

Water Transmission Pipelines - Valves & Pipeline Accessories



Introduction of The AVK Group

AVK is a true global group of companies with focus on R&D, manufacturing and sales of valves and pipeline accessories - primarily for water supply, waste water, fire fighting and natural gas.

Historically AVK is a leading, international manufacturer/supplier of valves and accessories for distribution networks, service connections, pumping stations etc. - but in more recent years has also become a global market leader for large valves used for Water Transmission Pipelines (also called trunk mains, water transfer/conveyance pipelines) etc. AVK manufacture/supply valves and pipeline accessories for the total water supply system: From dams/reservoirs - transmission pipelines - treatment plants - pumping stations - distribution networks down to the individual house connection. Company acquisitions that have strengthened AVK's Product Offer for Water Transmission Pipelines include Wouter Witzel Eurovalve (Holland) and Glenfield Valves (Scotland). The AVK Group has continued using these brands along with the AVK brand.

Through our global presence with factories and sales companies the AVK Group today offers products to most of the common national and international standards such as; EN, AS, NZS, ISO, CEN, DIN, NF, BS, AWWA, JWWA, SABS and GOST. The AVK Group valves and accessories used in water supply have 3rd party approvals for use with drinking water, such as WRAS, KIWA, GSK or similar.

AVK factories are certified acc to ISO 9001 and most also to ISO 14001 (Environmental) and ISO 18001 (Health & Safety).

We are close to the leading water utility companies, consultants and contractors - building partnerships by sharing our technical know how, experience and ability for application solutions.

This enables us to give our customers the quality products they require. After sales service is obviously part of this partnership - achievable through our presence in around 100 countries worldwide. Furthermore our comprehensive product range and global presence often enables us to comply with project restrictions related to package supply as well as country of origin.

AVK Group Product Offer – Water Transmission Pipelines:

Gate Valves: Resilient Seated and Metal Seated.

Butterfly Valves: Double Eccentric and Concentric Design.

Check Valves: Swing Check, Wafer Check and High Performance Recoil Non Slam Design.

Flow Control Valves: Various Designs available.

Air Release Valves: Various Designs available.

Ball Float Valves: For reservoirs and water tanks.

Pipe Joints: Dismantling Joints, Pipe Couplings & Flange Adapters.

Pipe Repair Clamps, Ductile Iron Pipe Fittings - along with various types of accessories for the products mentioned.

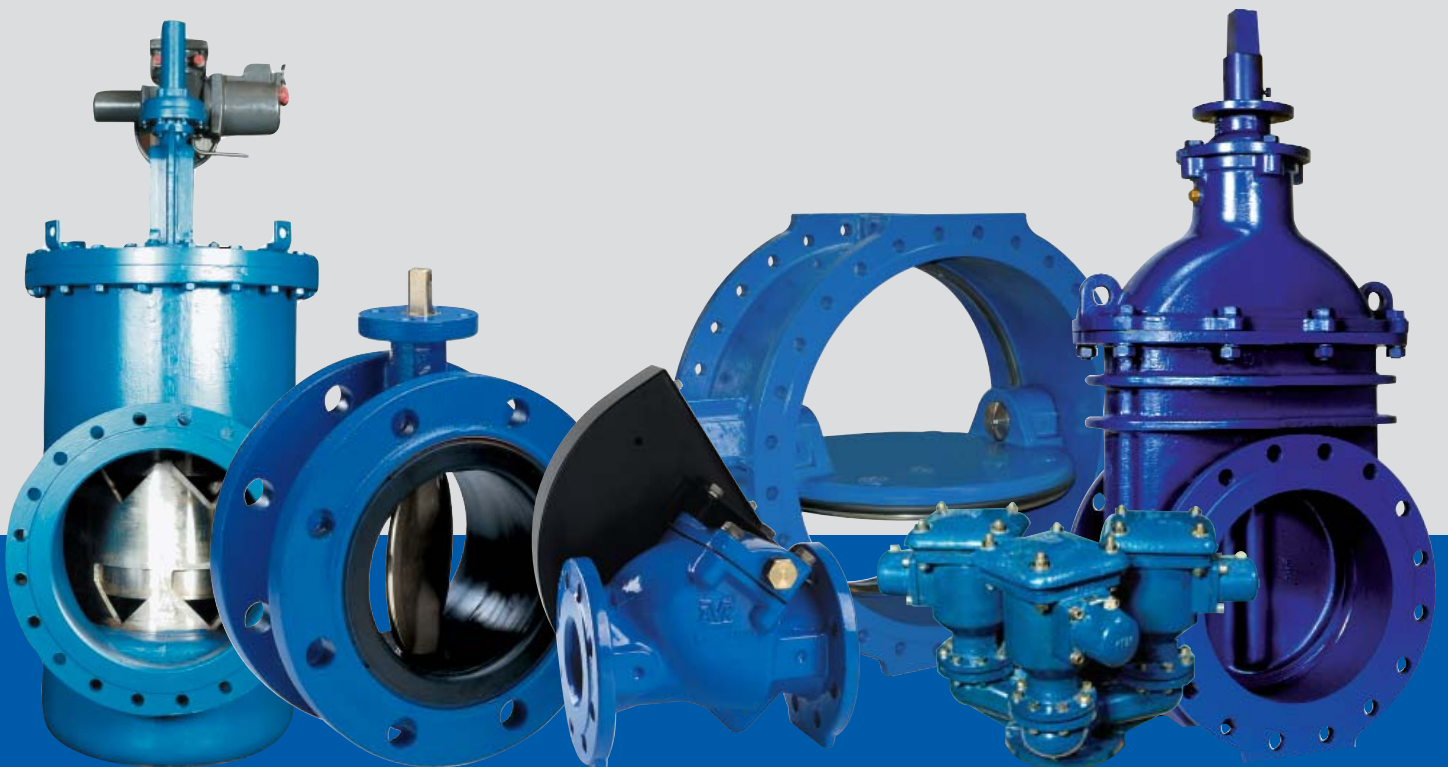


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Introduction & Definitions

- Water Transmission Pipelines

Usually the transport of water from storage facilities to distribution networks takes place through pressurized pipelines.

