

## VAG IKO<sup>®</sup>plus Gate Valves



## Table of contents

|          |  |          |
|----------|--|----------|
| <b>1</b> | <b>General</b>                                   | <b>3</b> |
| 1.1      | Safety   | 3        |
| 1.2      | Proper use                                       | 3        |
| 1.3      | Identification                                   | 3        |
| <b>2</b> | <b>Transport and Storage</b>                     | <b>3</b> |
| 2.1      | Transport  | 3        |
| 2.2      | Storage  | 4        |
| <b>3</b> | <b>Product features</b>                          | <b>4</b> |
| 3.1      | Features and function description                | 4        |
| 3.2      | Fields of application                            | 4        |
| 3.3      | Permissible and impermissible modes of operation | 5        |
| <b>4</b> | <b>Installation into the pipeline</b>            | <b>5</b> |
| 4.1      | Conditions required on site                      | 5        |
| 4.2      | Installation location                            | 5        |
| 4.3      | Installation position                            | 5        |
| 4.4      | Assembly instructions and fittings               | 6        |
| <b>5</b> | <b>Set-up and operation of the valve</b>         | <b>6</b> |
| 5.1      | Visual inspection and preparation                | 6        |
| 5.2      | Function check and pressure test                 | 6        |
| <b>6</b> | <b>Actuators</b>                                 | <b>6</b> |
| 6.1      | General  | 6        |
| 6.2      | Operating torques                                | 6        |
| 6.3      | Assembly of the electric actuator                | 7        |
| 6.4      | Commissioning of electric actuators              | 7        |
| <b>7</b> | <b>Maintenance and repair</b>                    | <b>7</b> |
| 7.1      | Maintenance and repair                           | 7        |
| 7.2      | Inspection and operation intervals               | 7        |
| 7.3      | Parts list                                       | 7        |
| 7.4      | Cleaning and lubrication                         | 7        |
| <b>8</b> | <b>Trouble-shooting</b>                          | <b>8</b> |
| <b>9</b> | <b>How to contact us</b>                         | <b>8</b> |

VAG reserves the right to make technical changes and use materials of similar or better quality without express notice. The pictures used are typical and non-binding.

# 1 General

## 1.1 Safety



These Operation and Maintenance Instructions must be observed and applied at all times along with the general "VAG Installation and Operation Instructions for Valves" (see [www.vag-group.com](http://www.vag-group.com) / Category: Installation and Operation Instructions).

Arbitrary alterations of this product and the parts supplied with it are not allowed. VAG will not assume any warranty or 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 W332 and W392, etc.). The installation must only be carried out by qualified staff (see also Section 7.1 General safety instructions). For further technical information such as dimensions, materials or applications, please refer to the respective documentation (KAT-A 1162).

VAG valves are designed and manufactured to the highest standards and their safety of operation is generally ensured. However, valves may be potentially dangerous if they are operated improperly or are not installed for their intended use.

All personnel dealing with the assembly, disassembly, operation, maintenance and repair of the valves must have read and understood the complete Operating and Maintenance Instructions (Accident Prevention Regulations, VBG 1 § 14 and following [Regulations issued by the Trade Associations] and ANSI Z535).

Before removing any protective devices and/or performing work on the valves, depressurise the pipeline section and ensure it is free of hazards. Unauthorised, unintentional and unexpected actuation as well as any hazardous movements caused by stored energy (pressurised air, water under pressure) must be prevented.

In the case of equipment that must be monitored and inspected, all relevant laws and regulations such as the Industrial Code, Accident Prevention Regulations, the Ordinance of Steam Boilers and instructional pamphlets issued by the Pressure Vessels Study Group must be complied with. In addition, the local accident prevention regulations must be observed.

When a valve needs to be dismantled from a pipeline, fluid may emerge from the pipeline or the valve. The pipeline must be emptied completely before the valve is dismantled. Special care needs to be taken in case of residues which may continue flowing.

## 1.2 Proper use

The VAG IKO<sup>®</sup>plus Gate Valve is a metallic-sealing shut-off valve for installation in pipelines.

