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P.O. Letter No.: 4553015-006/1.69666/136
Contract No.: 1.69666-10-GEM
Project Title: Zagros Mega Methanol Plant, Bandar Assaluyeh, Iran
Item Number: 00130 to 00150
ID-No.: A 310G

**MAINTENANCE & OPERATION  
MANUAL  
FOR  
WAFER TYPE BUTTERFLY  
VALVE**



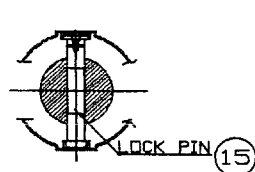
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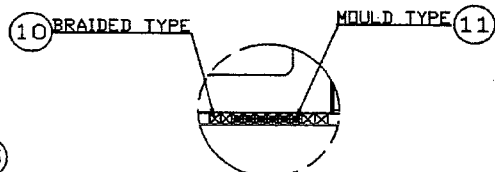
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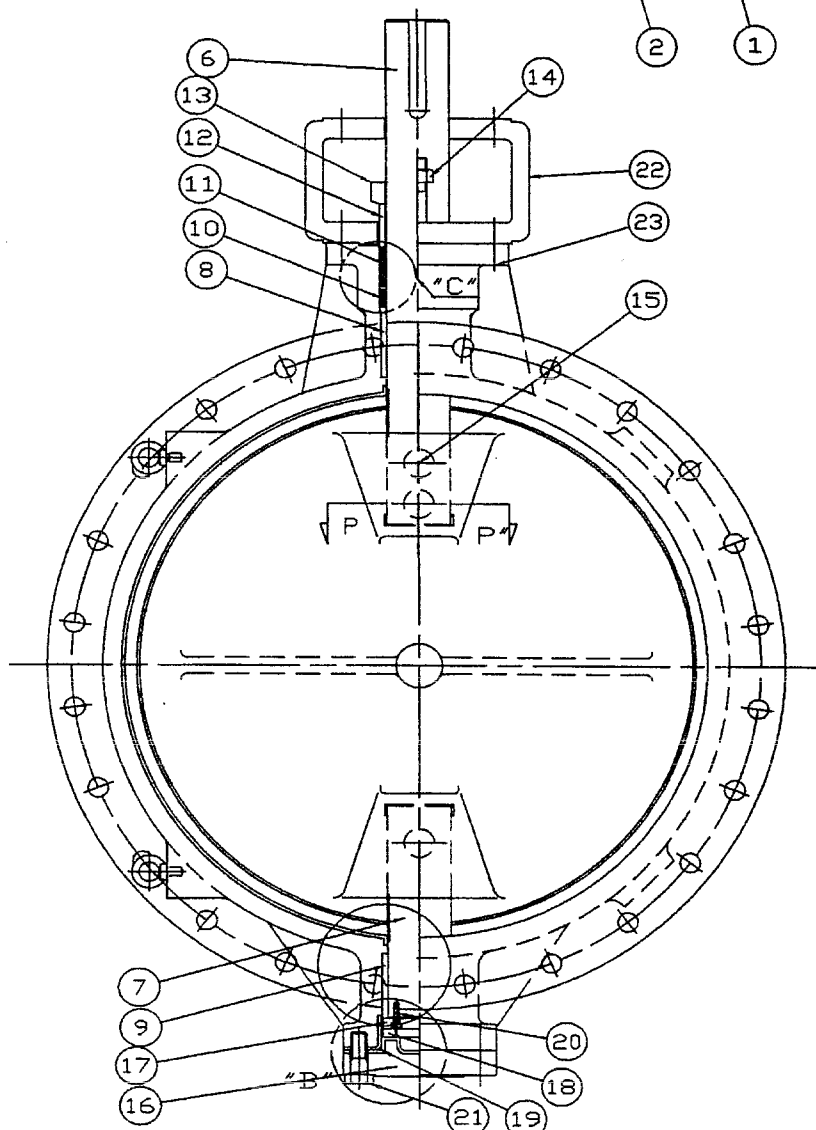
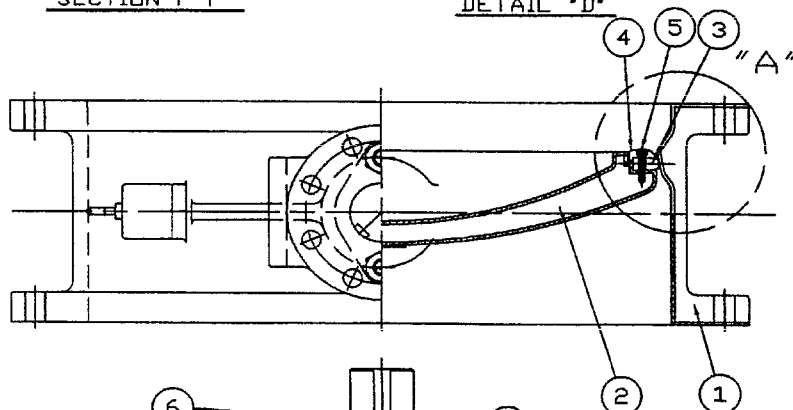
# INSTALLATION AND MAINTENANCE ISTRUCTIONS FOR BUTTERFLY VALVE WITH RUBBER TO RUBBER SEATED HFR-L Series