The pressure is created either through gravity or through associated pumping stations. The water is moved from source (such as dams) to water treatment plants and then (usually) pumped into service reservoirs and distribution networks to homes and businesses. Kindly see the illustration below for clarification of the water cyclus described.

The AVK Group manufactures valves and pipeline accessories for all these applications - but the focus of this brochure is on the valves used in the main transmission pipelines and the associated pumping stations.

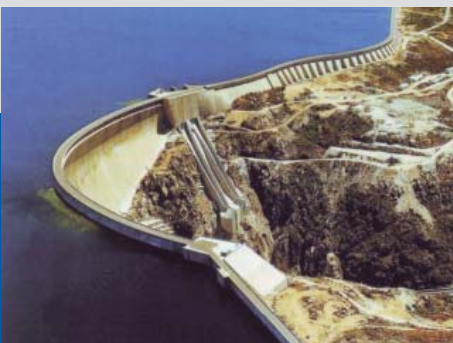
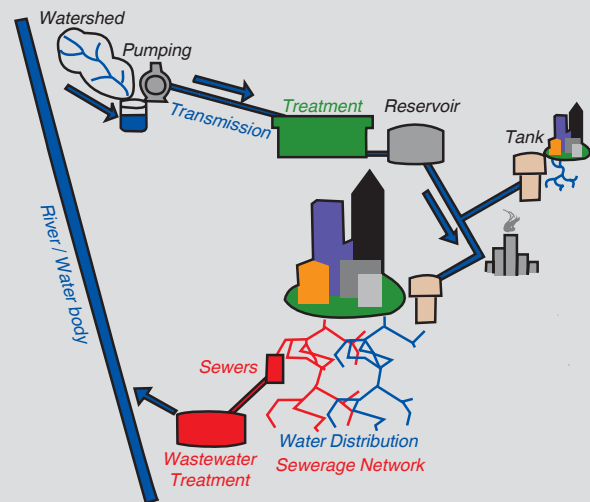
We refer to our other literature covering the remaining applications (dams, treatment plants, distribution networks and service/house connections).

Typically water transmission pipelines are either constructed using concrete pressure pipes, ductile iron pipes, steel pipes or GRP/GRE pipes. At the lower end of the dimensional range plastic pipes (such as HDPE) may be used.

There are various historical/design reasons as to why individual authorities & consulting engineers may prefer different valve designs. Some designers are more comfortable with gate valves others with butterfly valves - and within each valve category there are also more design options available. Choice of valves can also depend on project specific applications as well as availability for different pressure classes.

Fortunately the AVK Group manufactures most of these options, as this brochure will show, and as this business segment strategically is very important to us, we are continuously investing resources in order to extend our range of large valves.

More detailed technical information for each type of valve is available on our product data sheets and other technical documentation – available through our local sales companies and our web sites.



Selected Reference List

Middle East Supplies include:

- UAE: Dubai Electricity & Water Authority. Supply of most butterfly valves (e.g.) DEWA have installed since 1988.
- UAE: Federal Electricity & Water Authority. Supply of most butterfly valves (e.g.) FEWA have installed since 1992.
- UAE: Sharjah Electricity & Water Authority. From 1992 till now DN 350-1200.
- Saudi Arabia: Saline Water Corp Co (SWCC). From 1988 - valves up to DN1800.
- UAE: ADWEA/WED Abu Dhabi & Al Ain. Numerous projects including Al Shuaib Pipeline
- Qatar: KAHRAMAA – i.e. Ras Laffan B (GTC 43) and GTC 45 (the most prestigious projects 2005-2007)
- Kuwait: Ministry of Electricity & Water – i.e. Subiya C1 project - Phase 1 & 2 (2004-2006)
- Iraq: Hilla Pipeline Project, Mosul.

Asia Supplies include:

- Singapore: Public Utilities Board (PUB). A significant amount of various large dimension butterfly valves supplied since 1982. Including several DN2200 valves to NEWater Pipeline Project, 2007
- Malaysia: JKR Malaysia. From 1989 (i.e. in Johor Bahru)
- Brunei: BSB Valve Replacement (2006)

American Continent Supplies include:

- Mexico: Colorado River, Tijuana Aqueduct projects for AWWA gate valves up to 96" (2002, 2003, 2007/08)

Continental European Supplies include:

- Germany: Airport Berlin Brandenburg International (2006/07)
- Austria: Vienna, Fernwasser Torgau, reservoirs DN400-1200
- Cyprus: Southern Conveyor Project, Ministry of Water Resources (1982)
- Belgium: TNVW Gent, pipeline Aalst-Gent
- Holland: Water companies in Zeeland, Gelderland, PGEM, DWL, EWR, Rotterdam, Overijssel, Zuid from 1966 till now.
- Finland: Helsinki water 900 km pipeline DN 600-1200
- Finland: Turku Water (Turun Seudun Vesi Oy) - water transfer pipeline Huittinen-Turku (2008).