VAG IKO<sup>®</sup>plus Gate Valves are used to shut off the medium present in the pipeline. In plant construction and in the construction of buried pipelines, VAG IKO<sup>®</sup>plus Gate Valves are used for OPEN/CLOSE operation of pipelines. By turning the operation element (e.g. the handwheel) clockwise (i.e. to the right), the valve is closed. By turning the operation element to the left, the valve is opened. It is not possible to use this valve as a control valve. Continuous operation of the valve in an intermediate position will lead to increased wear and should therefore be avoided. For specific control tasks other types of valves should be used.

VAG IKO<sup>®</sup>plus Gate Valves meet the requirements of the standard DIN EN 1171 (similar to DIN 3352 – Parts 2 and 3).

For the respective technical application ranges (e.g. operating pressure, medium, temperature etc.), please refer to the product-related documentation (KAT-A 1162).

VAG IKO<sup>®</sup>plus Gate Valves can be pressurised in both flow directions.

For any deviating operating conditions and applications, the manufacturer's written approval must be obtained!

These Operation and Maintenance Instructions contain important information on the safe and reliable operation of the VAG IKO<sup>®</sup>plus Gate Valves.

Observing these Operation and Maintenance Instructions helps you to:

- Prevent hazards
- Reduce repair costs and down-times of the valve and/or the entire plant
- Improve the operational safety and useful life expectancy of the equipment

## 1.3 Identification

According to DIN EN 19, all valves bear an identification label specifying the nominal diameter (DN), nominal pressure (PN) and the manufacturer's logo.

A rating plate is attached to the body and contains at least the following information:

|                     |                               |
|---------------------|-------------------------------|
| VAG                 | Manufacturer's name           |
| DN                  | Nominal diameter of the valve |
| PN                  | Nominal pressure of the valve |
| Date of manufacture |                               |
| Serial number       |                               |

# 2 Transport and Storage

## 2.1 Transport

For transportation to its installation site, the valve must be packed in stable packaging material suitable for the size of the valve. Ensure that the valve is protected against atmospheric influences and external damage. When the valve is shipped under specific climatic conditions (e.g. overseas transport), it must be specially protected and wrapped in plastic film and a desiccant must be added.

The factory-applied corrosion protection and any assemblies must be protected against damage by external influences during transport and storage.

The VAG IKO<sup>®</sup>plus Gate Valve should be transported slightly open. During storage, the valve should rest safely and in a stable position on one of its flanges (see Picture 1). It is advisable to fix the gate valve bonnet with wooden plates or sturdy cardboard to prevent the valve from resting on the hand wheel. from resting on its stem square end.



Attention: When the VAG IKO<sup>®</sup>plus Gate Valve is delivered, it is not completely open / closed. Before putting the valve in operation, adjust it to the desired position (open/close operation).



Figure 1: Transport position of VAG IKO®plus Gate Valves

When the valve is equipped with an actuator, ensure safe storage of the actuator to prevent transverse loads from acting on the connections.

For the selection and use of slings, the weight of the valve and the type of sling must be considered. The weights of the VAG IKO®plus Gate Valves can be found in KAT-A 1162. The use of slings should comply with the relevant regulations.

Never lift or lower the load abruptly as the forces occurring in this case may damage both the valve and the lifting equipment.

For transport purposes and also to support assembly, lifting devices such as cables and belts must only be attached to the valve body.

The length and positioning of the cables/belts must ensure that the valve is in a horizontal position during the entire lifting procedure.

For valves that have been factory-packed in transport crates (wooden crates), the centre of gravity of the entire unit must be taken into account. The centre of gravity is marked on each side of the crate at our factory and must be considered for all lifting operations.

## 2.2 Storage

Store the VAG IKO®plus Gate Valve in a slightly open position. During storage, the valve should rest safely and in a stable position on one of its flanges (see Picture 1).

Store the valve in a dry and well-aerated place. Avoid direct radiator heat. Protect any assembly units important for the function such as the wedge against dust and other dirt by adequate covering.

Do not remove the protective caps of the connections / flanges and the packaging materials until immediately prior to assembly.

The valve can be stored in ambient temperatures ranging from -20° C to + 50° C (protected by adequate covers).

