CRANE FLUID SYSTEMS

OUR GENIUS IS VALVES

WAFER CHECK VALVES

FM463 / FM463W / FA463 / FM466 Cast & Ductile Iron

INTRODUCTION

Check valves permit flow in one direction only and close automatically if flow reverses. They are entirely automatic in action, depending upon pressure and velocity of flow within the line to perform the functions of the opening and closing.

WAFER CHECK VALVE

GENERAL INSTALLATION

Preparation

- Ensure valve is suitable for service conditions e.g. pressure, temperature, service media.
- Remove dust caps/flange protectors, where fitted, and all other packaging material. Check that the bores are clean and free from foreign material and that the disks operate smoothly.
- The complete piping system must be flushed through prior to commissioning to ensure all foreign matter is removed. Subsequent valve failure is usually caused by dirt and other matter left in the pipeline.
- Prior to installation, a check of the identification plate and body marking must be made to ensure that the correct valve is being installed.
- Valves are precision manufactured items and as such, should not be subjected to misuse such as careless handling, allowing dirt to enter the valve through the end ports, lack of cleaning both valve and system before operation and excessive force during assembly.
- Care should be taken to provide correct alignment of the flanges being assembled and centralise the valve within the flange bolting. Ensure that the inter-bolt gasket is also centralised and does not protrude into the pipe bore.

GENERAL INSTALLATION (CONTINUED)

Pipe Flanges

- Before installation, check that the pipe flanges are to the correct size and standard to match the valve flanges.
- Ensure that all pipe flanges are cleaned prior to installation of the valves and that there are no damaged areas that may create a leak path.
- The mating faces of the valve and of the adjoining pipework 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.
- Suitable lubricant on bolt threads should be used. In assembly, bolts are tightened sequentially to make the initial contact of flanges and gaskets flat and parallel followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one pipe flange relative to the other.
- Parallel alignment of flanges is especially important in the case of the assembly of a valve into an existing system.
- Flanged joints depend on compressive deformation of the gasket material between the flange surfaces.
- The bolting must be checked for correct size, length, material and that all connection flange bolt holes are utilized.
- The gasket should be suitable for operation conditions or maximum pressure/ temperature ratings.
- The gaskets should be checked to ensure freedom from defects or damage.
- Valves above DN200 are supplied with a thread for fitting of an eye bolt for lifting purposes. This is designed to suit a collared eyebolt to BS EN ISO 3226 with a SWL of 200kg - M8; SWL of 320kg - M10; SWL of 400kg - M12; SWL of 800kg-M16 when used to lift vertically.

DN200: M8 | DN250 - DN300:M10 | DN350 - 400: M12 | DN450 - 600: M16

- It is the responsibility of the installer to be aware of the limitations on lifting imposed by BS EN ISO and/or any other applicable regulatory standards.

Valve Location

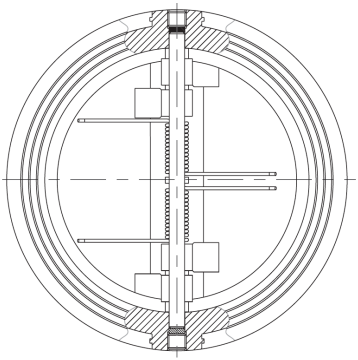
- The FM463, FM463W, FA463 & FM466 check valves are wafer pattern and are designed to fit between flanges, located within the flange bolting.
- It should be considered at the design stage where valves will be located to give access for inspection.

GENERAL INSTALLATION (CONTINUED)

Layout and Sitting

- Check valves may be installed in horizontal pipework and vertical pipework if the flow is in an upwards direction. All types of check valves should maintain 6 diameters of straight lengths of pipe upstream and 3 diameters downstream to avoid premature failure of product and are suitable for velocities up to 3 metres/second. If the valve is situated such that turbulent flow enters the valve or is situated close to reciprocating pumps then the velocity should not exceed 2 metres/second.
- These valves must not be fitted in vertical pipelines with the flow downwards. The valve must be installed with the direction arrow on the body coincident with the direction of the flow in the pipeline.
- For horizontal pipework the valve must be installed with the disk shaft vertical, this is indicated by having 2 shaft plug holes on the top i.e. uppermost to the pipework. For vertical pipework the disk shaft can be in any orientation.

Please note: shaft plugs should not be removed - see the drawing below.



- Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the valve body.
- Heavy valves may need independent support or anchorage.

Piping Supports

- These must be carefully aligned and at the correct distance between centres for the size and type of pipe. Please refer to the current best practice for details of correct spans and installation details.

OPERATION

- The operating conditions shall be consistent with the requirements in the performance specification.
- The FM463, FM463W, FA463 & FM466 check valves are self-acting valves.

INSPECTION AND MAINTENANCE

- The valve should be at zero pressure and ambient temperature prior to any inspection.
- The FM463, FM463W, FA463 & FM466 check valves are maintenance free. For any technical queries, please contact Crane Technical Department.
- If there is a service requirement for removing the valve from the system, Maintenance Engineers & Operators should have the appropriate level of competence and are reminded to use correct fitting tools and equipment.
- A maintenance program should include checks on the development of unforeseen conditions, which could lead to failure.
- Crane Fluid Systems do not offer spares for this product.
- If product is disassembled, warranty is void.

GENERAL CONSIDERATIONS

- The surfaces of valves in service may be subject to extreme temperatures; care should be taken when handling.

