



#### Instruction for use

Thank you for selecting an AVK product. With correct use, the product is guaranteed to deliver a long and reliable service. This manual has been prepared to assist you with the installation, operation and maintenance of the valve to the maximum efficiency. For ease of reference, it has been divided into sections covering all aspects of use, and it is in the users best interests to read it and ensure that it is fully understood.

#### Health and Safety

It is always recommended that wherever work is being carried out on a valve that the valve is fully depressurised prior to carrying it out, and for the convenience draining of the line may be beneficial.

It is essential that the user of the valve is aware of the weight of the components and/or assemblies that must be handled and manipulated during installation and maintenance. It is the users responsibility to ensure that safe working practices are followed at all times.

Whenever AVK products are installed, operated, or maintained, it is essential that the staff that undertake these operations be adequately trained. The hazards of pressurised liquids and gases can be severe, and it is the responsibility of the users to ensure that trained, competent staff undertake these duties. This manual has been designed to assist, but it can never fully replace quality training in the workplace. AVK technical staff will always be available to answer any questions relating to specific problems that may not be covered by this manual.

AVK products are designed and manufactured to be fit for purpose, and to a high and reliable standard. This provides a safe product with minimum risk to health when used correctly for the purpose for which it was designed. However, this assumes that the equipment is used and maintained in accordance with the manual, and the user is advised to study this manual, and to make it available to all staff that may need to refer to it.

AVK cannot be held responsible for any incidents arising from incorrect installation, operation or maintenance. The responsibility for this must rest wholly with the user.

### Storage

- The valve should not come into contact with any contaminative substances prior to installation
- Valve end protectors (if supplied) should not be removed unless necessary for inspection or installation.
- Protection against weather should be provided. Ideally, valves should be kept indoors with the actual valve temperature always higher than the dew point, particularly for valves fitted with actuators.
- If outdoor storage is unavoidable the valves should then be supported off the ground and protected by a weatherproof cover, from dust-laden damp or saline conditions and at an ambient temperature.
- If long term storage is envisaged, then it may be considered prudent to have a AVK engineer inspect the valve prior to installation.

### Handling

A basic consideration in handling protected valves should be to avoid damaging the coating protection and valves should never be thrown or dropped. Valves whose size requires handling by crane or lift truck should be slung or rigged carefully to avoid damage to exposed valve parts.

Handwheels, bypass, actuators and gearboxes in particular, should not be used as lifting or rigging points for valves.

#### 1. Introduction

AVK series 55 gate valves are available in DN450, DN500 and DN600. The valve has a full and straight bore corresponding to the nominal diameter and can be installed independent of the flow direction. To keep the advantage of the full and straight bore vertical installation is recommended, however, flow/pressure limitations outlined below should be observed.

The valves are 100% factory tested hydrostatically.

The valves have a standard gland flange according to ISO 5210. Various optional extras can be supplied factory fitted or in kit form for retrofitting. See data sheet.

A complete by-pass system is factory fitted. The by-pass system secures an optimum installation due to slow filling and emptying of the pipe line and passing of air.

**IT IS IMPORTANT TO STATE OPERATING TEMPERATURE, PRESSURE, MEDIUM AND OPERATING CONDITIONS WITH ENQUIRIES/ORDERS, SO THAT THE MOST SUITABLE VALVE WILL BE SUPPLIED FOR YOUR SPECIFIC PURPOSE.**

#### Materials:

##### Body, bonnet and gland flange

Ductile Iron, grade 500-7 to AS 1831

##### Coating

Epoxy coating - internally and externally to AS 4158

##### Stem

Stainless Steel 431

##### Stem sealing

NBR wiper ring, 2 NBR O-rings

##### Bearing

Polyamid

##### Wedge

Ductile Iron, grade 500-7, core fully vulcanised with EPDM rubber, with integral wedge nut of dezincification resistant brass, CZ 132 to AS 2345