## 3 Product features

### 3.1 Features and function description

In general, VAG IKO®plus Gate Valves serve the purpose of shut-

ting off the medium. Due to their fully flanged design, they can be used both between two flanges and as end-of-line valves without counter-flange at full operating pressure.

As a standard, the valve is available with synthetic resin coating in the following types (see Picture 2):

- Face-to-face length to EN 558-1, Basic Series 14 (DIN 3202, F4) with rising or non-rising stem
- Face-to-face length to EN 558-1, Basic Series 15 (DIN 3202, F5) with rising or non-rising stem

The valve is operated via a handwheel (rising or non-rising stem) or an electric actuator (rising stem).

### 3.2 Fields of application

Depending on the material used for the seals, VAG IKO®plus Gate Valves can be used with the following media:



VAG IKO®plus Absperrschieber Grundreihe 15

VAG IKO®plus Absperrschieber Grundreihe 14

Figure 2: Standard type of the VAG IKO®plus Gate Valve

#### Seals made of EPDM / brass:

- Water up to 150° C maximum
- Raw water and cooling water

#### Seals made of Viton / stainless steel:

- Water up to 200° C maximum
- Raw water and cooling water

VAG IKO®plus Gate Valves should only be used in media in which there is not risk of clogging.

For information about the corresponding temperature limits, please refer to the product-related technical documentation (KAT-A 1162).

In case of deviating operating conditions and applications, please consult the manufacturer.

### 3.3 Permissible and impermissible modes of operation

The maximum operating temperatures and operating pressures specified in the technical documentation (KAT-A 1162) must not be exceeded.

The pressure applied to the closed valve must not exceed its rated pressure.

The maximum permissible flow velocity (stable flow) is that specified in the EN 1074-1 standard.

#### R14 - short face-to-face length

PN 6 - 2,5 m/s

PN 10 - 3 m/s

#### R 15 – long face-to-face length

PN 16 - 4 m/s

Any exceptions from the above require the manufacturer's express written approval.

If the valve is operated in turbulent flows (e.g. installed downstream of elbows and similar sections) the flow velocity must be reduced accordingly in consultation with the manufacturer. If this is not possible, maintenance intervals must be shorter.

VAG IKO<sup>®</sup>plus Gate Valves are suitable for open/close operation only. Continuous operation of the valve in an intermediate position will lead to increased wear and should therefore be avoided. For specific control tasks other types of valves should be used.

## 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 alignment, they must be aligned before installation of the valve, as otherwise this may result in impermissibly high loads acting on the valve body during operation, which may eventually even lead to fracture.

When installing the valve into the pipeline, make sure it is as tension-free as possible. 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.

For assembly in drinking water pipelines, suitable sealing materials, lubricants and process materials must be used which are approved for use in drinking water pipelines.

Before putting the valve into operation, clean and purge the corresponding pipeline sections. For this operation, DVGW Instruction Sheets W 291 and W 346 must be observed.

### 4.2 Installation location

The installation location of the valve must be selected to provide

sufficient space for operation, function checks and maintenance works (e.g. dismantling and cleaning of the valve).

If the valve is installed in the open, it must be protected against extreme atmospheric influences (e.g. formation of ice) by adequate covers.

When installing the valve as an end-of-line valve, make sure in particular that the free outlet side cannot be accessed by people.

### 4.3 Installation position

When used with technically clean media, the VAG IKO<sup>®</sup>plus Gate Valve can be installed in any position.

In horizontal pipelines, VAG IKO<sup>®</sup>plus Gate Valves should be installed with an inclination not exceeding 30°.

For any other installation positions the manufacturer cannot guarantee the trouble-free function of the valve. In particular if the valve is installed in a vertical position or a horizontal position in vertical pipelines, increased deposits around the wedge may be expected. This increases the risk of malfunctions.

