Operating and Maintenance Instructions

VAG ZETA® Knife Gate Valve
Version with AUMA electrical multiturn actuator (EA)

KAT-B2 2410 Edition 8 - 30-11-2017

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1 General

1.1 Safety

These operation and maintenance instructions must be observed and applied along with the general „VAG Installation and Operation Instructions for Valves“. Arbitrary alterations of this product or parts supplied are not allo- wed. VAG will not assume any liability for consequential damage due to non-compliance with these instructions. When using this valve, the generally acknowledged rules of technology have to be observed (e.g. DIN standards, DVGW data sheets, VDI directives, etc.). The installation must only be carried out by qualified technical staff. For further technical information such as dimensions, materials or range of application, please refer to document KAT 2410-A.

1.2 Proper use

The VAG ZETA® Knife Gate Valve is a valve for installation into the pipeline, either as wafer type, fitted between flanges, or for end-of-line applications.

In its standard version, this valve is designed for the shut-off of pressurised pipelines. For technical data concerning the operating limits (e.g. operating pressure, medium or temperature) please refer to the product-related documentation KAT 2410-A. Alternative operating conditions and applications require the manufacturer‘s written approval.

The valve has been designed for operation in liquids. If it is operated temporarily in dry media, increased operating forces as well as increased wear of the lateral seal and the U-profile seal are to be expected. Permanent dry operation is impermissible for technical reasons!

2 Transport and Storage

2.1 Transport

The transportation of the valve to the installation site must be undertaken in suitable and stable packing corresponding to the valve size. The packing must guarantee protection against weat- her influences and damage from external forces.

In some cases, e.g. overseas transport, with specific climatic influences, the valves must be protected by wrapping them in plastic film and adding a desiccant.

In case of premounted drives or actuators, these have to be stored in a safe way which prevents the connection areas from being exposed to transverse loads. The factory-applied corrosion protection coating must be especially well protected at all times. When valves with pre-mounted electrical actuators are moved, the lifting equipment must not be attached to the multiturn actuator and not to the handwheel!

2.2 Storage

Store the ZETA® Knife Gate Valve with the knife in the closed position. Protect the elastomeric parts (gaskets) against direct sunlight; failure to do this may deteriorate the seals and thus affect proper and long-term function.

Store the valve in a dry and well-aerated location. Protect the valve from direct radiator heat. Protect any assembly units important for the function such as the stem, stem nut, gaskets or knife against dust and other dirt by adequate covering.

Connect the multiturn actuator to the mains supply immediately after assembly so that its heating can prevent the formation of condensation water!

For knife gate valves with premounted electrical multiturn actuators, the storage instructions issued by the respective actuator manufacturer must also be observed!

3 Product features

3.1 Features and function description

The VAG ZETA® Knife Gate Valve is a gate valve in full-flange design and can thus be applied either as wafer type in-between two flanges or for pipeline-end installation without additional counter flange and at full operating pressure. Due to its bi-direc- tional sealing arrangement, any installation position is possible. The knife slides in a U-profiled gasket made of elastomer bet- ween the two body parts. Sealing in flow direction is pressure-supported and soft sealing.

The sealing of the knife at the outlet of the body is realised by a defined and elastically prestressed lateral seal. This seal can be readjusted during operation and be easily replaced without dismantling the valve from the pipeline.

Warning!! Ensure the pipeline is depressurised before performing any replacement works.

In case of suspended installation of the valve, knife must be field-secured against falling out.

The lateral seal is factory-adjusted (pretensioned) with a sealing force equal to the nominal pressure (PN). In order to reduce the operating forces and the wear of the lateral seal, this pretension may later be adjusted to the actual operating pressure. To do this, loosen the screws holding the thrust piece accordingly.

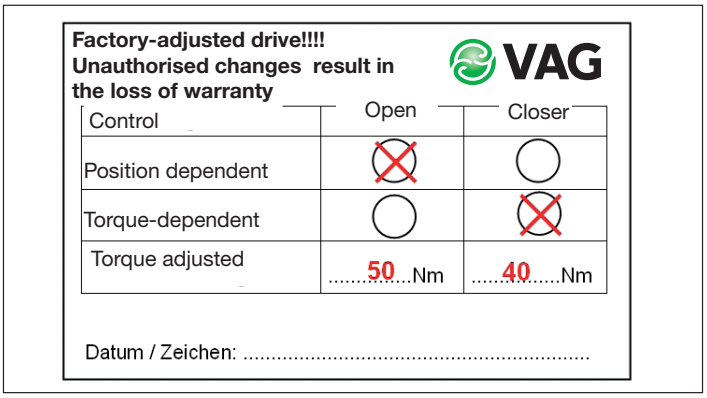
The electric multiturn actuator is directly mounted on the valve. The connection dimensions between the multiturn actuator and the valve are according to DIN ISO 5210.