LIMITS OF USE

These valves have been categorised in accordance with the Pressure Equipment Directive 2014/68/EU.

The fluid to be transported is limited to those shown in the product table below. On no account can these valves be used on any unstable fluids, or for the fluids groups not specified in the product table.

Note: Valves that are classified as SEP (Sound Engineering Practice) are not CE marked and therefore do not require a declaration of conformity.

Products conforming to Cat I of the PED 2014/68/EU shall include the CE Mark.

Products conforming to Cat II and above of the PED 2014/68/EU shall include the CE Mark and applicable Notified Body Number.

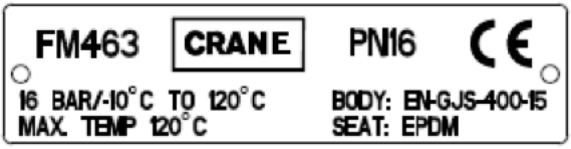
Fig No.	Material	PED category by valve size (DN)			Product applications			
		SEP	1	2	Group 1 Gas	Group 2 Gas	Group 1 Liquid	Group 2 Liquid
FM463	DN50 - 150: Cast Iron DN200 - 600: Ductile Iron	50-300	350-600	-	-	-	-	✓
FM463W	DN50 - 300: Ductile Iron	50-300	-	-	-	-	-	✓
FA463	DN50 - 150: Cast Iron DN200 - 600: Ductile Iron	50-350	400-600	-	-	-	-	✓
FM466	DN50 - 600: Ductile Iron	50-200	250-600	-	-	-	-	✓

LIMITS OF USE (CONTINUED)

- Valves must be installed into a well-designed system and it is recommended that the system be inspected in accordance with the appropriate national and regional legislation.
- Valves must be installed by trained personnel only.
- Maximum operating pressure reduces as service temperature increases. Service temperature and pressure indicated on the identification plate or body marking should not be exceeded – please refer to example below.
- The installation should be designed to provide adequate means of draining and venting to avoid harmful effects such as water hammer, vacuum collapse, corrosion and uncontrolled chemical reactions and to permit cleaning, inspection and maintenance in the correct manner.
- Valves are not designed to operate under high shock loadings. Where pressure increases occur due to shock loading (water hammer), they should be added to the working pressure to obtain the total pressure acting on the valve. The total must not exceed the pressure rating of the valve. A pressure surge, or shock, is usually caused by the rapid closure of a check valve or quarter turn valve resulting in a sudden reduction in flow rate.
- It is the responsibility of the installer to ensure that the valves do not exceed the allowable limits of pressure. However, the equipment is designed to withstand a momentary pressure surge of up to 10% above the maximum working pressure.
- The product has not been designed to include corrosion, erosion or abrasion allowances. Any queries regarding service applications should be addressed to the Crane Fluid Systems - Technical Sales Department.
- The valves have been designed for loadings, appropriate to its intended use and other reasonably foreseeable operating conditions. Loadings caused by traffic, wind and earthquake have not been taken into account.
- Not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids.
- The piping system shall be designed to reduce the risk of fatigue due to vibration of pipes.
- Crane valves have not been designed as fire safe valves.

OPERATING PRESSURE AND TEMPERATURE

Fig No.	Maximum Operating Pressure Conditions	Maximum Operating Temperature Conditions
FM463	16 Bar / -10 to 120°C	120°C maximum
FM463W	16 Bar / -10 to 120°C WRAS 85°C	120°C maximum WRAS 85°C
FA463	13.8 Bar / -10 to 65°C	12.1 Bar / 120°C
FM466	25 Bar / -10 to 120°C	120°C maximum



Example of Identification plates showing service pressure and temperature limitations.

STRESS CORROSION CRACKING

The use of chemicals for system dosing must be determined by the user as all aspects of the system must be established and considered, and the effect of the chemicals used (including compounds arising from chemical combinations) must also be established in order to accurately determine compatibility.

Crane (and its related brands) manufacture hardware (valves, couplings, etc) for the Building Services industry and Utilities industries. However, we are not system designers or operators and cannot make recommendations regarding chemical compatibility for the system, as a result of the above variables. Any comments from Crane regarding chemical compatibility shall relate solely to the Crane product and does not constitute a recommendation on compatibility for the wider system, resultant chemical compounds, components, substances or materials, in whole or in part.

For reference, and not exhaustive, certain austenitic stainless steels and aluminium alloys crack in the presence of chlorides, mild steel cracks in the presence of alkali and nitrates, copper alloys crack in ammoniacal solutions and iron with almost any caustic species (hydrogen presence notwithstanding).

For more information on how SCC can occur, please visit www.cranefs.com

To visit our Video Library go to:
www.youtube.com/user/CraneBSU

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CRANE HOUSE, EPSILON TERRACE,
WEST ROAD, IPSWICH,
SUFFOLK IP3 9FJ
TELEPHONE: +44 (0)1473 277300
FAX: +44 (0)1473 277301
UK SALES ENQUIRES: enquiries@cranefs.com
TECHNICAL ENQUIRES: tech-enquiries@crane-ltd.co.uk
TELEPHONE: +44 (0)1473 277400

MIDDLE EAST & NORTH AFRICA
SALES OFFICE,
BUILDING 4, OFFICE 901,
THE GALLERIES, PO BOX 17415,
DOWNTOWN JEBEL ALI
DUBAI, UAE
TELEPHONE: +971 4816 5800
EXPORT SALES ENQUIRES: mena-enquiries@cranefs.com

www.cranefs.com

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