UK Supplies include:

- Thames Water - Hampton Remodelling
- Severn Trent - Elms Fram project
- Scottish Water - Loch Katrine Project (2004-2007)
- Yorkshire Water - Knostrop Project & Esholt Project (Both 2007)
- United Utilities North West - PoakaBeck Phase 1 & 2" (2006/07)

African Continent Supplies include:

- Tunisia. Tunis pipeline + pumpingstations 1993-2000 DN 350-1400 (1993-2000, SONEDE)
- Libya - Great Man Made River Projects (since 1980)

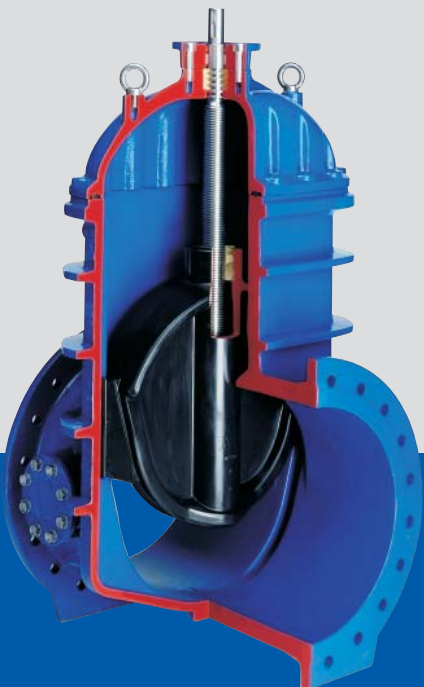


Large Diameter Gate Valves - Resilient Seated Design



The Series 55 sizes DN 450, 500 and 600 are part of the AVK range of high quality gate valves. Unlike most other large diameter gate valves these AVK valves are resilient seated. AVK were one of the first manufacturers designing/manufacturing resilient seated gate valves, so we have more than 35 years of experience with this type of valve.

The rubber coated, fully encapsulated wedge ensures tight closure and is capable of seating even when small fragments are present in the bore, without damaging the rubber.



The high quality rubber on the wedges is characterized by low deformation and high impact resistance which combined with the large valve seat area gives optimum tightness. The rubber is vulcanised to the ductile iron wedge by AVK GUMMI A/S, one of the world's leading manufacturers of high technology moulded rubber components. The rubber also protects the wedge against any risk of corrosion, thus increasing the lifetime of the valve.

Fixed, integrated wedge nut prevents damaging vibrations and polyacetal shoes on the wedge guides give extra protection against wear of the rubber and also reduce the operating torque. The valves are designed with a straight and clear bore. This feature reduces head loss in the piping system, prevents deposits in the valve bore and facilitates pipe pigging.

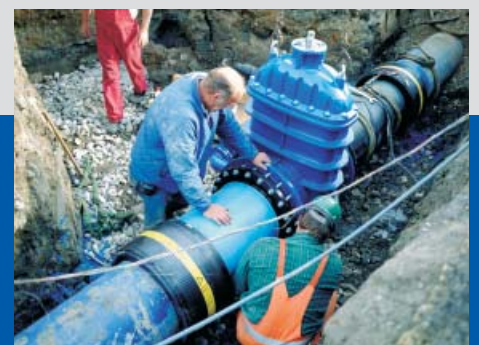
AVK offers the AVK PowerSaver model in a patented design which gives a built-in torque reduction. The AVK PowerSaver is well suited for valves operated by handwheel. The AVK PowerSaver reduces the valve torque in the last stage towards closed position without increasing the number of handwheel rotations.

The valves can be supplied both with and without integral by-pass arrangements. However as AVK focuses on safety, we recommend installation of by-pass for slow filling and balancing of pressure and to prevent water hammer in the system.

After pressure compensation, the main valve can be easily opened. If a pipeline is to be emptied due to leakage or for inspection, the by-pass can be used to drain the pipe slowly thus avoiding collapse of the pipe due to vacuum.

Valves can be coated to various standard/client specifications. As an example we are able to coat according to the GSK norms specifying layer thickness, adhesion, impact resistance etc. Today, GSK is regarded as the highest standard for electrostatic powder epoxy coating.

Valves within this dimensional range can be delivered to EN, DIN, BS, AWWA, GOST as well as AS standards.



Large Diameter Gate Valves - Metal Seated Design

Series 54 is a wedge gate valve available in sizes up to 2400 mm (96"). The valves are designed in accordance with the main international standards, e.g. EN, BS, DIN, AS, AWWA etc.

Please enquire for dimensional range available for the particular standard.

The valves are usually constructed in ductile iron with bronze seats and a stainless steel stem. They are protected externally and internally with appropriate coatings.

Each and every valve is thoroughly tested before it leaves our production facilities. Shell (body) and seat tests naturally comply with the national/international standards.

Various actuation methods can be accommodated: Electric, hydraulic and manual actuation are all available.

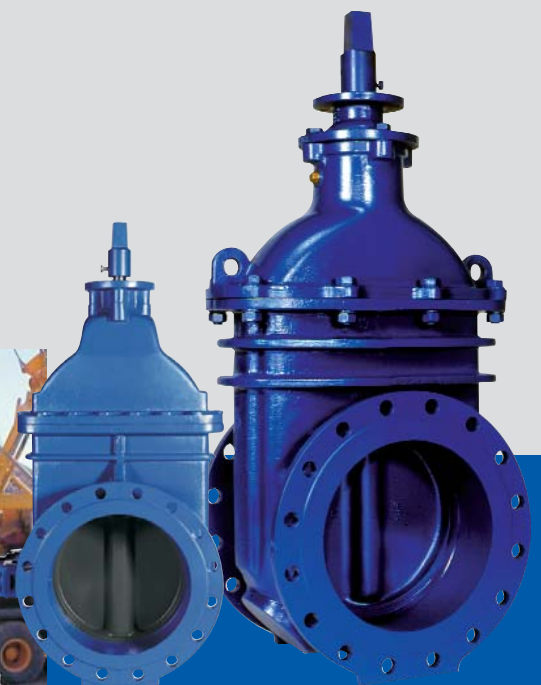
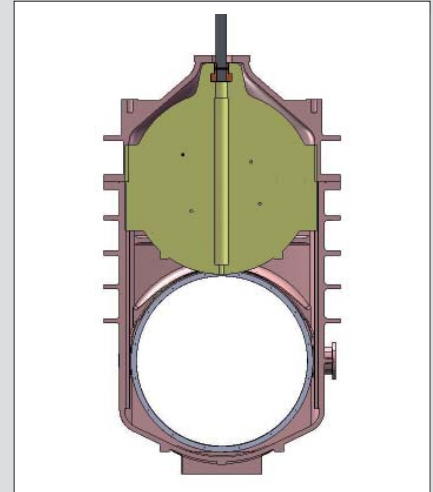
The valves are as standard available with Non Rising Stem – but for certain dimensions we are able to supply with Rising Stem (OS & Y).

