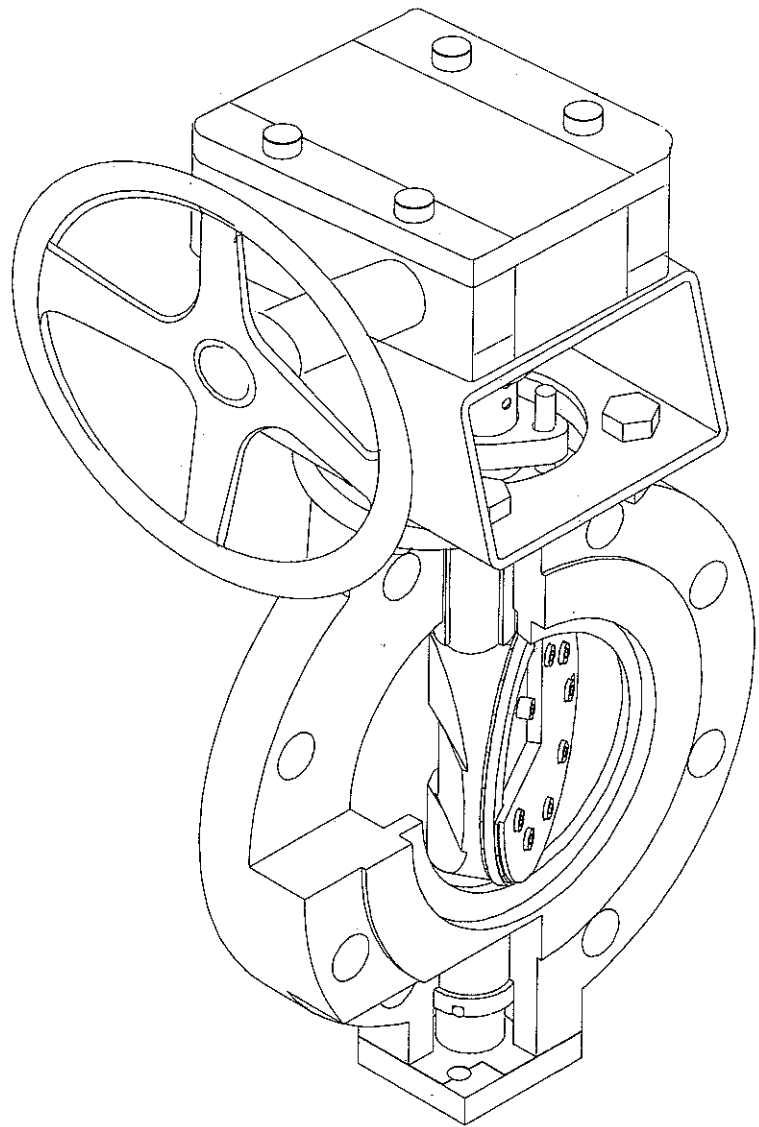


FLOWSEAL

Butterfly Valves, Series VIA/MS with Manual Actuation

Operating manual



CRANE[®]

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1. Declaration of conformity in accordance with 97/23 EC directive

The manufacturer

Crane Process Flow Technologies GmbH
Heerdter Lohweg 63-71, D 40549 Düsseldorf

declares that the valves:

FLOWSEAL Butterfly Valves, Series VIA/MS - with actuator and hand wheel

1. are pressure-bearing parts of equipment as defined by the EC pressure devices directive 97/23 EC and conform to the requirements of this directive,
2. must only be operated in observance of the enclosed operating manual no BAMS-H

Applied conformity evaluation processes:
in accordance with annex II of the pressure devices directive 97/23 EC, category III, module H

Name of the specified authority:

RWTÜV Systems GmbH,
Kurfürstenstr. 58, D-45138 Essen

Identification no. of the specified authority: 0044

Applied harmonized standards: none

Applied standards/ regulations/ directives::

