Operating Instructions

ERHARD Butterfly Valve
EAK

with electric actuator

1 Description of Product and Range of Application

ERHARD Butterfly Valves   PN10 >= DN 700   Product No.  5074
ERHARD Butterfly Valves   PN16 >= DN 700   Product No.  5075
ERHARD Butterfly Valves   PN25 >= DN 150   Product No.  5016
ERHARD Butterfly Valves   PN40 >= DN  80   Product No.  5017

Valve design: to DIN EN 593
with double offset shaft bearing
> DN 1000 offset shaft bearing
resilient seated, tightly closing
of ductile cast iron SG GGG
with flanges

These operating instructions must always be used in combination with operating instructions BA01E001!

The valve disc closes in clockwise direction (turning e.g. the handwheel to the right). A 90° swinging movement is to be done from position “OPEN” to “CLOSED” which is transferred into a rotating movement by the mounted stem gearbox or slider-crank mechanism.
2 Design Features – Technical Data

2.1 Butterfly Valve

**DN 150 - DN 2000** to drawing 4.111 221

The profile ring (6) of resilient rubber is supported in a profile groove around the valve disc (10) and is efficiently fixed and adjustable by means of a clamping ring (7). Body seat (2) according to type:

50.. 95.. rolled-in solid ring of austenitic CrNi steel
50.. 72.. ERHARD vitreous enamel

Positive connection of the valve disc (10) with the shaft (11) by means of keys (12). The shafts are borne in large sized, maintenance-free PTFE compound bearings (3). Sealing of the shaft passage on the gearbox side is attained by two successively arranged 0-rings (4). The bearing cover (18) is sealed by means of enclosed 0-ring (17). In the closed limit position, the surface of the valve disc is moved into the mating seat with the given sealing pressure (offset bearing). In the closed limit position, a completely tight seating is achieved (at nominal pressure or given working pressure to DIN EN 1074, leakage rate A).

2.2 Stem gearbox or slider-crank mechanism

The rugged ERHARD stem gearbox or slider-crank mechanism turns the rotary movement of the stem into a translatory motion of the valve shaft. A nut running on the stem moves – depending on the type of gearbox – a gearbox fork or gearbox crank (with toggle lever) which is securely connected with the drive shaft. In both limit positions, the stem is equipped with grooved nuts serving as fixed limit stops. These stops limit the torques initiated by the stem preventing excessive forces from being transmitted onto the valve in the limit positions.

The stem gearbox or slider-crank mechanism is irreversible.

An indicator behind a sight-glass on the cover of the stem gearbox shows the valve position in a continuous manner. The indicator position corresponds to the position of the valve disc. The limit positions are shown as readily comprehensible symbols. The sight-glass made from shock-resistant polycarbonate (PC) is tightly screwed into the gearbox cover (IP 67).
3 Installation into the Pipeline - Mounting

Remove all packing materials from the valve. Prior to installation, check the pipeline for impurities and foreign bodies and clean it if necessary.

ATTENTION:

For valves with an arrow pointing in flow direction observe direction of installation!
For valves with weight-loaded hydraulic actuator observe actuator arrangement!
For valves with foot plate, foot plate only serves as support of the valve and not as point of anchorage or support of the pipeline.

It is important that all around the valve there is free access for operation and maintenance. For outdoor installation, the customer has to protect the valve against direct effects of the weather.

During installation of the valve, the distance between the pipe flanges should exceed the valve face-to-face dimension by at least 20 mm. Thus, the raised faces will not be damaged and the gaskets can be inserted. Steel-reinforced rubber seals to DIN 2690 are recommended to be used as flange gaskets (consider resistance to flow medium and temperature), for slip-on flanges they are absolutely necessary.

The mating pipe flanges must be plain-parallel and concentric.

Tighten the connecting bolts evenly (without distortion) and crosswise. The pipeline mustn’t by any means be pulled up to the valve.

In open position the valve disc exceeds the valve face-to-face dimension. Keep corresponding distance to any fitting or valve, e.g. check valve, see drawing no. 4E98300.
4 Initial Operation

After installation, check valve for smooth operation:
move the valve at the handwheel over the total travel (OPEN-CLOSED).

5 Operation and Application

Inadmissible Operation

Installation behind elbows or similar disturbing installation parts is to be prevented.
Long-time operation in throttled position leads to higher wear.
Do not exceed limiting values of the flow medium temperature.
Do not exceed limiting values of the working pressure.
Closed valve may only be charged up to the nominal pressure.
For EPDM profile sealing rings and sealings: rubber parts must not get in contact with
mineral oil or grease (EPDM swells!).

Avoid inadmissible jogging operation. See paragraph “Jogging Operation”

The electric actuator is mounted on the neck bearing of the stem gearbox.
The standard type is equipped with:

Torque and travel limit switches with 1 make and 1 break contact each,
Blinker transmitter for indication of running operation,
Thermal switch in the motor winding.

The valve is switched off in the following manner:

in closing direction: travel dependent
in opening direction: travel dependent.

The switching points of the travel and torque switch are set at the factory. Moreover,
the torque switches serve as safety switches, e.g. in intermediate positions.