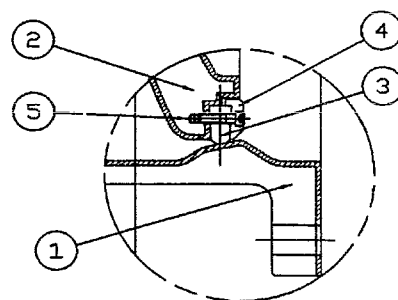
SECTION P-P'



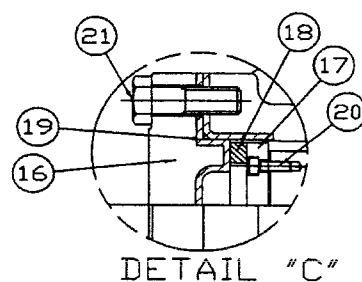
DETAIL "D"



PNC	PART NAME	MATERIAL	Q'TY
1	BODY	GS-C25N	1
2	DISC	GS-C25N	1
3	DISC SEAT	EPDM	1
4	SEAT GLAND	A240T304	1
5	GLAND BOLT	A193B8	1
6	MAIN SHAFT	A276T304	24
7	STUB SHAFT	A276T304	1
8	MAIN BEARING	OILLESS	1
9	STUB BEARING	OILLESS	1
10	PACKING-(BRAIDED)	PTFE	1
11	PACKING-(MOULD)	GRAPHITE	1
12	PACKING ADAPER	B148C954	1
13	PACKING GLAND	GS-C25N	1
14	PACKING GLAND BOLT	A193B8	2
15	LUCK PIN	A276T304	3
16	END COVER	GS-C25N	1
17	COLLAR	A276T304	1
18	COLLAR BEARING	B148C954	1
19	O - RING	EPDM	1
20	SET SCREW	A193B8	1
21	BOLT,WASHER	A307GR.B	4
22	STAND	A395	1
23	BOLT,WASHER	A307GR.B	4



DETAIL "A"



DETAIL "C"

## **2. MANUAL ACTIONING**

- 2.1 The opening and closing of the valve are carried out by turning the handwheel command with gearbox (gear). On the top of the gear a mechanical position indicator, indicating open or Closed is fitted. The valve closing is done by rotating the handwheel, in clockwise direction, while the opening is in anticlockwise direction.

## **3. REMOTE CONTROL**

- 3.1 The valve can be operated automatically with remote control by a pneumatic, hydraulic or electric actuator.  
3.2 If the valve is required with actuator there are no assembly problems, as it is supplied already fitted with the actuator. Normally, on the valve, no limit switch is mounted as it is part of the actuator.

## **4. INSTALLATION INSTRUCTIONS**

General information regarding the HFK-R series butterfly valve.

- 4.1 For the shipment, the surface of the body's seat and the stems are lubricated with grease. If this is not considered necessary, it can be removed with solvent. Should the valve be destined for oxygen, hydrogen or chlorine service, it is perfectly cleaned and degreased.  
4.2 General information for on-site assembly  
4.3 The valve is bi-directional and can be mounted on the pipe in any position. However it is important, where possible, to assemble the valve with the stem in horizontal position, with the inferior edge of the disc that opens towards the downstream pressure.