We supply PN10 and PN16 rated valves as standard – and PN25 in certain dimensions/applications. For AWWA we can supply 150 PSI, 250 PSI and up to 300 PSI nominal working pressure. Kindly contact us for specific information on range available.

A gate valve has much lower head loss than a butterfly valve and therefore consumes less energy during system operation.

The annual energy savings that result from using this design gate valve over a butterfly valve are therefore considerable. The full open headloss coefficient for large gate valves is in order of 0.05 against 0.18 for butterfly valves. The energy saving is proportional to this.

The valves are also suitable for pipe pigging and for higher velocities in full open position compared to most other isolating valves. This valve design is also suitable for other segments/applications, such as dock filling, under pressure connections etc.



Large Diameter Butterfly Valves - Double Eccentric Design



Series 756 Butterfly Valve is primarily designed and manufactured for isolation. The valve fully conforms to EN593 in sizes up to DN 2200.

Manufactured from ductile iron it incorporates a positively retained resilient disc seal and either an integral or replaceable body seat (Stainless Steel or Bronze) – availability depending on dimensional range required.

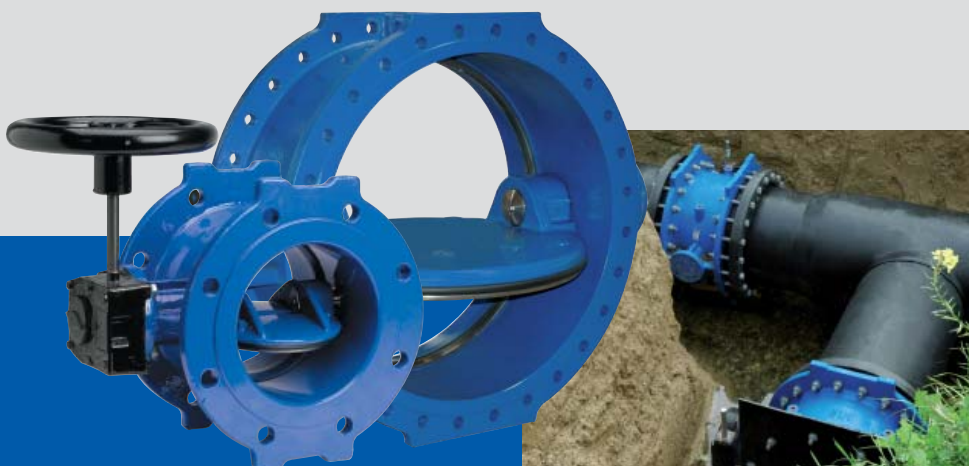
We supply this valve in three pressure classes: PN10, PN16 and PN25. Please enquire for further information regarding availability.

The double eccentric butterfly valve concept is mainly to offset the stem (shaft) in both directions with relation to the centre lines through the valve. The eccentricity is related to the centreline of the pipe(line), and the double eccentricity is related to the valve seat. This reduces operating torque and seal wear.

FEATURES:

- Double offset disc allows the seal to disengage immediately on opening, reducing seal wear.
- Low profiled disc ensured minimum pressure loss.
- Profiled body seat reduces opening and closing torque and ensures drop tight closure.
- Resilient disc seal positively retained prevents seal “roll out”.
- Epoxy coated body and disc
- Self lubricating shaft bearings reduce friction and operating torque.
- Standard ISO mounting flange suitable for most ranges of operators.
- Lockable disc option available.
- Bi-directional (kindly specify this feature when ordering).
- Close coupled worm and quadrant gearbox featuring adjustable open and closed position stops and disc position indicator.
- Anti-Flutter disc to shaft connections.
- Lifting points as standard.
- Segmented seal retainer facilitates maintenance.
- Vertical or horizontal shaft orientation (we require this information at enquiry stage).

Butterfly valves are not designed for throttling but for fully open - fully closed service. If temporary throttling required please consult us for further confirmation on suitability.



Large Diameter Butterfly Valves

- Concentric Design

Series 75 – EVFS / EVUS / EVFL up to DN 2200. These valves are of a concentric construction with internal rubber lining vulcanized to the body, offering an optimum combination of high quality and good economy, as well as a simple and maintenance free installation.

Wouter Witzel Eurovalve / AVK has a complete range of concentric rubber lined butterfly valves. They offer an optimum combination of high reliability and high efficiency, based on a maintenance free design. The butterfly valves are suited for almost any possible applications. Tailored to market needs - such as reliability, no maintenance and long service life we have developed a complete range of industrial butterfly valves. Long application experiences, continuous material research and innovation of efficient manufacturing technologies have resulted in an up-to-date product range. Designed in accordance with the latest international standards and environmental requirements.

Wouter Witzel Eurovalve / AVK butterfly valves liners are vulcanized using the “transfer injection moulding method”, which bonds the rubber directly to the valve body forming a permanent bond.