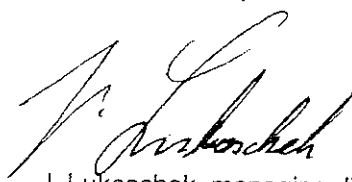
prEN 593, inspection2002
AD 2000

Type description and technical features:

Catalogue FLOWSEAL Butterfly Valves
Series VIA/MS

Modifications to valves and/or assemblies which effect the technical data of the valve, the <Intended use> according to section 3 of the operating manual and considerably alter the valve and/or a supplied assembly render these declarations invalid

Düsseldorf, 30 April 2002



J Lukoschek, managing director

2. Introduction

This manual is to support the user with the installation, operation and maintenance of FLOWSEAL Butterfly Valves of the series VIA/MS.



Caution!

If the following attention and warning notes are not adhered to, dangers could arise and the warranty of the manufacturer could become void.

In case of further questions please contact the manufacturer, **Crane Process Flow Technologies GmbH**; addresses see section 10.

3. Intended use

These valves are designed to cut off or release pipe sections or to control the flow after installation in a pipe system (between flanges or by welding) and to cut off, enable or control the flow of media within the permissible pressure and temperature limits. This is to take place after the installation in a pipe system

- between flanges in accordance with EN 1092-1 or EN 1759-1, with sealing strips according to shape C, D or E, which have to be mechanically processed parallel and level and which have to be flush (installation between other flanges and/or other sealing strips only after checking back with Crane Process Flow Technologies GmbH),
- media with maximum operating pressure PS, which is indicated for the maximum permissible temperature TS on the name plate of the butterfly valve,
- with permissible values of operating temperature/pressure, which are stated in the Crane Flow data sheets <Pressure/ temperature dependence>.
- with manual actuation.

Any other use of the valve is considered unintended



Caution!

If a valve is used in continuous operation for controlling purposes, the hydraulic flow parameters are to be selected in such a way that no damage can arise in the valve and in the discharge-sided pipeline due to excess speed. In case of doubt checking back with the manufacturer is recommended!

4. Safety notes

4.1 General safety notes

To valves the same safety regulations apply as to the pipe system in which they are installed. This manual you have at hand only provides such safety notes which are additionally to be observed for valves.

4.2 Safety notes for the operator

It is not the responsibility of the manufacturer, Crane Process Flow Technologies GmbH, to ensure that

- the valve is only used as intended, as it is described in section 3,



Mortal danger!

No valve must be operated the permissible pressure/ temperature range (=“rating“) of which is insufficient for the operating condition: this permissible range is described in section 3. The application limits for pressure and temperature are marked on the valve.

The non-compliance of this instruction involves a risk to life and limb and may cause damage to the pipe system.



Mortal danger!

It has to be ensured that the selected materials of the medium-contacting valve parts are suitable for the used media. The manufacturer does not assume any liability for damage resulting from corrosion caused by aggressive media.

The non-compliance of this instruction may involve a risk to life and limb and cause damage to the pipe system.

- a manual actuator which was subsequently mounted on the valve is adapted to the valve and correctly adjusted in both end positions of the valve – especially in the closing position,
 - the pipe system and the control system were professionally mounted. The wall thickness of the valve housing is dimensioned so that in such professionally routed pipelines an additional load Fz of the standard range ($Fz = \frac{\pi}{4} \cdot DN^2 \cdot PS$) is considered. With butterfly valves for clamping even higher values for Fz can be permitted,
- (PS = maximum permissible rated pressure at room temperature),

- the valve is professionally connected to these systems, especially such valves which are connected to the pipeline by welding,
- in this pipe system the usual flow rates (e.g. 4 m/s for liquids) in continuous operation are not exceeded and abnormal operating conditions such as vibrations, water hammers, temperature shocks, cavitation, wet steam with a high water content and more than insignificant portions of solids in the medium – especially abrasive ones – are co-ordinated with the manufacturer, Crane Process Flow Technologies GmbH,
- valves which are operated at operating temperatures of $>50^{\circ}\text{C}$ (122°F) or $<-20^{\circ}\text{C}$ (-4°F) are protected against contact together with the pipe connections,
- the valve is only operated and maintained by personnel being expert in pressurized pipelines.



