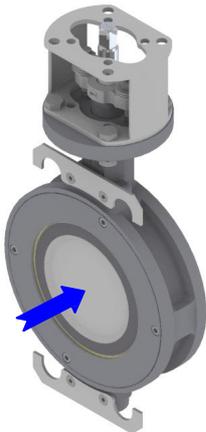
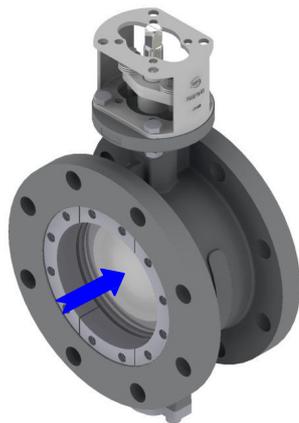
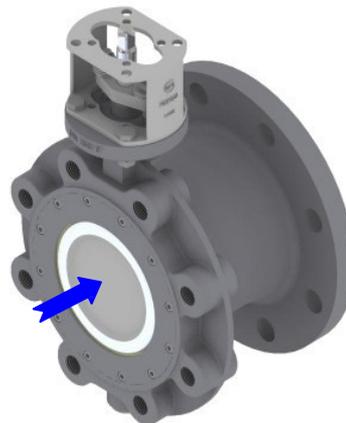
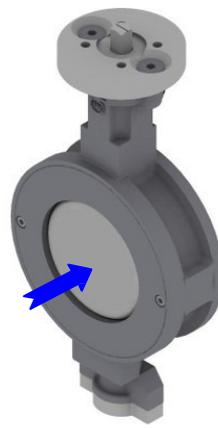


High Performance butterfly valves Series HP

HP111**HP112****HP112-S****HP114****HP120****HP111-E****-L****-KOB**

Exemplary illustrations, not all possible type versions are illustrated!

Maintenance manual

Supplementary sheet to the assembly and operating
instructions BA 3.0 - DGRL/MRL

Language Version English

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If necessary, additional information can be downloaded or requested from the following address:

www.ebro-armaturen.com or visit:

EBRO ARMATUREN GmbH Karlstraße 8 D-58135 Hagen (02331) 904-0 Fax (02331) 904-111	EBRO ARMATUREN Ges.m.b.H Seybelgasse 13, TOP 9 A 1230 Vienna (01) 201 7607 Fax (01) 201 7607	Bröer Absperrarmaturen Est&Co.KG Gewerbestrasse 5 CH-6330 Cham (041) 748 5959 Fax (041) 748 5999
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E General

In general: Lubrication or routine maintenance of the butterfly valve is not necessary, since the bearings are self-lubricating and the shaft seal is self-adjusting.

E1 Explanation of symbols

Notes are indicated in this manual by symbols:

	Unconditional prohibitionmust be obeyed
 XXXXX	Hazard / Caution / Warning ... indicates a hazardous situation which can result in death or serious injury of persons and/or damage in the pipe system.
	Note ... indicates an instruction that must be observed.
	Information ... provides useful tips and recommendations

If these notes, cautions and warnings are not followed, this may lead to hazards and may invalidate the manufacturer's warranty.

E2 Important note

This maintenance manual as a supplementary sheet to the assembly and operating instructions is intended to enable professional assembly and maintenance of EBRO high performance butterfly valves, as well as a trouble-free operation.

	The corresponding operating instructions are an elementary part of this maintenance manual and must be strictly observed.
---	--

Ignoring the operating and maintenance manual represents an important negligence and releases the manufacturer, EBRO-Armaturen from its product liability.

Read the operating and maintenance manual before starting any work.

E3 Personnel requirements

 Warning!	Warning! Danger of injury for unqualified personnel! Improper handling can result in significant personal injury and damage to property. <ul style="list-style-type: none"> • Activities must only be carried out by qualified personnel, the implementation of activities by "instructed persons" is not sufficient! • Keep unqualified personnel away from hazardous areas.
---	---

- **Qualified personnel**

Is based on its professional training, know-how and experience as well as knowledge of the applicable standards and regulations able to perform assigned work activities and to identify possible dangers on its own.

- **Instructed person**

Refers to an individual who has been advised by the operating company of the duties assigned to him/her and of any potential hazards associated with inappropriate procedures or conduct.

E4 Personal protective equipment (PPE)

When working, it is necessary to wear personal protective equipment in order to reduce the health hazards.

- Be sure to be always wearing the appropriate PPE for the job at hand.
- Observe any labels in the operating area regarding PPE. When working, always wear:

	Work clothes is a tight-fitting work clothes with low resistance to tearing, with narrow sleeves and without protruding parts. It mainly provides protection against friction, abrasions, punctures or deeper injuries as well as contact with hot surfaces, corrosive or hot gases and liquids.
---	---

	Safety helmet For the protection against parts falling down and flying around and against out flowing liquids and gases.
---	--

	Safety shoes For the protection against heavy parts falling down, contact with hot surfaces, corrosive or hot liquids and gases and slipping on slippery surfaces and from slipping on slippery surface.
---	--

	Protective gloves For the protection against friction, abrasions, punctures or deeper injuries as well as contact with hot surfaces, corrosive or hot gases and liquids.
--	--

When performing special tasks, it is necessary to wear specific protective equipment. Particular reference is made on the special tasks. This specific protective equipment is explained in the following.

E5 Special risks

E5.1 Electric current (with built-on electric drive)

 Danger!	Danger! Risk of loss of lives from electrical current! Contact with life parts causes a direct danger to life. Damage to the insulation or individual components can be life-threatening.
--	---

- If insulation is found to be defective, disconnect the power supply immediately and have the damage repaired.
- Any work required on the electrical system may only be carried out by qualified electrician.
- Read and observe the operating instructions of the electrical system carefully before starting work.
- When working on the electrical system, disconnect it from the power supply and check that is not live.
- Prior to maintenance, cleaning and repair work switch off the power supply and secure it against being switched on again.
- Never attempt to bypass or put out of operation fuses.
-

E5.2 Hydraulic fluid (with built-on hydraulic drive)

 Warning!	Warning! Danger due to misuse! Any other or incorrect use of the actuator could lead to hazardous situations or severe damage to property or to the environment.
---	--

- If pressure lines are found to be defective, immediately disconnect the pressure supply and repair the damage.
- Any work required on the hydraulic system may only be carried out by qualified personnel.
- Carefully read and observe the operating instructions of the actuator and the attachment parts before starting work.
- When working on the hydraulic system, depressurise it and check for zero pressure.
- Shut off and secure the pressure supply prior to maintenance, cleaning and repair work.
- Never attempt to bypass or put out of operation pipelines.

E5.3 Compressed air (at built-on pneumatic drive)

 Warning!	Warning! Danger due to misuse! Any other or incorrect use of the actuator can lead to dangerous situations.
---	---

- If pressure lines are found to be defective, immediately disconnect the pressure supply and repair the damage.
- Any work required on the pneumatic system may only be carried out by qualified personnel.
- Carefully read and observe the operating instructions of the actuator and the attachment parts before starting work.
- When working on the pneumatic system, depressurise it and check for zero pressure.
- Shut off and secure the compressed air supply prior to maintenance, cleaning and repair work.
- Never attempt to bypass or put out of operation pipelines.

E5.4 Manual actuation (with built-on hand lever / latching handle)

 Warning!	Warning! Danger due to misuse! Any other or incorrect use of the manual actuation can lead to dangerous situations.
 Warning!	Warning! Danger due to misuse! Ensure secure clamping assembly of the hand lever or complete locking of the latching handle. The clamping of the hand lever must ensure a secure attachment to all occurring operating conditions. Inadequate clamping can lead to dangerous situations.

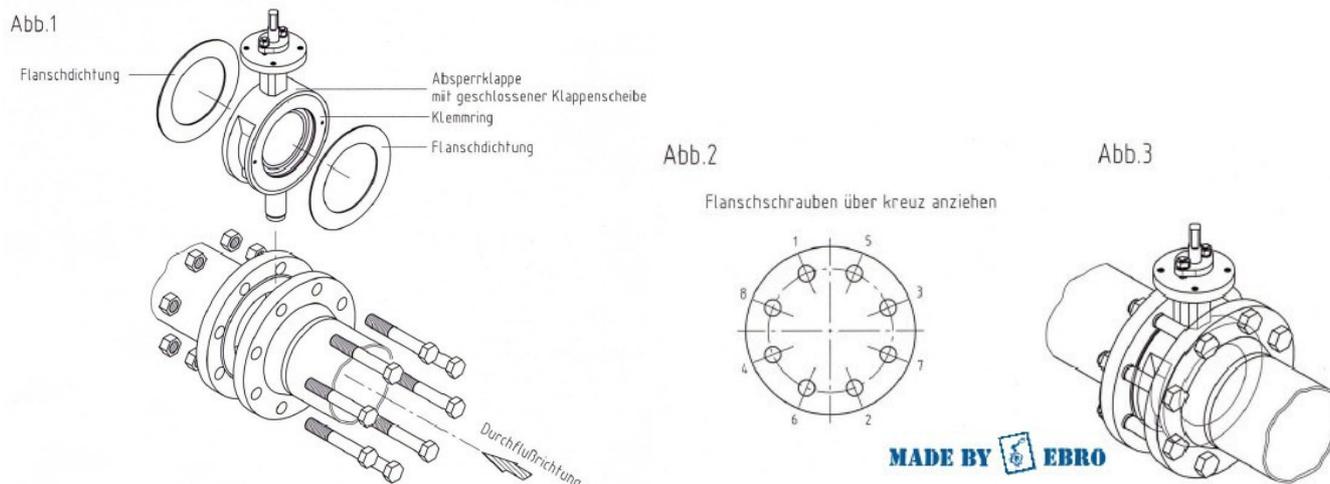
E5.5 Moving parts

 Warning!	Warning! Danger to life due to moving parts! Moving parts can cause severe injury. Operate the valve only after completed installation in the corresponding system. The operation of the valve while it is not in the installed condition, can lead to dangerous situations.
---	--

E6 Safety devices

 Warning!	Warning! Risk of loss of lives due to non-functioning safety devices! Security devices ensure maximum safety during operation. Even if work processes are complicated by safety devices, they must never be overridden. The safety is only guaranteed if the safety devices are intact.
---	--

- Before starting work, check whether the safety devices are functional and properly installed.



E8 Removal of the valve

1. Observe the instructions and safety rules
2. The valve must be removed from the pipeline only with a closed flap disc.
3. Please note that the medium may be present in the death space of the valve.
4. Provide appropriate lifting equipment to secure the valve and remove the valve from the pipeline.
5. HP111, 112, 114 - Loosen the flange screws crosswise.
6. Ensure that the flange sealing surfaces are not scratched when removing the valve.
7. HP120 – Disconnect the valve from the pipeline with lowest possible heat input in the area of the weld seam (special attention should be paid to the short clamping ring side). At the same time preserve the valve with actuator and attachment parts against damage from sparks, welding fumes or similar particles with safety covers.



For additional information, please see the associated operating instructions and the technical data sheets.

A butterfly valve with manual operation closes by turning the lever or hand wheel clockwise and opens in the opposite direction.

A butterfly valve with actuator must be actuated with the signals from the control. Butterfly valves that have been delivered ex works in perfectly adjusted condition - this adjustment in the gear / actuator should not be adjusted as long as the valve is working properly.

The only maintenance needed is the visual inspection of the tightness of the gland at appropriate intervals - in case of leakage see section C3 <Troubleshooting>.

It is recommended to operate butterfly valves that are always in the same position at regular intervals to ensure the free movement.

E9 Replacing the shaft seal HP DN50 – 1200 and HPE DN 50 – 200 (not Application “- L“)

E9.1 Replacing the PTFE-shaft seal (Pt. 14)

1. Disassemble the drive or the hand lever and the bracket (Pt. 21) with their fasteners screw (Pt. 22), disc (Pt. 24) and nut (Pt. 23).
2. Remove the two hex. nuts (Pt. 17).
3. Remove the Belleville spr. washers (Pt. 20) and the gland lid (Pt. 7).
4. Remove the thrust collar (Pt. 8) and the packing rings (Pt. 14) of the shaft seal with an appropriate tool. Caution: the surface of the bore or shaft must not be damaged!

5. Pay attention to the order and the installation position of the packing rings.
6. Clean the seal installation space of the shaft seal. Do not damage while doing so the sealing faces in the housing and on the shaft.
7. Slide the new packing rings individually, in the reverse order they were removed, over the shaft and press the packing rings in the housing bore. Make sure that the sealing lips of the packing rings are not damaged during installation.
8. Place the thrust collar (Pt. 8), the Belleville spr. washers (Pt. 20) and the gland lid (Pt. 7) back on the threaded pins (Pt. 16).
9. Tighten the hex. nuts (Pt. 17) in several steps equally until the Belleville disc springs are on block. Then loosen the hex. nuts by 1 ½ - 2 turns and check whether the gland lid is parallel to the head flange of the valve.