##### Thrust collar

Dezincification resistant brass, CZ 132 to AS 2345

##### Bonnet bolts

Stainless Steel 316, sealed with hot melt

##### Bonnet gasket, stem/bonnet and O-ring

EPDM rubber

##### Gland flange O-rings

NBR rubber

##### Lifting eyes

Zinc plated steel

##### Stud bolts, nuts and washers

Stainless Steel

##### Gland flange bolts

SS 316

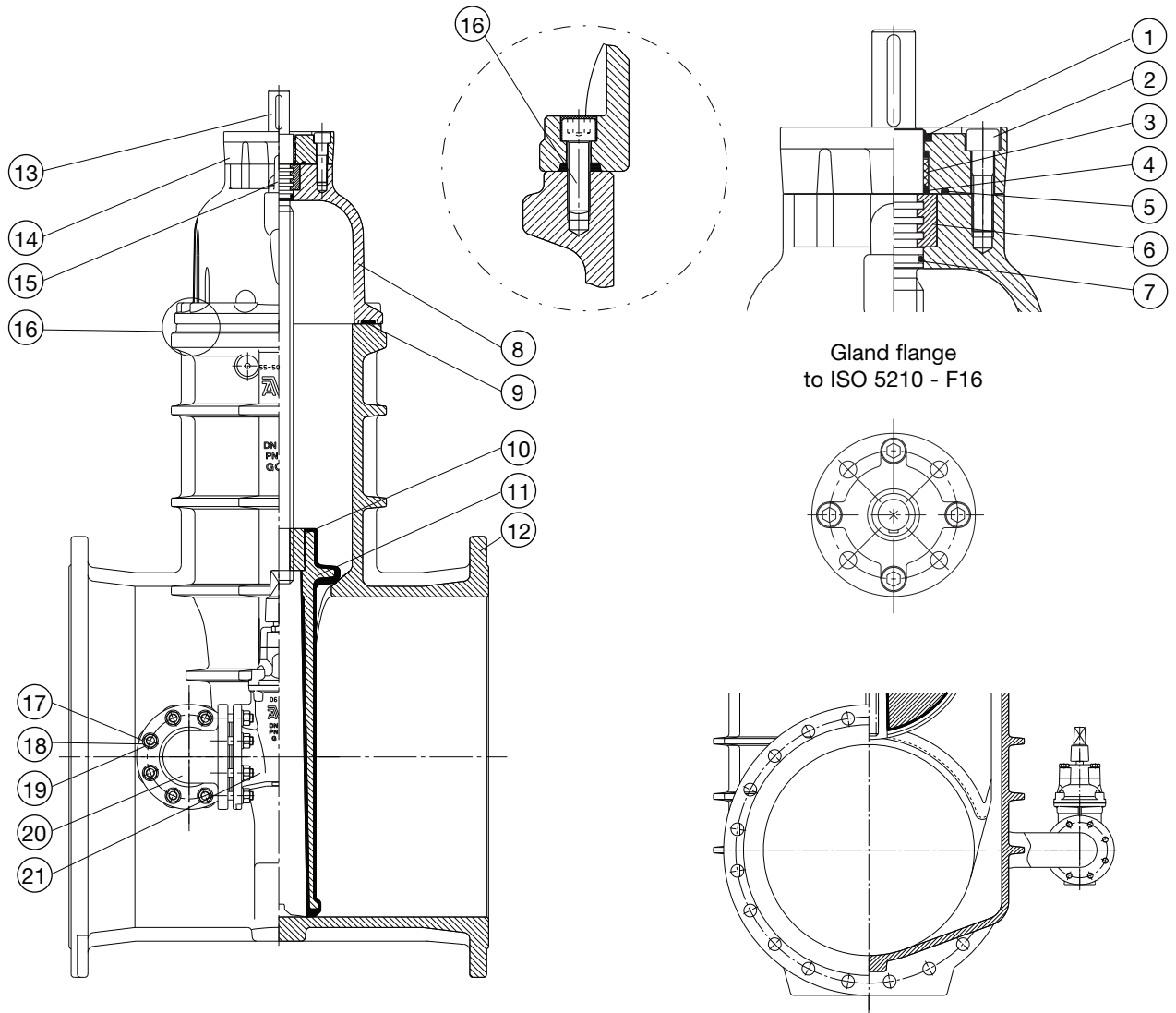
##### By-pass valve, bends

Ductile Iron, grade 500 - 7 to AS 1831



#### Component list

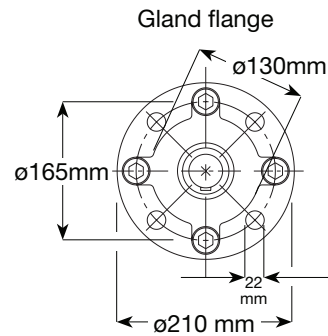
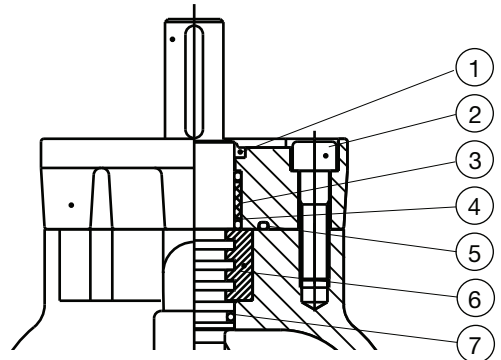
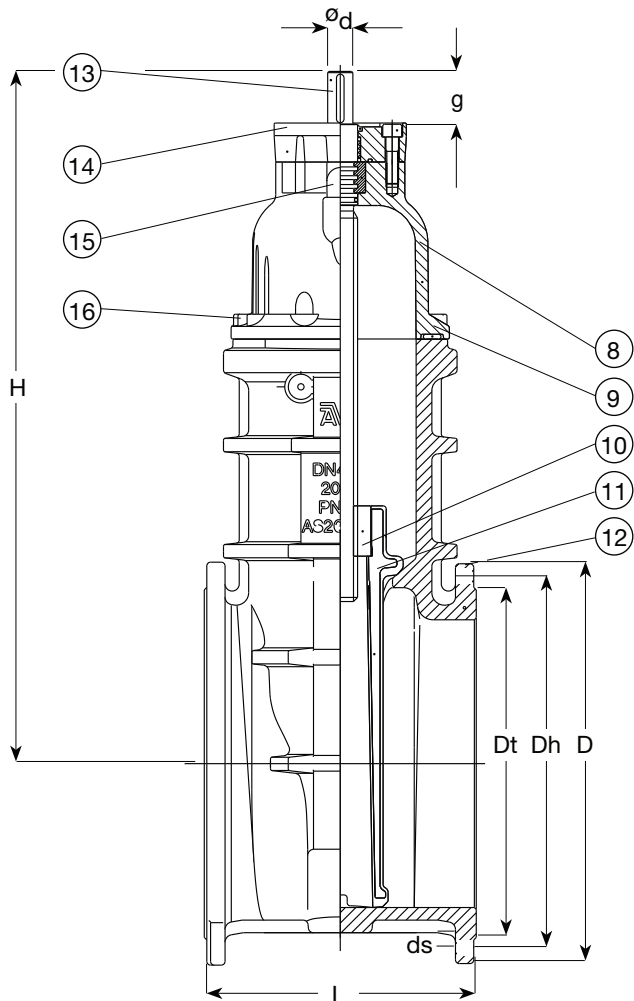
- |                        |                       |                  |                   |
|------------------------|-----------------------|------------------|-------------------|
| 1. Wiper ring          | 7. Stem/Bonnet O-ring | 13. Stem         | 19. Washer        |
| 2. Gland flange bolt   | 8. Bonnet             | 14. Gland flange | 20. Bend          |
| 3. Bearing             | 9. Bonnet gasket      | 15. Lifting eye  | 21. By-pass valve |
| 4. Stem seal O-ring    | 10. Wedge nut         | 16. Bonnet bolt  |                   |
| 5. Gland flange O-ring | 11. Wedge             | 17. Stud bolt    |                   |
| 6. Thrust collar       | 12. Body              | 18. Nut          |                   |



**Long face to face with integral bypass capability**

#### Component list

- |                        |                       |                  |
|------------------------|-----------------------|------------------|
| 1. Wiper ring          | 7. Stem/Bonnet O-ring | 13. Stem         |
