



Table 1

Pos.	Quant.	Description
1	1	Body 1
2	1	Body 2
•• 3	1	Ball
• 4	2	Seat
•• 5	1	Stem
• 6	1	Stem seal
• 7	1	Stem packing
• 7d	1	Stem packing d
8	1	Gland packing
8a	1	Gland packing a
9	3	Spring washer
13	2	Cover bolt
• 14	1	Body seal 1
15	-	Body bolt
•• 19	1	Spring
•• 20	1	Antistatic ball
22	2+2	Stop pin
• 34	1	Body seal 2
• 35	1	Stem O-ring
• 44a	2	Ring seat 1
44b	2	Ring seat 2
45	-	Spring seat
• 46	2	Seat seal
•• 50	1	Subjection ring
68	1	Casing extension
• 71	1	Housing seal
75	4	Bolt extension
86	1	Drain plug
86a	1	Vent plug
• 109	1	Cover seal
• 127	2	Stem bearing
128	1	Body cover 2
149	1	ISO cover
153	2	ISO cover bolt
163	4	Body cover 2 bolt
• 165	1	Stem bearing

- Start-up: 5% of ordered quantity
- SOFT PARTS KIT
- METALLIC PARTS

Suggested materials to be checked at least every five (5) year service.

See point 5 (Maintenance)

Torque screw tightness values for bolts (Nr. 15) can be found attached in document DC-08-07-03 PF "Screw torque".

1. SCOPE

This manual is intended as a guide to assist customers or end-users in the correct storage, installation and maintenance of PEKOS ball valves.

2. APPLICABILITY

This manual is applicable to trunnion reduced bore ball valves in cryogenic service as per norm ANSI in the following pressures and sizes: NPS ½"-4" Class 150 and NPS 1 ½"-4" Class300.

3. STORAGE

3.1 Maintenance during storage

- a. Stainless steel and carbon steel valves should be stored separately, to protect the stainless steel against corrosion.
- b. Valves must remain in open position with plastic end covers fitted.
- c. If possible, it would be advisable to leave the ball valves in their own packing cases.
- d. Valves to be stored for a long time shall be checked by the quality control personnel every 6 months.

3.3 Environment conditions

- a. Valves shall be stored in dry conditions. Other corrosive environment conditions must be also avoided.
- b. Valves must be protected against ambient dust.

4. INSTALLATION

- As the valves are degreased, they have to be completely free of dirt. Handle carefully.
- Verify that valves have not been damaged during transit. Inspect inside of the valves and the pipeline of the installation to be able to verify there are no strange particles.
- It is advisable to use protective filters during the installation and check-in period while the possibility of dirt or even oxidation of the pipes exists. They have to be used until pipes are absolutely free of particles in suspension.
- If possible, valve shall be mounted in such way to allow periodic inspections.
- Valves are unidirectional, so fluid can run in only one direction (as it is indicated in the valve).
- Valves can be mounted in any position (except valves in liquid service, only capable of operating with the valve stem 45° at or above the horizontal position).
- It is necessary to obtain correct alignment and parallelism to avoid any kind of stress.
- Once the installation is completed, valve must be operated for at least one opening and closing action to ensure perfect operation.
- After cleaning, protective filters could be removed.
- Protective filters should remain installed on dirty applications.

5. MAINTENANCE

Pekos recommends inspecting the valves at least every five (5) years. These inspection intervals could be affected by the process service (fluid, temperature, service, and cycles), and environmental condition.

5.1 Valves revision

PEKOS ball valves do not need lubrication.

Ball (3), seats (4), stem (5), stem seals (6), stem packing (7 and 7d), body seals (14 and 34), stem o-ring (35), seat seals (46), housing seal (71), cover seal (109), bearing (127) and stem bearing (165) can be replaced easily using common tools. As replacement pieces is advisable to follow the instructions below table 1.

Prior to carrying out work on valves the pipeline must be completely empty, including the ball valve body cavity by half opening valve to allow any pressure build up to escape.

Care must be taken to avoid contact with dangerous or toxic chemical products. The valves must be thoroughly cleaned (see point 4a), in particular the body cavity, before handling and dismantling.

5.2 Stem leakage

- Remove *subjection ring (50)* from the *ISO cover (149)*.
- Remove *ISO cover (149)* by loosening *cover bolts (13)*. Replace the stem bearing (165).
- Remove the *casing extension (68)* by loosening *bolt extension (75)*.
- From *casing extension (68)* remove the *spring washers (9)*, the *gland packings (8a and 8b)*, the *stem packing (7 and 7d)*, the *bearing (127)* and the *stem seal (6)*, and replace the damaged items.
- Remove the *cover seal (71)* and replace it.
- Reassemble the pieces accordingly as it is indicated in point 6.
- This process can be carried out with the valve under pressure due to the *double block and bleed* characteristic. The only condition is that the valve must be totally opened or totally closed.