E9.2 Replacing the graphite shaft seal for metal seat (Pt. 14)

1. Disassemble the drive or the hand lever and the bracket (Pt. 21) with their fasteners screw (Pt. 22), disc (Pt. 24) and nut (Pt. 23).
2. Remove the two hex. nuts (Pt. 17)
3. Remove the Belleville spr. washers (Pt. 20) and the gland lid (Pt. 7).
4. Remove the thrust collar (Pt. 8) and the packing rings (Pt. 14) of the shaft seal with an appropriate tool. Caution: the surface of the bore or shaft must not be damaged!
5. Clean the seal installation space of the shaft seal. Do not damage while doing so the sealing faces in the housing and on the shaft.
6. Slide two new packing rings on the shaft and press them into the housing bore. Then press the two packing rings used by means of the thrust collar (Pt. 8), the gland lid (Pt. 7) and the hex. nuts (Pt. 17) into the housing. Tighten the hex. nuts firmly.
7. Repeat the same procedure with the remaining packing rings, insert and press them one by one.
8. Now insert the Belleville spr. Washers (Pt. 20) back on the threaded pins and tighten the hex. Nuts (Pt. 17) equally in several steps until the Belleville disc springs are on block.
9. Then loosen the hex. nuts by one turn and check whether the gland lid is parallel to the head flange of the butterfly valve.

HIGH PERFORMANCE FLAP HP-L and HPE-L (Application “- L”)

E9.3 Replacing the PTFE-shaft seal (Pt. 14)

1. Disassemble the drive or the hand lever.
2. Remove the two countersunk screws (Pt. 32).
3. Remove the top plate (Pt. 31) and the Belleville spr. washers (Pt. 30).
4. Remove the thrust collar (Pt. 8) and the packing rings (Pt. 14) of the shaft seal with an appropriate tool.
Caution: the surface of the bore or shaft must not be damaged!
5. Pay attention to the order and the installation position of the packing rings.
6. Clean the seal installation space of the shaft seal. Do not damage while doing so the sealing faces in the housing and on the shaft.
7. Slide the new packing rings individually in the reverse order they were removed over the shaft and press the packing rings in the housing bore. Make sure that the sealing lips of the packing rings are not damaged during installation.
8. Assemble the thrust collar (Pt 8), the Belleville spr. washers (Pt. 30) and the top plate (Pt. 31). Pay attention to the installation position and layering of the Belleville spr. washers!



Caution! The function of the shaft seal can be compromised due to incorrect layering!

9. Tighten the countersunk screws (Pt. 31) equally in several steps until the top plate (Pt. 31) is on block.
 10. Check whether the top plate (Pt. 31) is parallel to the head flange of the valve.
-

E10 Replacing the seat ring HP DN 50-1200 and HPE DN 50-200 and their application “- L“ (not HP120 - see remark)

E10.1 only type HP120

On type HP 120 the disassembly of the welded clamping ring can only be performed by means of machining. The mounting of the clamping ring with a weld seam can only be carried out by welding companies, certified for this welding process. The replacement of the seat ring (Pt. 5) for this valve type can only be carried out by the manufacturer EBRO ARMATUREN.

E10.2 Replacing the PTFE-shaft seal (Pt. 5)

1. Remove the butterfly valve from the pipeline and clamp it into a vice or similar.
2. Open the butterfly valve.
3. Remove the hex.-socket screws (Pt. 15), the clamping ring (Pt. 3) and the seat ring (Pt. 5). Note: Flange seals (Pt. 19) are only required for metal seat and are not used here!
4. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
5. Clean the isolation valve.
6. Lubricate the seat ring with a compatible lubricant, if permitted.
7. Insert a new seat ring (Pt. 5) in the nut of the housing.
8. Mount the clamping ring (Pt. 3) and slightly tighten the hex. -socket screws (Pt. 15) crossways.
9. Close the butterfly valve.
10. Tighten the hex.-socket screws (Pt. 15) crossways with the indicated torques.

Tightening torque for screws:

M5 = 4 Nm (DN 50/65, DN 80, DN 100)

M6 = 6 Nm (DN 125, DN 150, DN 200, DN 250)

M8 = 14 Nm (DN 300, DN 350, DN 400, DN 450)

M10 = 30 Nm (DN 500, DN 550)

M12 = 60 Nm (DN 600, DN 700, DN 800, DN

900) M16 = 127 Nm (DN 1000, DN 1100, DN 1200)

E10.3 Replacing the metal seat ring (Pt. 5)

1. Remove the butterfly valve from the pipeline and clamp it into a vice or similar.
2. Open the butterfly valve.
3. Remove the hex.-socket screws (Pt. 15), the clamping ring (Pt. 3), the seat ring (Pt. 5) and the graphite seals (Pt. 19).
4. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
5. Clean the butterfly valve. Any residues of the graphite seals (Pt. 19) in the housing and the clamping ring can be removed with a suitable solvent. Do not use sharp tools to remove the seal residues, as these can damage the sealing faces.
6. Close the valve and put it flat down, with the flap disc upwards.
7. Insert a graphite seal (Pt.19) into the housing.



Caution! Handle the graphite seals with great care. Broken or damaged seals cause leakage.

8. Place the metal seat ring (Pt. 5) on the graphite seal in the housing. 8a. From DN 300 on self-adhesive graphite tape is pasted to the lower flange side of the metal sealing ring.
9. Place the second graphite seal (Pt. 19) into the nut of the clamping ring (Pt. 3). Use a compatible lubricant to fix the graphite seal.
10. Mount the clamping ring (Pt. 3) together with the inserted graphite seal into the housing.

11. Tighten the hex.-socket screws (Pt. 15) crossways in several steps with the indicated torques.

Tightening torque for screws:

M5 = 4 Nm (DN 50/65, DN 80, DN 100)

M6 = 6 Nm (DN 125, DN 150, DN 200, DN 250)

M8 = 14 Nm (DN 300, DN 350, DN 400, DN 450)

M10 = 30 Nm (DN 500, DN 550)

M12 = 60 Nm (DN 600, DN 700, DN 800, DN

900) M16 = 127 Nm (DN 1000, DN 1100, DN

1200)

12. Open the valve, then again tighten the hex. -socket screws (Pt. 15) crossways in several steps with the indicated torques.

13. Close and reopen the valve 3-4 times to test the proper function.

14. The valve is subject to a pressure and leak test in accordance with Section B4 of the operating instructions.

E10.4 Replacing the PTFE-shaft seal (Pt. 5) HP112 (Cast construction)

1. Remove the butterfly valve from the pipeline and clamp it into a vice or similar.

2. Open the butterfly valve.

3. Remove the hex. -socket screws (Pt. 15). First, remove the two smaller parts of the four-way supporting ring (Pt. 30.2) by pulling towards the tube centre out of the housing (Pt. 1). After removing the two bigger parts of the four-way supporting ring (Pt. 30.1), remove the clamping ring (Pt. 3) and the seat ring (Pt. 5). Note: Flange seals (Pt. 19) are only required for metal seat and are not used here!

4. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.

5. Clean the isolation valve.

6. Lubricate the seat ring with a compatible lubricant, if permitted.

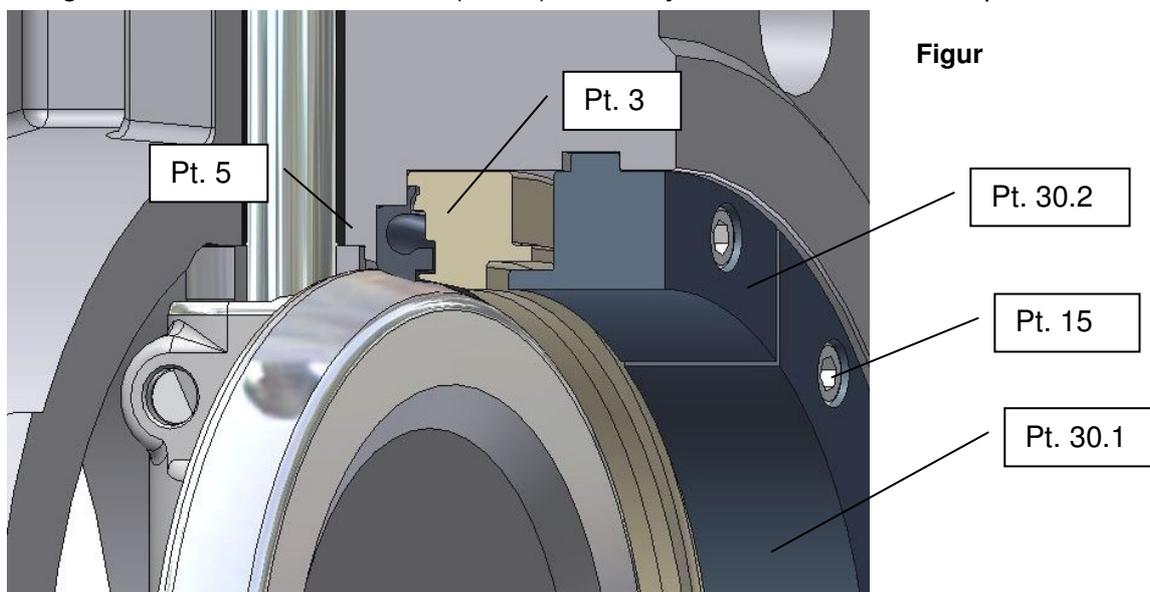
7. Insert a new seat ring (Pt. 5) in the nut of the housing.

8. Place the clamping ring (Pt. 3) into the housing (Pt. 1) on the seat ring (Pt. 5). First slide the two bigger parts of the four-way supporting ring (Pt. 30.1) rotating them to the stop into the nut from the housing (Pt. 1) place them on the clamping ring (Pt. 3) and fix them with hex. -socket screws (Pt. 15) (see Figure 1).

Now slide the two smaller parts of the four-way supporting ring (Pt. 30.2) rotating them into the remaining nut from the housing (Pt. 1) and place the two already mounted parts (Pt. 30.2) on the clamping ring (Pt. 3) and fix them with hex. -socket screws (Pt. 15) (see Figure 1). Pay attention on the cylindrical alignment of the supporting ring (Pt. 30.1 and Pt. 30.2) in the housing (Pt. 1) before finally fixing the hex. -socket screws (Pt. 15).

9. Close the butterfly valve.

10. Tighten the hex.-socket screws (Pt. 15) crossways with the indicated torques.



11. Open the valve, then again tighten the hex. -socket screws (Pt. 15) crossways in several steps with the indicated torques.
12. Close and reopen the valve 3-4 times to test the proper function.
13. The valve is subject to a pressure and leak test in accordance with Section B4 of the corresponding operating instructions.

Tightening torque for screws:

M5 = 4 Nm (DN 50/65, DN 80, DN 100)

M6 = 6 Nm (DN 125, DN 150, DN 200, DN 250)

M8 = 14 Nm (DN 300, DN 350, DN 400, DN 450)

M10 = 30 Nm (DN 500, DN 550)

M12 = 60 Nm (DN 600, DN 700, DN 800, DN

900) M16 = 127 Nm (DN 1000, DN 1100, DN

1200)

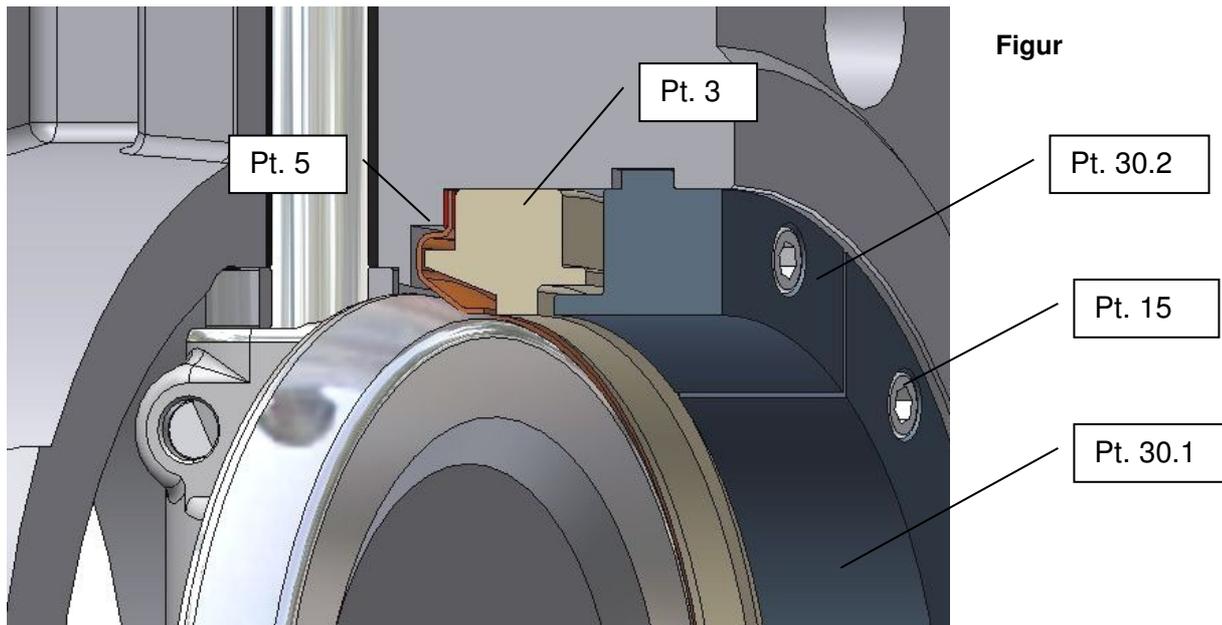
E10.5 Replacing the metal seat ring (Pt. 5) HP112 (Cast construction)

1. Remove the butterfly valve from the pipeline and clamp it into a vice or similar.
2. Open the butterfly valve.
3. . Remove the hex.-socket screws (Pt. 15). First, remove the two smaller parts of the four-way supporting ring (Pt. 30.2) by pulling towards the tube centre out of the housing (Pt. 1). After removing the two bigger parts of the four-way supporting ring (Pt. 30.1), remove the clamping ring (Pt. 3), the seat ring (Pt. 5) and the graphite seals (Pt. 19)
4. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
5. Clean the butterfly valve. Any residues of the graphite seals (Pt. 19) in the housing and the clamping ring can be removed with a suitable solvent. Do not use sharp tools to remove the seal residues, as these can damage the sealing faces.
6. Close the valve and put it flat down, with the flap disc upwards.
7. Insert a graphite seal (Pt.19) into the housing.