The “fixed liner” design has many advantages over the “loose liner” design:

- increased operational life.
- a low flow resistance when the valve is open
- no risk of corrosion between body and liner
- no deformation of liner
- less torque (Nm) during open/close function
- optimum fixation of liner to body
- no tolerance problems between body and liner
- long lifetime with no maintenance required



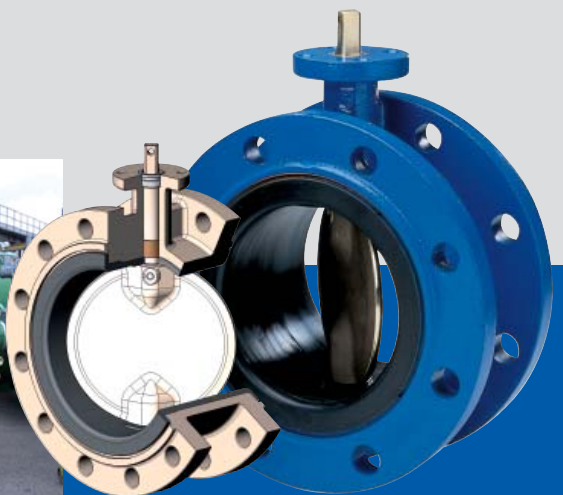
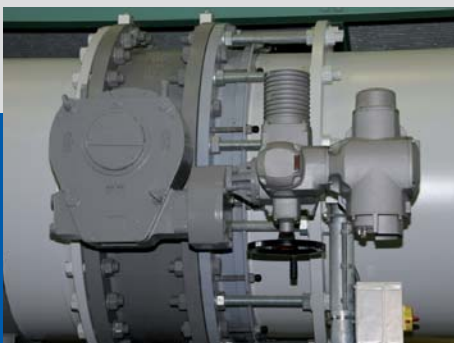
Wouter Witzel Eurovalve / AVK butterfly valves are vulcanized using the "transfer injection moulding method".



In addition to Wouter Witzel Eurovalve / AVK's standard design, a variety of optional material combinations are available on request. The technical assistance in the selection of suitable materials is part of our service.

FEATURES:

- The concentric butterfly valve accepts the flow in either direction.
- The compact low-weight construction saves space and is easy to handle.
- The streamlined disc shape causes a minimum turbulence and head loss and gives high Kv-values.
- The few moving parts need no maintenance.
- Easy to operate (low torques) – resulting in good actuator economy.
- Long life due to minimal wear and low friction.
- Every valve undergoes a pressure and material strength test.
- In accordance with BS, DIN, ANSI and ISO standards and future CEN standards.



Check Valves

- Swing Check Design

Check valves are often referred to as non return valves, as they prevent reverse flow.

In many pumped installations the switch from forward to reverse flow is very rapid resulting in harmful “water hammer”. Check valves must therefore close very quickly, before reverse flow of the fluid column is established i.e. valves must close the instant forward flow ceases.

There are a number of means used to give valves this rapid closing capability, e.g.:

Lever & Weight, Springs, Dashpots and Dampers.

For the swing check valves AVK can provide Lever & Weight as well as a Spring Kit. But apart from the conventional check valves, we also provide high performance recoil valves (see next page). Dashpots and Dampers require regular maintenance, which is something we at AVK try to prevent through our design concepts.

AVK can supply the swing check valves in either metal seated (up to DN 1000, PN 16/25) or resilient seated design (up to DN 300, PN 10/16). The resilient seated design protects the disc against corrosion and ensures drop tight closure, low noise and long life.

The valves can be supplied with proximity switches, safety guards (for L/W versions) – and air cock for the larger dimensions. Headloss and Valve Characteristic Graphs are available upon request.

Typically swing check valves are installed in pumping or gravity systems in which sluggish to moderately brisk flow reversal can occur. These are generally described as systems with low deceleration gradient and often comprise of single pump installations having low to moderate branch velocities.

AVK also manufacture check valves in flangeless wafer type design (Type ECV). This design supplied with bonded rubber seat in body – and a self acting pivoting double disc. Available up to DN 600 in PN 16.



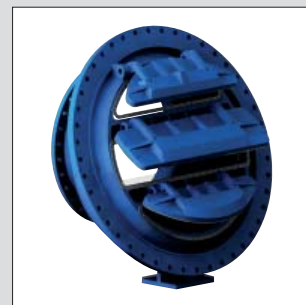
High Performance Check Valves - Recoil Non Slam Design

The AVK / Glenfield High Performance Recoil Valves are designed to work in extreme conditions. These onerous systems are those where branch velocities are high, multi pump delivery is used, vertical lift is involved and where surge vessels or similar are employed. The valves are constructed for a non slam design. Preference is for horizontal installations.

As mentioned on the previous page valves must close the instant forward flow ceases. Keeping in-line with our design criteria of providing maintenance-free valves, the best solution for check valves is to disregard solutions incorporating high maintenance dashpots, dampers, springs or other external mechanisms – and to consider the AVK / Glenfield design for our High Performance Recoil Check Valves. These valves have a low reverse velocity capability.

We believe this design provides the most effective solution, while keeping the design simple, reliable and flexible.

The design is according to AVK / Glenfield's own proven standards - and the valves are available with single door design (DN 100-500, PN 16/25) and with multiple door design (DN 600-1600, PN 16/25 - please enquire regarding dimensional range for PN 25 rated valves).



Flanges can be drilled according to the major, international standards such as EN, BS, DIN, AS, ANSI (AWWA).

The valves can also be supplied with limit/proximity switches.

Headloss and valve characteristic graphs are available upon request.



