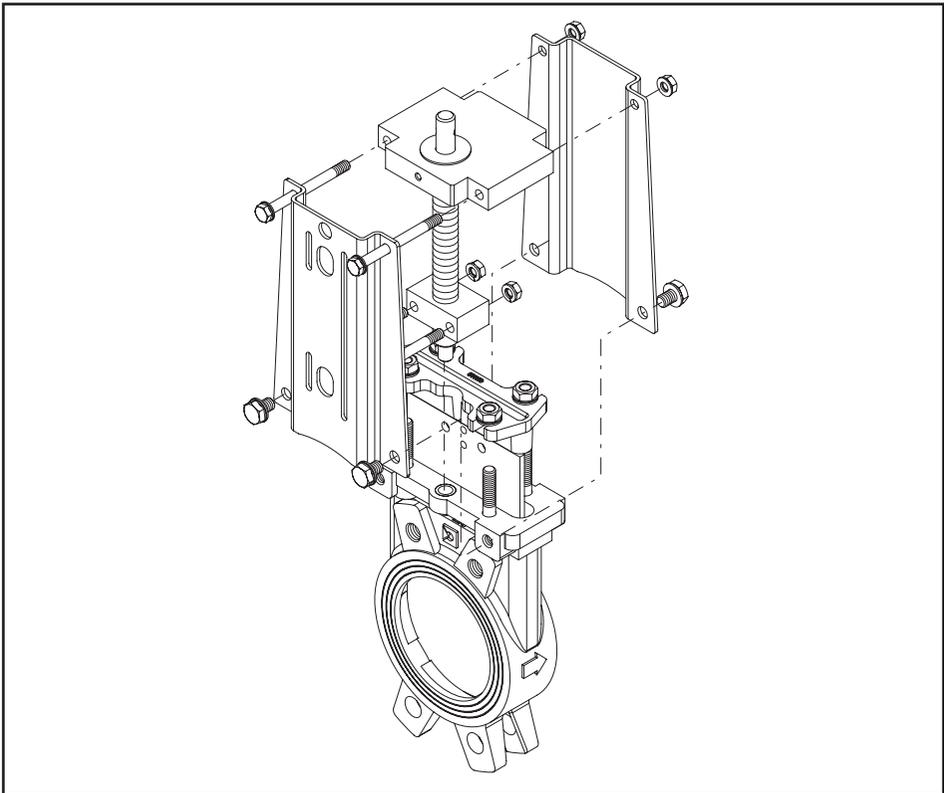


Fig. 7.3 - knife-gate-valve, repack the stuffing box



Concerning the repack of the stuffing box please follow the visual instruction of the following pictures.