Caution! Handle the graphite seals with great care. Broken or damaged seals cause leakage.

8. Place the metal seat ring (Pt. 5) on the graphite seal in the housing. 8a. From DN 300 on self-adhesive graphite tape is pasted to the lower flange side of the metal sealing ring.
9. Place the second graphite seal (Pt. 19) into the nut of the clamping ring (Pt. 3). Use a compatible lubricant to fix the graphite seal.
10. Place the clamping ring (Pt. 3) into the housing (Pt. 1) on the seat ring (Pt. 5). First slide the two bigger parts of the four-way supporting ring (Pt. 30.1) rotating them to the stop into the nut from the housing (Pt. 2) place them on the clamping ring (Pt. 3) and fix them with hex. -socket screws (Pt. 15) (see Figure 1). Now slide the two smaller parts of the four-way supporting ring (Pt. 30.2) rotating them into the remaining nut from the housing (Pt. 1) and place the two already mounted parts (Pt. 30.1) on the clamping ring (Pt. 3) and fix them with hex.-socket screws (Pt. 15) (see Figure 2). Pay attention on the cylindrical alignment of the supporting ring (Pt. 30.1 and Pt. 30.2) in the housing (Pt. 1) before finally fixing the hex. -socket screws (Pt. 15).
Mount the clamping ring (Pt. 3) together with the inserted graphite seal into the housing.
11. Tighten the hex.-socket screws (Pt. 15) crossways in several steps with the indicated torques.
12. Open the valve, then again tighten the hex. -socket screws (Pt. 15) crossways in several steps with the indicated torques.
13. Close and reopen the valve 3-4 times to test the proper function.
14. The valve is subject to a pressure and leak test in accordance with Section B4 of the corresponding operating instructions.



Tightening torque for screws:

M5 = 4 Nm (DN 50/65, DN 80, DN 100)

M6 = 6 Nm (DN 125, DN 150, DN 200, DN 250)

M8 = 14 Nm (DN 300, DN 350, DN 400, DN 450)

M10 = 30 Nm (DN 500, DN 550)

M12 = 60 Nm (DN 600, DN 700, DN 800, DN

900) M16 = 127 Nm (DN 1000, DN 1100, DN 1200)

E11 Disassembly and reassembly of the butterfly valves HP DN50 – 1200

E11.1 Disassembly of the butterfly valve HP

1. Loosen the hex. nuts (Pt. 17) of the gland lid and remove the Belleville spr. washers (Pt. 20), the gland lid (Pt. 7) and the thrust collar (Pt. 8).
2. Remove the clamping ring (Pt. 3) and the seat ring (Pt. 5) as described under Replacing the seat ring.
3. **Up to DN 300:** Loosen the plug (Pt. 12) and remove the plug seal (Pt. 13).
Up to DN 350: Loosen the screws (Pt. 27) and remove the lid (Pt. 26) and the seal (Pt.25).
4. Grind the weld seam of the taper pin (Pt. 11) and drive out the taper pins in the opposite direction to the arrow.



Caution! The disassembly of the pins is challenging in terms of handling and only necessary when replacing the flap disc or the shaft. It should therefore be carried out by qualified EBRO-employees!

5. Pull the shaft (Pt. 4) upwards out of the housing.

Caution! When pulling the shaft (Pt. 4) the flap disc (Pt. 2) disengages. Avoid damage to the sealing face. Support the flap disc, so that it cannot fall out of the housing.

6. Remove the shaft seal (Pt. 14), the suppor. washer (Pt. 10), the spacer sleeve (PT. 18) and the shaft bearings (Pt. 6).

E11.2 Assembly of the disassembled butterfly valve HP

1. Clean and check all parts for damage. Pay particular attention to the sealing faces for the shaft seal in the housing and on the shaft and the sealing face of the flap disc.
2. Place the butterfly valve with the clamping ring side down on a workbench.
3. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
4. Up to DN 300: Mount the plug (Pt. 12) and remove the plug seal (Pt. 13).
From DN 350: Mount the lid (Pt. 26), the seal (Pt. 25) and the screws (Pt. 27).
5. Push the shaft bearings (Pt. 6) in the bore of the housing.
6. Mount the spacer sleeve (Pt. 18) and the support washer (Pt. 10) in the housing and insert the shaft seal (Pt. 14).
7. Lightly lubricate the bore of the flap disc (Pt. 2) and the shaft (Pt. 4) with a compatible lubricant.
8. Insert a flap disc (Pt. 2) into the housing. Make sure that the word "TOP" is pointing in the direction of the head flange of the valve or that the stop surface of the flap disc is below the housing stop.
9. Insert the bearing rings (Pt. 9) between the housing and the flap disc (Pt. 2)
10. Insert the shaft (Pt. 4) into the housing from above. To this end, the flap disc (Pt. 2) must be slightly lifted.
11. Mount the thrust collar (Pt. 8), the gland lid (Pt. 7), the Belleville spr. washers (Pt. 20) and the hex. nuts (Pt. 17) as described under Replacing the shaft seal. But do not fully tighten the hex. nuts (Pt. 17) yet.



Caution! The function of the shaft seal can be compromised due to incorrect layering of the Belleville spr. washers!

12. Firmly insert the taper pins (Pt. 11) in the direction of the arrow, by means of a chuck. The taper pins (Pt. 11) must be inserted uniformly, so that the ends of the taper pins protrude to an equal extent from the flap disc.



Caution! If the pins are not properly introduced into the shaft pins there may be no shaft blow out protection => danger to life!

13. After visual inspection of the correct assembly of the pins (Pt. 11), weld the narrow end of the taper pins (Pt. 11) with the flap disc and brush the welded joints clean afterwards. Use suitable and adequate filler metals for flap disc material and shaft material.



Caution! The assembly and welding securing of the pins is challenging in terms of handling. It should therefore be carried out by qualified EBRO-employees!

14. Now install the new seat ring (Pt. 5) as described under Replacing the seat ring.
15. Tighten the hex. nuts (Pt. 17) of the gland lid (Pt. 7) as described under Replacing the shaft seal.

HIGH PERFORMANCE FLAP HPE

E12 Disassembly and reassembly HPE DN 50 – 100

E12.1 Disassembly of the butterfly valve HPE DN 50-100

1. Loosen the hex. nuts (Pt. 17) of the gland lid and remove the Belleville spr. washers (Pt. 20), the gland lid (Pt. 7) and the thrust collar (Pt. 8).
2. Remove the clamping ring (Pt. 3) and the seat ring (Pt. 5) as described under Replacing the seat ring.

3. Loosen the hex.-socket screws (Pt. 27). Remove the screws (Pt. 27), cover plate (Pt. 26), seal (Pt. 25) and the segments (Pt. 9) as well as any existing shim rings.
4. Loosen and remove the set screws (Pt. 13).
5. Grind the weld seam of the cylindrical pins (Pt. 11 and 12) and drive out the pins.



Caution! The disassembly of the pins is challenging in terms of handling and only necessary when replacing the flap disc or the shaft. It should therefore be carried out by qualified EBRO-employees!

6. Pull the upper shaft (Pt. 4.1) upwards out of the housing. Caution! When pulling the shaft (Pt. 4.1) the flap disc (Pt. 2) disengages. Avoid damage to the sealing face. Support the flap disc, so that it cannot fall out of the housing.
7. Pull the lower shaft (Pt. 4.2) downwards out of the housing. Caution! When pulling the shaft (Pt. 4.2) the flap disc (Pt. 2) disengages. Avoid damage to the sealing face. Support the flap disc, so that it cannot fall out of the housing.
8. Remove the shaft seal (Pt. 14), the support washer (Pt. 10), the spacer sleeve (Pt. 18) and the shaft bearings (Pt. 6).

E12.2 Assembly of the disassembled butterfly valve HPE DN 50-100

1. Clean and check all parts for damage. Pay particular attention to the sealing faces for the shaft seal in the housing and on the shaft and the sealing face of the flap disc.
2. Place the butterfly valve with the camping ring side down on a workbench.
3. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
4. Push the shaft bearings (Pt. 6) and the spacer sleeves (Pt. 18) in the bores of the housing.
5. Mount the support washer (Pt. 10) in the housing and insert the shaft seal (Pt. 14).
7. Lightly lubricate the bore of the flap disc (Pt. 2) and the shaft, above (Pt. 4.1) with a compatible lubricant.
8. Insert the flap disc (Pt. 2) with the disc side down into the housing. Make sure that the word "TOP" is pointing in the direction of the head flange of the valve or that the stop surface of the flap disc is below the housing stop.
9. Insert the upper shaft (Pt. 4.1) into the housing from above. To this end, the flap disc (Pt. 2) must be slightly lifted. Check the position of the counterbore for the pin of the set screw (Pt. 13). This must match the position of the thread hole in the flap disc.
10. Insert the lower shaft (Pt. 4.2) into the housing from below. To this end, the flap disc (Pt. 2) must be slightly lifted. Check the position of the counterbore for the pin of the set screw (Pt. 13). This must match the position of the thread hole in the flap disc.
11. Mount the set screws (Pt. 13). Make sure that the pins of the set screws are completely inserted in the appropriate counterbores in the shafts. This will be the case when the heads of the set screws do not protrude over the hubs.
The correct position can also be checked by firmly pulling on the upper shaft (Pt. 4.2). The shaft must not be loose.
12. After visual inspection of the correct assembly of the set screws (Pt. 13) these are caulked with the hub by a punch mark and secured against loosening.
13. Insert the cylindrical pins (Pt. 11 and 12) firmly. The pins must be inserted uniformly, so that the ends of the taper pins do not protrude from the flap disc.



Caution! If the pins are not properly introduced into the shaft pins there may be no shaft blow out protection => danger to life!

14. After visual inspection of the correct assembly of the pins (Pt 11 and 12), weld the end of the pins (Pt. 11 and 12) with the flap disc and brush the welded joints blank afterwards. Use suitable and adequate filler metals for flap disc material and shaft material.



Caution! The assembly and welding securing of the pins is challenging in terms of handling. It should therefore be carried out by qualified EBRO-employees!

15. Mount the thrust collar (Pt. 8), the gland lid (Pt. 7), the Belleville spr. washers (Pt. 20) and the hex. nuts (Pt. 17) as described under Replacing the shaft seal. But do not fully tighten the hex. nuts (Pt. 17) yet.
16. Now install the new seat ring (Pt. 5) as described under Replacing the seat ring.
17. Mount the segments (Pt. 9), the seal (Pt. 25) and the cover plate (Pt. 26) as well as any existing shim rings. Note: The shim rings are used for the centric alignment of the flap disc in the axial direction (measurable with a feeler gauge distance flap disc - seat ring, there should be a regular distance), and are mounted above or below the segments.
18. Tighten the hex. nuts (Pt. 17) of the gland lid (Pt. 7) as described under Replacing the shaft seal.

E13 Disassembly and reassembly HPE DN 125 – 200

E13.1 Disassembly of the butterfly valve HPE DN 125 – 200

1. Loosen the hex. nuts (Pt. 17) of the gland lid and remove the Belleville spr. washers (Pt. 20), the gland lid (Pt. 7) and the thrust collar (Pt. 8).
2. Remove the clamping ring (Pt. 3) and the seat ring (Pt. 5) as described under Replacing the seat ring.
3. Loosen the hex.-socket screws (Pt. 27). Remove the screws (Pt. 27), cover plate (Pt. 26), seal (Pt. 25) and the segments (Pt. 9) as well as any existing shim rings.
4. Grind the weld seam of the taper pin (Pt. 11) and drive out the taper pins in the opposite direction to the arrow.



Caution! The disassembly of the pins is challenging in terms of handling and only necessary when replacing the flap disc or the shaft. It should therefore be carried out by qualified EBRO-employees!