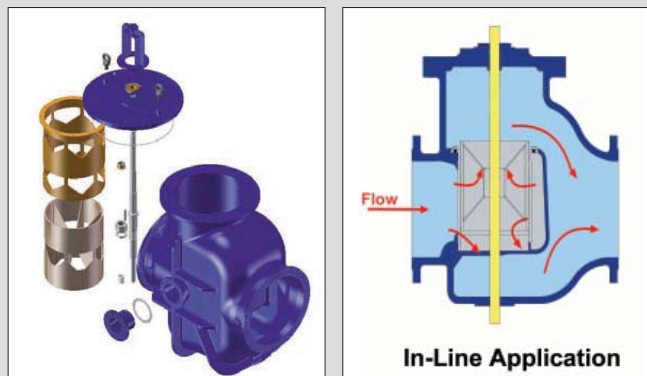
In Line Flow Control Valves

The control of flow within a pipeline can vary from moderately to extremely severe and involves difficulties such as vibration, cavitation, erosion and scouring. Few of the more common valve designs are capable of fully performing the regulating function over the major part of the stroke.

The Series 855 In-Line Flow Throttling Valve (available up to DN 1000, PN 16) consists of a flanged ductile iron valve body and a vertical sliding cylindrical sleeve. All interior surfaces that come in contact with the fluid are fabricated from stainless steel or bronze. All ductile iron is epoxy coated. Flow takes place radially inwards through ports in an outer fixed cylindrical liner and then through corresponding ports in a similar movable inner sleeve into the interior of the valve.

The energy of the jets is dissipated as they impinge against radially opposite jets. Thus vibration is not transmitted to the valve components. Actuation of the valve via fine thread rising screw can be manual, electric or hydraulic operators. Electric actuators can be supplied for local and remote control, and to work in conjunction with flow metering or telemetry equipment.

In all installations where throttling occurs, dissolved air may separate out of the water stream due to the reduction of pressure. It is therefore good practice to provide a small orifice air relief valve a short distance downstream of the regulating valve.



The Series 855 (replaces series 1400) In-Line Flow Throttling Valve controls flow using the principle of throttling across multiple tapered ports, which are positioned around the valve liner. The port shape and arrangement can be designed specifically for each application to provide optimum valve performance and flow control characteristics.

The valve is capable of operating for long periods at any degree of opening over the full length of its stroke, the shape of the ports in the liner being designed to give flow regulation over the full travel, without risk of vibration and with complete safety. Drop tight closure is not provided, this is effected by the pipeline isolation valves.



Air Valves and Ball Float Valves

Air Valves

The AVK Group promote a variety of air valve designs including the Glenfield range after acquiring Glenfield Valves in 2001.

The internationally renowned "Apex" air valves are available for the large pipe dimensions, as used in water transmission pipelines. Double orifice Apex aerokinetic cluster air valve arrangement comprising multiple DN100 double air valves – in ductile iron construction with ABS floats and trim, EPDM seals, fitted to a ductile iron inlet branch pipe.

The "Aerokinetic principle" along with the cylindrical float means the valve will not close prematurely while air is being released from a pipeline. Having full outlet bore equal to the inlet and no baffles enables optimum discharge/inflow capacities to be obtained.

A number of options exists, i.e. the "in flow check valve", which can be used with negative hydraulic gradient.

The "vented non return valve", which provides optimum surge alleviation through variable outlets orifice adjustment.

The standard Apex Cluster Air Valves are suitable for pipe dimensions up to 2200 mm.

Please contact us for correct selection/sizing.

Ball Float Valves

The duty of this valve type is to control a tank water level in a tank or reservoir within pre determined limits. For this purpose the valve may be sited inside or outside the tank. It may be at ground level (large valves) or at tank water level.

Two basic types are available, which are:

1. Single beat direct operated, Series 854 (1005/1006)
2. Single beat pressure operated Series 854 (1048)

Option 1 - a right angled equilibrium float valve is best suited for location within the tank as the valve is of an open top design. Lever and float can be rotated in steps of 90 degrees. This valve has a low headloss.

Option 2 - a right angled pressure operated float valve suitable for sitting outside the tank, as the lever can be arranged at any angle provided this detail is advised at the time of order. Has higher headloss coefficient than Option 1. Requires minimum running head of 3.5 m

These valves have ported valve guides, therefore good flow cut off performance is obtained.

Accessories:

Vertical Float Arrangements

With or without Stilling Tank

Delayed Action Arrangement



Pipeline Accessories

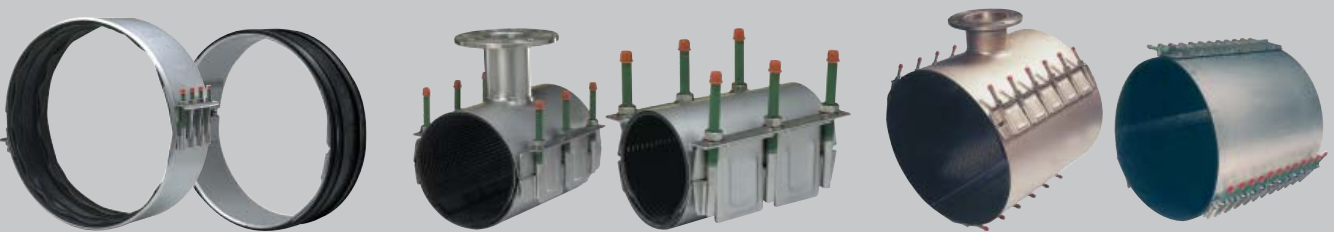
Pipe Couplings & Flange Adapters



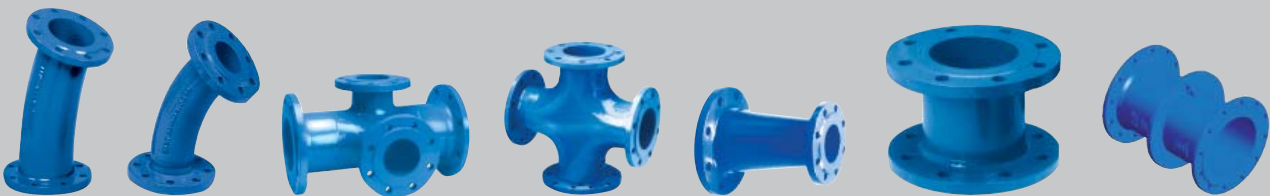
Dismantling Joints



Pipe Repair Clamps - Internal & External



Epoxy Coated - Ductile Iron Fittings



Technical Specifications

- Main Products

Large Diameter Gate Valves

- Metal Seated Series 54

- Up to DN 2400.
- PN 10/16 rated (PN 25 for some dimensions).
- Generally in accordance with BS 5163/5150 (AS/AWWA/DIN also available in part of range).
- In ductile iron construction with gunmetal/ aluminium bronze seats and faces.
- Stainless steel inside non rising screw (outside rising screw upto DN 1200).
- The valves are full bore.
- PTFE impregnated packed stuffing box stem seal.
- Cap top, handwheel, bevel / spur gearbox, powered actuator.
- Close clockwise as standard.
- Seat tested to 1,1 x nominal pressure and shell tested to 1,5 x nominal pressure.
- Coated internally and externally with blue epoxy.
- Options: DN80 By-Pass Arrangement, manual gear, electrical actuation etc.

Large Diameter Gate Valves

- Resilient Seated Series 55

- DN 450-500-600.
- The valves are suitable for any installation above as well as below ground.
- The valves are with full bore and no bottom sump, and should be mounted in upright position to keep this advantage.
- Body/Bonnet in Ductile Iron.
- Torques: DN450: 500 Nm
DN500: 500 Nm
DN600: 700 Nm
- F16 ISO top flange.
- Face to face to DIN 3202, part 1, F5 or to ANSI B16.10.
- PN 10, PN 16 and ANSI B16.1/5 flange (optional drilling to AS4087) drillings as standard options.
- Seat tested to 1,1 x nominal pressure and shell tested to 1,5 x nominal pressure.
- Coated internally and externally with blue epoxy.
- Options: DN 80 By-Pass Arrangement, manual gear, electric actuation etc.

Large Diameter Butterfly Valves

- Double Eccentric Series 756

- Up to DN 2200.
- PN 10, PN16 alternatively PN25 rated - ask for specific dimensional range available for each class.
- Double flanged to EN558-1 Series 13 or 14.
- EN 593 Butterfly Valve.
- In ductile iron construction.
- Integral seat in body (Alternative Stainless Steel/Bronze replaceable seat).
- EPDM resilient seal on disc.
- Ductile Iron alternatively Stainless Steel retaining ring.
- Disc offset supported in self lubricating bearings by stainless steel stub shafts.

- Operation: Worm and quadrant gearbox, electric actuator, hydraulic opening / gravity weight closing.
- Seat tested to 1,1 x nominal pressure and shell tested to 1,5 x nominal pressure.
- Flanges to EN1092-2 PN10, PN16 or PN25
- Coated internally and externally with blue epoxy.
- Note - Preferred installation is in a horizontal pipeline with valve shaft horizontal and operator on right hand side of valve when looking in direction of flow.

Large Diameter Butterfly Valves

- Concentric Series 75 (EVFS, EVFL, EVUS)

- up to DN 2200.
- Many body types available: wafer, lugged, double and single flanged.
- Economically choice of actuators, due to low torque levels.
- Protection of the body against corrosion and erosion by the fluid
- Resilient seating material.
- Flange gasket sealing.
- The centric shaft position guarantees 100% bidirectional tight shut off.
- Installation without restriction in direction of flow.
- Suitable for working pressures up to 10, 16 and 25 bar, depending on pressure class.
- EN 593 butterfly valve.
- EPDM/NBR fixed lining by injection moulding.
- Seat tested to 1,1 x nominal pressure and shell tested to 1,5 x nominal pressure.
- Coated externally with blue/orange epoxy.
- Body material: Grey cast iron / Ductile iron / Steel cast / Stainless steel cast / Aluminium bronze / bronze.
- Sealing: Rubber seat.
- Operation: Wormgear, pneumatic actuator, electric actuator, hydraulic actuator.
- Installation in flanged piping systems: PN6, 10, 16, 20, 25, ANSI Class 150, JIS etc.
- Regulating valves:
The sizing of regulating valves requires detailed calculations for each case, taking into account eg noise and cavitation. Please ask us for advice or ask for our Technical Data Sheet for the selection and sizing of butterfly valves for control applications.

Flow Control Valves – Series 855

- Up to DN 1000.
- PN 16 rated.
- The valve body flanged on both the upstream and downstream ends conforming to applicable standards for bolting into the system conduit.
- The body section and flanges are constructed in ductile iron.
- The fixed liner which contains the ports is constructed in stainless steel / bronze.

- The size and quantity of the ports determined by the flow and pressure requirements to meet the application for which it is intended.
- The moving sleeve manufactured of stainless steel or bronze, providing long-life, nongalling operation.
- Operation of sleeve is by means of a shaft with rigidly attached external and internal guides.
- Stem made in stainless steel
- Coating : Internal and external blue epoxy.
- The valves are hydrostatically shell tested at a pressure equal to 1.5 x working pressure.
- The valve is cycled from closed to open three times for operational testing.
- Operation: Gearbox or electric actuator.

