



Table 1

| Pos. | Quant. | Description |
|-------|---------|-----------------------------|
| 1 | 1 | Body 1 |
| 2 | 3 or 4* | Body 2 |
| •• 3 | 1 | Ball |
| • 4 | 4 | Seat |
| •• 5 | 1 | Stem |
| • 6 | 1 | Stem seal |
| • 7 | 1 | Stem packing |
| 11 | 1 | Body cover |
| 13 | 2 | Cover bolt |
| • 14 | 4 | Body seal 1 |
| 15 | - | Body bolt |
| •• 19 | 1 | Spring |
| •• 20 | 1 | Antistatic ball |
| 30 | 1 | Subjection ring |
| • 31 | 2 | Bearing |
| • 34 | 5 | Body seal 2 (if applicable) |
| • 35 | 2 | Stem O-ring |
| • 44a | 4 | Ring seat 1 |
| 44b | 4 | Ring seat 2 |
| 45 | - | Spring seat |
| • 46 | 4 | Seat seal |
| 64 | 1 | Body cover |
| 65 | ** | Body blind |
| • 66 | 1 | Body cover seal |
| 86 | 1 | Drain plug |
| • 108 | 4 | Seat O-ring |
| • 109 | 1 | Cover seal |
| 128 | 1 | Body cover 2 |
| • 148 | 1 | Cover O-ring |
| 153 | - | ISO cover bolt |
| 163 | - | Body cover 2 bolt |
| • 165 | 2 | Stem bearing |
| • 170 | 12 | Stop seal |

* 3 if 3 way, 4 if 4 way
** Only 3 way valve

- 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 PEKOS ball valves as per norm ANSI in the following pressures and sizes: NPS 1/2"-2 1/2" Class 900-1500 3/4 way.

3. STORAGE

3.1 Supplying conditions

Up to 14", carbon steel ball valves are supplied with a phosphated treatment to protect against corrosion. From 14" a painting coating is provided. These conditions are standard, but they can be changed on demand.

3.2 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.
- e. Degreased valves shall only be unpacked before installation.

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

- a. 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.

- b. 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.
- c. If possible, valve shall be mounted in such way to allow periodic inspections.
- d. Valves shall be installed so that the fluid directions coincide.
- e. Valves can be mounted in any position but it is advisable to mount the valves with the stem in vertical position.
- f. It is necessary to obtain correct alignment and parallelism to avoid any kind of stress.
- g. Once the installation is completed, valve must be operated for at least one opening and closing action to ensure perfect operation.
- h. After cleaning, protective filters could be removed.
- i. 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 seal (6), stem packing (7), body seals (14 and 34), stem o-ring (35), seat seals (46), body cover seal (66), seat o-rings (108), cover seal (109), cover o-ring (148), stem bearings (165) and stop seals (170) 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, in particular the body cavity, before handling and dismantling.

5.2 Stem leakage

The packing system of the *stem (5)* of PEKOS ANSI ball valves has been designed for a long life. In case of leakage, the stem seals shall be replaced as it is shown:

- a. Remove *subjection ring (30)* and *o subjection ring seal (110)*. Remove *cover (11)* by loosening *cover bolts (13)*.
- b. Remove the *stem packing (7)*, the *stem o-ring (35)*, the *stem seal (6)*, the *stop seals (170)* and the *stem bearings (165)*, and replace them.
- c. Reassemble the pieces accordingly as it is indicated in point 6.
- d. 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

PEKOS ANSI three way ball valves are built with a central *body (1)*, three *body adapters (2)* a *body blind (65)* and a *body cover (64)* on the top of it. Four way ball valves are built with a central *body (1)*, four *body adapters (2)* and a *body cover (64)* on the top of it. Body covers fasteners should be checked for tightness if leakage occurs between *body (1)* and *body cover (64)* and if necessary *body cover (64)* should be removed to replace the *body cover seal (66)*. On the other hand, if leakage occurs between *body (1)* and *body adapters (2)*, if necessary, *body seals (14 and 34)* should be replaced as it is shown:

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

5.4 Seat leakage

- a. Make alignment marks on *body (1)* and the *adapter (2)* where the leakage is produced.
- b. Loosen and remove the *body bolts (15)*, remove the *body adapter (2)* from the *body (1)*. Remove the *seat (4) – ring seat 1 (44a)* set, the *seat O-ring (108)* the *seat seal (46)*, the *stop seals (170)* and if necessary replace them.
- c. Reassemble the pieces accordingly as it is indicated in point 6.
- d. This process has to be done in one *body end (2)*, and later on, in the other one.

5.5 Body cover 2 leakage

- a. Loosen the *body cover 2 bolts (163)* to remove the *body cover 2 (128)*.
- b. Replace the *cover seal (109)*, the *cover O-ring (148)* and the *stop seals (170)*.
- c. Reassemble the pieces accordingly as it is indicated in point 6.

6. ASSEMBLY

- a. Prior to assembly all components and body cavity should be cleaned of any incrustation, dirt, rust etc., especially in the locations of seats & seals.
- b. Put the *cover seal (109)*, the *cover O-ring (148)* and the *stop seals (170)* in the *body cover 2 (128)*. Introduce the *body cover 2 (128)* into the *body (1)* and joint the *body cover 2 (128)* to the *body (1)* with the *body cover 2 bolts (163)*.
- c. Put the *bearings (31)* and the *bearing disks (32)* in the *ball (3)*. Introduce the *ball (3)* in the *body (1)*. The *ball (3)* must be guided by the *body cover 2 (128)*.
- d. Check the *antistatic devices (pos. 19, 20)*. Put the *stem seal (6)* the *stem O-rings (35)* and the *stop seals (170)* in the *stem (5)* and a *stem bearing (165)* in the *body cover (64)*. Assembly the *stem (5)* into the *body cover (64)*.
- e. Put the *stem packing (7)* in the *body cover (64)*.
- f. Put the *body cover seal (66 and 34)* and the *stop seals (170)* in the *body (1)*. Place the *body cover (64) – stem (5)* set in the *body (1)* and joint them by means of *body bolts (15)* providing that the *ball (3)* is guided by the *body cover (64)* and the *stem (5)* aligned with the *ball (3)*.

- g. Place the *cover (11)* together with the other *stem bearing (165)* in the *body cover (64)*, place the *cover bolts (13)* and tighten them.
- h. Place the *subjection ring (30)* into the *stem (5)*.
- i. Place the *spring seats (45)* into their housings in the *bodies 2 (2)*. Introduce the *ring seats 2 (44b)* and *seat seals (46)* in the *body ends (2)*. After placing the *seat o-ring (108)* and the *stop seals (170)* in the *ring seat 1(44a)*, introduce the *seat (4) – ring seat 1 (44a)* sets in the *body ends (2)*.
- k. Put the *body seals (14 and 34)* and the *stop seals (170)* into their housing of the *body 1 (1)*, and assemble the *body 1 (1)* with the *body ends (2)*. Joint them by means of *bolts (15)* tightening them in diagonal using a torque wrench and the values indicated attached in document DC-08-07-03 PF "Screw torque".
- l. Just in case of a 3 way valve, repeat the points i and j with the *body blind (65)*.
- m. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats (4)* and the *ball (3)*.
- n. 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.