**The reason of this recommendations are :**

- a) The disc's and the stems weight is held by radial bearings instead of axial bearings
  - b) In horizontal pipelines the solid material that can accumulate in the lower part, when the valve is in closed position, does not obstruct the disc movement in opening position.
- 4.4 Before the installation, the pipelines must be cleaned from impurities, dirt and welding residuals, otherwise it is possible to damage the rubber seal ring.  
4.5 The pipeline must free from electric voltage  
4.6 The HFK-R series valve, Wafer, Lug or Flanged type can be fitted between flanges inserting two gaskets between the valve's body and the flange to guarantee an efficient seal towards the outside.  
4.7 On-line installation (on existing pipeline) of a HFK-R series valve Wafer or Flanged type  
4.8 Check that the distance between the flanges corresponds the valve's face to face dimension.  
4.9 separate the flanges with special tools, so it is easier to insert the valve.  
4.10 Insert between the flanges at least two bolts in the inferior part.  
4.11 Close the valve's disc so that the disc's profile is inside the body.  
4.12 Insert the valve between the flanges, with the two gaskets, that will be retained by two bolts fitted previously in the lower part of the flanges.  
4.13 Screw the screws in the centering holes of the valve's body.  
4.14 Insert all the remaining bolts aligning the valve with the flanges and screwing the nuts manually.  
4.15 Maintaining the valve aligned, gradually removed the flange spacers and partially tighten the nuts.  
4.16 Check that the valve's opening and closing operations are easy.  
4.17 Open the valve and complete tightening the nuts evenly crossed until the adequate torque value is reached.  
4.18 For the Lug type valve installation, proceed as per Wafer and Flanged type, using screws instead of nuts and bolts.  
4.19 On-line installation (on new pipeline) of HFK-R series valve Wafer or Flanged type.  
4.20 Close the valve's disc so that disc is in the valve's body.  
4.21 Center the two flanges with valve's body after having positioned the two gaskets.  
4.22 Close the valve's body between some bolts and partially tighten the bolts, and complete tightening the nuts eventually crossed.  
4.23 Use the assembled block, flange-valve-flange, for the pipeline preparation and centrage.  
4.24 Spot-weld the flanges to the pipeline.  
4.25 Remove the bolts and valve from the flanges.  
Important : do not finish welding the flanges to the pipeline with the valve inserted between them, as some welding residuals in the pipeline could damage the rubber seal ring or the body's seat.  
4.26 Complete the flanges welding and let it cool completely.

## **5. MAINTENANCE**

- 5.1 The HFK-R series valve Wafer, Lug, Butt welding and Flanged type does not require periodical maintenance or lubrication, however the body is supplied with threaded holes for grease nipples.  
5.2 The valve is lubricated in the rotating points with grease mixture that remains imprisoned and active in the special lantern rings.

- 5.3 The valve apart from the normal lubrication, is supplied with bearings that assure a long life and easy valve operation. In-line leakage or stem leakage. :

## 6. IN-LINE LEAKAGE

- 6.1 Check that the valve is perfectly closed. In This case the leakage is due to damages to the rubber seal ring or to the body's seat. It is therefore necessary to disassemble the valve and substitute the damages parts.
- 6.2 Safety precautions before valve disassembly from the pipeline :
- a) The fluid that passes in a pipeline can be corrosive, toxic, inflammable or contaminating.
  - b) before removing the valve check that there is no upstream or downstream pressure in the pipeline and in the valve. It is suggested to close all the valves that are situated before and after the valve that must be repaired.
- 6.3 Close the disc nearly completely, remove all the nuts and after all the bolts excepted for the two lower ones that hold the valve weight.
- 6.4 Separate the flanges with special tools and remove the valve to substitute the rubber seal ring.
- Attention :** do not use the valve to separate the flanges as this could cause damages the rubber seal ring or to the body's seat.
- 6.5 Substitution of the rubber seal ring
- 6.6 Put the valve in opening position.
- 6.7 Remove the grand bolts(5) that connect the seal retaining ring to the disc.
- 6.8 Remove the seal retaining ring(4), the rubber seal ring(3).
- 6.9 Clean the grooves of the rubber seal ring, of the seal retaining ring.
- 6.10 Inspection and clean the valve's body seat. if it is scratched or pitted, clean with a slightly abrasive both.
- 6.11 Carefully check the rubber seal ring and the disc, and, if necessary substitute it.
- 6.12 Substitute the rubber seal ring, checking carefully that the existing marking meets perfectly the centering pin of the disc and the marking of the seal retaining ring.
- 6.13 Put the loctite type 971 on the fixing screws of the disc's seal retaining ring's and screw them manually without tightening.
- 6.14 Close the vale twice, using the actuator or the gear, so that the rubber seal ring can self-centre.
- 6.15 Complete the fixing screw crossed tightening of the seal retaining ring to the disc with a mechanic key and with the disc always in closed position.