5. Pull the upper shaft (Pt. 4.1) upwards out of the housing. Caution! When pulling the shaft (Pt. 4.1) the flap disc (Pt. 2) disengages. Avoid damage to the sealing face. Support the flap disc, so that it cannot fall out of the housing.
6. Pull the lower shaft (Pt. 4.2) downwards out of the housing. Caution! When pulling the shaft (Pt. 4.2) the flap disc (Pt. 2) disengages. Avoid damage to the sealing face. Support the flap disc, so that it cannot fall out of the housing.
7. Remove the shaft seal (Pt. 14), the suppor. washer (Pt. 10), the spacer sleeve (Pt. 18) and the shaft bearings (Pt. 6).

E13.2 Assembly of the disassembled butterfly valve HPE DN 125 – 200

1. Clean and check all parts for damage. Pay particular attention to the sealing faces for the shaft seal in the housing and on the shaft and the sealing face of the flap disc.
2. Place the butterfly valve with the clamping ring side down on a workbench.
3. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
4. Push the shaft bearings (Pt. 6) and the spacer sleeves (Pt. 18) in the bores of the housing.
5. Mount the suppor. washer (Pt. 10) in the housing and insert the shaft seal (Pt. 12).
7. Lightly lubricate the bore of the flap disc (Pt. 2) and the shaft, above (Pt. 4.1) with a compatible lubricant.
8. Insert the flap disc (Pt. 2) with the disc side down into the housing. Make sure that the word "TOP" is pointing in the direction of the head flange of the valve or that the stop surface of the flap disc is below the housing stop.
9. Insert the upper shaft (Pt. 4.1) into the housing from above. To this end, the flap disc (Pt. 2) must be slightly lifted.

10. Insert the lower shaft (Pt. 4.2) into the housing from below. To this end, the flap disc (Pt. 2) must be slightly lifted.

11. Firmly insert the taper pins (Pt. 11) in the direction of the arrow, by means of a chuck. The taper pins (Pt. 11) must be inserted uniformly, so that the ends of the taper pins protrude to an equal extent from the flap disc.



Caution! If the pins are not properly introduced into the shaft pins there may be no shaft blow out protection => danger to life!

12. After visual inspection of the correct assembly of the pins (Pt 11), weld the end of the pins (Pt. 11) with the flap disc and brush the welded joints blank afterwards. Use suitable and adequate filler metals for flap disc material and shaft material.



Caution! The assembly and welding securing of the pins is challenging in terms of handling. It should therefore be carried out by qualified EBRO-employees!

13. Mount the thrust collar (Pt. 8), the gland lid (Pt. 7), the Belleville spr. washers (Pt. 20) and the hex. nuts (Pt. 17) as described under Replacing the shaft seal. But do not fully tighten the hex. nuts (Pt. 17) yet.

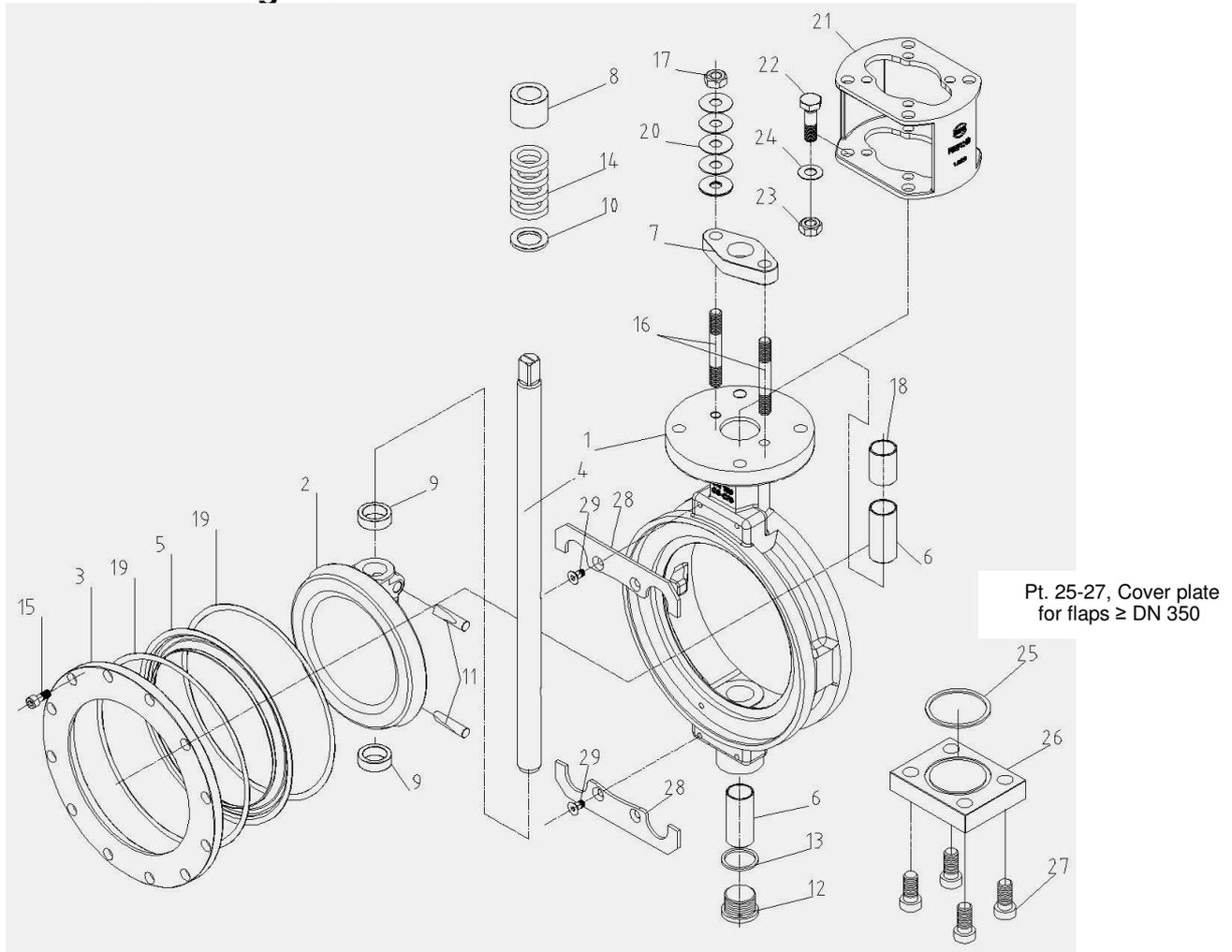
14. Now install the new seat ring (Pt. 5) as described under Replacing the sear ring.

15. Mount the segments (Pt. 9), the seal (Pt. 25) and the cover plate (Pt. 26) as well as any existing shim rings. Note: The shim rings are used for the centric alignment of the flap disc in the axial direction (measurable with a feeler gauge distance flap disc - seat ring, there should be a regular distance), and are mounted above or below the segments.

16. Tighten the hex. nuts (Pt. 17) of the gland lid (Pt. 7) as described under Replacing the shaft seal.

Exploded view and parts lists

E14.1 Drawing Valve HP-111



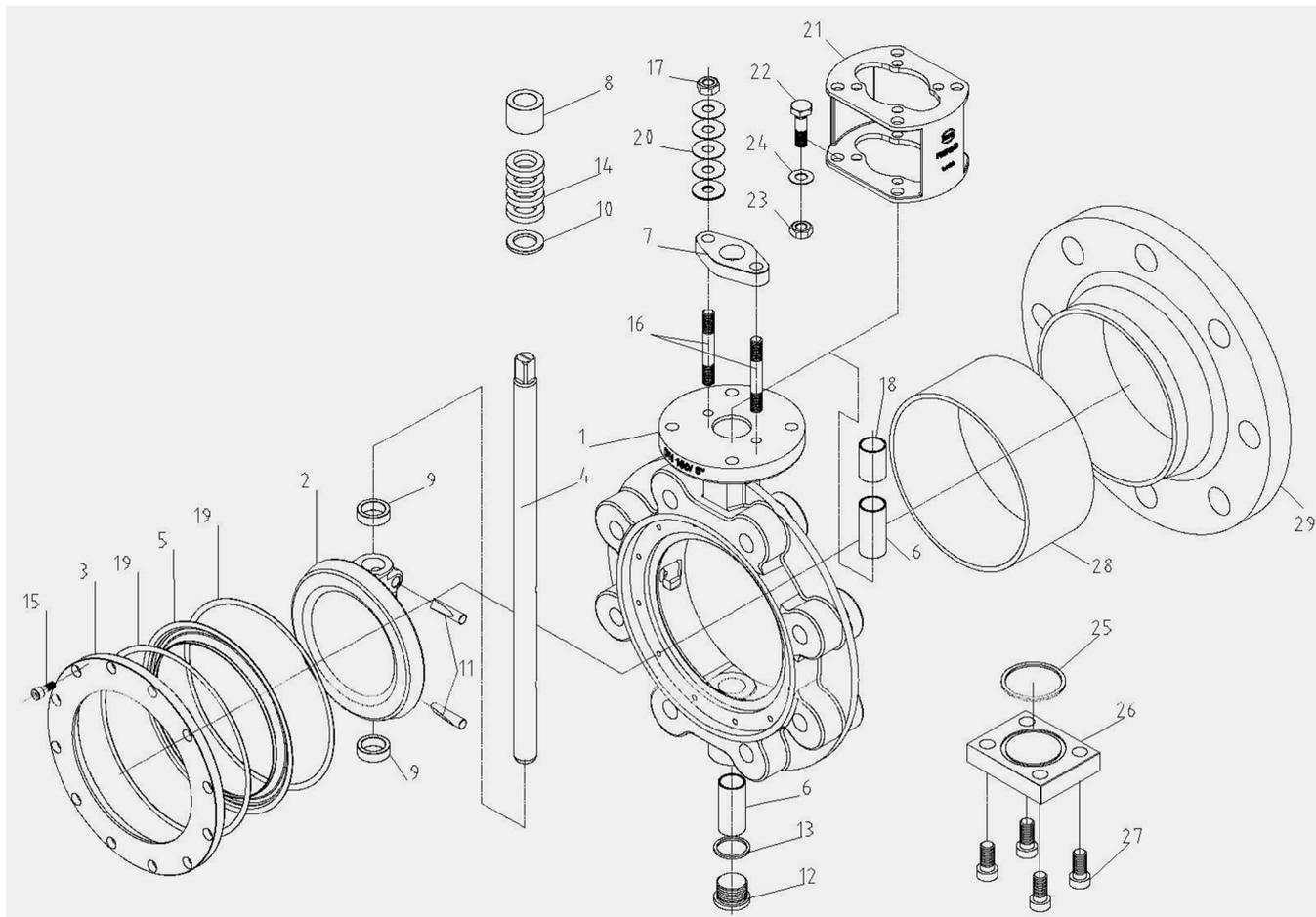
E14.2 Parts list HP-111

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM	
1	Gehäuse / Body				
	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB	
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M	
2	Scheibe / Disc				
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M	
3	Klemmring / Clamping ring	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
		Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401	316
4	Welle / Shaft				
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418		
5	Sitzring / Seat ring				
	R-PTFE	PTFE-Compound			
	Inconel	Inconel 625			
6	Wellenlager / Shaft bearing	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti 316
			X5CrNiMo17-12-2	1.4401 / PTFE	PTFE
7	Stopfbuchsflansch / Gland flange	Stahl / Steel	St 37-2	1.0037	283-C
		Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304

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	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
8	Druckring / Thrust collar			
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
9	Lagerring / Bearing ring			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 h. verchromt / chr-pld	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Keilstift / Taper pin			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
12	DN50-DN300 Verschlußschraube / Plug screw	DN350-DN600 Abschlußdeckel / Cover plate		
	Edelstahl / Stainless steel	GX5CrNiMo19-11-2	1.4408	CF8M
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Stahl / Steel	St 37-2 verzinkt / St37-2 galvanized	1.0037	283-C
13	Dichtung / Seal			
	Graphit			
	PTFE			
14	Wellendichtung / Shaft seal			
	Graphit			
	PTFE			
15	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M
16	Stiftschraube / Threaded pin			
	Edelstahl / Stainless Steel	A2-70		B 8
17	Sechskantmutter / Hex. Nut			
	Edelstahl / Stainless Steel	A2		8
18	Distanzhülse / Spacer sleeve			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
19	Graphitdichtung (bei Metall-Sitz)	Graphit seal (for metal seat)		
	Graphit			
20	Tellerfeder / Belleville spr. washer			
	Federstahl / Spring steel	51CrV4	1.8159	6150
	Federstahl / Stainless Steel	X10CrNi18-8	1.4310	301 Ti
21	Konsole / Bracket			
	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
22	Sechskantschraube / Hex. bolt			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2-70		B 8
23	Sechskantmutter / Hex. Nut			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
24	Unterlegscheibe / Washer			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
25	Dichtung / Seal			
	Graphit			
	PTFE			
26	Abschlußdeckel / Cover plate			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
27	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A2-70		B 8M
28	Zentrierstück / Centering piece			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
29	Senkschraube / Countersunk screw			
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304

E15.1 Drawing Valve HP-112-S (Welded design)



