Instructions and operation manual for butterfly valves
This manual is intended to support the users of Herberholz butterfly valves type HRD/HRA, RD/RA, LDKE/LDKF for installation, operation and maintenance activities.

**Warning!**
The nonobservance of these instructions and warning notes may cause personal injuries, hazards or property damages. The manufacturer will not assume any liability in case of nonobservance of these instructions and warning notes. Please contact the manufacturer for any question concerning these instructions (refer to address mentioned below).

1. Intended use

The butterfly valves are exclusively intended to shut off or to control media within the pressure and temperature limits defined by the manufacturer. The valves must be properly installed in the piping system and the actuator must be properly connected to the adequate power source. The pressure and temperature limit ranges are indicated in the technical specifications (refer to project file). Butterfly valves model HRD/HRA and RD/RA must be connected to EN 1092-1 form A, B or E flanges. Valves model LDKE/LDKF must be connected to EN12220 (former DIN 24154) flanges. Pipeline flanges must be parallel and aligned. The use of other flange type is forbidden unless special approval of the manufacturer.

“Safety instructions for the operator” - paragraph 2.2 must be observed when using the valves.

2. Safety instructions

2.1 General safety instructions

Safety instructions are applicable to the valves, to the pipeline systems to which they are connected and to the control system to which valve actuators are connected. This manual only contains safety instructions for valves. Please refer to the corresponding Instructions and Operation Manual for actuators safety instructions.

2.2 Safety instructions for the operator

**Danger for life!**
Operating conditions exceeding the indicated pressure and temperature limits of the valve are not allowed. The pressure and temperature limit ranges are indicated in the project specifications or in the manufacturer’s order confirmation. The manufacturer’s approval is mandatory in case of operating conditions exceeding the pressure and temperature limits. The nonobservance of this instruction may cause severe or fatal injuries and property damages.

**Danger for life!**
The material compatibility of the valve wetted parts with the media must be controlled. The manufacturer will not assume any liability in case of damages due to corrosive media. The nonobservance of this instruction may cause severe or fatal injuries and property damages.

The manufacturer will not assume any liability in case of nonobservance of one or more of the following instructions:

- Valves must be used according to par. 1 - “Intended use”.
- In case of installation of an actuator on existing valve. The actuator must be correctly installed on the valve. The open and, particularly, the close position must be properly adjusted.
- The pipeline system has to be routed and installed in a professional way and has to be controlled on a regular basis. The wall thickness of the valve body...
is dimensioned to withstand the standard forces and torques generated by a pipeline system installed in a professional way.

- Valves have to be properly connected to the pipeline system.
- The operating time of actuated valves has to be adapted to the requirements of the pipeline system.
- Usual flow conditions must not be exceeded during continuous operations. Manufacturer’s approval is mandatory in case of abnormal service conditions like vibrations, water hammer, cavitation or media containing solid parts.
- Valves operating at temperature > 50°C or < -20°C must be insulated to avoid physical contact and possible injuries.
- The operation and maintenance of valves installed in pressurized pipeline systems must be performed by skilled and experienced personnel.

### 2.3 Particular dangers

#### Danger for life!

The pipeline system must be totally depressurized, drained and flushed prior to dismantling the valve bottom cover or dismantling the valve from the pipeline in order to avoid uncontrolled media leakage.

#### Warning!

For valves used in end of line service for gas applications, high temperature service and/or corrosive service: a blind flanged must be installed downstream or the valve must be secured in closed position with a safety interlock device.

#### Warning!

If a end of line service valve installed in a pressurized system must be opened: the valve must be carefully operated in order to avoid injuries or damages caused by fluid projection.

#### Warning!

Risk of pinching an object between body and disc! Be careful when closing the valve: the valve must be operated carefully and the clearance between disc and body must be controlled during valve operations.
2.4 Butterfly valves identification
The following informations are indicated on the valve body or on the identification plate:

<table>
<thead>
<tr>
<th>for</th>
<th>Identification</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Herberholz</td>
<td>Address - see section 8 - “Information”</td>
</tr>
<tr>
<td>Type</td>
<td>e.g. HRD/HRA</td>
<td></td>
</tr>
<tr>
<td>Identification (ID-No.)</td>
<td>e.g. 2008-20123</td>
<td>NPos. 1 to 4 : year of order</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pos. 5 9 : order reference</td>
</tr>
<tr>
<td>DN</td>
<td>DN+value</td>
<td>Size - e.g. DN80</td>
</tr>
<tr>
<td>PN</td>
<td>PN+value</td>
<td>Nominal pressure - e.g. PN10</td>
</tr>
<tr>
<td>Material</td>
<td>e.g.: EN-GJS-400-15</td>
<td>Body material</td>
</tr>
</tbody>
</table>

The information indicated on the valve body and on the identification plate must remain readable for further valve.