The shut-off of the multiturn actuator in closing direction is factory-adjusted in dependence of the torque. In opening direction, the actuator is shut off in dependence of the position. The respective final positions „OPEN“ and „CLOSE“ are signalled by a limit switch!! This factory adjustment must be observed for the planning and configuration of the electronic control!

The factory-adjusted torque-controlled shut-off of the multiturn actuator in „closed“ position guarantees the defined pressing of the bore seal and prevents premature leaking of the valve. This adjustment ensures that the knife exerts a constant closing force on the bore seal which can neither be affected by the com- pression set of the seal nor by wear and tear of the stem nut or any other positional changes.

The position-controlled shut-off of the multiturn actuator in „closed“ position is also available upon the customer‘s express request. However, we expressly point out that we assume no liability for the failures that usually result from this shut-off method, such as leaks due to the compression set of the bore seal and the required readjustment of the limit position.

For the user‘s information, a clearly visible label has been attached to the cover of the switch mechanism of the electric actuator (see Fig. 1), bearing the adjustment information, adjustment torques etc.. The screws of the switch mechanism cover are factory-sealed with sealing wax. Breaking this seal by unauthorised opening will result in the loss of warranty.



Picture 1: Example of a label showing the adjustments of the electric actuator

3.2 Applications

In its standard version, the VAG ZETA® Knife Gate Valve with NBR sealing material can be used for the following media:

- Water, raw water, cooling water, municipal waste water, grease- and oil-containing media, weak acids and bases

For alternative operating conditions and applications, please contact the manufacturer.

3.3 Permissible and impermissible modes of operation

Avoid the exertion of excessive force caused by using extensions on the operating elements, as this may dama- ge the valve due to overload.

The ZETA® Knife Gate Valve with electric multiturn actuator is suitable for „Open/Close“ operation. For special control applications, special versions such as the ZETA®control with control orifice are required.

The maximum operating temperatures and operating pressures specified in the technical documentation must not be exceeded. The closed knife gate valve must not be exposed to pressures exceeding its nominal pressure (see Table 3 / nominal pressure PN). Upon delivery, the tight sealing of the valve is only guaran- teed up to its maximum permissible operating pressure.

The valve has been designed for operation in liquids. If it is operated temporarily in dry media, increased operating forces as well as increased wear of the lateral seal and the U-profile seal are to be expected. Permanent dry operation is impermissible for technical reasons!

4 Installation into the pipeline

4.1 Conditions required on site

When installing the valve between two pipeline flanges, these must be coplanar and in alignment. If the pipes are not in align- ment, they must be aligned before installation of the valve, as otherwise this may result in impermissibly high loads acting onto the valve body during operation and eventually even lead to fracture.

The valve is to be installed tensionless into the pipeline. No pipeline forces must be transmitted from the pipeline onto the valve. The space between the flanges should be wide enough to prevent damage to the coating of the flange gasket frames during installation.

In case of works around the valve causing dirt (e.g. painting, masonry or working with concrete), the valve must be protected by adequate covering.

4.2 Installation location

The installation location of the valve must provide enough space for operation, later function tests and maintenance works (e.g. re-adjusting the lateral seal). If the valve is to be installed outside, it has to be protected by adequate covering against direct weather influences such as icing. If the valve is mounted as an overflow installation, higher operation forces and higher wear and tear of the relatively moving parts must be expected. This fact is to be taken into account when determining the maintenance intervals

If the valve is to be installed at pipeline end, make sure that the free outlet is absolutely inaccessible for anybody.

Warning!! The nominal pressure on the closed valve must not be exceeded (see document KAT 2410-A). In case of a pressure test in the pipeline using higher pressures than the admissible nominal pressure, close the gate valve with a cover and slightly open the knife during the test.

4.3 Installation position

If the valve is to be installed in a horizontal pipeline and if the media conveyed contain solid particles (e.g. sand, etc.), the valve should not be inclined more than 60° from the vertical position (see Fig. 2). This allows the continuous flushing of the operating area and reliable guiding of the knife.

In different installation positions, especially if the valve is suspended or installed horizontally in a vertical pipeline, increased deposition of solids on the knife cannot be avoided. This increases the risk of malfunction (e.g. wear of the lateral seal, increa- sed operating forces, etc.) and requires more frequent maintenance.

Attention: To ensure its proper function at all times, the valve should not be installed outside the permissible range. In case of deviating installation positions, always contact the manufacturer for technical coordination, providing precise information about the installation position, operating conditions and quality of the medium (especially about its solids content).