Pt. 25-27, Cover plate for flaps \geq DN 350

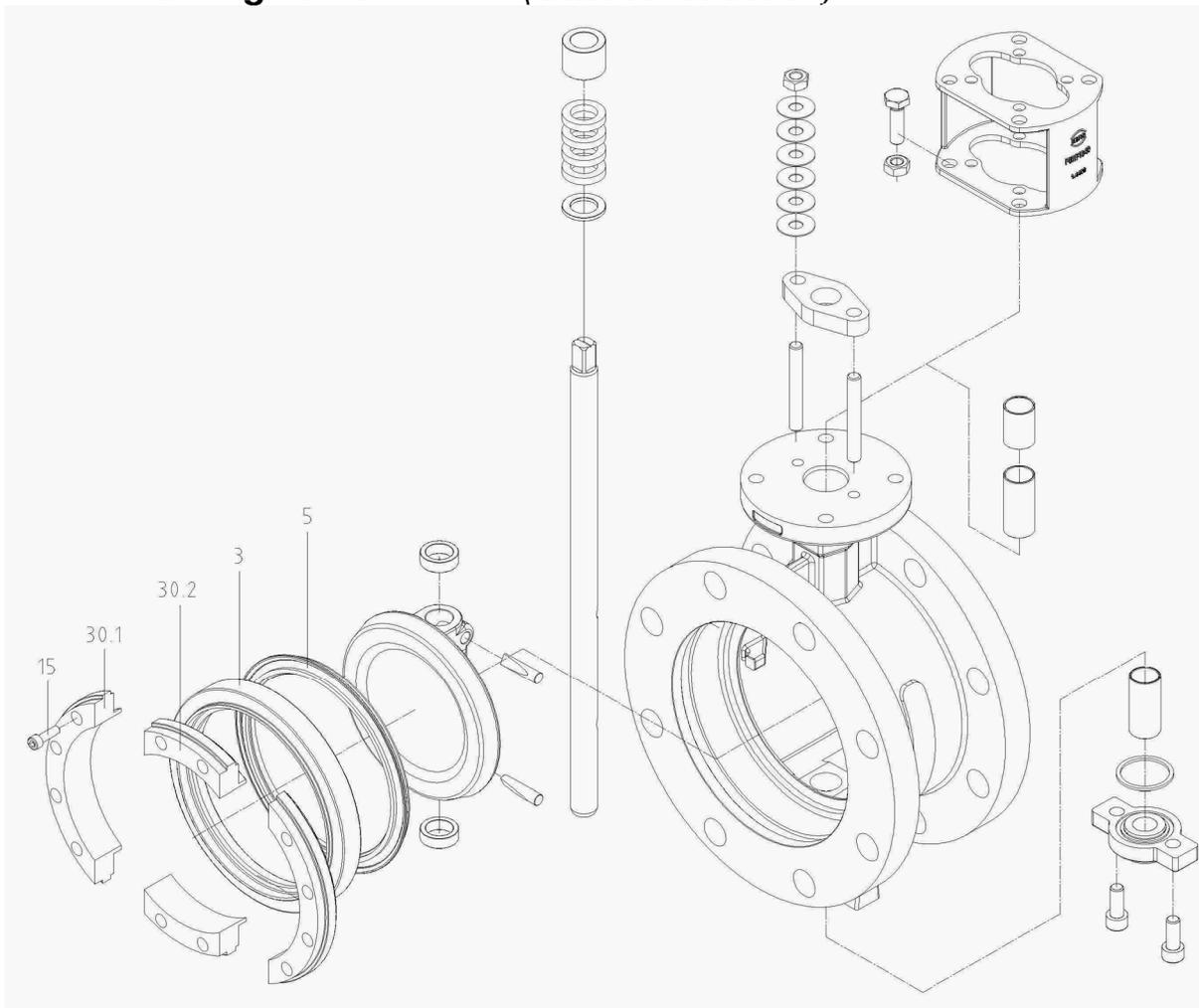
E15.2 Parts list HP-112-S (Welded design)

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM
1	Gehäuse / Body			
	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
2	Scheibe / Disc			
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
3	Klemmring / Clamping ring			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401	316
4	Welle / Shaft			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
5	Sitzring / Seat ring			
	R-PTFE	PTFE-Compound		
	Inconel	Inconel 625		
6	Wellenlager / Shaft bearing			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti
		X5CrNiMo17-12-2	1.4401 / PTFE	316 PTFE
7	Stopfbuchsenflansch / Gland flange			
	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
8	Druckring / Thrust collar			

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	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
9	Lagerring / Bearing ring			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 h. verchromt / chr-pld	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Keilstift / Taper pin			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
12	DN50-DN300 Verschlußschraube / Plug screw		DN350-DN600 Abschlußdeckel / Cover plate	
	Edelstahl / Stainless steel	GX5CrNiMo19-11-2	1.4408	CF8M
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Stahl / Steel	St 37-2 verzinkt / St37-2 galvanized	1.0037	283-C
13	Dichtung / Seal			
	Graphit			
	PTFE			
14	Wellendichtung / Shaft seal			
	Graphit			
	PTFE			
15	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M
16	Stiftschraube / Threaded pin			
	Edelstahl / Stainless Steel	A2-70		B 8
17	Sechskantmutter / Hex. Nut			
	Edelstahl / Stainless Steel	A2		8
18	Distanzhülse / Spacer sleeve			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
19	Graphitdichtung (bei Metall-Sitz)		Graphit seal (for metal seat)	
	Graphit			
20	Tellerfeder / Belleville spr. washer			
	Federstahl / Spring steel	51CrV4	1.8159	6150
	Federstahl / Stainless Steel	X10CrNi18-8	1.4310	301 Ti
21	Konsole / Bracket			
	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
22	Sechskantschraube / Hex. bolt			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2-70		B 8
23	Sechskantmutter / Hex. Nut			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
24	Unterlegscheibe / Washer			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
25	Dichtung / Seal			
	Graphit			
	PTFE			
26	Abschlußdeckel / Cover plate			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
27	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A2-70		B 8
28	Rohrstück / Tube			
	Stahl / Steel	P235G1TH (St 35.8)	1.0305	A106-04
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
29	Vorschweißflansch / Weld neck flange			
	Stahl / Steel	P250GH (C 22.8)	1.0460	
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4571	316 Ti

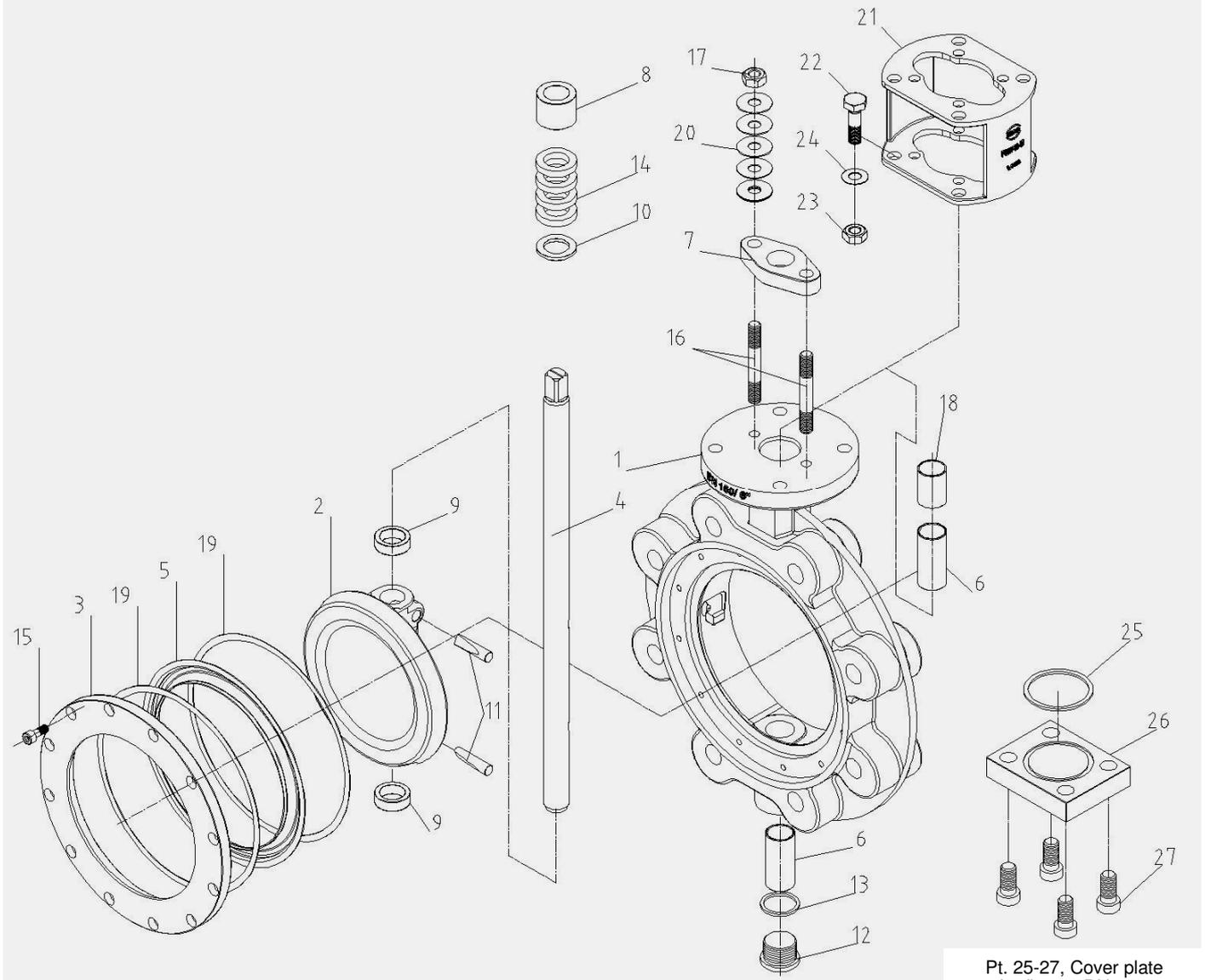
E16.1 Drawing Valve HP-112 (Cast construction)



E16.2 Parts list HP-112 (Cast construction)

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.
Unlisted positions identical to HP112			
3	Klemmring / Clamping ring		
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038 283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401 316
5	Sitzring / Seat ring		
	R-PTFE	PTFE-Compound	
	Inconel	Inconel 625	
15	Zylinderschraube / Hex.-socket		
	Edelstahl / Stainless Steel	A4-70	B 8 M
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038 283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301 304
30.1	Stützring / Supporting ring		
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038 283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401 316
30.2	Stützring / Supporting ring		
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038 283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401 316

E17.1 Drawing Valve HP-114



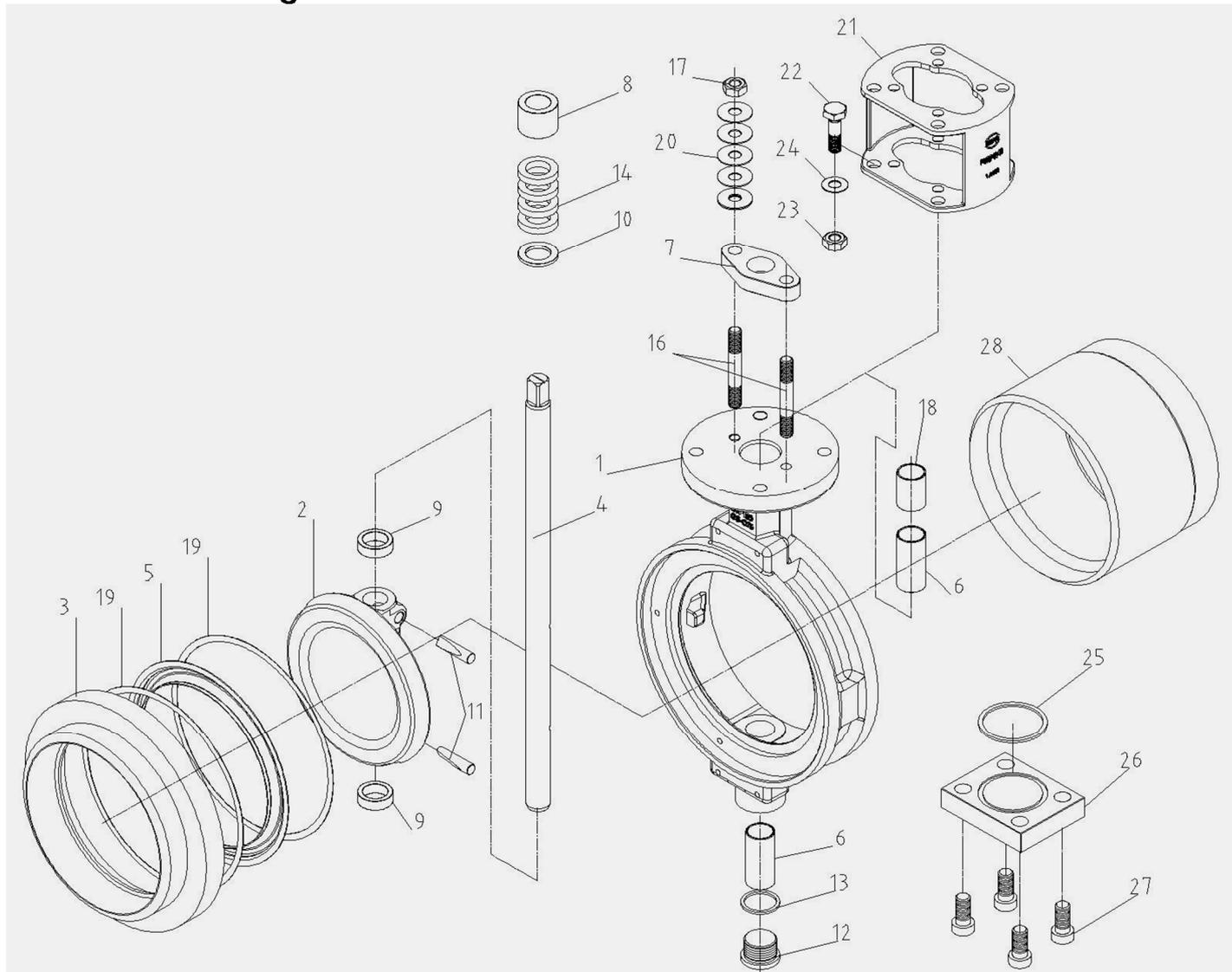
E17.2 Parts list HP-114

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.		
1	Gehäuse / Body	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB
		Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
2	Scheibe / Disc	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
3	Klemmring / Clamping ring	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
		Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401	316
4	Welle / Shaft	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
5	Sitzring / Seat ring	R-PTFE	PTFE-Compound		
		Inconel	Inconel 625		
6	Wellenlager / Shaft bearing	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti
			X5CrNiMo17-12-2	1.4401 / PTFE	316 PTFE
7	Stopfbuchsflansch / Gland flange				