3. Transportation and storage
Valves must be carefully handled, transported and stored.
- Valves must be transported and stored in their original packing until installation.
- Lifting accessories (slings, ropes) must be attached on the valve body - NOT on the actuator.
- Valves must be stored in a closed room and must be protected against direct sunlight (UV light), dirt, moisture and any kind of contamination.
- Butterfly valves must be stored with the disc in slightly open position. Do not operate the actuator.

4. Installation

4.1. General information
Installation instructions for pipeline and pipeline elements are also applicable to valve installation works. The following instructions are additional instructions for valves installation. Instructions described in section 3 are applicable to the transport and the storage of valves to the installation site.

Warning!
Valves supplied without actuator - risk of pinching an object between body and disc! The actuator must be installed and connected to the power source only after the valve is correctly installed in the pipeline. Valves used as end of line device must be fitted with a blind flanged downstream or secured in closed position with a safety interlock device in order to avoid any risk of pinching.

Warning!
Valves supplied without actuator: the disk of a bare stem valve is not self maintained. Secure the valve and avoid any shock or vibration which could open the valve disc during storage and transport.
4.2 Preparation for installation

Make sure that the valve is suitable for the service and installation conditions i.e. pressure class, dimensions, connections. Refer to the valve identification informations.

**Danger for life!**

It is forbidden to install a valves in a system with pressure and/temperature limits exceeding the limits of the valve. The pressure and temperature limits of the valve are indicated on the indication plate of the valve or in the project specifications. **The nonobservance of this instruction may cause severe or fatal injuries and property damages.** Contact Herberholz for any question.

- Check the valve and the actuator for damages. Damaged valve or actuator must not be installed.
- Pipeline flanges must be parallel and aligned.

**Warning!**

If a valve is exceptionally delivered without actuator, the valve may be installed but it may not be pressurized. If an actuator is installed on such valve: the torque, the rotating direction, the stroke and the open and close limit stop adjustment of the actuator must be controlled. **The nonobservance of this instruction may cause severe or fatal injuries and property damages.**

**Warning!**

Valves with electric actuator: the open and close position must be controlled with open and close limit switches. Torque switches must not be used for this purpose. Only use torque switches for failure signal or troubleshooting. Please refer to electrical actuator instructions and operation manual for further information.

**Note!**

Two flanges gaskets according to DIN EN 1514-1 must be foreseen. Not included in our supply.

**Warning!**

Actuators are supplied and adjusted according to the purchase order specifications. **The setting of the open and close limit stops must not be modified without manufacturer's approval.**

**Warning!**

Flange dimensions must allow free movement of the disc.
4.3 Installation

**Warning!**

Butterfly valves must be installed between flanges with the disc in nearly close position to avoid damage to the disc.

**Danger for life!**

For butterfly valves fitted single acting actuator - spring to open:

**Installation**

- Disassemble the actuator from the valve
- Manually close the valve and install the valve in the pipeline.
- Manually open the valve and install the actuator on the valve.

The nonobservance of this instruction may cause severe or fatal injuries and property damages.

- There is no preferred flow direction. The valve must be installed with the shaft in horizontal position and with the lower disc-edge opening downstream (self-cleaning effect). If possible, the actuator will not be installed below the valve (leakage at the valve stem will damage the actuator). Any deviation to this instruction must be approved by Herberholz.

- Solenoid valves exhaust port must be fitted with an adequate silencer.

- When installing the valve into existing pipeline system, the distance between flange must be controlled and adapted to allow the installation of the valve without damaging the valve and the flanges sealing surfaces. The distance between flanges must not exceed the required value to avoid additional piping stress when tightening the flange bolts.

- The valve must be properly centered between flanges.

**Note!**

Bolts of different dimensions are sometimes required to install the valve between flanges.

- Cross-tighten and block all flange bolts to ensure perfect flange sealing.

**Note!**

In case of welding works to the counter flanges: the valve must be removed from the pipeline and must only be installed when the flanges temperature is < 50°C.
4.4 Installation

Warning!

- When installing the valve between flanges: flange gaskets must be properly aligned with the flanges and the valve sealing surfaces. If not, flange gaskets will be damaged when stroking the valve.

- Contact between pipe flanges and disc will damage the disc. Make sure that the valve is correctly centered. Open the disc to ensure proper clearances between disc and flanges.

- The valve must be open during commissioning procedure in case of high service pressure and/or high flow rate.

- Check the shaft packing tightness during commissioning procedure. Slightly tighten the packing if necessary. Do no over tighten the packing! Over tightening the packing will cause excessive friction and wear.

- We recommend to insulate the valve. Although, make sure that the shaft bearings and the packing gland are not insulated.

