

# AVK WEDGE GATE VALVES

21/00

21/01

21/60

## OPERATION & MAINTENANCE MANUAL



The designs, materials and specifications shown are subject to change without notice due to our continuing programme of product development.

## OPERATION:

Series 21 valves are suitable for use with clean water or neutral liquids up to 70°C. Minimum liquid temperature must be above freezing. Insulation is essential for external temperatures from 0° to -10°C. The valves can be operated manually by either ring key and bar, tee key, handwheel, gearbox or electric actuation. Direction of closing is on top of the gland flange (13).

**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. The gunmetal outlet and class A coating (300 microns inside and out) are also recommended.

**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.

## MAINTENANCE:

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.*

## 1) Replacement of Stem Seals

This can be carried out with 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.
- b) In the case of a stem cap being fitted carefully prise out plastic insert (20). Remove stem cap bolt (19) and stem cap (18).
- c) Remove 2 hexagon headed bolts (16) on top of gland flange (13).
- d) Gland flange (13) can now be lifted clear of stem (5) allowing access to the stem sealing arrangement. Lift clear of stem and replace the 2 'O' Rings (15) and it is recommended to lubricate the 'O' rings using a Water Regulations approved grease e.g. Rocol, Aqua-Sil. Refit bushing (14) on stem taking care not to nip or tear the new 'O' Rings.
- e) Refit gland flange (13) with a new gland flange 'O' Ring (12) and tighten the 2 hexagon headed bolts (16) using a torque wrench set at 100 NM to 110 NM. If the wiper ring (17) is damaged, a complete new gland flange must be fitted.
- f) Refit stem cap assembly i.e.:- (18) (19) (20).
- g) Close wedge by a few turns and check the integrity of the new seal arrangement.

## 2) 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 (9) to expose bonnet bolts (6) then remove bolts.
- d) Lift the entire bonnet assembly (8) and wedge (3) clear of valve body (1).
- e) Unscrew wedge (3) from the stem (5).
- 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 gasket (7). It is suggested that the bonnet bolts (6) are inserted into the bonnet holes first and then the gasket (7) is fitted over them. The whole bonnet assembly can now be refitted onto the body (1).
- h) Tighten the bonnet bolts (6) 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.
- i) Check integrity of seal by re-charging the main. Ensure all air is vented prior to fitting the valve.
- j) Should any leakage be found, tighten bonnet bolts (6) following the diagonal sequence as in h) with the torque wrench set at 70 NM to 80 NM.
- k) We recommend that the bonnet bolt heads are re-sealed to prevent corrosion. Ensure the sealant is water resistant by using for example a silicone type sealant.

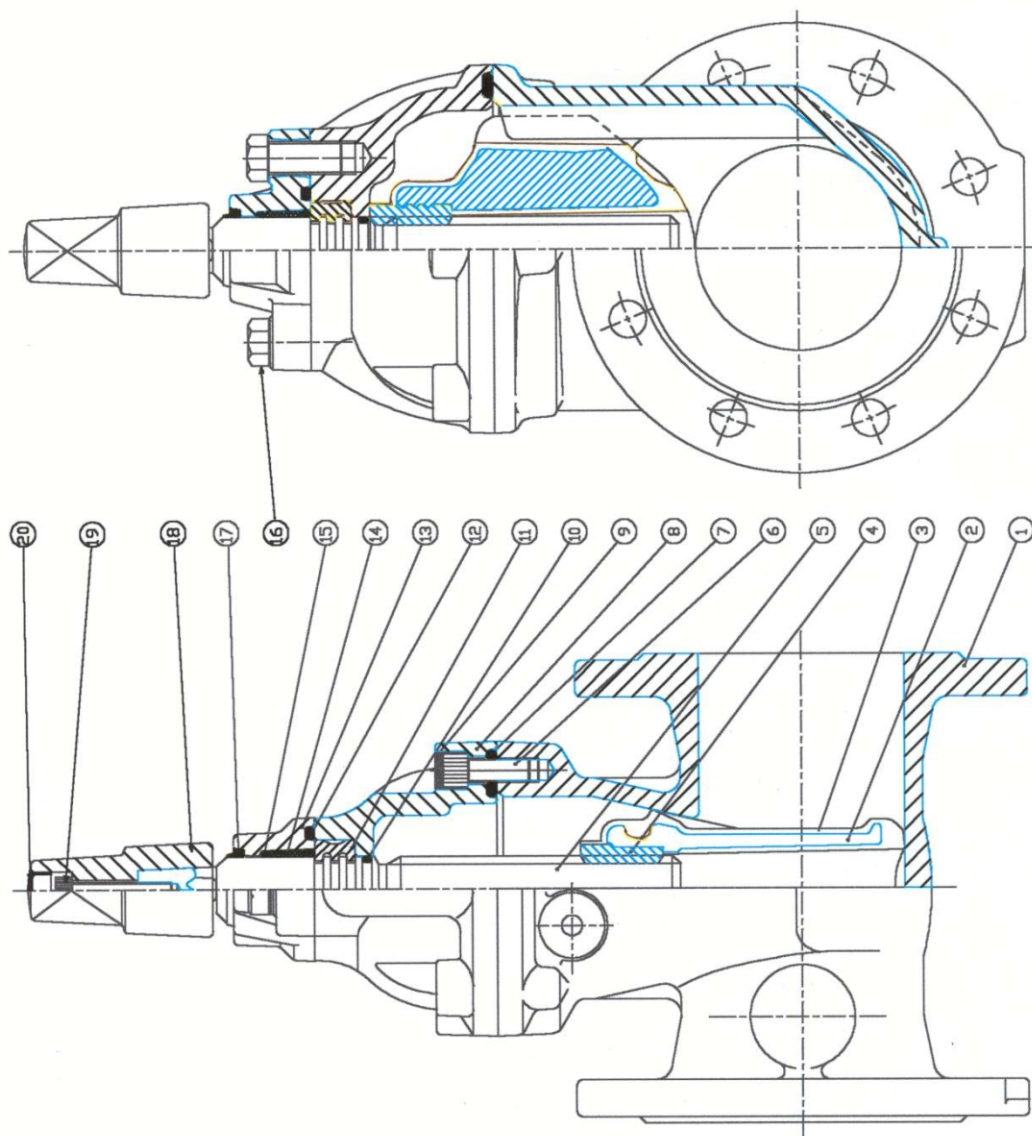
### 3) **Replacement of Stem Seal 'O' Ring (Item 10)**