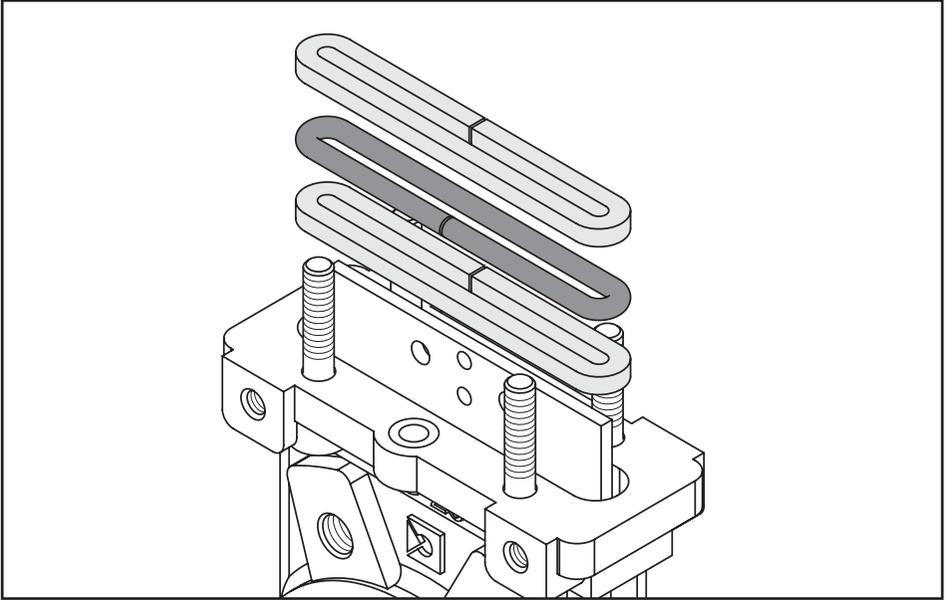


Fig. 7.4 - knife-gate-valve, repack the stuffing box

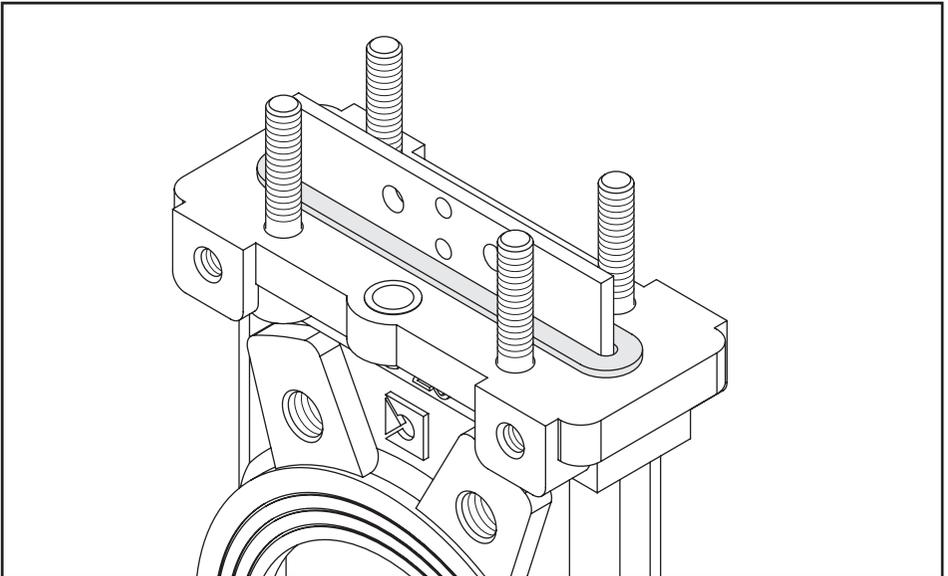


Fig. 7.5 - knife-gate-valve, repack the stuffing box