| 2. Gland flange bolt   | 8. Bonnet             | 14. Gland flange |
| 3. Bearing             | 9. Bonnet gasket      | 15. Lifting eye  |
| 4. Stem seal O-ring    | 10. Wedge nut         | 16. Bonnet bolt  |
| 5. Gland flange O-ring | 11. Wedge             |                  |
| 6. Thrust collar       | 12. Body              |                  |



**Short face to face with no bypass capability**

## 2. Installation

- When installing the gate valves, ensure that the seats and the flange faces are clean.
- When valves are provided with lifting lugs, plates or eye nuts, these must be used to lift the valve.
- To ensure adequate sealing it is important to select the correct type of gasket for the medium concerned, 2 gaskets with the correct flange size must be used.
- Place valve between pipe flanges, and insert the bolts.
- Tighten bolts loosely.
- Tighten bolts in a diagonal sequence to ensure flanges are pulled parallel.
- Finally tighten bolts to correct torque levels as recommended in WSA 109.

### 2.1. Bolts

#### 2.1.1 Bolt size

The following table shows bolt size you should use for which valve dimensions.

DN mm	Bolts	Quantity
450	M 24	16
500	M 24	16
600	M 27	16

### 2.2. Exchange/retrofit a by-pass System

#### **IMPORTANT! Before mounting a by-pass system:**

1. The main valve must not be under pressure.
2. The medium must be below the level of the by-pass flanges on the side of the valve.  
Preparation of the main valve.  
Clean the flanges of the valve carefully to remove dirt and impurities.

#### **Preparation of the main valve**

Clean the flanges of the valve carefully to remove dirt and impurities.