Danger!

If a valve has to be opened in a pressurized line as a terminal valve, this must be accomplished with utmost caution so that the squirting-out medium does not cause any damage.

Take care when closing such a valve: danger of squashing!



Danger!

If a valve has to be removed from a pipeline, medium may escape from the line or the valve. In the case of media which are harmful to health or hazardous the pipeline has to be completely empty before the valve is removed.

Take care with residues which continue to flow from dead spaces or which remained in the valve (under pressure).

4.3 Particular dangers



Mortal danger!

The valve shaft is sealed by a stuffing box. Before the nuts on the stuffing box gland are loosened or unscrewed the pressure in the pipeline has to be completely reduced so that no medium escapes from the stuffing box.



Mortal danger!

Before loosening the plug (or the cover) on the housing or before removing the valve from the pipeline the pressure in the pipeline has to be completely reduced so that the medium does not uncontrollably escape from the line.



Danger!

For valves which are used as terminal valve:
With normal operation, especially with gaseous, hot and/or hazardous media, a dummy flange or a sealing cover has to be mounted on the free connecting socket or (only for short-term use!) the valve has to be securely locked in "CLOSED" position.

5. Transport and storage

Valves have to be handled, transported and stored carefully:

- The valve is to be borne in its original packaging and/or with the protection caps on the flange connections/weld ends. The valves should be borne and transported (also to the installation site) on a pallet (or supported in a similar way).
- If the packaging does not feature any damage, valves should be unpacked just before their installation in the pipeline
- In the case of storage prior to installation the valve is to be stored in a closed room and to be protected against harmful influences like dirt or moisture
- Especially the actuator and the flange connection faces/ weld ends must not be damaged by mechanical or any other influences
- Valves are to be stored as delivered. The valve must not be operated.



Caution!

If lifting tackles (ropes or similar) are required for transport, these have to be attached in such a way that the actuator is not stressed and that neither the valve nor the actuator are damaged.



Danger!

Valves which are delivered without actuator:
The valve has to be transported carefully: the unsecured valve disc may open from closing position due to external effect.

6. Installation in the pipeline

6.1. General remarks

To the installation of valves in a pipeline the same instructions apply as to the connection of pipes and similar piping elements. The following instructions additionally apply to valves. For the transport to the installation site please also observe section 5



Caution!

The sealing surfaces on housings with flange ends of the butterfly valve are designed in such a way that flange seals according to EN1514-1 or ANSI B16.21 are to be implemented. Counterflanges must feature smooth sealing strips, e.g. shape C, D or E in accordance with the -EN 1092 or EN 1759 standard. Other flange shapes are to be agreed on with the manufacturer, Crane Process Flow Technologies GmbH.



Caution!

To avoid any damage to valves with weld ends:
When welding the valve into the pipeline the welding process has to be controlled in such a way that the supplied thermal energy is limited and a distortion of the valve housing is avoided.



Danger!

To avoid any leakage on the flange connection:
For a flange connection only suitable gaskets must be used.



Danger!

The actuator is adjusted for the operating data stated in the order. The setting of the end stops "OPEN" and "CLOSED" must not be altered without the consent of the manufacturer, Crane Process Flow Technologies GmbH.



Danger!

If – in an exceptional case – a valve has to be mounted without actuator, it has to be ensured that such a valve is not pressurized.



Danger!

If an actuating unit is retrofitted, torque, direction of rotation, actuating angle and the setting of the end stops "OPEN" and "CLOSED" have to be agreed on with the manufacturer, Crane Process Flow Technologies GmbH. The non-compliance of these instructions might involve danger to the user and cause damage to the pipe system.