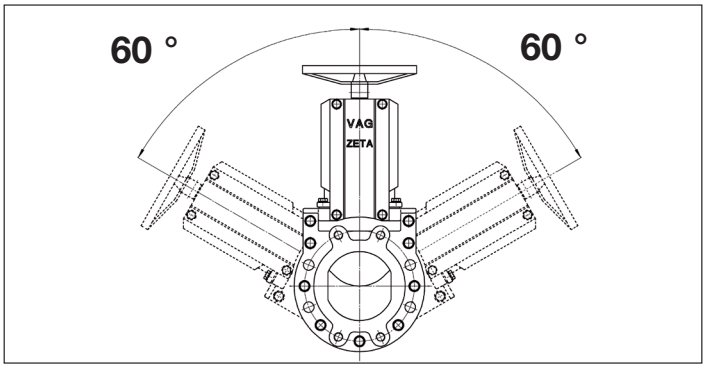
If assembly and maintenance work are carried out on valves with a suspended installation positi- on, the knife must be secured on site against falling out when the lateral seal is being replaced.

Attention! Exception!

VAG ZETA®control valve with VAG control orifice. The ZETA®control valve must be installed in a vertical position as otherwise its function may be affected by the accumulation of dirt upstream of the control orifice.

Concerning the installation direction of the ZETA®control valve, the following instructions must be observed:

- The control orifice must be positioned in flow direction downstream of the knife!
- The control orifice must be positioned in pressure direction (direction of action of the differential pressure after closing) downstream of the knife!



Picture 2: Installation position of the VAG ZETA® Gate Valve

4.4 Assembly instructions and fittings

The valve is bidirectional and therefore can be installed in any installation position.

Check the valve for any possible transport or storage damage before installation. Protect the valve against dirt on site by ade- quate covering until installation.

When the valve is being installed, the functional parts such as the stem, stem nut, gasket and knife must be free from dust and dirt.

For the installation of the ZETA® Knife Gate Valve you will need adequate load suspension devices (e.g. ring bolt in the blind hole) as well as transport and lifting equipment. Lifting the valve for example at the handwheel may lead to damage and impairment of its function.

When repainting the valve, make sure that no functional parts such as the stem, stem nut, gasket, knife or piston rod are covered by the paint.

When installing an extension rod to the valve, mount it perpendicularly to the stem axis above the fixing point.

When installing an extension rod to the valve, mount it perpendicularly to the stem axis above the fixing point.

When connecting the valve to the pipeline flanges with through-holes, use hexagon head screws and nuts with washers on both sides from flange to flange.

When connecting the valve to the pipeline flanges with blind thread holes, use stud bolts with washers and nuts for a safe and reliable installation (see example 3 at fig. 3). Screw the stud bolts completely to the ground of the blind thread holes of the valve. This guarantees an optimum connection, as the threads are used over their whole effective depth. Then align the valve with the flange by using the stud screws as orientation pins.

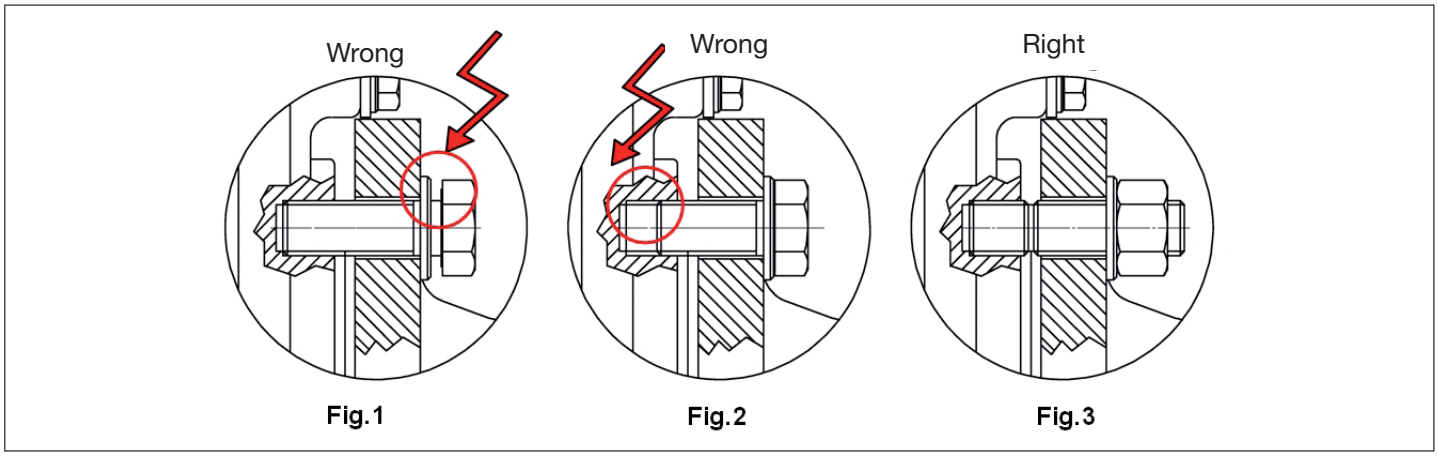
Using hexagon head screws in case of blind thread holes can lead to leaky connections (see example 1 and 2 at fig. 3).