- Insert the valve between flanges with the disc in nearly close position. Use flange spreaders if the distance between flanges is not sufficient for safe insert of the valve.

- Adjust and slightly tight the valve with 4 flange bolts. Tack weld the flanges to the pipe.

- Remove the valve from the pipeline. Weld the flanges to the pipe.

- Install the valve after cooling of the flanges < 50°C. There must be enough space between pipe flanges to insert the valve. In case of insufficient clearance, flange gaskets, pipeline flange and valve body mating surfaces will be damaged.

- Align and slightly tight the valve with 4 flange bolts.

- Open the disc to ensure proper clearances. Close the valve to the nearly close position.

- Cross-tighten and block all flange bolts.

- Repeat a full open to close rotation of the disc to control the valve operation.
6. **Routine maintenance**

Actuated valves must be controlled by the control system. Actuated valves delivered by the manufacturer have been adjusted and tested prior to shipment and does not require any adjustment or maintenance as long as they are working properly. The use of lever or any tools is forbidden with emergency manual device. Control valves are dimensioned for a control range between $15^\circ$ and $70^\circ$ rotation. It is mandatory to avoid cavitation.

**Warning!**

Dysfunctions in control command system may lead to dangerous situation and property damages.

5. **Pressure test of the system**

The valve pressure test has been performed by the manufacturer. The following instructions are applicable to the pressure test of the pipeline systems including Herberholz valves:

- Pipelines must be properly drained, cleaned and flushed in order to eliminate all solid parts, dirt and contaminant materials from the pipelines.
- Pressure test with valve in open position: the test pressure value must not exceed $1,5 \times PS$ according to the valve identification information ($PS = \text{max allowable pressure}$).
- Refer to section 7 “Troubleshooting” in case of valve leakage.
- When the pipeline is dried after test pressure, the drying conditions must not exceed the pressure and temperature limits of the valves as stated in section 1.

**Warning!**

The disc position of a butterfly valve is not self maintained. It is forbidden to remove the valve actuator if the pipeline system is pressurized.

**Warning!**

Piston type pneumatic actuators are not self maintained. The air supply pressure must be maintained if supply pressure is required to control the valve position (air to open - air to close).
## Troubleshooting guide

Always apply instructions of section 2 “Safety Instructions”.

### Warning!

Valves in contact with dangerous or contaminant products must be properly cleaned and decontaminated prior to shipment to the repair workshop.

<table>
<thead>
<tr>
<th>Failure</th>
<th>Possible cause</th>
<th>Resolution</th>
</tr>
</thead>
</table>
| Flange bolts loosen | - Tighten flange bolts properly | - Apply instructions of section 2.3 “Particular danger”.  
- Pipeline system shutdown.  
- Remove the valve.  
- Check the flange gaskets for damages.  
- Install the valve properly (refer to section 4).  
- Functional test. |
| Valve is not properly centered between flanges | - Apply instructions of section 2.3 “Particular danger”.  
- Pipeline system shutdown.  
- Remove the valve.  
- Check the flange gaskets for damages.  
- Install the valve properly (refer to section 4).  
- Functional test. |
| Wrong or non conform flanges | - Replace the flanges if necessary.  
- Install the valve properly (refer to section 4).  
- Functional test. |
| Flange gaskets damaged | - Replace the flange gaskets.  
- Install the valve properly (refer to section 4).  
- Functional test. |
### Failure | Possible cause | Resolution
---|---|---
Valve does not close | Debris or dirt trapped in the valve | - Apply instructions of section 2.3 “Particular danger”.  
- Pipeline system shutdown.  
- Remove the valve.  
- Remove debris and dirt from the valve and the pipeline.  
- Functional test.

Service pressure too high (Insufficient actuator output torque) | - Check the service pressure according to the specifications. (Refer to actuator instructions maintenance). |

Shaft leakage | Wear | - Apply instructions of section 2.3 “Particular danger”.  
- Adjust the packing tightening (refer to section 6). Proceed as follow if the problem is not resolved:  
- Pipeline system shutdown.  
- Remove the valve.  
- Replace the shaft packing or send the valve to Herberholz for repair.  
- Install the valve properly (refer to section 4).  
- Functional test.  
- Adapt maintenance intervals.

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**Note 1:**  
Only use Herberholz original spare parts for repair. Please mention all informations indicated on the valve body and on the identification plate when ordering spare parts.

**Note 2:**  
Contact Herberholz for other material choice if it appears that wetted parts are not compatible with the media.

In case of actuator failure, please refer to the corresponding instructions manual.

### 8. Additional information

Instructions manuals, product data sheets and other information about Herberholz products are available on [www.herberholz.com](http://www.herberholz.com)