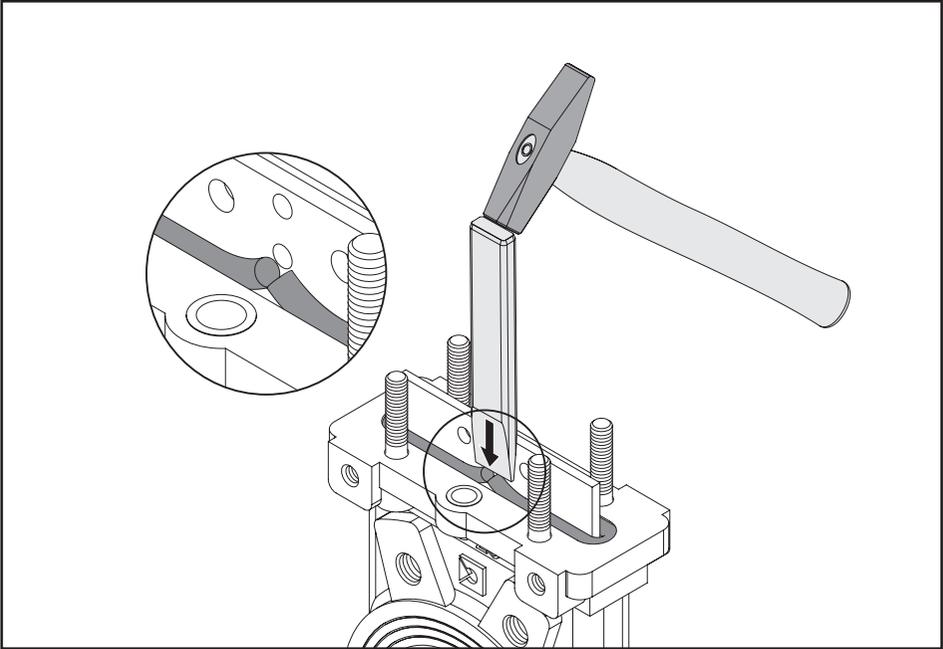


Fig. 7.6 - knife-gate-valve, repack the stuffing box

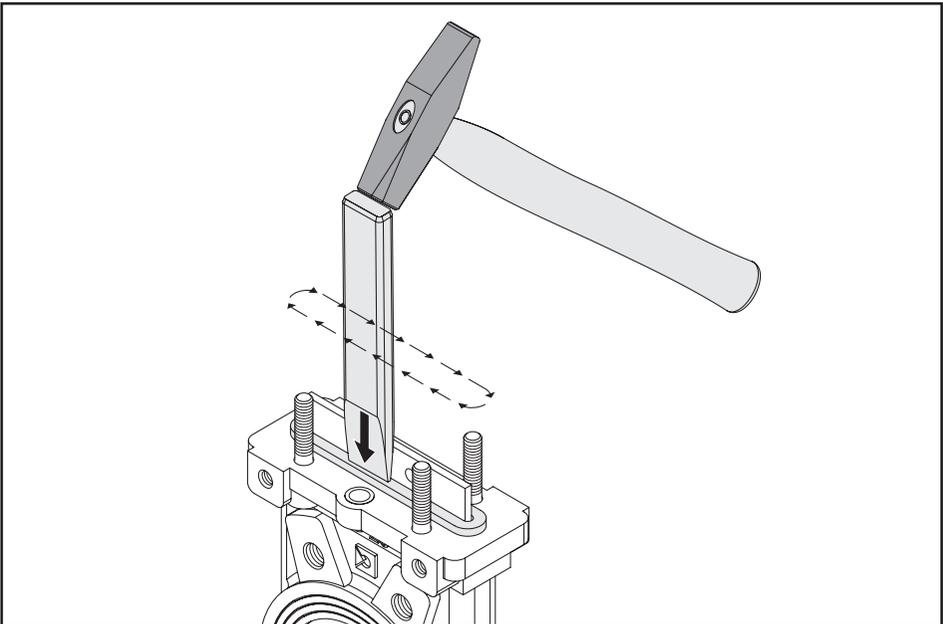