5.3 Body leakage

These ball valves PEKOS ANSI are constructed in 2 pieces, *body (1)* and *body end (2)*. Body fasteners should be checked for tightness. If leakage occurs and if necessary, *body seals (14)* and *(34)* should be replaced as it is shown:

- Make alignment marks on the *body (1)* and *end (2)* prior to dismantling, to ensure a correct alignment when reassembling.
- Remove *bolts (15)* and disassemble the *adaptor (2)*.
- Substitute *body seals (14 and 34)*.
- Assemble the pieces accordingly as it is indicated in point 6.

5.4 Seat leakage

- Maintain the valve in the closed position, loosen and remove the *bolts (15)*, remove the *body 2 (2)* from the *body (1)*. Remove the *seat (4) – ring seat 1 (44a)* sets and change the seats (4). If necessary, replace the *seat seals (46)*.
- The *bearing (127)* can be replaced removing the *ball (3)* from the *body 1 (1)*. To remove the *ball (3)*, the *casing extension (68)* and the *body cover 2 (128)* have to be removed loosening the *bolts (163)*.
- Reassemble the pieces accordingly as it is indicated in point 6.

5.5 Body cover 2 leakage

- Loosen the *body cover 2 bolts (163)* to remove the *body cover 2 (128)*.
- Replace the *cover seal (109)*.
- If the *bearing (127)* is damaged, remove the *ball (3)* as it is indicated in the 5.4 point.
- Reassemble the pieces accordingly as it is indicated in point 6.

6. ASSEMBLY

- Prior to re assembly all components and body cavity should be cleaned of any incrustation, dirt, rust etc., especially in the locations of seats & seals.
- Place the *cover seal (109)* in the *body cover 2 (128)*.
- Place the other *housing seal (71)* and the *stop pins (22)* in the *body 1 (1)*.
- Assemble the following component into the casing extension (68) in this order: the *stem packing (7)*, the *gland packing (8)*, the *stem packing (7d)*, the *gland packing a (8a)* and the *spring washers (9)*.
- Put the *stem o-ring (35)* and the *bearing (127)* in the *casing extension (68)*.
- Put the *stem seal (6)* into the *stem (5)*. Check the *antistatic devices (pos. 19, 20)*.

	<p style="text-align: center;">MANUAL INSTRUCTION</p> <p style="text-align: center;">FOR STORAGE, INSTALLATION, OPERATION AND MAINTENANCE OF PEKOS BALL VALVES</p>	<p style="text-align: center;">ANSI ZFGOSU Class 150-300 NPS 1 ½"-4"</p>	<p style="text-align: center;">Nr.177 02/09/20 Rev.4</p>
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- g. Assembly the *stem* (5) into the *casing extension* (68).
- h. Place the *spring seats* (45) into their housings in the *body 1* (1). Introduce the *ring seat 2* (44b) and the *seat seal* (46) in the *body 1* (1). Introduce the *seat* (4) – *ring seat 1* (44a) set in the *body 1* (1).
- i. Insert the *bearing* (127) in the *ball* (3) and introduce the *ball* (3) into the *body 1* (1). The *ball* (3) must be guided by the *body cover 2* (128) and the *casing extension* (68).
- j. Join the *body cover* (128) with the *body 1* (1) by means of *bolts* (163).
- k. Join the *casing extension* (68) with the *body 1* (1) by means of *bolt extension* (75).
- l. Place the *spring seats* (45) into their housings in the *body 2* (2). Introduce the *ring seats 2* (44b) and the *seat seals* (46) in the *body ends* (2). Introduce the *seat* (4) – *ring seat 1* (44a) set in the *body end* (2).
- m. Put the *body seals* (14 and 34) into their housing of the *body 1* (1) and assemble the *body 1* (1) with the *body end* (2). Join them by means of *bolts* (15) evenly tighten in diagonal using a torque wrench and the values indicated attached in document DC-08-07-03 PF "Screw torque".
- n. After placing the *pins* (22), place the *ISO cover* (149) and the *stem bearing* (165) in the casing extension (68), place the *cover bolts* (13) and tighten them.
- o. Place the *subjection ring* (50) into the *casing extension* (68).
- p. Screw the *drain* and *vent plugs* (86 and 86a).
- q. If the valve contains handle, put the *handle* (16) into its housing in the *stem* (5), and tighten the *handle bolt* (17).
- r. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats* (4) and *ball* (3).
- s. Carefully cycle the valve twice in order to check the correct working. *Stem* (5) should rotate smoothly offering resistance as indicated by the manufacturers torque figures. Tests should be carried out according to API 598, at the pressure rating that corresponds to the valve, before reinstallation.

The end user is responsible, in case that the fluid is not communicated, checking the compatibility of the service media/ fluid with the valve materials.