## 7. STEM'S LEAKAGE

- 7.1 In case of leakage from the stem : tighten the gland's nut 1/2 turn each time while the valve is open until the leakage is eliminated. When the valves are delivery, they are shipped with the gland registered according to the pressure required. After a long storage it is advised to check the sealing and if necessary, tighten the gland's bolts until the requested sealing is obtained.

**Attention :**

Do not over in tighten the gland's bolts, otherwise the valve torque could increase too much, damage the correct functioning of the valve. If the leakage continues, it is necessary to substitute the packing as follows :

- 7.2 Make sure the is no in-line pressure.
- 7.3 Remove the actuator with its stand to the valve.
- 7.4 Remove nuts(14) and packing gland(13)
- 7.5 Remove the packing rings(12) and let in compressed air in the bottom one of the two grease holes of the valve.
- 7.6 Clean carefully the packing.
- 7.7 Insert new packing.
- 7.8 Assemble the gland(13) and tighten the bolts(14).
- 7.9 Reassemble the actuator with its stand (22).

## 8. COMPLETE DISASSEMBLE OF THE VALVE

- 8.1 Follow the safety precautions before disassembly of the valve from the pipeline (see point 6.2)
- 8.2 After having verified that there is no pressure in line, remove all the nuts and then all the flanges bolts, except for the tow lower ones that hold the valve's weight.
- 8.3 Separate the flanges with special tools and remove the valve from the pipeline.
- 8.4 Put the valve in open position.
- 8.5 Remove the actuator from the valve and the stand(22).
- 8.6 Remove the nuts(14) and the gland(13).
- 8.7 Remove the end cover(16).
- 8.8 Carefully remove the o-ring gasket(19) for the stem sealing.
- 8.9 Remove the collar bearing(18).
- 8.10 Remove the thrust collar(17).

- 8.11 Remove the thrust collar bolt(20).
- 8.12 Remove the rubber seal ring following the previous instructions (see points 6.5-6.8), having the valve in open position.
- 8.13 Remove the lock pins(15) that connects the disc (2) to the shaft (6)(7).
- 8.14 Push the stem out of the lower part of the valve.
- 8.15 Remove the disc (2).
- 8.16 Remove the bearings (8)(9) pushing them out with a round wooden spindle, being careful not to damage them.

## **9. REASSEMBLY OF THE VALVE**

- 9.1 Before reassembling the valve, remove all the seal rings and carefully clean all the components included in the seats of the seal rings and in the area of the lower thrust collar bearing.
- 9.2 Inspection the body's seat and if there are scratches, polish with slightly abrasive cloth.
- 9.3 Insert in the upper and lower part of the valve bearing (8)(9) by means of a round wooden spindle.
- 9.4 Partially insert the shaft (6)(7) through the upper part of the valve, in such way that the lower part of the stem does not come out from inside the valve.
- 9.5 Install the disc (2) positioning it in open position and meeting perfectly the disc's marked hub with the upper part of the valve. Push the stem down, through the disc, until the holes of the stem and of the disc meet perfectly. Be careful with hole's draft direction.
- 9.6 Insert the lock pin(15) and tighten the bolt with their, unloosening washers.
- 9.7 Install the thrust bearing(18) and sufficiently without tightening until the thrust bearing reach the beat on the lower bearing(9).
- 9.8 To adjust the thrust bearing, close the disc and centre it to the body's seat, measuring the same distance between seat and disc. When the disc is completely centred, complete the thrust bearing screws tightening(20).
- 9.9 Install the o-ring gasket (19) on the bottom flange.
- 9.10 Install the end cover (16) with its screws(21).
- 9.11 Insert in the upper part of the valve, the three packings (10)(11).
- 9.12 Install the gland (13) without tightening the nuts(14).
- 9.13 Install the rubber seal ring(3), following the previous instructions (see points 6.5-6.13)
- 9.14 Tighten the nuts(14) of the gland, being careful not to over tighten otherwise the torque value is increased.