Fig. 7.7 - knife-gate-valve, repack the stuffing box

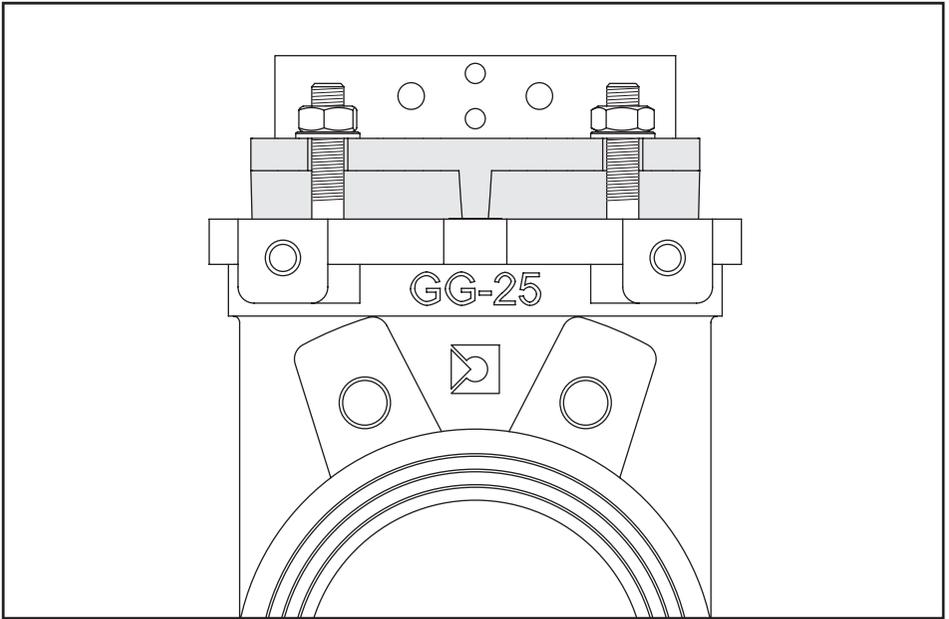
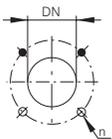
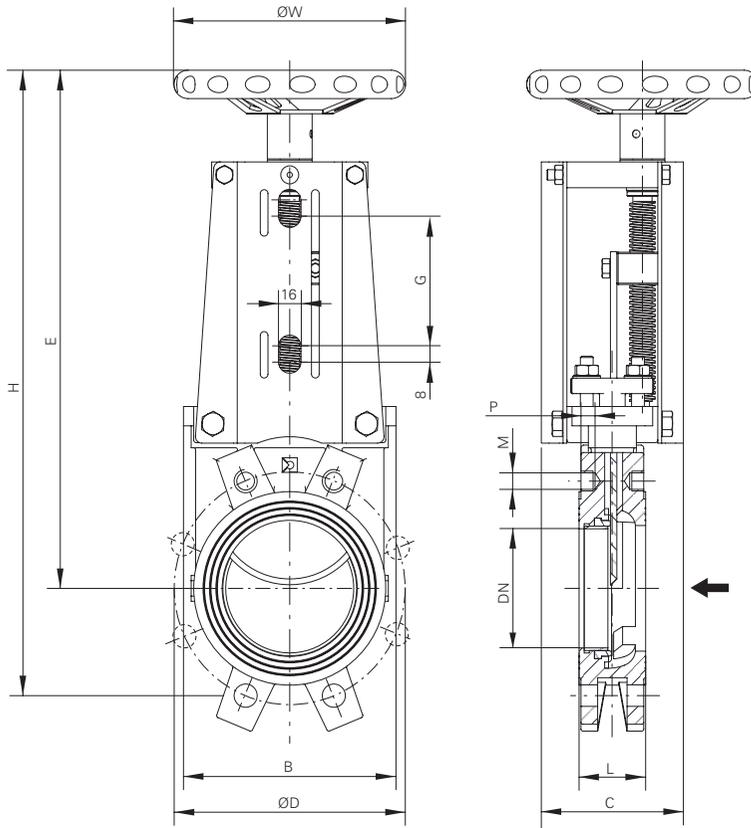