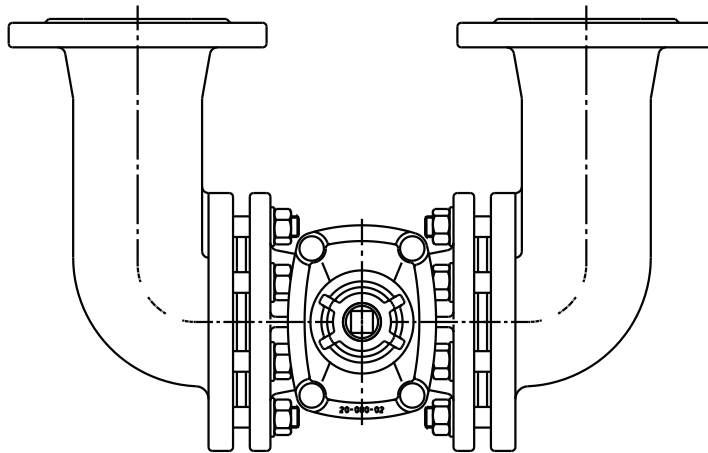
#### **Preparation of the by-pass system**

Screw the stud bolts into the two cast iron bends and fit the bends to the by-pass valve together with the mating gaskets (see drawing).

Fasten the nuts loosely to ensure that the bends can move freely in relation to the valve.

#### **Mounting**

Mount the by-pass system on the main valve together with new gaskets and re-use the nuts and washers removed previously for fastening.



### 3. Operation

#### 3.1. Right-hand closing valves

##### 3.1.1. Closing

During manual operation the valve is closed by turning the handwheel clockwise until the valve is completely closed, however only up to max. operating torque (see table).

For valves supplied with gears, the handwheels are also turned clockwise. It is IMPORTANT that the interchange of the gear is taken into consideration, so that the valve is not operated at a higher torque than max. operating torque (see table).

When closing valves with actuators, adjust the actuator so that the output shaft moves clockwise, and adjust the on/off torque switch so that the valve is not operated at a higher torque than the max. operating torque (see table).

##### 3.1.2. Opening

The valves are opened by turning the handwheel, gear or actuator anti-clockwise until the valve is completely open. This is recognised by a powerful (and sudden) stop.

#### 3.2. Left-hand closing valves

##### 3.2.1. Closing

During manual operation the valve is closed by turning the handwheel anti-clockwise until the valve is completely closed, however only up to max. operating torque (see table).

For valves supplied with gears, the handwheels are turned anti-clockwise. It is IMPORTANT that the interchange of the gear is taken into consideration, so that the valve is not operated at a higher torque than the max. operating torque (see table).

When closing valves with actuators, adjust the actuator so that the output shaft moves clockwise, and adjust the of/off torque switch so that the valve is not operated at a higher torque than the max. operating torque (see table).

##### 3.2.2. Opening

The valves are opened by turning the handwheel, gear or actuator clockwise until the valve is completely open. This is recognised by a powerful (and sudden) stop.

DN	Max. closing torque (Nm) (pressureless)	Turns to open	Free running torque (Nm)
450	600	40	25
500	660	44	25
600	800	53	25



### 4. Maintenance

#### 4.1. General

If the valve is installed according to AVK instructions, it is maintenance-free.

However, every 4-5 years we recommend that you:

- 1) Carry out a routine check of the valve for leaks around the stem and the flange gaskets. All seals will in the course of time be influenced by air and sunshine, and frequent and careful checks can reveal leaks.
- 2) Adjust the bolts in the flange connections, as the compression of the flange gaskets may be reduced in the course of time and thus leaks may arise. Please observe the bolt torques and sequence table under section 2.2.

#### 4.2. Replacement

AVK valves are factory lubricated and maintenance-free. If it is necessary to replace the stem seal the following procedure must be observed.

##### 4.2.1. Before replacement

Before replacement inform your supplier of the valve size. A gasket set will be delivered consisting of:

- 1 wiper ring
- 2 internal stem seal O-ring
- 1 gland flange O-ring
- 1 nylon bearing

##### 4.2.2. Disassembling

**IMPORTANT!** Before replacing the stem sealing the valve should be fully opened and not under pressure. This is done by turning the handwheel in opening direction until impact. It is very important to ensure that the wedge is fully open.

- 1) Unscrew the 4 gland flange bolts (pos 3.), lift out the gland flange (pos. 6) and pull off the stem.
- 2) Remove wiper ring (pos.1), O-rings (pos. 2, 5) and bearing (pos.4) carefully without damaging the gland flange.

##### 4.2.3. Assembling

- 1) Clean the internal surfaces in the gland flange and check for damage.
- 2) Lubricate the new O-rings, wiper ring and plastic bearing all over with a thin layer of grease (Molykote 111).
- 3) Fit the wiper ring, plastic bearing and O-rings carefully in the cleaned gland flange (see figure).
- 4) Clean the stem and gland flange and check for damage.
- 5) Apply a thin layer of grease (Molykote 111) to the stem.
- 6) Fit the gland flange on the valve and fix with the 4 gland flange bolts (pos. 3).

Please ensure that the O-ring (pos. 5) is not stuck between bonnet and gland flange.

Tighten the bolts with a torque of 35 Nm.

- 7) The valve can be closed again by turning the handwheel in closing direction.