Fasten the screws carefully and evenly crosswise, thus preventing unnecessary tensions and cracks or fractures.

The pipeline must in no case be pulled towards the valve. If the gap between the valve and the flange is too wide, this should to be compensated by thicker gaskets.

We recommend steel-reinforced rubber gaskets according to DIN EN 1514-1 shape IBC for sealing. If the flanges are crimped, these gaskets must be used.

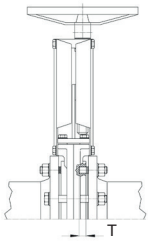
For the kind and the sizes of the required connection parts for each kind of installation (as wafer type in-between two flanges or for pipeline end installation), see the following tables (Table 1 and Table 2).



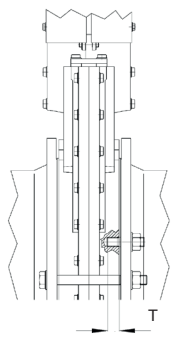
Picture 3: Assembly of the VAG ZETA® Knife Gate Valve

Connection parts for flange connection, wafer type

DN 50...600



DN 700...1400

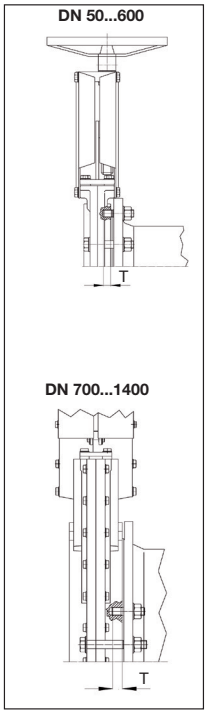


Flanges				Wafer-type							
Connecting dimensions acc. to DIN EN 1092-1 Typ 11				Blind thread hole ●				Through hole ○			
DN	bolt circle ∅	flange outside ∅	thread height T	Threaded pin DIN 939		Hexagon nut DIN 939		Hexagon head screw DIN EN 24014		Hexagon nut DIN 934	
				qty	dimension	qty	size	qty	dimension	qty	size
50	125	165	10	8	M16 x 35	8	M16	-	-	-	-
65	145	185	12	8	M16 x 35	8	M16	-	-	-	-
80	160	200	12	8	M16 x 40	8	M16	4	M16 x 120	4	M16
100	180	220	14	8	M16 x 40	8	M16	4	M16 x 130	4	M16
125	210	250	15	8	M16 x 45	8	M16	4	M16 x 130	4	M16
150	240	285	15	8	M20 x 45	8	M20	4	M20 x 130	4	M20
200	295	340	15	8	M20 x 45	8	M20	4	M20 x 150	4	M20
250	350	395	17	16	M20 x 50	16	M20	4	M20 x 160	4	M20
300	400	445	22	16	M20 x 55	16	M20	4	M20 x 170	4	M20
350	460	505	22	20	M20 x 55	20	M20	6	M20 x 170	6	M20
400	515	565	26	20	M24 x 60	20	M24	6	M24 x 200	6	M24
500	620	670	30	28	M24 x 65	28	M24	6	M24 x 220	6	M24
600	725	780	32	28	M27 x 70	28	M27	6	M27 x 260	6	M27
700	840	895	27	32	M27x80	32	M 27	8	M27 x 300	8	M 27
800	950	1015	30	32	M30x90	32	M 30	8	M30 x 320	8	M 30
900	1050	1115	30	36	M30x90	36	M 30	10	M30 x 340	10	M 30
1000	1160	1230	33	36	M33x100	36	M 33	10	M33 x 360	10	M 33
1200	1380	1455	36	48	M36x110	48	M 36	8	M36 x 440	8	M 36
1400	1590	1675	39	52	M39x120	52	M 39	10	M39x500	10	M39

Lengths of screws are for pre-welded flanges acc. to DIN EN 1092-1, PN 10 type 11, washers acc. to DIN 125 (ISO 7090).DN 50...600: Flat gaskets acc. to DIN EN 1514-1 / PN 10 / shape IBC, thickness 3 mm; DN 700...1400: Flat gasket according to DIN EN 1514-1 / PN 6 / shape IBC, thickness 8 mm, (flange sealing face PN 6)