High Performance Recoil Check Valves

- Series 641

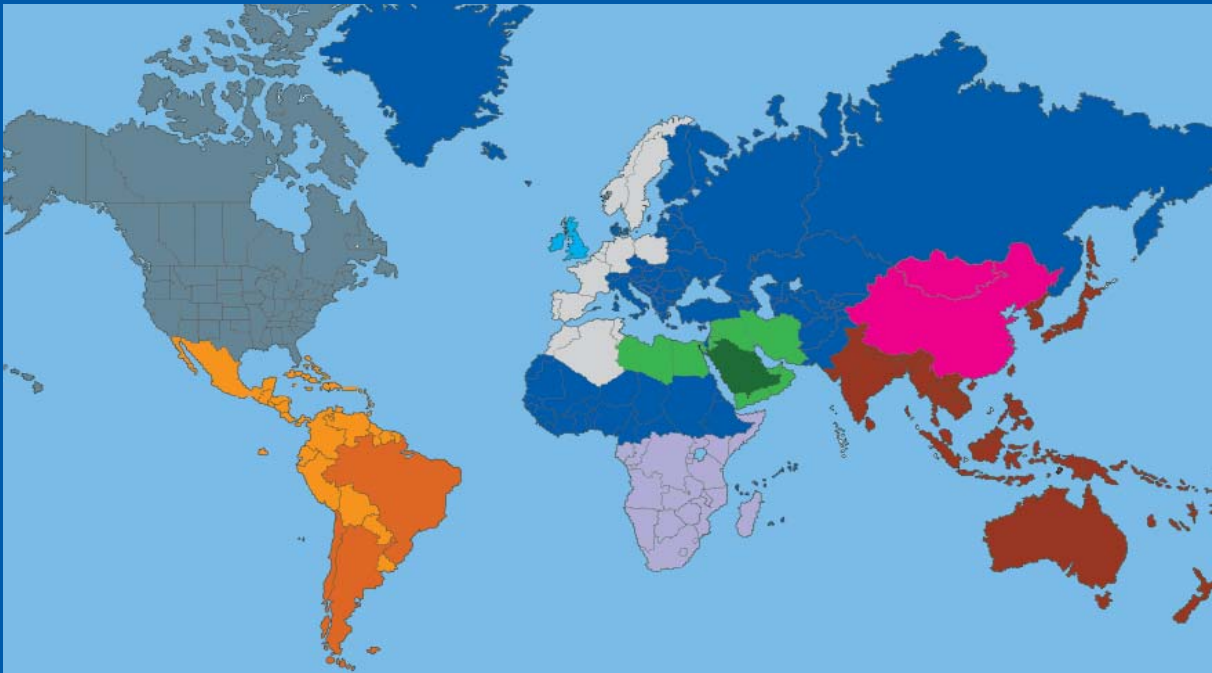
- Up to DN1600.
- Pressure ratings PN16 and PN25.
- Double Flanged to BS EN 1092-2. PN16/25, AS or ANSI.
- 3 part construction inlet, outlet, door(s).
- Ductile iron body/bonnet and bronze trim (faces/seats).
- Stainless steel stub shaft and hinge pin.
- Low friction bearings.
- Voluminous outlet casing.
- Non Slam Design.
- Low Reverse Velocity.
- Limit/Proximity switch and by-pass available.
- Horizontal siting preferred.
- Seat tested to 1,1 x nominal pressure and shell tested to 1,5 x nominal pressure.
- Coating: Internal/external blue epoxy.

Air Valves – Series 851 (Apex)

- Double orifice Apex aerokinetic cluster air valve arrangement comprising multiple DN100 double air valves -
- High volume discharge.
- Ductile iron construction.
- ABS floats and trim.
- EPDM seals.
- Fitted to a ductile iron inlet branch pipe.
- Suitable for working pressures of either PN16 or PN 25.
- Tested to 1,5 x nominal pressure.
- Epoxy coated.
- Coated internally and externally with blue epoxy.

See our other product literature - and websites - for further introduction of valves not included above.

Geographical regions covered by the AVK Group



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- Continental Europe, Russia, Northern and Central Africa, South Eastern Europe - **AVK International A/S** - www.avkvalves.com

- AVK Sales Companies - Continental Europe:
 - AVK Norge AS - Norway - www.avk.no
 - AVK Sverige AB - Sweden
 - AVK Mittellmann Armaturen GmbH - Germany - www.avkmittellmann.com
 - AVK Nederland BV - the Netherlands - www.avknederland.nl
 - AVK Belgium NV - Belgium
 - AVK Armadan Sp. z o.o. - Poland - www.avk.com.pl
 - AVK FRANCE S.A. - France - www.avk.fr
 - AVK Válvulas, S.A. - Spain - www.avkvalvulas.com
 - AVK Romania SA - Romania

- UK and Ireland - **AVK UK Limited** - www.avkuk.co.uk

- North America - **American AVK Inc.** - www.americanavk.com

- Latin America and the Caribbean - **AVK Overseas**

- Brazil, Argentina & Chile - **AVK Valvulas do Brazil Ltda.**

- Australasia - **AVK Australia Pty Ltd** - www.avkvalves.com.au
AVK Philippines Inc. - the Philippines

- Asia - **AVK Valves Manufacturing Malaysia Sdn Bhd** - www.avkvalves.com.my
AVK Vietnam - Vietnam

- China and Hong Kong - **AVK Valves (Shanghai) Co., Ltd.** - www.avkchina.com
AVK Valves Company Hong Kong Ltd.

- Saudi Arabia - **Saudi Valves Manufacturing Co. Ltd.** - www.avksvmc.com

- The Middle East - **AVK Middle East FZE** - www.avk.ae

- Southern Africa - **AVK Valves Southern Africa (Pty) Ltd.** - www.avkvalves.co.za

For further information on the products, we refer to following websites from our factories:

Wouter Witzel Eurovalve - www.wouterwitzel.com

Glenfield Valves Ltd - www.glenfield.co.uk

AVK - www.avkvalves.com

Please contact your local AVK office with your enquiries.

