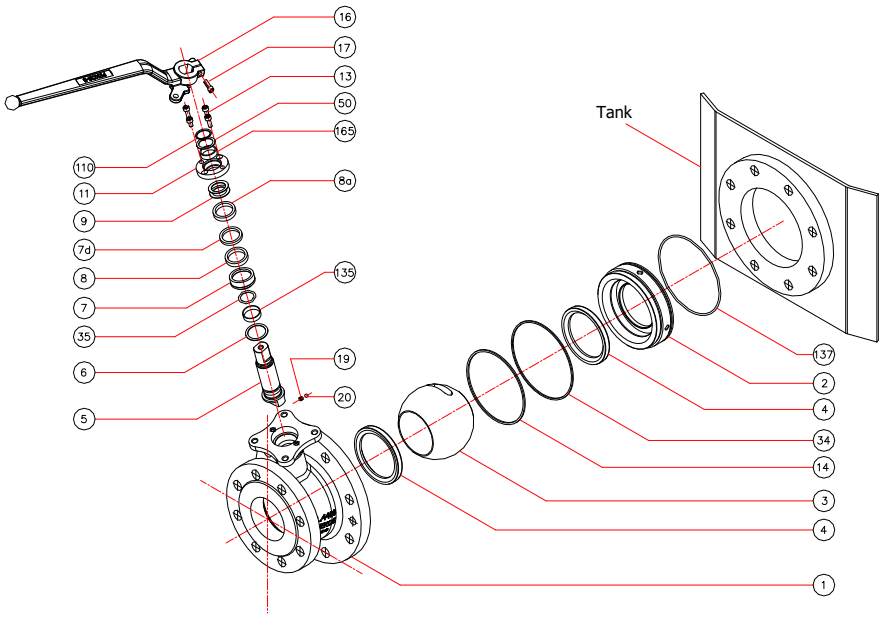

Table 1

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	2 or 3	*Spring washer*
11	1	*Cover*
13	2	*Cover bolt*
• 14	1	*Body seal 1*
16	1	*Handle*
17	1	*Handle bolt*
•• 19	1	*Spring*
•• 20	1	*Antistatic Ball*
• 34	1	*Body seal 2*
• 35	1	*Stem O-ring*
50	1	*Subjection ring*
110	1	*Subjection ring seal*
• 135	1	*Stem bearing*
• 137	1	*O-ring 3*
• 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)

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 for inclined stem tank bottom.

2. APPLICABILITY

This manual is applicable to PEKOS ball valves for Z inclined stem tank bottom according to DIN type.

3. STORAGE

3.1 Maintenance during storage

a. Valves must remain in open position with plastic end covers fitted.
b. If possible it would be advisable to leave the ball valves in their own packing cases.
c. Valves to be stored for a long time shall be checked by the quality control personnel every 6 months.

3.2 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 are bidirectional, so fluid can run in both directions.
e. Valves can be mounted in any 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.
j. Valve installation can be done in two ways: Using a counter flange which is welded to the tank or the tank can be set to be assembled to the valve.

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 and stem packing requires no adjustment.
Ball (3), seats (4), stem (5), stem seal (6), stem packing (7), body seals (14 and 34) and stem o-rings (35) can be replaced easily using common tools. As replacement pieces is advisable to follow the instructions below table1.
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 DIN ball valves has been designed for a long life. The *spring washers (9)* compensate any looseness inside the packing. In case of leakage, the stem seals shall be replaced as it is shown:

a. If the valve contains handle, loosen the *handle bolt (17)* and remove the *handle (16)*.
b. Loosen the *cover bolts (13)* and remove the *cover (11)*.
c. Remove the *spring washers (9)*, the *gland packing (8a and 8b)* and the *stem packing (7 and 7d)*, and replace them.
d. Reassemble the pieces accordingly as it is indicated in point 6.

5.3 Body leakage

Inclined stem type PEKOS ball valves are built in just one *body 1 (1)* and a *body 2 (2)* that is threaded into the *body 1 (1)*. In case of leakage the correct tightening of the *body 2* (2) should be checked and, if necessary, replace the *body seal 1 (14)* and the *body seal* 2 (34), proceeding as explained below:

a. Loosen and remove the *body 2 (2)* using the correct fork key. If required, it could be supplied by PEKOS.
b. Replace the *body seals (14 & 34)* and *O-ring 3 (137)* that are placed in the *body (1)*.
c. Reassemble the pieces accordingly as it is indicated in point 6.

5.4 Seat leakage

In case of *seat* (4) leakage, it should be advisable to replace them as indicated next:

a. Maintain the valve in closed position, separate the *body 2 (2)* from the *body 1 (1)* in order to inspect the *ball (3)* and the *seats (4)*. Remove the *ball (3)*. If necessary, remove it, hit it gently with a soft material tool.
b. Check the damage caused by erosion or other defects in all the components, replacing them if necessary
c. Reassemble the pieces accordingly as it is indicated in point 6.

6. ASSEMBLY

a. 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.
b. Replace *seats (4)* into their housing in the *body 1&2 (1, 2)*. Ensure that they are fitted squarely and carefully pushed completely into the recesses.
c. Put the *stem washer (6), the stem seal bearing (135) and the stem o-ring (35)* onto the *stem (5)*. Check the *antistatic devices (pos. 19, 20)*.
d. Assemble the *stem (5)* into the valve from inside to outside, as indicated by the arrow in the main figure.
e. Assemble the following components into the *body 1 (1)* introducing them through the stem (5) in this order: *stem packing (7)*, *gland packing (8)*, *stem packing* d (7d), *gland packing* a (8a) and *spring washers (9)*, putting the *stem (5)* in closed position.
f. Carefully introduce the *ball (3)* in the *body (1)* matching the alignment marks of the *ball (3)* and the *stem (5)*.
g. Place the body seal *(14)* and *(34)* in its housing in the body *(1)*.
h. Maintain the valve in its closed position and present *body 2 (2)* to *body (1)* ensuring that alignment marks are matched. Place *O-ring 3 (137)* into its housing in the *body 2 (2)*.
i. Assemble the *stem bearing (165)* in the *cover (11)*, and put both of them in the body introducing through the *stem (5)*. Match them to the *body 1 (1)* by means of the *cover bolts (13)*.
j. Put the *subjection ring seal (110)* and the *subjection ring (50)*.
k. If the valve contains handle, assemble the *handle (16)* onto *stem (5)* and tighten the *handle bolt (17)*.
l. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats (4)* and *ball (3)*.
m. 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 EN 12266-1, 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.