Table 1: Connection parts for flange connection, wafer type

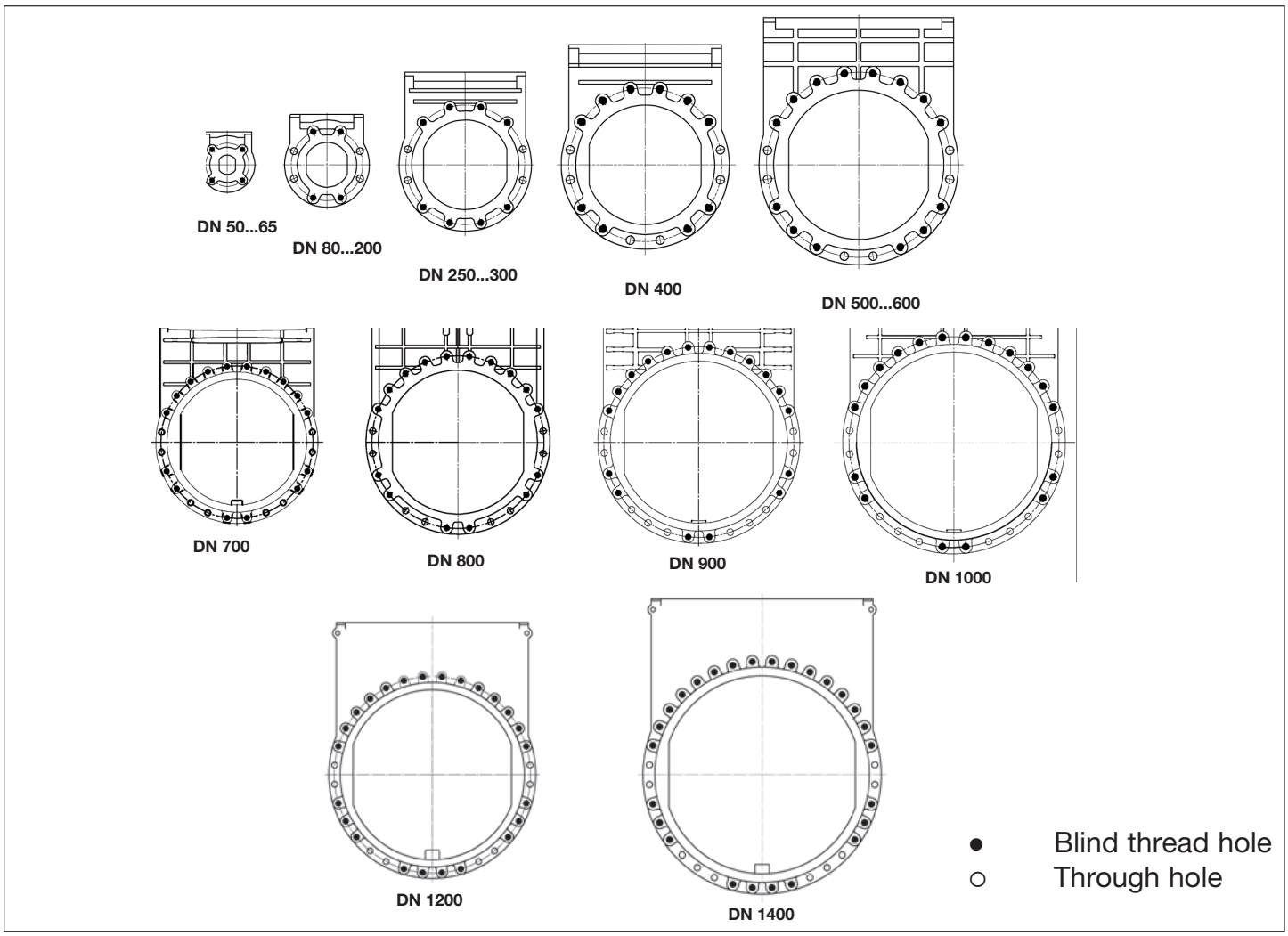
Connection parts for flange connection, pipeline end installation



