

Bryan Donkin Valves Limited

Product Information and Operating Instructions Figure 661/ 662 Cast Iron Coke Oven Wedge Gate Valves

AVKD IM5666 Rev F

Date 21/09/21



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CE MARKING AND THE PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU, UKCA MARKING AND THE PRESSURE EQUIPMENT REGULATIONS SI2016 No. 1105 AS AMENDED BY SI2019 No. 696

The regulations apply to all valves that are not designed specifically for pipelines. Valves with a maximum allowable pressure not exceeding 0.5 barg are outside the scope of the directive. Valves are categorised in relation to the intended fluid contents, the maximum working pressure and the nominal size. Fluids are classified as Group 1, dangerous substances, Group 2, all other fluids including steam. Categories are SEP (sound engineering practise) and for ascending levels of hazard, I, II, III or IV. Valves designated as SEP do not bear the CE or UKCA mark and do not require a Declaration of Conformity.

Valves classified as category I, II, III or IV carry the CE or UKCA mark and require a Declaration of Conformity (Note: all valves up to and including 25mm (1") having a maximum allowable pressure greater than 0.5 bar are designated SEP regardless of fluid group).

PRODUCT LIFE CYCLE

The life of the valve is dependent upon its installation and application. The valve should be protected from the adverse effects of mechanical shock, loading and excess weight and corrosion. This includes forces either applied to it or via the installation process or pipe work that the valve is attached to; also consideration should be given to various loadings, which can occur at the same time. The valve on no account should be tampered with or modified in any way.

If for any reason work is to be carried out on the valve it is wholly the responsibility of the user to ensure the valve is depressurised and rendered safe prior to any fasteners/fixings being loosened.

To ensure correct installation of the valve it is essential that the personnel carrying out the installation have correct training and skills.

TYPE

General purpose full clear bore double metal to metal internal or external screw solid wedge gate valve.

- Internal screw/external screw. Fig 662 valve is of an external screw operation, this is where the operating screw thread is external to the main casing of the valve and during opening of the valve the spindle rises at the same time as the gate, the extra projection of the spindle above the handwheel being a guide to the amount the valve is open.
- Outside screw version suitable for duties where necessary to isolate screw threads from gas flow
- Adjustable packed gland
- Larger sizes fitted with thrust bearing
- Drain and bleed plugs fitted as standard

LIMITS OF USE

They are permitted for use with Group 1 hazardous gases. As standard they are suitable for the isolation of Natural Gas, Towns Gas and control of contaminated Industrial Gases such as Coke Oven, and other media like flushing liquor, effluent and other aggressive liquids subject to compatibility with the materials of construction.

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The valves are not designed for 'end of line' service. In the event of the valve being mounted at the end of the pipeline, we strongly advise the use of a blanking plate. They are not suitable for fatigue loading, creep conditions, wind and earthquake loading, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids. It is the responsibility of the end user to ensure the integrity of the valve is not adversely affected by the surrounding environment. If there is any doubt the user must implement checks to monitor the product integrity.

The valves referred to in this document have been categorised in accordance with the Pressure Equipment Directive, Pressure Equipment (Safety) Regulations

Maximum Allowable Pressure PS (barg)	Nominal Size DN	Category
0.50	Up to 450	SEP
0.68	500	III
0.35	600 - 900	SEP
0.25	975 - 1800	SEP

Categories I, II, and III require CE or UKCA mark.

OPERATING PRESSURES AND TEMPERATURES

Size	Maximum Working Pressure (barg)	Temperature
350 - 450	0.50 (7 psig)	-10°C to +250°C
500	0.68 (10 psig)	
600 - 900	0.35 (5 psig)	
975 - 1800	0.25 (3.5 psig)	

PRESSURE/TEMPERATURE RATING

Valves must only be installed in a piping system whose pressure and temperature do not exceed the above ratings.

If system testing will subject the valve to pressures in excess of the working pressure rating, this should be within the production test pressure for the valve.

The maximum allowable pressure as specified is for non-shock conditions. Water hammer and impact for example, should be avoided.

If the limits of use specified in these instructions are exceeded or if the valve is used on applications for which it was not designed, a potential hazard could result.

