



# OPERATION AND MAINTENANCE INSTRUCTIONS

## AVK WEDGE GATE VALVE FOR WATER AND WASTE WATER

### 21/35, 21/37 and 21/78

#### 1. INTRODUCTION

Operation and Maintenance instructions for the series 21/35, 21/37 & 21/78 wedge gate valves.



#### 2. HEALTH AND SAFETY PRECAUTIONS

The valve is designed for underground use with minimum maintenance and requires no lubrication. In the event of a spares replacement becoming necessary the recommended procedure is as follows:- All of the following procedures must be carried out with due regard to relevant Road Traffic Act Guidelines, Health and Safety and COSHH directives.

**SAFETY NOTE:** Please take care when lifting either valves or components, make sure that health and safety guidelines are observed.

**SAFETY NOTE:** The valves now accommodate lifting bars for the safe handling of valves. These lifting bars are rated to the weight of the bare valve and stem cap (where fitted) only and should not be utilised if the valve is fitted with pipe, mechanical pipe joints, gearboxes, actuators or any other external fitment. AVK will not accept any responsibility for loss or damage if the lifting bars are not used in strict accordance with this guidance.

**NOTE:** The valves are NOT designed for "end of line" services. In the event of a valve being mounted on the end of a pipeline, we strongly advise the use of a blanking flange or plug.

**NOTE:** Resilient seated isolating (gate) valves designed for waterworks purposes may have a small air gap under the wedge bottom if being closed in dry conditions, using relatively low closing torque with the valve inadequately restrained. This is because the friction between the wedge rubber and the coated valve body seats is higher in dry conditions. The air gap is designed to allow for full compression of the rubber on the wedge against all sealing surfaces. Full compression takes place when the rubber wedge is lubricated by the pipeline medium thus allowing the valve to be fully closed.

**NOTE:** It is recommended that applications in a corrosive atmosphere or sited in exposed locations or in proximity to sea water or spray, use a stainless steel stem 1.4404 (316) and all exposed fasteners are in A4 stainless steel. A class "A" coating (300 microns inside and out 100% Holiday Free) is also recommended. Please see AVK Series 21/58 for this application.

**NOTE:** Air Venting: whenever a valve or pipeline is being filled it should be done slowly. It is also vitally important to ensure that all air is vented, preferably by using air release valves particularly at the highest point in the pipeline. These will also assist when emptying the line.

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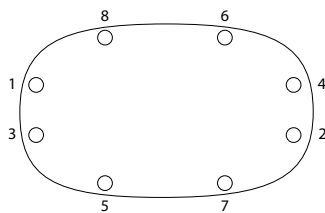
#### 3. REPLACEMENT OF STEM SEAL

This can be carried out with the valve under pressure in the pipeline, but take care over step 'a' to ensure a seal is formed between wedge and bonnet.

- a. Fully open valve to ensure it is back-seated. Apply a minimum of 60NM torque to ensure a watertight seal.
- b. In the case of a stem cap being fitted carefully prise out plastic insert. Remove stem cap bolt and stem cap (1).
- c. Remove hot melt / screw cover to expose 2 x socket cap bolts (7).
- d. Gland flange (15) can now be lifted clear of stem (2) allowing access to the stem sealing arrangement. Lift clear of stem and replace the 2 stem seal O-rings and nylon bush it is recommended to lubricate the stem seal 'O' rings using a Water Regulations approved grease e.g. Rocol, Aqua-Sil.
- e. Refit gland flange (15) with a new gland flange 'O' ring and tighten the 2 socket cap bolts using a torque wrench set at 40 NM to 60 NM. If the wiper ring is damaged, a complete new gland flange must be fitted.
- f. Refit stem cap assembly and insert (1).
- g. Close wedge by a few turns and check the integrity of the new seal arrangement.

#### 4. REPLACEMENT OF WEDGE

- a. Isolate valve and ensure there is no pressure in the pipeline.
- b. Adjust handwheel or stem cap to put the wedge into a slightly open position.
- c. Remove hot melt / screw cover to expose bonnet bolts (7) then remove bolts.
- d. Lift the entire bonnet (5) and wedge assembly (8) clear of valve body (9). Ensure H+S is followed, these assemblies are heavy.
- e. Unscrew wedge (8) from the stem (2).
- f. Fit new wedge by reversing step 'e', take care that the wedge is in a mid-position on the stem so that when refitting it will be clear of the base of the body.
- g. Replace bonnet seal (14). It is suggested that the bonnet bolts (7) are inserted into the bonnet holes first and then the seal (14) is fitted over them. The whole bonnet assembly can now be refitted onto the body (9).
- h. Tighten the bonnet bolts (7) following a diagonal sequence and using a torque wrench set at 25NM to 30 NM. Re-set the torque wrench at 40 NM to 50 NM and re-tighten the bolts following a circumferential sequence as per the 8-bolt example below.