Flanges				Pipeline end installation							
Connecting dimensions acc. to DIN EN 1092-1 Typ 11				Blind thread hole ●				Through hole ○			
DN	∅ bolt circle	∅ flange outside	thread height T	Threaded pin DIN 939		Hexagon nut DIN 939		Hexagon head screw DIN EN 24014		Hexagon nut DIN 934	
				qty	dimension	qty	size	qty	dimension	qty	size
50	125	165	10	4	M16 x 35	4	M16	-	-	-	-
65	145	185	12	4	M16 x 35	4	M16	-	-	-	-
80	160	200	12	4	M16 x 40	4	M16	4	M16 x 90	4	M16
100	180	220	14	4	M16 x 40	4	M16	4	M16 x 90	4	M16
125	210	250	15	4	M16 x 45	4	M16	4	M16 x 100	4	M16
150	240	285	15	4	M20 x 45	4	M20	4	M20 x 100	4	M20
200	295	340	15	4	M20 x 45	4	M20	4	M20 x 110	4	M20
250	350	395	17	8	M20 x 50	8	M20	4	M20 x 120	4	M20
300	400	445	22	8	M20 x 55	8	M20	4	M20 x 130	4	M20
350	460	505	22	10	M20 x 55	8	M20	6	M20 x 130	6	M20
400	515	565	26	10	M24 x 60	10	M24	6	M24 x 140	6	M24
500	620	670	30	14	M24 x 65	14	M24	6	M24 x 160	6	M24
600	725	780	32	14	M27 x 70	14	M27	6	M27 x 180	6	M 27
700	840	895	27	16	M27x80	16	M 27	8	M 27 x 260	8	M 27
800	950	1015	30	16	M30x90	16	M 30	8	M 30 x 280	8	M 30
900	1050	1115	30	18	M30x90	18	M 30	10	M 30 x 300	10	M 30
1000	1160	1230	33	18	M33x100	18	M 33	10	M 33 x 320	10	M 33
1200	1380	1455	36	24	M36x110	24	M36	8	M36x380	8	M 36
1400	1590	1675	39	26	M39x120	26	M39	10	M39x420	10	M 39

Lengths of screws are for pre-welded flanges acc. to DIN EN 1092-1, PN 10 type 11, washers acc. to DIN 125 (ISO 7090). DN 50...600: Flat gaskets acc. to DIN EN 1514-1 / PN 10 / shape IBC, thickness 3 mm; DN 700...1400: Flat gasket according to DIN EN 1514-1 / PN 6 / shape IBC, thickness 8 mm, (flange sealing face PN 6)

Table 2: Connection parts for flange connection, pipeline end installation



Picture 4: Blind thread hole and through hole

5 Putting the valve into operation

5.1 Visual check of the valve

Before putting the valve and the electric multiturn actuator into operation, make a visual inspection of the functional parts. Thoroughly clean all parts essential for proper function (such as the stem, bearing, seals, knife etc.) to remove all dirt.

VAG does not assume any liability for consequential damage caused by dirt, residue of shot blasting particles or welding beads on the knife. The valves are thoroughly lubricated at the factory to ensure trouble-free transport, storage and installation. However, it might be necessary to lubricate them again when taking them into operation.

Recommended lubricants:

- Knife and seals: Fuchs Chemplex Si 2; Fuchs Notropeen Si 1; Klüber Unisilikon L 641
- Stem and stem nut: KLÜBERPLEX BE 31-502 for electric drives Manufacturer: Klüber Lubrication München AG, Germany

Connection to the electrical mains!
Work on electrical devices or equipment must only be performed by skilled persons or specially trained staff under supervision and in compliance with the electro-technical rules. Connection to the electrical mains must be performed in compliance with the operation manual and the circuit diagram and terminal diagram of the manufacturer of the electric actuator.
The regulations and directives for operation in potentially explosive atmospheres must be observed.
After installing the valve, make sure it is properly grounded, e.g. via the flange connection.
After assembling the multiturn actuator, immediately connect it to the mains so that its heating can prevent the formation of condensation water!

5.2 Putting the electrical multiturn actuator into operation

5.2.1 Using the handwheel, first turn the knife of the ZETA® Knife Gate Valve manually into central position.

5.2.2 Then shortly operate the electrical multiturn actuator to check the direction of movement of the knife and thus the correct direction of rotation of the actuator.

Correct: Actuator turns RIGHT (clockwise) = Valve closes

Correct: Actuator turns LEFT (counter-clockwise) = Valve opens

5.2.3 When the direction of rotation is wrong, the polarity of the connection cables must be reversed.

Warning!!! If the electrical connections are wrongly polarised, the limit switches and torque switch will not work!

5.2.4 The electric actuator can only operate the valve over its entire length of stroke when the direction of rotation and the polarisation are correct.

5.2.5 Operate the valve over its entire length of stroke to check for smooth movement and the correct final positions „OPEN“ and „CLOSE“.

5.3 Emergency manual operation via the handwheel

The diameter of the handwheel for emergency operation is factory-defined and designed for normal manual forces only.

When the valve is operated via the handwheel of the electric multiturn actuator, it must be taken into account that there is no protection of the operating mechanism in case the failure moments are exceeded.

Careful and meticulous operation of the handwheel is therefore necessary.