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	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
8	Druckring / Thrust collar			
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
9	Lagerring / Bearing ring			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 h. verchromt / chr-pld	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Keilstift / Taper pin			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
12	DN50-DN300 Verschlusschraube / Plug screw	DN350-DN600 Abschlußdeckel / Cover plate		
	Edelstahl / Stainless steel	GX5CrNiMo19-11-2	1.4408	CF8M
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Stahl / Steel	St 37-2 verzinkt / St37-2 galvanized	1.0037	283-C
13	Dichtung / Seal			
	Graphit			
	PTFE			
14	Wellendichtung / Shaft seal			
	Graphit			
	PTFE			
15	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M
16	Stiftschraube / Threaded pin			
	Edelstahl / Stainless Steel	A2-70		B 8
17	Sechskantmutter / Hex. Nut			
	Edelstahl / Stainless Steel	A2		8
18	Distanzhülse / Spacer sleeve			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
19	Graphitdichtung (bei Metall-Sitz) Graphit seal (for metal seat)			
	Graphit			
20	Tellerfeder / Belleville spr. washer			
	Federstahl / Spring steel	51CrV4	1.8159	6150
	Federstahl / Stainless Steel	X10CrNi18-8	1.4310	301 Ti
21	Konsole / Bracket			
	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
22	Sechskantschraube / Hex. bolt			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2-70		B 8
23	Sechskantmutter / Hex. Nut			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
24	Unterlegscheibe / Washer			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
25	Dichtung / Seal			
	Graphit			
	PTFE			
26	Abschlußdeckel / Cover plate			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
27	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A2-70		B 8

E18.1 Drawing Valve HP-120



Pt. 25-27, Cover plate for flaps \geq DN 350

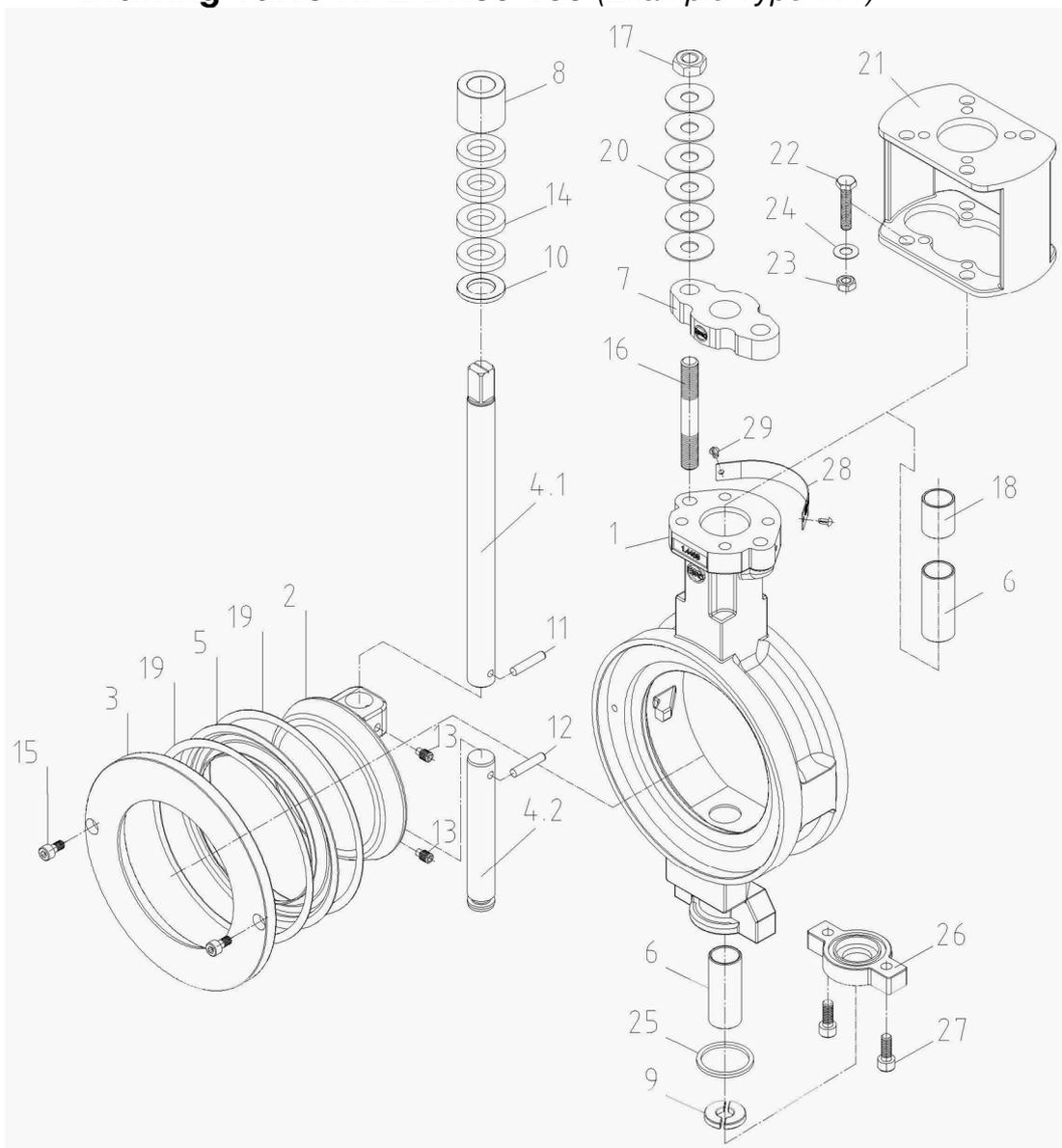
E18.2 Parts list HP-120

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM	
1	Gehäuse / Body				
	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB	
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M	
2	Scheibe / Disc	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
3	Klemmring / Clamping ring	Stahl / Steel	P250GH (C 22.8)	1.0460	
		Edelstahl / Stainless Steel	X5CrNi18-10	1.4571	316 Ti
4	Welle / Shaft	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
5	Sitzring / Seat ring	R-PTFE	PTFE-Compound		
		Inconel	Inconel 625		
6	Wellenlager / Shaft bearing	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti
					316
			X5CrNiMo17-12-2	1.4401 / PTFE	PTFE
7	Stopfbuchsflansch / Gland flange				

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	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
8	Druckring / Thrust collar			
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
9	Lagerring / Bearing ring			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 h. verchromt / chr-pld	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Keilstift / Taper pin			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
12	DN50-DN300 Verschlusschraube / Plug screw	DN350-DN600 Abschlußdeckel / Cover plate		
	Edelstahl / Stainless steel	GX5CrNiMo19-11-2	1.4408	CF8M
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Stahl / Steel	St 37-2 verzinkt / St37-2 galvanized	1.0037	283-C
13	Dichtung / Seal			
	Graphit			
	PTFE			
14	Wellendichtung / Shaft seal			
	Graphit			
	PTFE			
16	Stiftschraube / Threaded pin			
	Edelstahl / Stainless Steel	A2-70		B 8
17	Sechskantmutter / Hex. Nut			
	Edelstahl / Stainless Steel	A2		8
18	Distanzhülse / Spacer sleeve			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
19	Graphitdichtung (bei Metall-Sitz)	Graphit seal (for metal seat)		
	Graphit			
20	Tellerfeder / Belleville spr. washer			
	Federstahl / Spring steel	51CrV4	1.8159	6150
	Federstahl / Stainless Steel	X10CrNi18-8	1.4310	301 Ti
21	Konsole / Bracket			
	Stahl / Steel	St 37-2	1.0037	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
22	Sechskantschraube / Hex. bolt			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2-70		B 8
23	Sechskantmutter / Hex. Nut			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
24	Unterlegscheibe / Washer			
	Stahl / Steel	St verzinkt / St galvanized		CS
	Edelstahl / Stainless Steel	A2		8
25	Dichtung / Seal			
	Graphit			
	PTFE			
26	Abschlußdeckel / Cover plate			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
27	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A2-70		B 8
28	Rohrstück / Tube			
	Stahl / Steel	P235G1TH (St 35.8)	1.0305	A106-04
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti

E19.1 Drawing Valve HPE DN50-100 (Example Type 111)



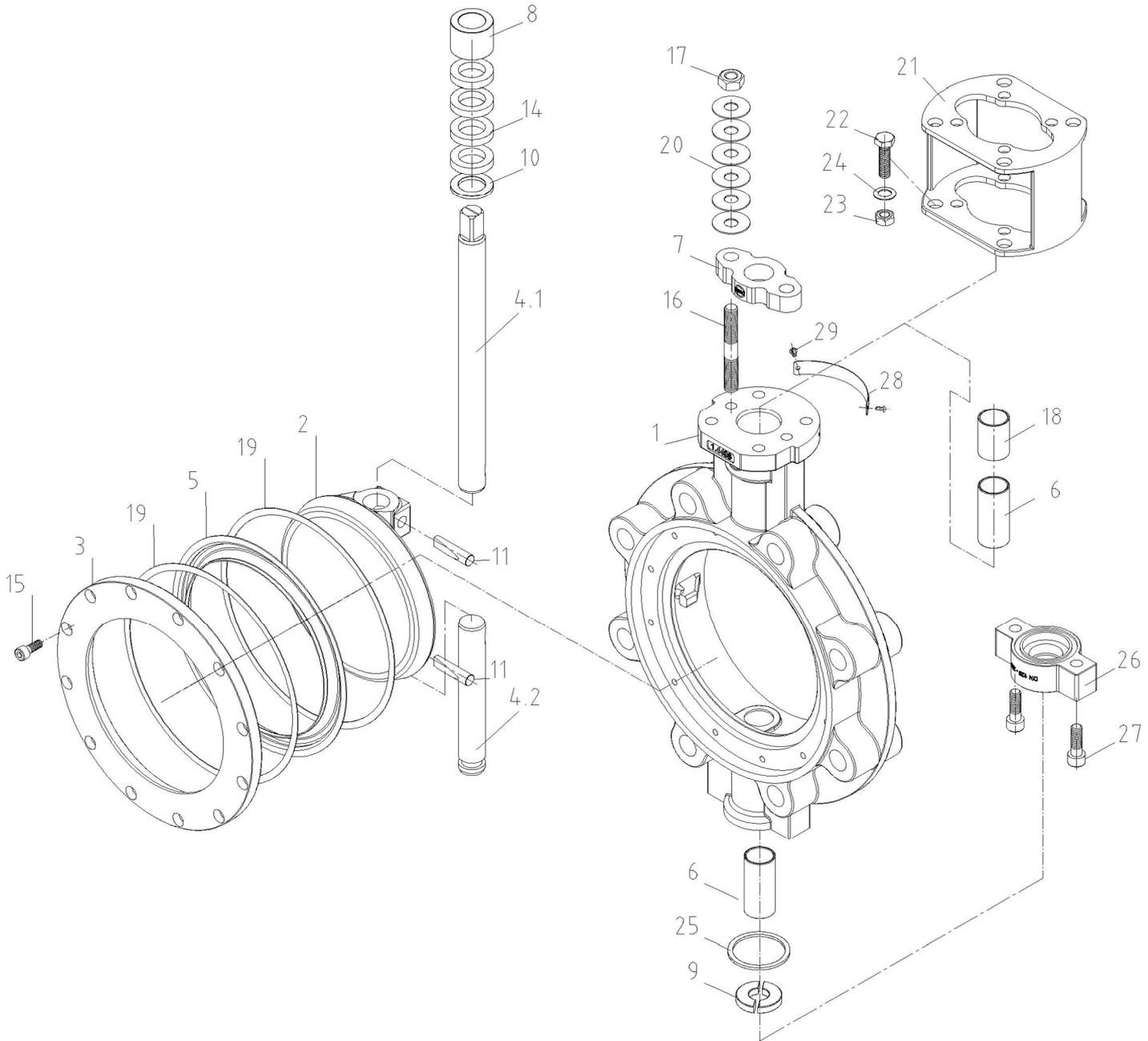
E19.2 Parts list valve HPE111 DN 50-100

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM
1	Gehäuse / Body			
	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB
	Edelstahl / Stainless Steel	GX5CrNiMo19-11	1.4408	CF8M
2	Scheibe / Disc			
	Edelstahl / Stainless Steel	GX5CrNiMo19-11	1.4408	CF8M
3	Klemmring / Clamping ring			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401	316
4.1	Welle, oben / Upper shaft			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
	Edelstahl / Stainless Steel	X5CrNiCuNb16-4	1.4542	630
4.2	Welle, unten / Lower shaft			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
5	Sitzring / Seat ring			
	R-PTFE	PTFE-Compound		
	Inconel	Inconel 625		
6	Wellenlager / Shaft bearing			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti

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		X5CrNiMo17-12-2	1.4401 / PTFE	316 PTFE
7	Stopfbuchsflansch / Gland flange			
	Stainless steel	GX5CrNiMo19-11	1.4408	CF8M
8	Druckring / Thrust collar			
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
9	Segmente / Segments			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Stift / pin			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
12	Stift / pin			
	Edelstahl / Stainless Steel	VA		SS
13	Gewindestift / Set screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M
14	Wellendichtung / Shaft seal			
	Graphit			
	PTFE			
15	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M
16	Stiftschraube / Threaded pin			
	Stainless steel	A2-70		B 8
17	Sechskantmutter / Hex. Nut			
	Stainless steel	A2		8
18	Distanzhülse / Spacer sleeve			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
19	Graphitdichtung (bei Metall-Sitz)	Graphit seal (for metal seat)		
	Graphit			
20	Tellerfeder / Belleville spr. washer			
	Federstahl / Spring steel	51CrV4	1.8159	6150
	Federstahl / Stainless Steel	X10CrNi18-8	1.4310	301 Ti
21	Konsole / Bracket			
	Stainless steel	GX5CrNiMo19-11	1.4408	CF8M
22	Sechskantschraube / Hex. Bolt			
	Stainless steel	A2-70		B 8
23	Sechskantmutter / Hex. Nut			
	Stainless steel	A2		8
24	Unterlegscheibe / Washer			
	Stainless steel	A2		8
25	Dichtung / Seal			
	Graphit			
	PTFE			
	NBR			
	FPM			FKM
26	Abschlußdeckel / Cover plate			
	Edelstahl / Stainless Steel	GX5CrNiMo19-11	1.4408	CF8M
27	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M

E20.1 Drawing Valve HPE DN 125-200 (Example Type 114)



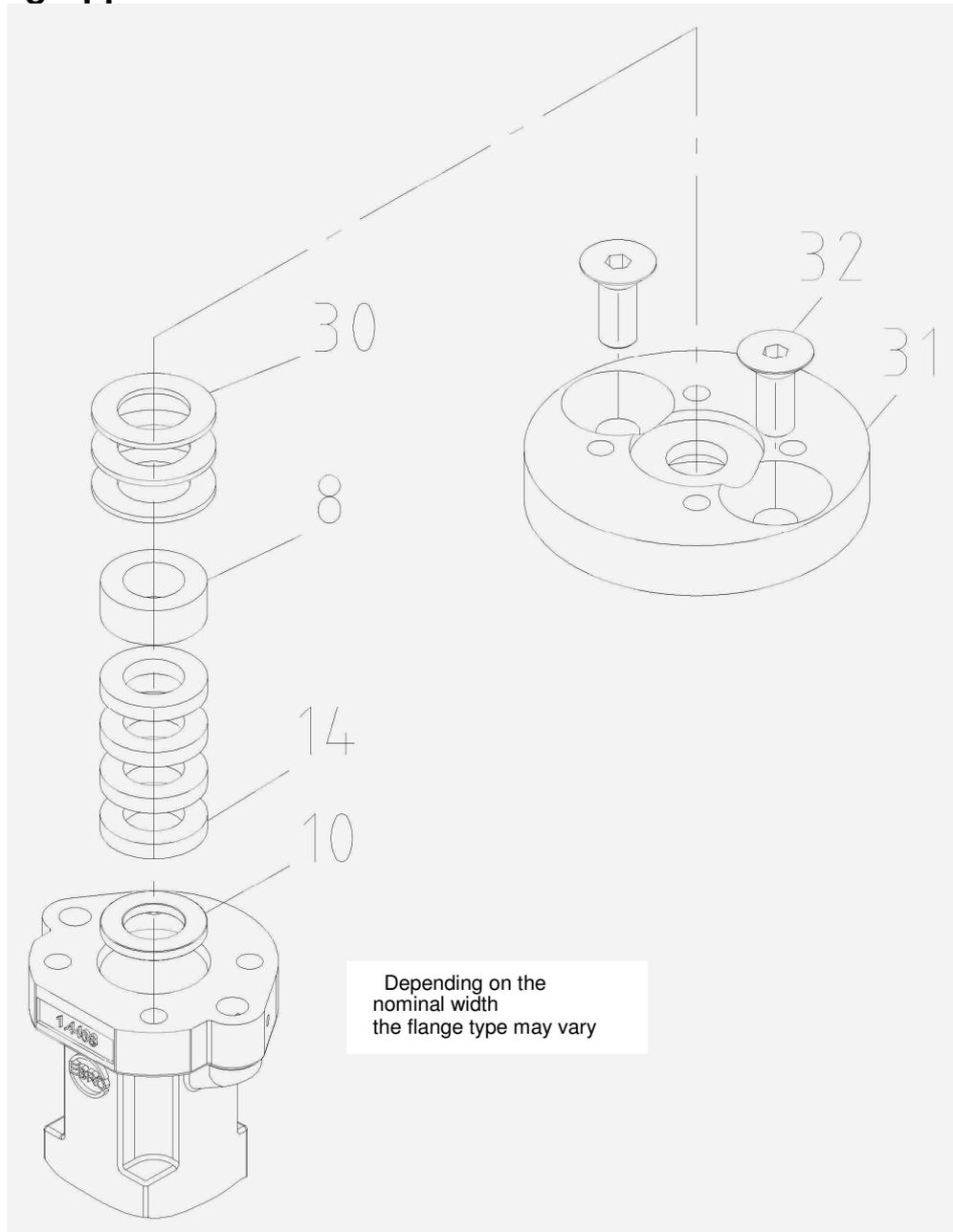
E20.2 Parts list valve HPE114 DN125-200

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM
1	Gehäuse / Body			
	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB
	Edelstahl / Stainless Steel	GX5CrNiMo19-11	1.4408	CF8M
2	Scheibe / Disc			
	Edelstahl / Stainless Steel	GX5CrNiMo19-11	1.4408	CF8M
3	Klemmring / Clamping ring			
	Stahl / Carbon Steel	S235JR (RSt37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401	316
4.1	Welle, oben / Upper shaft			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
	Edelstahl / Stainless Steel	X5CrNiCuNb16-4	1.4542	630
4.2	Welle, unten / Lower shaft			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
5	Sitzring / Seat ring			

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	R-PTFE Inconel	PTFE-Compound Inconel 625		
6	Wellenlager / Shaft bearing			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12- 2 X5CrNiMo17-12-	1.4571 nitrated 1.4401 / PTFE	316 Ti 316 PTFE
7	Stopfbuchsflansch / Gland flange			
	Stainless steel	GX5CrNiMo19-11	1.4408	CF8M
8	Druckring / Thrust collar			
	Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
9	Segmente / Segments			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Stift / pin			
	Edelstahl / Stainless Steel	X4CrNiMo16-5-1	1.4418	
12	-			
13	-			
14	Wellendichtung / Shaft seal			
	Graphit PTFE			
15	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M
16	Stiftschraube / Threaded pin			
	Stainless steel	A2-70		B 8
17	Sechskantmutter / Hex. Nut			
	Stainless steel	A2		8
18	Distanzhülse / Spacer sleeve			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
19	Graphitdichtung (bei Metall-Sitz)	Graphit seal (for metal seat)		
	Graphit			
20	Tellerfeder / Belleville spr. washer			
	Federstahl / Spring steel	51CrV4	1.8159	6150
	Federstahl / Stainless Steel	X10CrNi18-8	1.4310	301 Ti
21	Konsole / Bracket			
	Stainless steel	GX5CrNiMo19-11	1.4408	CF8M
22	Sechskantschraube / Hex. Bolt			
	Stainless steel	A2-70		B 8
23	Sechskantmutter / Hex. Nut			
	Stainless steel	A2		8
24	Unterlegscheibe / Washer			
	Stainless steel	A2		8
25	Dichtung / Seal			
	Graphit PTFE NBR FPM			FKM
26	Abschlußdeckel / Cover plate			
	Edelstahl / Stainless Steel	GX5CrNiMo19-11	1.4408	CF8M
27	Zylinderschraube / Hex.-socket screw			
	Edelstahl / Stainless Steel	A4-70		B 8 M

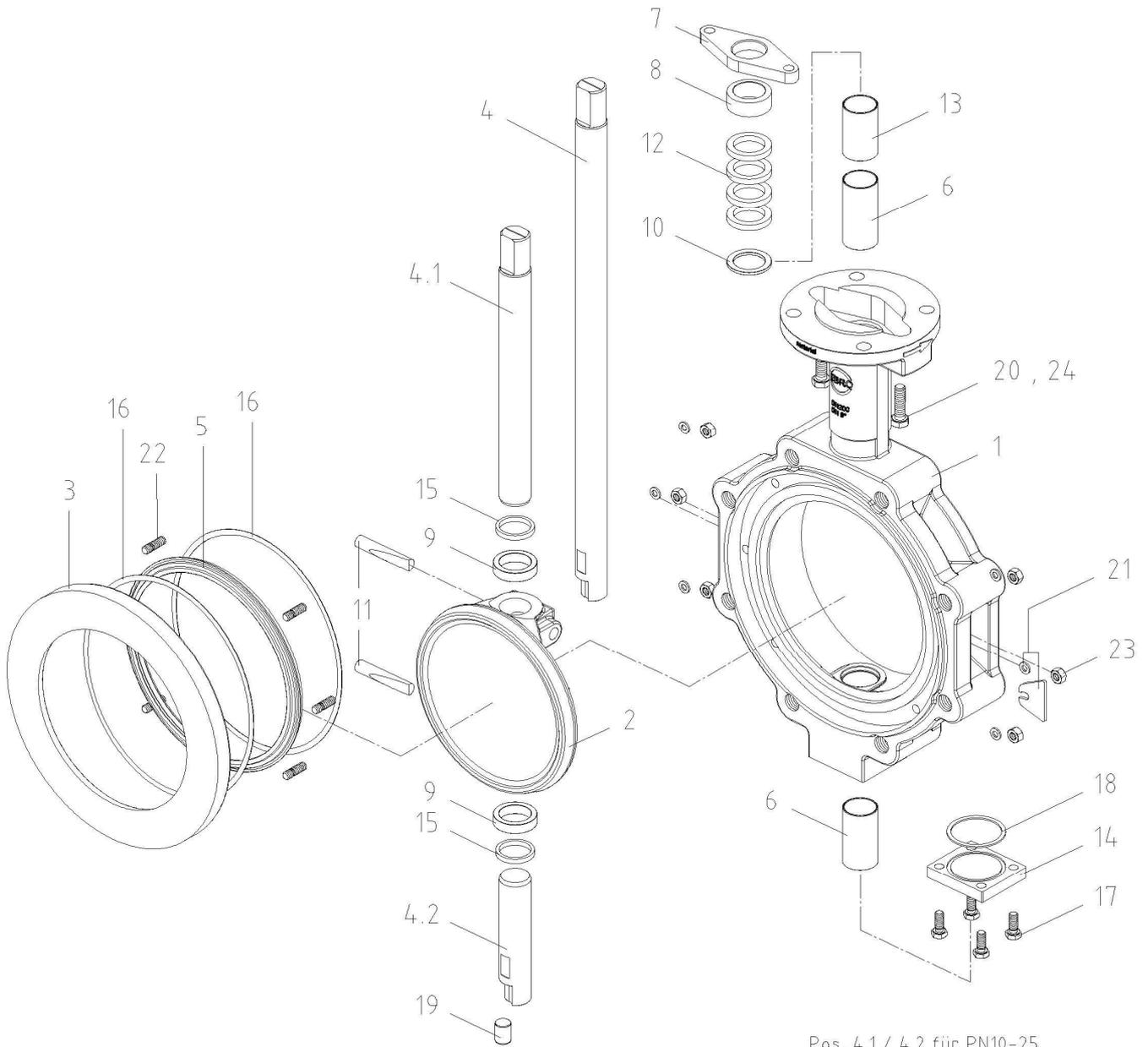
E21.1 Drawing Application - L



E21.2 Parts list Application - L

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM
8	Druckring / Thrust collar Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
10	Auflagescheibe / Suppor. washer Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
14	Wellendichtung / Shaft seal PTFE			
30	Tellerfeder / Belleville spr. washer Federstahl / Spring steel Federstahl / Stainless Steel	51CrV4 X10CrNi18-8	1.8159 1.4310	6150 301 Ti
31	Antriebsdeckel / Top plate Edelstahl / Stainless Steel	X5CrNi18-10	1.4301	304
32	Senkschraube / Countersunk screw Edelstahl / Stainless Steel	A4-70		B 8 M