When the valve is supplied without mounted electric actuator, the travel switches
have to be adjusted after mounting the electric actuator.

See paragraph "5.2 Putting into operation" and "5.3 Resetting the limit switches"
Observe the relevant safety measures (VDE/TAB etc.) and the instructions of the manufacturer of the electric actuator concerning transport, storage, initial operation and maintenance (operating instructions).

For the electrical connection, observe the suggested wiring and terminal diagram supplied by the manufacturer of the electric actuator (travel, torque and thermal switches, motor and heating device in case).
Measure the insulating resistance of the motor prior to connection. (If it is less than 500 K-ohms, this shows that there is moisture in the winding. Remove the motor for drying-up and heat it by means of a hot-air fan or in a heating chamber: max. admissible temperature 100°C).

Compare the existing voltages with the data on the name plate. After connection, the covers and the cable glands on the electric actuator have to be closed and sealed carefully.

5.1 Inching operation and manual emergency operation

ATTENTION:

If a foreign body is jammed in when operating the valve, the corresponding torque switch responds and switches off the motor. The time lag between response of the torque switch and disconnection of the motor from the network depends on the signal delay. If a new order is given before the valve has been opened sufficiently, the torque will increase. If this procedure is repeated several times, the torque will accumulate. The valve and its operating elements are not designed for such an emergency.

**We explicitly draw your attention to the fact that such “inking operation“ is inadmissible.**

Inching is only admissible under the following conditions:

If the torque switch responds in intermediate position, the valve must first be moved in the opposite direction until the torque switch completely returns to its original position. Only now the valve may be moved again in the direction in which the disturbance occurred. Proceeding this way, you will obtain torques corresponding to the torques set at the torque switch. Moreover, the foreign matter can come off and be flushed out of the seating zone.
Operation by emergency handwheel:

If the valve is operated by means of the handwheel of the electric actuator, the torque switches do not provide any safety function.

If a foreign body is jammed with the valve being in intermediate position, excessive operating force – particularly in case of high gear reduction – might be damaging to the actuating components.

If any resistance is detected during emergency handwheel operation, some turns must be made in the opposite direction before the valve is moved in the direction in which the disturbance occurred (flush out the foreign body). Continue operation with utmost care, in no case using excessive force. If need be, repeat flushing operation.

5.2 Putting into operation:

5.2.1 Turn the valve manually to central position.
5.2.2 Check movement of the indicator at the stem gearbox and thus the direction of rotation of the motor by brief electrical starting.
5.2.3 In case of faulty direction of rotation, change the poles of the motor connection.
5.2.4 Check once again the direction of rotation shown by the indicator by means of brief electrical starting.
5.2.5 Check disconnection of the torque and travel switches in OPEN and CLOSED directions by operating the switches manually in central position.
5.2.6 Change poles if necessary.
5.2.7 Carry out complete travel only when the correct direction of rotation and disconnecting performance are ensured.

In case of faulty direction of rotation, the travel and torque switches do not work!
5.3 Resetting the limit switches:

5.3.1 Move the valve manually against the limit stop in position "C" of the indicator
5.3.2 Return by one turn of the stem
5.3.3 Adjust "OPEN" travel switch according to the operating instructions for the electric actuator.
5.3.4 Move the valve manually against the limit stop in position "B" of the indicator.
5.3.5 Return by one turn of the stem
5.3.6 Adjust the "CLOSED" travel switch according to the operating instructions for the electric actuator.

If these proposed measures are not respected, we cannot be made liable for any damages resulting thereof.

6 Maintenance

6.1 Maintenance

ERHARD Butterfly Valves are equipped with maintenance-free plain bearings. Gearbox stem and gearbox bearing are of the long-time lubricating type. Control of the performance and tightness is to be done regularly in intervals of <= 4 years according to DVGW print W392.

In case of regulating service, the internal components of the gearbox have to be checked for wear and tear once a year and to be regreased as described under paragraph 6.5.

Before carrying out work on the valve, the inspection valve must be closed and the pipe section must be made pressureless. Observe operating instructions for special actuator.

6.2 Inspection

Check external condition of the valve including operating gear.
If necessary clean the valve and repair the coating.
Check tightness at flanges.
Check for smooth operation of valve and operating gear.
Move valve manually over total travel.
Check seat tightness: close the valve.
Check pressure drop upstream and downstream of the valve.
6.3 Readjustment of Profile Ring  see drawing No. 4.111 221

ERHARD Butterfly Valves starting from DN 150 are equipped with a readjustable sealing system. The profile ring (6) can be readjusted in closed position of the valve disc. For this purpose, loosen the counter pins (9) and tighten evenly the tensioning screws (8). Afterwards tighten counter pins (9) by turning them in clockwise direction.

6.4 Replacement of Profile Ring  see drawing No. 4.111 221

Slightly turn valve disc off the body seat. 
Mount from valve side "B". 
Counter pins (9) remain in their position. 
Mark position of clamping ring. 
Loosen and screw off tensioning screws (8). 
Lift off clamping ring (7) and profile ring (6) from the valve disc (10). 
Clean profile groove in valve disc and clamping ring, apply new corrosion protection if necessary. 
Insert new profile ring into profile groove of the valve disc. 
Mount clamping ring (7) in marked position. 
Screw in and tighten tensioning screws (8) until the limit stop of the counter pins is reached. 
Slightly grease the new profile ring in the sealing zone (comply with grease recommendation).