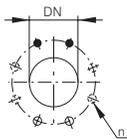
Fig. 7.8 - knife-gate-valve, repack the stuffing box

# Dimension

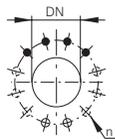
## 8 Dimension 8.1 Dimension (manual operated)



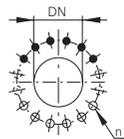
DN 50 - DN 65



DN 80 - DN 200



DN 250 - DN 300



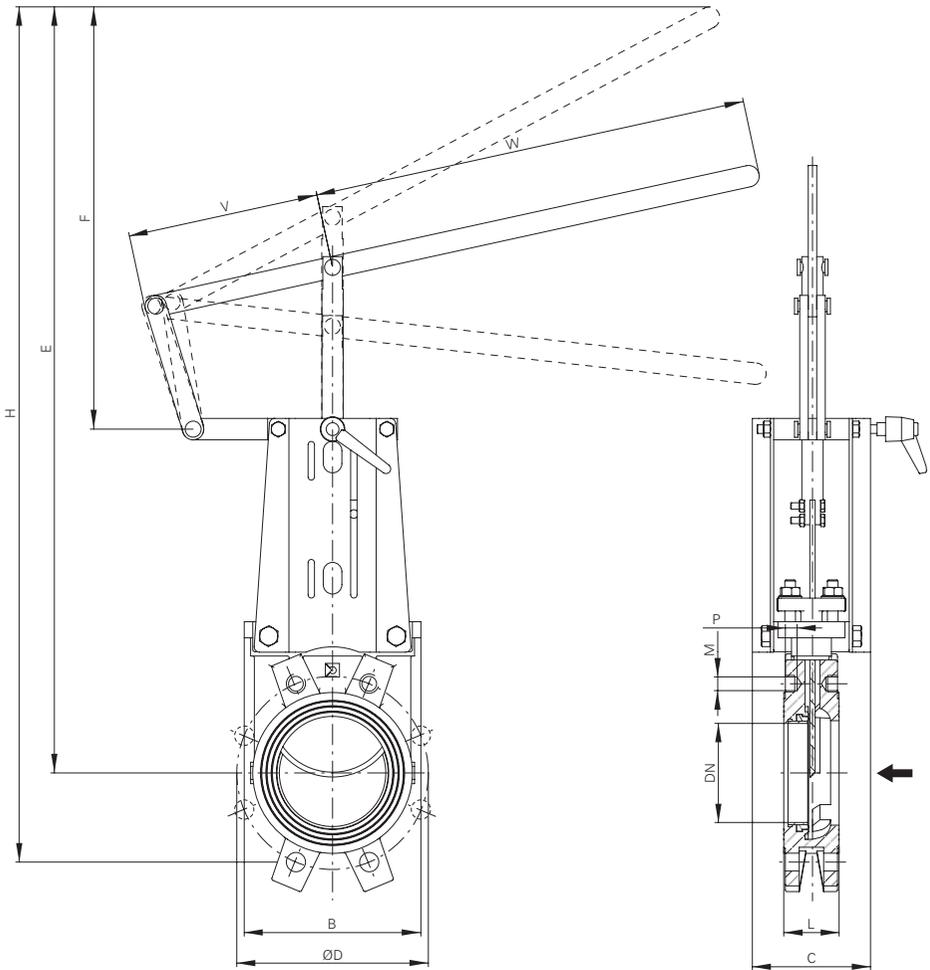
DN 350 - DN 400

● blind hole, threaded

⊕ through hole

DN	ØD	H	L	E	B	C	G	W	n	M	P	●	⊕	bar	kg
50	125	372	43	328	116	102	53	200	4	M16	8	2	2	10	8
65	145	405	46	354	131	102	53	200	4	M16	9	2	2	10	9
80	160	441	46	367	146	102	82	200	8	M16	9	2	2	10	10
100	180	479	52	396	166	112	102	200	8	M16	9	2	2	10	13
125	210	510	56	413	197	112	130	250	8	M16	9	2	2	10	17
150	240	573	56	462	222	112	156	250	8	M20	10	2	2	10	20
200	295	714	60	578	275	130	205	350	8	M20	10	2	2	8	34
250	350	878	68	709	332	130	270	350	12	M20	12	4	2	7	50
300	400	1.010	78	815	386	130	320	350	12	M20	12	4	2	6	66
350	460	1.180	96	955	437	196		400	16	M20	12	6	6	6	ca.105
400	515	1.311	100	1.059	491	196		400	16	M20	12	6	6	5	ca.135

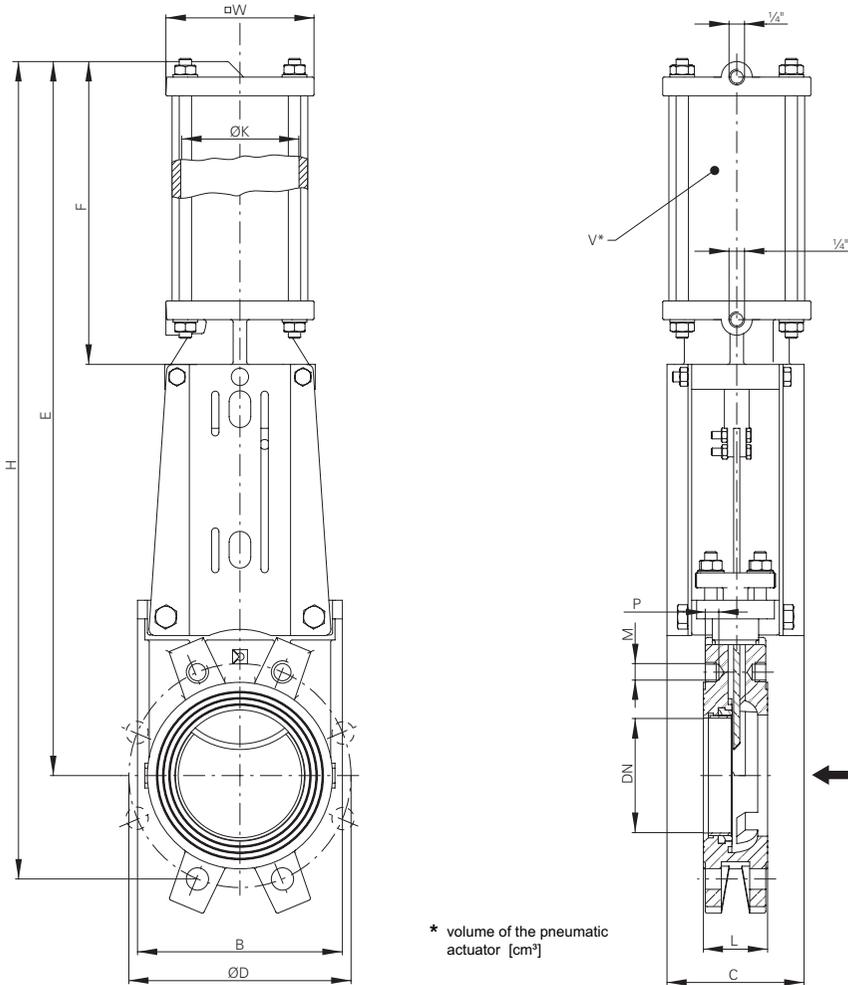
8.2 Dimension (with handle)