STORAGE

The valve should be handled and stored in such a way as to always protect the valve from becoming damaged both internally and externally, either mechanically or by chemical/substance corrosion and to ensure the protective coating supplied remains intact.

If fitted, valve end protectors should not be removed unless necessary to do so for inspection or installation. If outdoor storage is unavoidable, valves should be supported off the ground and protected by a weatherproof cover.

LAYOUT AND SITING

It should be considered at the design stage where valves will be located to give access for operation, adjustment, maintenance and repair.

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Valves must be provided with adequate support. Adjoining pipe work must be supported to avoid the imposition of pipeline strains on the valve body, which would impair its performance. Heavy valves may need independent support or anchorage.

The valves are delivered corrosion protected for normal transportation and storage conditions only. It is the users/installers responsibility to further adequately protect the valve from corrosion in relation to the installed environment.

Valves below DN750 (30") may be installed in any orientation. Larger sizes are manufactured to the required orientation.

In the interests of safety, it is highly recommended that valves installed on end-of-line services should be fitted with a locking device on the operating mechanism or a blanking flange on the downstream flange of the valve to prevent unauthorised discharge to atmosphere.

INSTALLATION

Prior to installation, a check of the valve labelling and marking must be made to ensure that the correct valve is being installed.

Record the valve serial number and its location to help with traceability.

The valve should be fully opened and closed to ensure it is operating satisfactorily.

Valves are precision manufactured items and as such, should not be subjected to misuse such as careless handling or allowing dirt to enter the valve through the end ports.

Excessive forces during installation and operation must be avoided.

All special packaging materials must be removed.

When valves are provided with lifting lugs or eye nuts, these should be used to lift the valve. These lugs are designed to take the weight of the valve only and not any attached pipe work etc. Valves should not be lifted using the hand wheel or stem. During lifting all applicable Health & Safety requirements should be observed. Immediately prior to valve installation, the pipe work to which the valve is fastened should be checked for cleanliness and freedom from debris.

Valve end protectors should only be permanently removed immediately before installation. The valve interior should be inspected through the end ports to determine whether it is clean and free from foreign matter.

The mating flanges (both valve and pipe work flanges) should be checked for correct gasket contact face, surface finish and condition. If a condition is found which might cause leakage, no attempt to assemble should be made until the condition has been corrected.

The gasket should be suitable for operation conditions or maximum pressure/temperature ratings and should be checked to ensure freedom from defects or damage.

Care should be taken to provide correct alignment of the flanges being assembled. It is important when installing any valve that pipeline stresses are kept to a minimum and no undue external forces are placed on the valve connections. During assembly the bolts must be tightened sequentially to make the initial contact of flange and gasket flat and parallel followed by gradual and uniform tightening to the specified torque for the gasket being used in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces.

Parallel alignment of flanges is especially important in the case of the assembly of a valve into an existing system.

The bolting used for the flange connection must be checked for correct size, length, material and that all connection flange bolt holes are utilised.

NOTE: as per EN 1092-2:1997 section 5.3 Bolting

The bolting shall be chosen by the user according to the pressure, temperature, flange material and gasket. For joints comprising at least one grey iron flange it is recommended that bolting having a yield strength not exceeding 240N/mm² should be used.

CORROSION PROTECTION: It is the users/installers responsibility that valves intended for underground usage or valves to be installed in an area with risk of corrosion are to be provided with adequate corrosion protection, e.g. appropriately wrapped. The corrosion protection should be of a sufficient quality and execution to ensure protection of the valves and their components against the environment in which they are installed throughout their expected lifetime.

OPERATING

Clockwise rotation to close by means of factory fitted hand wheel.

MAINTENANCE

The valve is designed to give long trouble free service without the need of routine maintenance.

If internal or external leakage is suspected, it is recommended that AVKUK be contacted to suggest suitable remedial action.