<table>
<thead>
<tr>
<th>Flow medium</th>
<th>Lubricant</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>UNISILIKON L 641</td>
<td>Kühler Lubrication München KG</td>
</tr>
<tr>
<td>Gas</td>
<td>NOSOL GBY 2</td>
<td>Kühler Lubrication München KG</td>
</tr>
</tbody>
</table>

6.5 Relubricating of the internal parts of stem gearbox, see drawing No. 4E116311

Screw off hexagon bolts (26) and lift off gearbox cover (25). 
Lubricate stem (7) and sliding surfaces of gearbox fork (5) with lubricant. *)
Put on gearbox cover (25) with gasket (24) and screw in hexagon bolts (26).

Pay attention to the gasket (24) being inserted so that it fits on all sides.

6.6 Relubricating of the internal parts of slider-crank mechanism, drawing 1E 30641

Screw off hexagon bolts (44) and lift off gearbox cover (41). 
Lubricate stem (16) and sliding surfaces of the rollers (12) with lubricant. *)
Put on gearbox cover (41) with gasket (42) and screw in hexagon bolts (44).

Pay attention to the gasket (42) being inserted so that it fits on all sides.

*) Lubricant  Manufacturer  Class NLGI
Renolit CX-FO20  Fuchs Europe Schmierstoffe, Mannheim  KP 2 N-30
Operating Instructions for ERHARD Butterfly Valve with electric actuator

Ausführung: Gehäusesitz nichtrostender Stahl
Type: stainless steel body seat

Type: siège du corps en acier inoxydable

Ausführung: Gehäusesitz ERHARD-Emailierung
Type: ERHARD enamel body seat

Type: siège du corps en émail ERHARD

1 Gehäuse 1 body
2 Gehäusesitz 2 body seat
3 Lagerbuchse 3 bearing bush
4 O-Ring 4 O-ring
5 Stützring 5 back-up-ring
6 Profilring 6 profile ring
7 Klemmring 7 clamping ring
8 Spannschraube 8 set screw
9 Konterstift 9 counterpin
10 Klappenscheibe 10 valve disc
11 Antriebswelle 11 drive shaft
12 Kiel 12 key
13 Sicherungsblech 13 safety plate
14 Ekt Schraube 14 hexagon head cap screw
15 Lagerzapfen 15 trunnion
16 Passring 16 fitting ring
17 O-Ring 17 O-ring
18 Lagerdeckel 18 bearing cover
19 6kt Schraube 19 hexagon head cap screw

Corps
2 Siège du corps
3 Coussinet
4 Anneau torique
5 Bague de serrage
6 Anneau profilé
7 Bague de serrage
8 Vis de serrage
9 Contre-goupille
10 Lentille
11 Arbre de commande
12 Clavette
13 Plaque d’arrêt
14 Boulon hexagonal
15 Tourillon
16 Bague d’ajustage
17 Anneau torique
18 Chapeau de palier
19 Boulon hexagonal

ERHARD-Absperrklappe Lager- und Dichtpartie
ERHARD Butterfly Valve Bearing and sealing zone
Vanne papillon ERHARD Zone de logement et d’étanchéité

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Operating Instructions for ERHARD Butterfly Valve with electric actuator

Die ERHARD-Absperrklappen sind in beide Richtungen dicht. ERHARD Butterfly Valves are tight in both directions.

Bei einseitiger Druckbeaufschlagung soll der Druck von der Seite A anstehen (bevorzugte Druckrichtung).

When the pressure is applied from one side it should act from side A (preferred pressure direction).

Si la pression est appliquée d’un côté, elle devrait agir du côté A (direction préférée de la pression).

ERHARD-Absperrklappen können in allen Lagen eingebaut werden. Sämtliche Bilder sind auch für senkrechte Rohrleitungen verwendbar.

ERHARD Butterfly Valves can be installed in any position.

All patterns can also be applied for vertical pipelines.

Les robinets à papillon ERHARD peuvent être installés dans toutes les positions.

Toutes les images sont applicables également pour conduites verticales.

Durch Rechtsdrehen des Handrades schließt die Klappenscheibe.

The valve disc is closed by turning the handwheel in clockwise direction.

Le papillon est fermé en tournant le volant à droite.

Gehäuse DN 150-1000 mit Flanschfugen, ab DN 1100 nur unten.

Body equipped DN 150-1000 with flange feet, from DN 1100 only at bottom.

Le corps DN 150-1000 est muni de pried-bride, à partir du DN 1100 seulement au-dessous.
ATTENTION:

The valve has to be installed in such a way that the weight-loaded lever of the ERHARD Check Valve is located on the left seen in flow direction, and the gearbox of the ERHARD Butterfly Valve on the right in flow direction. Thus, there is no collision of weight-loaded lever and gearbox.