- a) **Isolate** valve and ensure there is **no pressure** in the pipeline.
- b) Turn stem (5) to put the wedge (3) into a slightly open position.
- c) In the case of a stem cap being fitted carefully prise out plastic insert (20). Remove stem cap bolt (19) and stem cap (18).
- d) Remove 2 hexagon bolts (16) on top of gland flange (13).
- e) The gland flange (13) can now be lifted clear of stem (5) allowing access to the stem seal arrangement.
- f) Fully close the valve in order to raise the stem (5) clear of the bonnet (8), ensuring that the two thrust collars (11) are retained for re-assembly.
- g) Remove stem seal 'O' ring (10) and replace with a new 'O' ring (10), grease the 'O' ring with a Water Regulations approved grease e.g. Rocol Aqua-Sil.
- h) Replace the two 'O' rings (15) and nylon bushing (14) in the glandflange (13). Grease internally using the approved grease. Grease thrust collar grooves in stem (5). Screw stem (5) back into wedge (3) whilst fitting thrust collars (11) ensuring they seat fully inside recess in bonnet (8).
- i) Refit gland flange (13) with a new gland flange 'O' Ring (12) and tighten the 2 hexagon bolts (16) using a torque wrench set at 100 NM to 110 NM.
- j) Refit stem cap (18), bolt (19) and insert (20).
- k) Close wedge by a few turns and check the integrity of the new seal arrangement.
- l) To check the integrity of the new seal arrangement, it will be necessary to re-charge the main slowly and open and close the wedge (3) a few times.

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

# OPERATING AND MAINTENANCE INSTRUCTION DIAGRAM

FOR SERIES 21 XXX 00



|     |                  |  |
|-----|------------------|--|
| 20  | Insert           | PE Plastic   |
| 19  | Stem cap bolt    | Stainless steel BS 970 A2                                |
| 18  | Stem cap         | Ductile iron to BS 2789, Grade 500-7                     |
| 17  | Upper ring       | NBR-rubber, BS 2494 type 3                               |
| 16  | Gland bolts      | Zinc covered Steel 8.8 QD                                |
| 15  | O-ring           | NBR-rubber, BS 2494 type 3                               |
| 14  | Bushing          | Polyamid 6.6   |
| 13  | Gland flange     | Ductile iron to BS 2789, Grade 500-7                     |
| 12  | O-Ring           | NBR-rubber, BS 2494 type 3                               |
| 11  | Stem Collar      | High tensile alloy Cz 132, BS 2872                       |
| 10  | O-Ring stem seal | NBR-rubber, BS 2494 type 3                               |
| 9   | Screw cover      | Hot melt   |
| 8   | Bonnet           | Grey cast iron BS EN 1561 1997<br>EN-6.1-18895 Grade 250 |
| 7   | Bonnet gasket    | NBR-rubber, BS 2494 type 3                               |
| 6   | Bonnet bolts     | Zinc coated carbon steel 8.8 QD                          |
| 5   | Stem             | Stainless steel BS 970/420 S 37                          |
| 4   | Stem nut         | High tensile alloy Cz 132, BS 2874                       |
| 3   | Wedge, rubber    | EPDM   |
| 2   | Wedge casting    | Ductile iron GGG-50 to DIN 1693                          |
| 1   | Valve body       | Grey cast iron BS EN 1561 1997<br>EN-6.1-18895 Grade 250 |
| Pos | Valve detail     | Material   |

Valve type : Resilient-Seated solid wedge gate valve

Valve standard : To B.S. 5163, 1986

Valve sizes : DN150-400-100-150-200-250-300

Valve pressure rating : PN16

Pressure groups : For PN10 or PN 16 Flange piping systems  
To BS EN 1092-2 1997 (formerly BS 4594)

**AVR**

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