NOTE: Actual bolting sequence may differ depending on the valve size.

- i. Check integrity of seal by re-charging the main. Ensure all air is vented prior to testing the valve.
- j. Should any leakage be found, tighten bonnet bolts (7) following the diagonal sequence as in 'h' with the torque wrench set at 70 NM to 80 NM.

**NOTE: It is vitally IMPORTANT to ensure all air is vented prior to fully charging the main.  
Hot melt removed: Recommend Denso Tape around bolts (7) to ensure corrosion protection.**

#### 5. REPLACEMENT OF PRIMARY SEAL 'O' RING

- a. Isolate valve and ensure there is no pressure in the pipeline.
- b. Turn stem (2) to put the wedge (8) into a slightly open position.
- c. In the case of a stem cap being fitted carefully prise out plastic insert and remove stem cap bolt and stem cap (1).
- d. Remove hot melt / screw cover to expose 2x Socket Cap bolts (7).
- e. The gland flange (15) can now be lifted clear of stem (2) allowing access to the stem seal arrangement.
- f. Remove stem seal O-rings x2 (11) and nylon bush
- g. Fully close the valve in order to raise the stem (2) clear of the bonnet (5), ensuring that the two thrust collars (4) are retained for re-assembly.
- h. Remove primary 'O' ring (13) and replace with a new 'O' ring, grease the 'O' ring with a Water Regulations approved grease e.g. Rocol Aqua-Sil.
- i. Replace the two stem seal 'O' rings (11) and nylon bushing in the gland flange (15). Grease internally using the approved grease. Do NOT grease the thrust collar groove in stem (2). Screw stem (2) back into wedge (8) whilst fitting thrust collars (4) ensuring they seat fully inside recess in bonnet (5).
- j. Refit gland flange (15) with a new gland flange 'O' Ring and tighten the 2 Socket cap bolts using a torque wrench set at 40 NM to 60 NM.
- k. Refit stem cap assembly (1) and insert.
- l. Close wedge by a few turns and check the integrity of the new seal arrangement.
- m. To check the integrity of the new seal arrangement, it will be necessary to recharge the main slowly and open and close the wedge (8) a few times.

**NOTE: It is vitally IMPORTANT to ensure all air is vented prior to fully charging the main.**

#### Materials of construction

- |                          |   |
|--------------------------|---|
| 1. Stem cap              | Grey iron, BS EN 1561EN-GJL-250 complete with cap screw FZP GR 8.8 to ISO 4762.   |
| 2. Stem                  | Stainless steel, BS EN. 10088-1. No.1.4021  |
| 3. Wiper ring            | EPDM rubber.  |
| 4. Thrust collar         | DZR brass, BS EN 12164, CW602N.   |
| 5. Bonnet                | Ductile iron, BS EN 1563 EN-GJS-500-7.  |
| 6. Bonnet bolts          | FZP Gr 8.8 to ISO 4762 sealed with hot melt.  |
| 7. Gland bolts           | FZP Gr 8.8 to ISO 4762 sealed with hot melt.  |
| 8. Body                  | Ductile iron, BS EN 1563 EN-GJS-500-7.  |
| 9. Wedge assembly        | Ductile iron, BS EN 1563 EN-GJS-500-7. Fully encapsulated with ESW-70 rubber WRAS listed, complete with wedge Z a N nut of D R br ss BS E 12164, CW 602N. |
| 10. Coating              | Internal and external, electrostatically applied, Blue epoxy to WIS 4-52-01 Class B. WRAS listed.   |
| 11. Stem seals           | EPDM rubber.  |
| 12. Gland seal           | EPDM rubber.  |
| 13. Primary seal         | EPDM rubber.  |
| 14. Body / bonnet gasket | EPDM rubber.  |
| 15. Gland flange         | Ductile iron, BS EN 1563, EN-GJS-500-7.   |