E22.1 Drawing Valve HPC



YHPW-000-0013-22

Pos. 4.1 / 4.2 für PN10-25
Pos. 4 für PN40

E22.2 Parts list valve HPC

Pos. / Pt.	Bezeichnung / Description	Werkstoff / Material	Werkstoff-Nr. / Material-No.	ASTM
1	Gehäuse / Body			
	Stahlguss / Carbon Steel	GP240GH (GS-C25N)	1.0619	WCB
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
2	Scheibe / Disc			
	Edelstahl / Stainless Steel	GX5CrNiMo19-11-2	1.4408	CF8M
3	Klemmring / Clamping ring			
	Stahl / Steel	S235JR (RST37-2)	1.0038	283-C
	Edelstahl / Stainless Steel	X5CrNiMo17-12-2	1.4401	316
	Edelstahl / Stainless Steel	X2CrNiMo17-12-2	1.4404	316 L
4	Welle / Shaft			
	Edelstahl / Stainless Steel	X5CrNiCuNb 16-4	1.4542	
	Edelstahl / Stainless Steel	X4CrNiMo 16-5-1	1.4418	

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5	Sitzring / Seat ring			
	R-PTFE		PTFE-Compound	
	Inconel		Inconel 625	
6	Wellenlager / Shaft bearing			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 nitrated	316 Ti
		X5CrNiMo17-12-2	1.4401 / PTFE	316 PTFE
7	Stopfbuchsflansch / Gland flange			
	Edelstahl / Stainless Steel	GX2CrNiMoN26-7-4	1.4469	A995
	Edelstahl / Stainless Steel	X2CrNiMoN22-5-3	1.4462	F51
8	Druckring / Thrust collar			
	Edelstahl / Stainless Steel	X8CrNiS18-9	1.4305	304
	Edelstahl / Stainless Steel	X5CrNiS18-10	1.4301	304
9	Lagerring / Bearing ring			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571 h. verchromt / chr-pld	316 Ti
10	Auflagescheibe / Suppor. washer			
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
11	Keilstift / Taper pin			
	Edelstahl / Stainless Steel	X5CrNiCuNb 16-4	1.4542	
	Edelstahl / Stainless Steel	X4CrNiMo 16-5-1	1.4418	
12	Wellendichtung / Shaft seal			
	Graphit			
	PTFE			
14	Abschlußdeckel / Cover plate			
	Edelstahl / Stainless Steel	X8CrNiS18-9	1.4305	304
	Edelstahl / Stainless Steel	X5CrNiS18-10	1.4301	304
15	Turcon - Variseal - M2			
	PTFE / Metal spring	PTFE / Metal spring		
16	Graphitdichtung (bei Metall-Sitz)	Graphit seal (for metal seat)		
	Graphit			
17	Sechskantschraube / Hex. bolt			
	Edelstahl / Stainless Steel	A4-70		B 8 M
18	Dichtung / Seal			
	Graphit			
	PTFE			
19	Stift -Anschlag / gtooved pin			
	Edelstahl / Stainless Steel	X5CrNiCuNb 16-4	1.4542	
	Edelstahl / Stainless Steel	X4CrNiMo 16-5-1	1.4418	
20	Sechskantschraube / Hex. bolt			
	Edelstahl / Stainless Steel	A4-70		B 8 M
21	Unterlegscheibe / Washer			
	Edelstahl / Stainless Steel	A4		8
	Edelstahl / Stainless Steel	X6CrNiMoTi17-12-2	1.4571	316 Ti
22	Stiftschraube / Threaded pin			
	Edelstahl / Stainless Steel	A4-70		B 8 M
23	Sechskantmutter / Hex. Nut			
	Edelstahl / Stainless Steel	A4-70		B 8 M

E23 Replacing the shaft seal HP-C

E23.1 Replacing the PTFE-shaft seal (Pt. 12)

1. Disassemble the drive or the hand lever *and the bracket with their fasteners screw, disc and nut with the high-temperature version.*
2. Loosen the two gland screws [Hex. bolt (Pt.20)]
3. Remove the flush-mounted gland flange (Pt. 7).
4. Remove the thrust collar (Pt. 8) and the packing rings (Pt. 12) of the shaft seal with an appropriate tool. Caution: the surface of the bore or shaft must not be damaged!
5. Pay attention to the order and the installation position of the packing rings.
6. Clean the seal installation space of the shaft seal. Do not damage while doing so the sealing faces in the housing and on the shaft.
7. Slide the new packing rings individually, in the reverse order they were removed, over the shaft and press the packing rings in the housing bore. Make sure that the sealing lips of the packing rings are not damaged during installation.
8. Place the thrust collar (Pt. 8) and the gland flange (Pt. 7) back on the stuffing box screws.
9. Tighten the stuffing box screws (Pt. 20) equally in several steps.

E23.2 Replacing the graphite shaft seal for metal seat (Pt. 12)

1. Disassemble the drive or the hand lever *and the bracket with their fasteners screw, disc and nut with the high-temperature version.*
2. Loosen the two stuffing box screws [Hex. bolt (Pt.20)].
3. Remove the flush-mounted gland flange (Pt. 7).
4. Remove the thrust collar (Pt. 8) and the packing rings (Pt. 12) of the shaft seal with an appropriate tool. Caution: the surface of the bore or shaft must not be damaged!
5. Clean the seal installation space of the shaft seal. Do not damage while doing so the sealing faces in the housing and on the shaft.
6. Slide two new packing rings on the shaft and press them into the housing bore. Then press the two packing rings used by means of the thrust collar (Pt. 8) and the gland lid (Pt. 7) into the housing.
7. Repeat the same procedure with the remaining packing rings, insert and press them one by one.
8. Place the thrust collar (Pt. 8) and the gland flange (Pt. 7) back on the stuffing box screws.
9. Tighten the stuffing box screws (Pt. 20) equally in several steps.

E24 Replacing the seat ring HP-C

E24.1 Replacing the PTFE-shaft seal (Pt. 5)

1. Remove the butterfly valve from the pipeline and clamp it into a vice or similar.
2. Open the butterfly valve.
3. Loosen the hex. nuts (Pt. 23) and remove the clamping ring (Pt. 3) and the seat ring (Pt. 5). Note: Flange seals (Pt. 16) are only required for metal seat and are not used here!
4. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
5. Clean the isolation valve.
6. Lubricate the seat ring with a compatible lubricant, if permitted.
7. Insert a new seat ring (Pt. 5) in the nut of the housing.
8. Mount the clamping ring (Pt. 3) and slightly tighten the hex. nuts (Pt. 23) crossways.
9. Close the butterfly valve.
10. Tighten the threaded pins (Pt. 22) crossways with the indicated torques.

Tightening torque for screws:

M6 = 6 Nm (DN 80, DN 100, DN 150, DN 200 PN16-40, DN 250, DN 300 PN25-40, DN 350 PN25-40, DN 400 PN10-16)

M8 = 14 Nm (DN 200 PN10, DN 300 PN10-16, DN 350 PN10-16, DN 400 PN25-40)

E24.2 Replacing the metal seat ring (Pt. 5)

1. Remove the butterfly valve from the pipeline and clamp it into a vice or similar.
2. Open the butterfly valve.
3. Loosen the hex. nuts (Pt. 23) and remove the clamping ring (Pt. 3), the seat ring (Pt. 5) and the graphite seals (Pt. 16).
4. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.
5. Clean the butterfly valve. Any residues of the graphite seals (Pt. 16) in the housing and the clamping ring can be removed with a suitable solvent. Do not use sharp tools to remove the seal residues, as these can damage the sealing faces.
6. Close the valve and put it flat down, with the flap disc upwards.
7. Insert a graphite seal (Pt. 16) into the housing.



Caution! Handle the graphite seals with great care. Broken or damaged seals cause leakage.

8. Place the metal seat ring (Pt. 5) on the graphite seal in the housing. 8a. From DN 300 on self-adhesive graphite tape is pasted to the lower flange side of the metal sealing ring.
9. Place the second graphite seal (Pt. 16) into the nut of the clamping ring (Pt. 3). Use a compatible lubricant to fix the graphite seal.
10. Mount the clamping ring (Pt. 3) together with the inserted graphite seal into the housing.
11. Tighten the threaded pins (Pt. 22) crossways in several steps with the indicated torques.

Tightening torque for screws:

M6 = 6 Nm (DN 80, DN 100, DN 150, DN 200 PN16-40, DN 250, DN 300 PN25-40, DN 350 PN25-40, DN 400 PN10-16)

M8 = 14 Nm (DN 200 PN10, DN 300 PN10-16, DN 350 PN10-16, DN 400 PN25-40) M12 = 60 Nm (DN 600)

12. Open the valve, then tighten the threaded pins (Pt. 22) again crossways in several steps with the indicated torques.
13. Close and reopen the valve 3-4 times to test the proper function.
14. The valve is subject to a pressure and leak test in accordance with Section B4 of the operating instructions.

E25 Disassembly and reassembly of the butterfly valves HP-C

E25.1 Disassembly of the butterfly valve HP-C

1. Loosen the stuffing box screws (Pt. 20) of the gland flange and remove the gland flange and the thrust collar (Pt. 8).
2. Remove the clamping ring (Pt. 3) and the seat ring (Pt. 5) as described under Replacing the seat ring.
3. Loosen the screws (Pt. 17) and remove the lid (Pt. 14) and the seal (Pt. 18).
4. Grind the weld seam of the taper pin (Pt. 11) and drive out the taper pins in the opposite direction to the arrow.



Caution! The disassembly of the pins is challenging in terms of handling and only necessary when replacing the flap disc or the shaft. It should therefore be carried out by qualified EBRO-employees!

5. Pull the shaft (Pt. 4) upwards out of the housing.

Caution! When pulling the shaft (Pt. 4) the flap disc (Pt. 2) disengages. Avoid damage to the sealing face. Support the flap disc, so that it cannot fall out of the housing.

6. Remove the shaft seal (Pt. 12), the suppor. washer (Pt. 10) and the shaft bearings (Pt. 6).

E25.2 Assembly of the disassembled butterfly valve HP-C

1. Clean and check all parts for damage. Pay particular attention to the sealing faces for the shaft seal in the housing and on the shaft and the sealing face of the flap disc.

2. Place the butterfly valve with the camping ring side down on a workbench.

3. Polish the sealing face of the flap disc (Pt. 2) with an emery cloth. While doing so, small scratches or other minor damages to the sealing face can be levelled.

4. Mount the lid (Pt. 14), the seal (Pt. 18) and the screws (Pt. 17).

5. Push the shaft bearings (Pt. 6) in the bore of the housing.

6. Mount the suppor. washer (Pt. 10) in the housing and insert the shaft seal (Pt. 12).

7. Lightly lubricate the bore of the flap disc (Pt. 2) and the shaft (Pt. 4) with a compatible lubricant.

8. Insert a flap disc (Pt. 2) into the housing. Make sure that the word "TOP" is pointing in the direction of the head flange of the valve or that the stop surface of the flap disc is below the housing stop.

9. Insert the bearing rings (Pt. 9) between the housing and the flap disc (Pt. 2)

10. Insert the shaft (Pt. 4) into the housing from above. To this end, the flap disc (Pt. 2) must be slightly lifted.

11. Mount the thrust collar (Pt. 8), the gland flange (Pt. 7) and the stuffing box screws (Pt. 20) as described under Replacing the shaft seal. But do not fully tighten the stuffing box screws (Pt. 20) yet.



Insert the taper pins (Pt. 11) firmly in the direction of the arrow, by means of a chuck. The taper pins (Pt. 11) must be inserted uniformly, so that the ends of the taper pins protrude to an equal extent from the flap disc.



Caution! If the pins are not properly introduced into the shaft pins there may be no shaft blow out protection => danger to life!

13. After visual inspection of the correct assembly of the pins (Pt 11), weld the narrow end of the taper pins (Pt. 11) with the flap disc and brush the welded joints clean afterwards. Use suitable and adequate filler metals for flap disc material and shaft material.



Caution! The assembly and welding securing of the pins is challenging in terms of handling. It should therefore be carried out by qualified EBRO-employees!

14. Now install the new seat ring (Pt. 5) as described under Replacing the seat ring.

15. Tighten the stuffing box screws (Pt. 20) of the gland flange (Pt. 7) as described under Replacing the shaft seal.