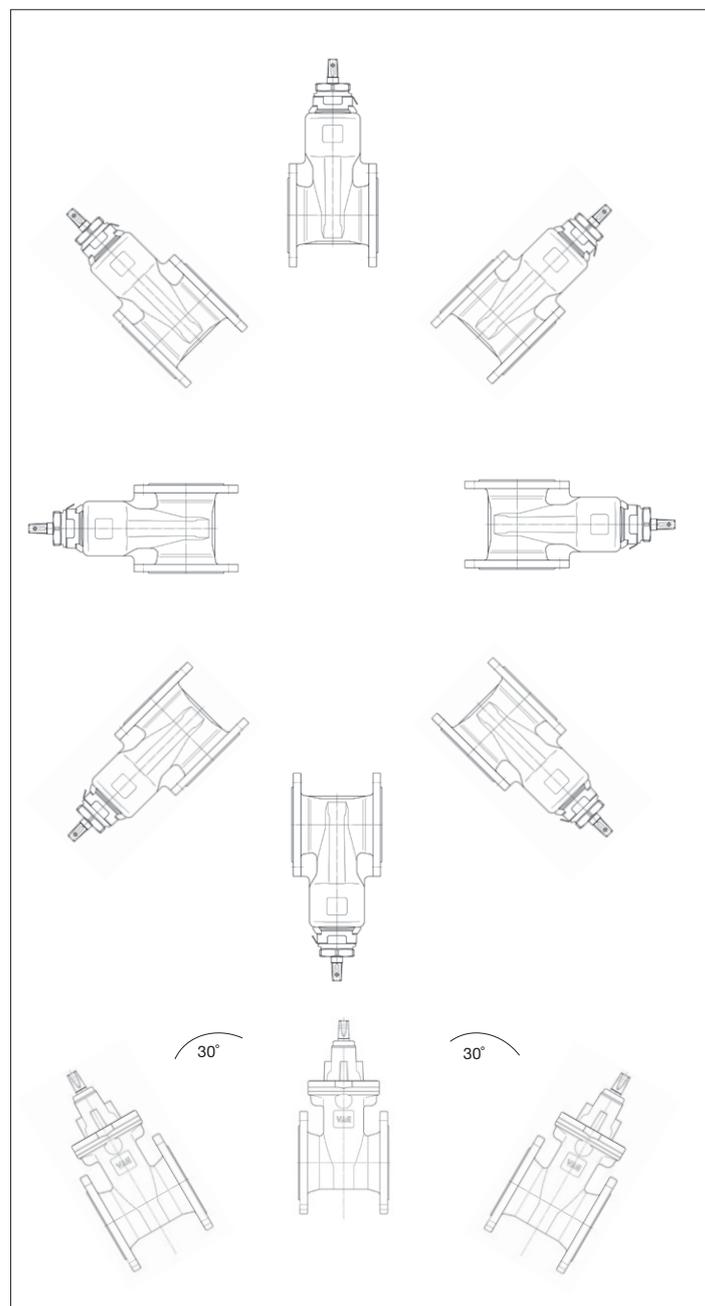


Figure 3: Installation positions of the valve

## 4.4 Assembly instructions and fittings

Prior to assembly check the valve for possible damage that may have occurred during transport and storage. Protect the valve against dirt caused from the construction site by adequate covering until installation. Prior to installation, all components essential for proper function, such as the wedge and in general the inner surfaces of the valve must be thoroughly cleaned to remove all dirt particles. VAG does not assume any liability for consequential damage caused by dirt.

The function parts should be checked for proper operation prior to installation.

Should the valves be repainted later on, it must be ensured that no paint is applied to the functional parts. The identification plates must not be painted over either. If the equipment is sand-blasted to clean it prior to installation, these parts must be adequately covered. If solvents are used for cleaning, you should ensure that they do not destroy the seals of the pipeline or the valve.

For the assembly of the VAG IKO<sup>®</sup>plus Gate Valve, it must be ensured that suitable load suspension devices as well as transport and lifting equipment are available.

When connecting the valve with the pipeline flanges, hexagon bolts and nuts with washers from flange to flange must be used in the through holes.

Fasten the bolts evenly and crosswise to prevent unnecessary tension that may result in cracks or breaks in the flange. The pipeline must not be pulled towards the valve. Should the gap between valve and flange be too wide, this should be compensated by thicker seals.

We recommend using steel-reinforced rubber seals to DIN EN 1514-1 Shape IBC. If you use raised face flanges, the use of IBC seals is mandatory.

While the valve is being installed, it must be ensured that the flanges of the pipeline it is connected to are aligned and level with each other. Welding works on the pipeline must be performed before the valves are installed to prevent damage to the seals and the corrosion protection. Welding residue must be removed before the equipment is put into operation.