DN	ØD	H	L	B	C	E	F	V	W	n	M	P	bar	kg
50	125	488	43	116	102	444	217	115	325	4	M16	8	10	8
65	145	552	46	131	102	501	264	115	325	4	M16	9	10	9
80	160	629	46	146	102	555	311	115	325	8	M16	9	10	10
100	180	720	52	166	112	637	398	170	400	8	M16	9	10	13
125	210	845	56	197	112	478	482	170	400	8	M16	9	10	17
150	240	961	56	222	112	850	564	170	400	8	M20	10	10	20
200	295	1151	60	275	130	1015	608	340	600	8	M20	10	8	34
250	350	1403	68	332	130	1234	768	340	600	12	M20	12	7	50
300	400	1654	78	386	130	1459	908	340	600	12	M20	12	6	66

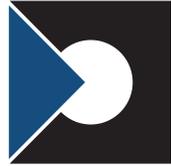
# Dimension

## 8.3 Dimension (pneumatically actuated)



\* volume of the pneumatic actuator [cm<sup>3</sup>]

DN	$\varnothing D$	H	L	E	F	B	C	$\square W$	n	M	P	$V^*$	J	bar	kg
50	125	491	43	446	195	116	102	103	4	M16	8	573	1/4	10	9
65	145	543	46	491	205	131	102	103	4	M16	9	625	1/4	10	10
80	160	591	46	519	220	146	102	103	8	M16	9	692	1/4	10	11
100	180	664	52	575	245	166	112	120	8	M16	9	1.260	1/4	10	14
125	210	738	56	640	280	197	112	150	8	M16	9	2.342	1/4	10	19
150	240	829	56	714	300	222	112	150	8	M20	10	2.610	1/4	10	22
200	295	1.025	60	885	365	275	130	185	8	M20	10	5.231	1/4	8	38
250	350	1.230	68	1.056	438	332	130	228	12	M20	12	10.053	1/4	7	57
300	400	1.413	78	1.216	488	386	130	228	12	M20	12	11.574	1/4	6	75
350	460	1.590	96	1.360		437	196		16	M20	12		3/8	6	
400	515	1.770	100	1.512		491	196		16	M20	12		3/8	5	



(1) **Declaration of conformity**

(2) **as defined by Pressure-Equipment-Directive 97/23/EG**

(3) Herewith we declare that the supplied articles:

WGE and various types

(4) of the company **Watergates GmbH & Co. KG**  
D-32547 Bad Oeynhausen  
Germany

(5) are in conformity with the regulations of the directive 97/23/EG.

(6) Applied conformity assessment: Modul H.

(7) Notified body for conformity assessment PED an Quality-Management-System:

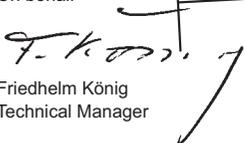


**Bureau Veritas S.A.**  
Paris / Frankreich  
Kennzeichen 0062

(8) Applied harmonized standards, in particular:

**DIN 3840:1982      Armaturengehäuse  
Festigkeitsberechnung gegen Innendruck**

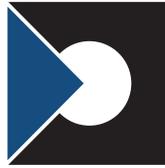
(9) On behalf 53 Bad Oeynhausen, 13. January 2005

  
Friedhelm König  
Technical Manager

  
knife-gate-valves - Stoffschieber  
  
Quality Manager

# watergates

knife-gate-valves - Stoffschieber



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