Caution!

The screws of the clamping cover are to be retightened with a torque wrench prior to the installation of the butterfly valve into the pipeline (see also warning note on the clamping cover). The required torques are to be taken from the table on page 10 or the detailed assembly and maintenance manual.

6.2 Working steps

- Transport valve in the protective packaging to the installation site and unpack it only there
- Inspect valve and actuator for damage in transport. Damaged valves or actuators must not be installed.
- Make sure that only valves are installed the pressure class, connection type and connection dimensions of which meet the application requirements. See name plate on the valve. The name plate or signs on the valve have still to be identifiable after commissioning



Mortal danger!

No valve must be operated the permissible pressure/ temperature range (= "rating") of which is insufficient for the operating condition: this permissible range is described in section 3, <Intended use>. The non-compliance of this instruction involves a risk to life and limb and may cause damage to the pipe system.

■ Butterfly valves with a short face-to-face dimension :

Counter-flanges and/or pipe ends have to feature a clear span allowing for sufficient space for the opened valve disc so that the latter is not damaged when being swivelled out. This corresponds to the "U" dimension in the Crane Flow data sheets <Dimensions and weights>, see section 10, <Information>.

- At the beginning of the installation an operational check is to be carried out: the valve must close and open properly. Discernible malfunctions are absolutely to be redressed prior to commissioning. See also section 9, <Troubleshooting>. The position display on the actuator (if available) has to correspond to the position of the valve disc
- Prior to installation the valve and the downstream pipeline have to be thoroughly cleaned of any contamination, especially of hard foreign substances.
- FLOWSEAL Butterfly Valves of the series VIA/MS can generally be installed irrespective of the flow direction. In order to benefit from the optimum function of the butterfly valve the following is recommended:

Install the valve so that an arrow direction marked on the name plate with "PREFERRED" corresponds to the direction in which pressure is applied to a closed valve. This direction may well be opposite to the flow direction with opened butterfly valve!

- The preferred installation position is the one with horizontal valve shaft. If possible, an actuator should not be mounted directly below the valve: stuffing box leakage could damage the actuator.
- When inserting the valve (and the flange seals) in an already mounted pipeline the distance between the pipe ends has to be dimensioned in such a way that all connecting surfaces (and seals) remain undamaged. The gap, however, must not be larger than necessary so that no additional stress is generated in the pipeline during installation.



Caution!

Valves with a short face-to-face dimension have to be mounted with closed valve disc in the gap between the pipe ends: otherwise the valve disc could be damaged and the valve is not tight any more.

Only butterfly valves which are mounted between flanges:

- The counterflanges of the pipeline have to be flush, level and parallel.
- Screws which are used in threaded holes of the valve housing are to be implemented with a separating agent (e.g. graphite-containing).

- Flanged butterfly valves are to be centered on the counterflange during installation by means of the flange screws before the screws are tightened.



Caution!

FLOWSEAL Butterfly Valves of the series VIA/MS partly require screws of a varying length for the connection to the counterflanges. For the measurements for the flange screws please refer to Crane Flow data sheets <Screw dimensions>.

- As usual the torque for tightening the flange screws has to be adapted to the strength of the screw materials used, the flange seal used and the operating conditions.

Only butterfly valves which are welded:

- The weld ends of the valve have to be flush, level and parallel and of the same material as the pipes – see name plate of the valve. Opposite weld ends have to fit to one another as far as diameter and shape are concerned.
- By professional welding it has to be ensured that neither considerable tensions are generated in the pipe section or transferred to the valve nor that the butterfly valve is damaged by heat effect: only temperatures of <math><300^{\circ}\text{C}</math> (572°F), measured on the housing wall next to the bearing socket, are permissible.
- The welding is to be carried out professionally so that the welding seam features all round a temperature which is as constant as possible. Valves >DN400 are to be welded alternately on opposite sides.
- Welding cables must not be connected to the valve but to the pipeline.