The assembly and use of lever extensions (e.g. handwheel rods)

is impermissible.
Should you detect a noticeable resistance when closing the valve via the handwheel, do not exert higher manual force but turn the handwheel back into the opposite direction by some turns and then try to operate the valve again.
If the handwheel keeps blocking, the pipeline should be checked for obstructions.

5.4 Function check

Before putting the valve into operation, open and close it at least once over its entire stroke and check for easy movement.
If the pipeline has to undergo a pressure test with water, the maximum permissible operating pressure (see Table 3) of the valve must not be exceeded when the knife is open.

The pressure exerted on the closed valve must not exceed the maximum permissible operating pressure (see Table 3).

The lateral seal of the valve has been factory-adjusted to the maximum permissible operating pressure / nominal pressure PN (see Table 3) in the body. For pressure tests with higher pressures (up to the maximum test pressure for resistance in the body according to Table 3) the tension of the lateral seal can be increased on site by turning the screws of the cover clockwise.

DN mm	PN	max. admissible operating overpressure PS bar	Admissible operating temperature for water, waste water and sewage sludge °C	Test pressure in bar with water Resistance[1)] in body	 Leak-freeness in seat
50...300	10	10	50	15	10
350...400	10	8	50	12	8
500...600	10	6	50	9	6
700...800	10	4	50	6 (4)*	4
900...1000	10	2,5	50	3,75 (2,5)*	2,5
1200, 1400	10	2	50	3,0	2,0

* Guaranteed resistance 1.5 x PN, leak-freeness only up to PN
1) In delivery condition, the leak-freeness of the valve is guaranteed only up to its maximum admissible operating pressure.

Table 3: Field of use

After the pressure test, the tension of the lateral seal must be relieved to achieve its original state as otherwise the multiturn actuator may be overloaded due to increased operating forces.

In general the tension of the lateral seal can be released to adjust it to the actual operating pressure (see Section 3.1). This reduces the wear of the seal during operation and lowers the operating forces of the valve. It also increases the useful life of the valve and reduces maintenance work on the lateral seal.

6 Maintenance and service

6.1 General safety instruction

Before the performance of inspection and maintenance work on the valve or on parts mounted to it the pressurised pipeline must be shut off, depressurised and protected against unintentional restart.

Depending on the kind and dangerousness of the medium conveyed, all the relevant safety regulations must be com plied with! After completing the maintenance work and before restart, all connections must be checked for proper and close fit and for leakfreeness. For restart, perform the steps described under Section 5 for initial startup.

6.2 Inspection- and operation intervals

Due to its mode of operation, it is advisable to operate the valve over its entire stroke at least four times per year and to check its components for proper function. Under extreme operation conditions and in case of operation with heavily soiled media, these operation and function checks are to be performed more frequently in accordance with the operator‘s experience.

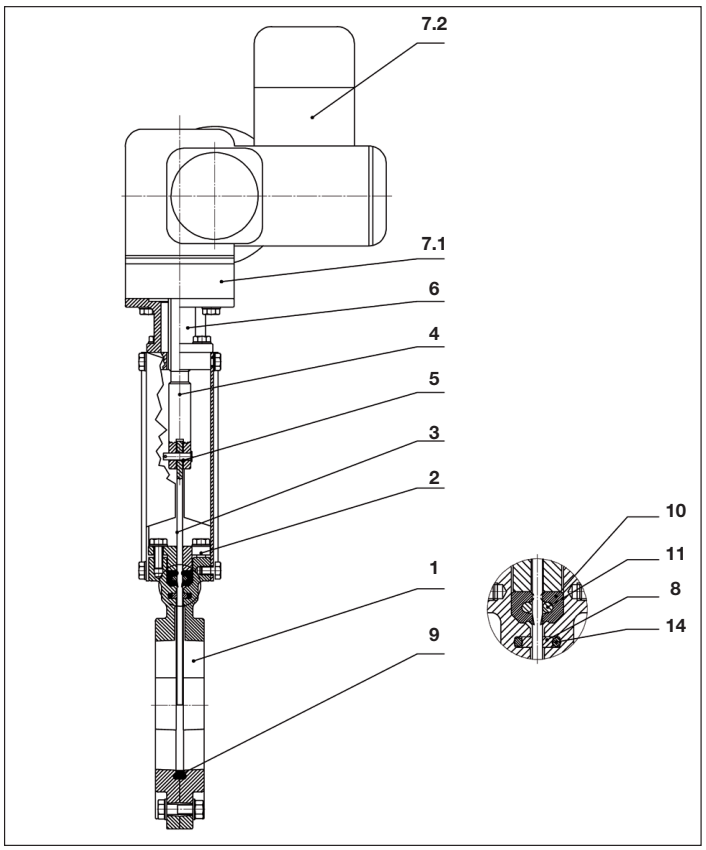
6.3 Maintenance and replacement of spare parts

6.3.1 Testing for easy movement

During maintenance work performed according to the recommended intervals, the valve should be operated over its entire stroke. In case of difficult movement, clean and lubricate the stem and knife.