The pipeline must be laid in a way that prevents harmful pipeline forces from being transmitted to the valve body. Should construction works near or above the valve not be completed yet, the valve must be covered to protect it from dirt.

## 5 Set-up and operation of the valve

### 5.1 Visual inspection and preparation

Before putting the valve and the equipment into operation, perform a visual inspection of all functional parts. Check whether all bolted connections have been properly fastened.

Check whether the gate valve is soft-running. For this purpose, move the wedge of the gate valve over its entire stroke (OPEN - CLOSE). You can operate the valve with a handwheel or with the emergency handwheel (electric actuator). Do not use excessive force.

#### Type with non-rising stem:

The valves are maintenance-free. The stem bearing of the VAG

IKO<sup>®</sup>plus Gate Valve is safe to run dry. Subsequent lubrication is not necessary.

#### Type with rising stem:

It needs to be ensured that the stem of valves with rising stem is free from dirt and properly lubricated.

When putting the valve into operation, check the stuffing box packing as it may have subsided a bit during transport and storage. This may cause leaks. The stuffing box screws should be refastened, if required. If the stuffing box is fastened too firmly, the force required to operate the gate valve will increase, making the valve difficult to operate and reducing the service life of the stuffing box.

At certain intervals (in particular after longer periods of standstill) this adjustment of the stuffing box must be repeated and the gland must be refastened, if necessary.

## 5.2 Function check and pressure test

Prior to installation, the function parts of the valve have to be opened and closed completely at least once and should be checked for proper operation.

The dimensions of the valve allow its operation by one person via a handwheel or an operating key. Extensions for operation are not permissible and may cause damage to the valve due to excessive loads.



**Warning!!** The pressure exerted on the closed valve must not exceed its nominal pressure (see technical data sheet KAT-A 1162). When a pressure test is performed on the pipeline with a test pressure exceeding the admissible nominal pressure in closing direction, the pressure must be compensated by way of a by-pass.

Newly installed pipeline systems should first be thoroughly purged to remove all foreign particles. If residues or dirt particles are present in the pipeline, they might clog the installations while the pipeline is being purged. This may impair the function of the valve or even block it.

In particular after repair work or upon the commissioning of new equipment, the pipeline system is to be purged again with the valve being fully open. If detergents or disinfectants are used, it must be ensured they do not attack the valve materials.

## 6 Actuators

### 6.1 General

Actuators (handwheel, electric actuator) are designed for flow velocities according to Table 2 in EN 1074-1 (valves used for water supply; requirements relating to fitness for use). Any deviating operating conditions need to be specified.

For detailed information about drives and actuators, please refer to the operation manuals provided by the manufacturers (e.g. AUMA,...). These may have to be purchased by the user himself.

### 6.2 Operating torques

The design of the operating elements (handwheel) prevents the maximum hand forces to EN12570 from being exceeded.

Factory-assembled electric actuators are designed for the forces required to close the valve tightly. The minimum strength torque is specified by Category 1 of the standard 1171 Industrial Valves (Cast-iron gate valves).

### 6.3 Assembly of the electric actuator

The electric actuator is mounted to the inlet flange. The size of the actuator is selected according to the maximum operating torques.

The valve is switched off:

- path-dependent in open position
- path-dependent in closed position

The switching points are factory-adjusted. The torque switches serve as overload protection in intermediate positions. If the valve is retrofitted with an electric actuator, the limit switches have to be adjusted after the assembly of the actuator. For information about adjustment, please refer to the operation instructions of the manufacturer of the electric actuator.

The relevant safety regulations of the VDI/VDE and the instructions of the manufacturer of the electric actuator must be complied with.

Upon delivery, the adjustment screws and connection bolts of the electric actuator are sealed by adhesive labels or identified by colour markings. If these identifications are broken later on, this will result in the loss of the manufacturer's warranty.

### 6.4 Commissioning of electric actuators

- Turn the valve in a central intermediate position by hand.
- Check the direction of rotation of the motor by shortly switching it on.
- Should the motor be running in the wrong direction, reverse poles of the motor connection.
- Then check the direction of rotation again by shortly switching the motor on.
- Check the switch-off function of the torque and limit switches in both directions by manual operation of the switches in intermediate position.
- Reverse poles if necessary.