Caution!

The non-compliance of these instructions may cause distortion of the valve housing. Already a lasting distortion of 1/10 mm in the seat area (around the bearing sockets) can render the valve useless.

7. Pressure test of the pipe section

To the pressure test of valves the same instructions apply as to the pipeline. In addition, the following applies:

- First thoroughly flush newly installed line systems in order to flood out all foreign substances.
- The testing pressure of an opened valve must not exceed the value of $1.5 \times \text{PS}$ (at $20^{\circ}\text{C}/68^{\circ}\text{F}$). The component with the lowest PN limits the maximum permissible testing pressure in the line section (PS = maximum permissible operating pressure, see also name plate).
- A closed valve must only be pressure-tested with $1.1 \times \text{PS}$.

8. Normal operation and maintenance

Valves which were delivered ex works with actuator are exactly adjusted and must not be re-adjusted as long as the valve is in perfect working order.

For the actuation on the hand wheel of the actuator normal manual forces are sufficient; the use of extensions to increase the actuation torque is not permissible.

Regular maintenance work on the valves is not required; however, when the line section is inspected no leakage must escape to the outside on any valve. In such cases please observe section 9, <Troubleshooting>.

It is recommended to actuate valves which always remain in one position once or twice a year.




Danger!

A butterfly valve is not self-locking: The actuator must not be removed as long as the butterfly valve is pressurized.

9. Troubleshooting

When rectifying faults section 4, <Safety notes>, must absolutely be observed

Kind of fault	Remedy	Note
Leakage on the flange connection or plug/ housing cover	<p>Retighten flange screws or plugs</p> <p>If leakage cannot be redressed in this way:</p> <p>Repair required: replace seal: request spare part and necessary manual from Crane Process Flow Technologies GmbH</p> <p>Observe section 4.3, <Particular dangers></p>	
Leakage in the seat seal	<p>Check whether the valve is closed 100%. If this is the case: Check whether the valve is closed with full torque.</p> <p>If the valve is o.k.: Open/ close valve repeatedly under pressure.</p> <p>If the valve is still leaking: Check whether leakage can be minimized by resetting the "CLOSED" stop in the actuator (valve has to move further into the "CLOSED" position).</p> <p>If the valve is still leaking: Repair required: replace seat seal, request spare parts and necessary manual from Crane Process Flow Technologies GmbH. Observe section 4.3, <Particular dangers></p>	

Kind of fault	Remedy	Note
Leakage on the stuffing box	<p>Retighten both nuts on the stuffing box gland alternately and in small steps of $\frac{1}{4}$ turn each clockwise.</p> <p>If leakage cannot be redressed in this way:</p> <p>Repair required: request spare parts and necessary manual from Crane Process Flow Technologies GmbH. Observe section 4.3, <Particular dangers></p> <p>If the nuts on the stuffing box gland have to be loosened or unscrewed (counter-clockwise):</p> <div style="display: flex; align-items: center;">  <p>In order to protect the operating personnel against any danger it has to be made sure that the line has been completely depressurized. Observe section 4.3, <Particular dangers>.</p> </div>	<p><u>Note 1:</u> If after the removal it is discovered that the housing and/ or the inner parts are not sufficiently resistant to the medium, parts made of a suitable material are to be selected.</p>
Malfunction	<p>If actuator is o k :</p> <p>Remove and inspect valve (in observance of the notes from section 4.3, <Particular dangers>).</p> <p>If the valve is damaged: Repair required: request spare parts and necessary manual from Crane Process Flow Technologies GmbH</p>	

10. Further information

Table for torques, clamping ring screws

DN	Screw	Torque [Nm]
80 - 250	M6	10
300	M8	24
350 / 400	M10	45
450 / 500	M12	60
600	M16	145

You can obtain this manual, the above-mentioned data and design sheets, additional assembly and maintenance manuals as well as further information und details – also in other languages - via:

Address:

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