On assembly of the valves in the works, the valves are lubricated where necessary, and the stuffing boxes packed using the type of gland packing to suit the operating medium. For valves under normal operating conditions a routine monthly maintenance is required on the following: -

- 1) Lubrication of the spindle on the Fig 661 valve there is a grease nipple fitted on the stuffing box, and this should be charged using graphite grease. On the Fig 662 valve, the lubricant can be applied directly onto the spindle thread.
- 2) The gland should be checked for gas tightness, and if necessary, the gland studs should be equally adjusted to further compress the packing to prevent leakage. After prolonged service it may be necessary to replace the gland packing.
- 3) A bottom cover is provided on each valve, and with the valve in the fully closed position, and ensuring the casing of the valve is vented, any deposits, which may have accumulated in the valve, can be extracted when this cover is removed. If a valve when in the closed position is allowing gas to pass, this is due to one of the following reasons:
 - a) Pipeline stresses have distorted the valve body, and thus changed to seat face angle, and therefore the valve gate will not seat properly, this can be checked by slackening off one set of flange bolts and ensuring the mating flanges are parallel.
 - b) For valves handling unfiltered gas, debris can build up on the body and wedge seat faces, which if happens will gradually make the wedge sit higher and higher in the body or have the effect of changing the seat face angle. Eventually this will not allow enough travel into the seat faces and leakage will occur.

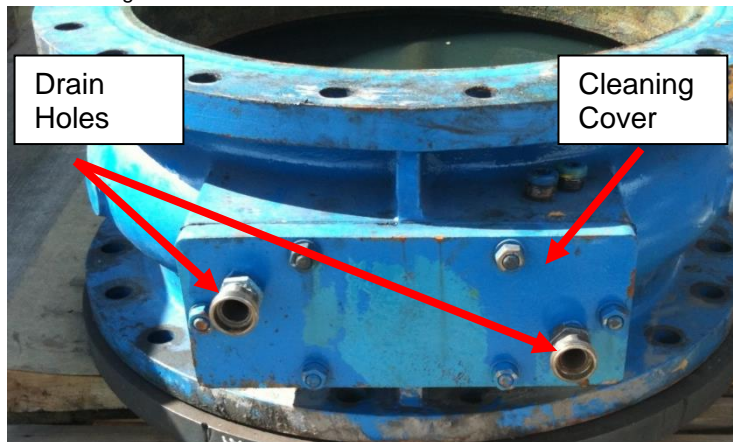
To prevent this, we recommend a more regular maintenance program.

1. Operating the valves to the fully closed position at least once every two weeks in order to scrape loose recently deposited debris from the seat faces.
2. The spindle position (how far it protrudes from the top of the hand wheel nut) should be noted. If this protrusion starts to increase over time it will signify dirt build up on the seats that results in the wedge starting to sit high (see Fig A).



(Fig A)

3. If it is felt the wedge is starting to sit high a more thorough clean of the seat faces is required.
4. This can be done by injecting steam sprays, naphthalene sprays or a suitable cleaning liquor into the valve via the drain holes in the cleaning cover at the base of the valve or any other jetting points on the valve whilst operating the valve. This will have the effect of loosening the debris from the faces to allow the wedge to travel further into the seats.



Note: Ammonia liquor that is often used in the environment may not be compatible with viton rubber seals so must not be used if the particular valve has viton rubber seals fitted unless its compatibility

is verified. Other cleaning agents may be used but they also need to be verified that they will not perish the viton rubber seals.

5. If it is felt that there is debris at the base of the valve preventing the wedge from fully closing the valve should be closed and then the cleaning cover removed. The excess debris at the base of the valve can then be evacuated.
6. In extreme cases the valve will need removing and dismantling to allow both the body and wedge seat faces to be cleaned thoroughly by scraping off the debris to get back to the base metal. Depending upon time constraints this may necessitate a spare valve to be fitted to the pipe work whilst maintenance on the valve takes place to allow the plant to continue functioning.
7. For valves fitted with rubber door seals, the seals should also be replaced during the strip down operation.
8. If the base metal has become damaged the seat faces can be machined lightly in order to give a new clean machined face at Donkin. The wedges on all Donkin metal to metal faced valves are purposefully manufactured to sit high when new, thus allowing future machining to take place which when carried out each time will make the wedge sit lower and lower into the body. This operation is not an option on valves with seals fitted into the wedge and as such these valves are manufactured to sit the wedge centrally in the body to ensure the rubber seals sit in the middle of the body seat face. In this case a new door casting would be required.

Note: that throughout the above procedure & recommendations the appropriate Health and Safety procedures must be followed at all times.