The valve must not be operated over its entire stroke until the direction of rotation is correct and the switch-off function works properly.



Figure 4: Identification of electric actuator

If the direction of rotation is wrong, the limit and torque switches are ineffective!

## 7 Maintenance and repair



### 7.1 Maintenance and repair

Prior to the performance of inspection and maintenance work on the valve or its assemblies, shut off the pressurised pipeline, depressurise it and secure it against inadvertent activation. Depending on the type and hazard risk of the fluid conveyed, comply with all required safety regulations!

After completing the maintenance works and before resuming operation, check all connections for tightness. Perform the steps described for initial set-up as described under Section 5 "Set-up and operation".

Statutory and local provisions as well as the safety and accident prevention regulations must be observed and complied with at all times.

Servicing, maintenance and inspection work as well as the replacement of spare parts must only be carried out by qualified personnel. The plant operator is responsible for determining the suitability of the personnel and/or for ensuring that they have all relevant qualifications.

In case the operator's employees do not have the qualifications required, they should attend a training course. Valve-related training courses can be undertaken by VAG Service employees.

In addition to this, the plant operator needs to ensure that all employees have understood these Operation and Maintenance Instructions as well as all further instructions referred to in them.

Protective equipment such as safety boots, safety helmets, protective clothing, goggles, protective gloves etc. must be worn during all work requiring such protective equipment or for which such protective equipment is prescribed.

Improper, wrong and abrupt use of the valve should be avoided. Prior to the performance of any work on the valve and equipment, it must be ensured that the relevant pipeline section has been depressurised and/or de-energised.

### 7.2 Inspection and operation intervals

The tightness, operability and corrosion protection of the valve should be checked depending on the plant and operating conditions. We recommend operating the valve at least once per year to prevent the build-up of incrustations.

In case of extreme operating conditions, inspections should be performed more frequently.

How often the body seals have to be replaced depends on their wear and the medium they are used in.

The stuffing box packing (valves with rising stem) should be refastened when necessary (see Chapter 5.1).

### 7.3 Parts list

The sealing sets needed can be found in the spare parts list KAT-E 1162. Suitable stuffing boxes are available upon request.

### 7.4 Cleaning and lubrication

The stem and stem nut must be free from dirt and always be properly greased. Depending on the operating conditions, clean the stem and slightly relubricate it.



For all repair and maintenance work, please observe the general safety instructions described in Section 7.1!

### Head office

VAG-Armaturen GmbH  
 Carl-Reuther-Str. 1  
 68305 Mannheim  
 Germany  
 Telephone: +49 (621) 749-0  
 Fax: +49 (621) 749-2153  
 info@vag-group.com  
<http://www.vag-group.com>

### Service

Our service hotline can be reached 24/7 world-wide. In case of emergency, please contact us directly by phone.

Service hotline: +49 621 - 749 2222

Service per email: [service@vag-group.com](mailto:service@vag-group.com)

| Problem                               | Possible causes                             | Remedial action                  |
|---------------------------------------|---|----------------------------------|
| Gate valve does not close             | Stem nut defective                          | Replace stem nut                 |
|                                       | Foreign particle on sealing face            | Remove foreign particle          |
|                                       | Wedge defective                             | Replace wedge                    |
|                                       | Stem distorted                              | Replace stem                     |
|                                       | Heavy deposits on the sliding surfaces      | Clean sliding surfaces           |
| Gate valve does not open              | Foreign particle is jamming wedge           | Remove foreign particle          |
|                                       | Stem distorted                              | Replace stem                     |
|                                       | Stem nut defective                          | Replace stem nut                 |
| Gate valve leaky at the bonnet        | Stem bearing or gland not properly fastened | Refasten stem bearing or gland   |
|                                       | Gasket defective                            | Replace gasket                   |
| Gate valve leaky at the stem bearing  | Stuffing box defective                      | Refasten or replace stuffing box |
| Defective O-rings in the stem bearing | Scraper ring defective (stem dirty)         | Replace scraper ring             |