6.3.2 Repairing a leak at the outlet of the knife

After longer shut-down periods, the seal may be slightly leaky. If leaks persist even after the valve has been operated several times, the lateral seal (10) can be easily re-tensioned without dismantling the valve. To do this, evenly turn the screws of the thrust piece (2) by approx. ½ turn each until the leaking stops. If it is not possible to re-tension the thrust piece (2) via the screws, the ent- ire lateral seal unit (Kit 1, items 10 and 11) has to be replaced. How often the lateral seal requires readjustment depends on the degree of soiling of the medium and on the operating conditions. The fact that the seal has to be readjusted does not constitute a material defect.



Picture 5: Single parts, position

6.3.3 Repairing a leak at the knife passage

If the knife passage leaks, this is mostly due to damage or irreparable wear of the U-profiled gasket (9). In this case, the parts of the entire unit 2 should be replaced. This can only be done when the valve is dismantled.

6.3.4 Cleaning and lubricating

The rising stem (4) must always be kept free from dirt and well lubricated.
Depending on the operating conditions, the knife must be cleaned and lightly relubricated.
The lubricator of the output drive Shape A (7.1) must be relubricated using a grease gun.
The rising stem moves in axial direction through the casing of the multiturn actuator. Depending on the nominal width or the length of stroke, the upper opening of the casing is closed either by a black threaded cap or a stem protection tube (15). VAG does not assume any liability for failures resulting from modified or removed protective devices.

Recommended lubricants::

- Knife and seals: Fuchs Chemplex Si 2; Fuchs Notropeen Si 1; Klüber Unisilikon L 641
- Stem and stem nut: KLÜBERPLEX BE 31-502 for electric drives

Manufacturer: Klüber Lubrication München AG, Germany

6.3.5 Recommendations for the replacement of parts (see Table 4/Parts list, spare parts units)

a)	Replacement of lateral seal	Unit 1	every 2 years
b)	Replacement of U-profiled seal and scraper	Unit 2	when necessary
c)	Replacement of stem, stem nut, slide bearing	Unit 3	when necessary

Under extreme operating conditions, the parts mentioned above may have to be replaced more frequently.

Pos.	Description	KIT 1	KIT 2	KIT 3
1	Body			
2	Thrust piece			
3	Knife			
4	Rising stem			•
5	Bolt, washer, split-pin			•
6	Adapter part			
7.1	Output drive shape A for electric acuator			
7.2	Electric actuator		•	
8	Scraper profile		•	
9	U-profiled qasket		•	
10	Lateral seal	•	•	
11	Sliding rod	•	•	
14	Compression profile		•	
15	Protection cap or stem protection tube			

Table 4: Parts list and recommended spare part units

7 Trouble-shooting

For all repair and maintenance work, please observe the general safety instructions described in Section 6.1

Problem	Cause	Remedial action
The knife does not move / is jammed	Lateral seal is too tight	Evenly unfasten the screws of the thrust piece
	Stem or stem nut is damaged	Check the stem for traces of jamming, clean and lubricate the parts, replace the parts if necessary!
	Foreign particle is jammed in the seat	Open the valve (up to 10 - 30% of the stroke) and close it again; repeat this action several times
	Knife is blocked by hardened particles in the medium	Unfasten the thrust piece by unfastening the screws evenly, slightly hammer against the knife from above and from the side with a rubber mallet, and try to operate the valve. If this does not solve the problem: dismantle the valve, dismantle the knife, clean it, lubricate it, replace damaged parts. See also Section 6.1!
High operating forces	Lateral seal is too tight	Evenly unfasten the screws of the thrust piece See also Section 6.1!
	Dirt sticks to the knife Dry run of the knife	Open the valve, clean the knife, lubricate it
	Stem and stem nut have run dry	Lubricate the parts
Leak at the knife passage	Foreign particle is jammed in the seat	Open the valve (up to 10 - 30% of the stroke) and close it again, repeat this action several times, remove jammed particle if possible
	U profiled gasket is damaged	Replace U profiled gasket according to Section 6.3.3
Leak at the outlet of the knife	Leaking lateral seal	Retighten the lateral seal according to Section 6.3.2 See also Section 6.1!
	Damaged lateral seal	Replace the lateral seal according to Section 6.3.2 Clean the knife and lubricate it See also Section 6.1!
	Damaged lateral seal	Open the valve, remove the protection panel, clean the knife and lubricate it

8 How to contact us

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Service

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