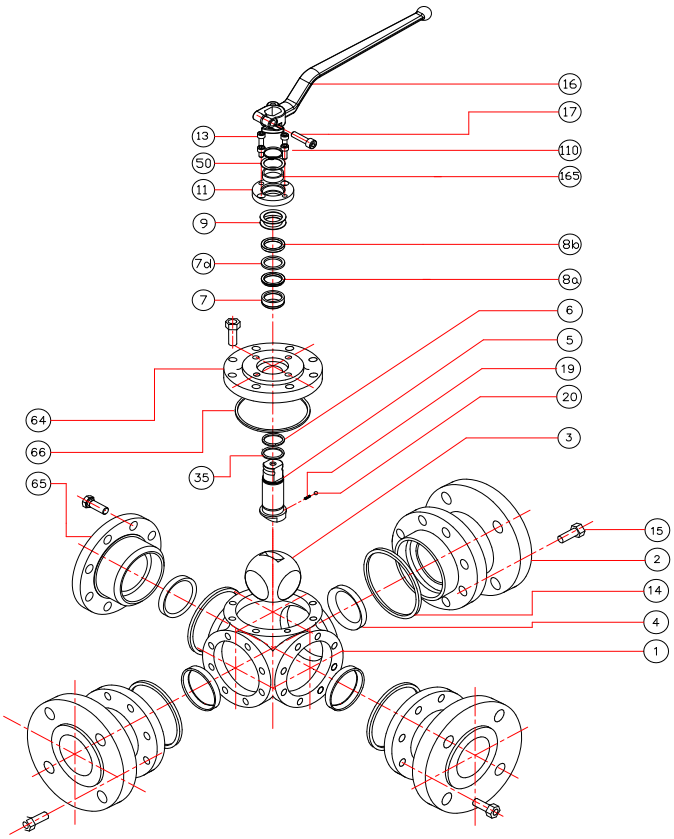

Table 1

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*
• 7d	1	*Stem packing d*
8	1	*Gland packing*
8a	1	*Gland packing a*
9	1	*Spring washer*
11	1	*Cover*
13	-	*Cover bolt*
• 14	4	*Body seal 1*
15	-	*Body bolt*
•• 19	1	*Spring*
•• 20	1	*Antistatic ball*
22	2	*Stop pin*
23	1	*Handle pin*
24	1	*Lengthening handle*
• 35	1	*Stem O-Ring (See point 6)*
50	1	*Subjection ring*
64	1	*Body cover*
65	**	*Body blind*
• 66	1	*Body cover seal*
110	1	*Subjection ring seal*
• 165	1	*Stem bearing*

* 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”

Table 2

DN	Bolt
25	M8
50	M10
65-100	M12
150-200	M16

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 3 ways ball valves as per norm DIN in the following pressures and sizes: PN10-16 DN25-200, PN25-40 DN25-100.

3. STORAGE

3.1 Supplying conditions

Up to DN350, cast iron and carbon steel ball valves are supplied with a phosphated treatment to protect against corrosion. From DN350 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 in such way that 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 and 7d), body seals (14), body cover seal (66) and *stem bearing (165)* 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. Remove *subjection ring (50)* and *subjection ring seal (110)*. Remove the *cover (11)* by loosening *cover bolts (13)*.
b. Remove the *spring washers (9)*, the *gland packing (8 and 8a)*, the *stem packing (7 and 7d)*, the *stem seal (6)* and the *stem bearing (165),* and replace them.
c. Reassemble the pieces accordingly as it is indicated in point 6.

5.3 Body leakage

PEKOS DIN 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)* 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 seal (14)*.
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)* and replace it.
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. Introduce the *ball (3)* in the *body (1)*.
c. Check the *antistatic devices (pos. 19, 20)*. *Stem O-Ring (35)* can be included or not, it depends on the figure.
Put the *stem seal (6)* in the *stem (5) first, and then stem O-ring (35)*. Assembly the *stem (5)* into the *body cover (64).*
d. Put the *stem packing (7 and 7d),* the *gland packing (8 and 8a)* and the *spring washers (9)* in the *body cover (64)*.
e. Put the *body cover seal (66)* 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 *stem (5)* is aligned with the *ball (3)*.
f. Place the *cover (11)* together with the *stem bearing (165)* in the *body cover (64),* place the *cover bolts (13)* and tighten them.
g. Place the *subjection ring seal (110)* and *subjection ring (50)* into the *stem (5).*
h. Introduce the *seats (4)* in the *body ends (2).*
i. Put the *body seals (14*) 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”.
j. Just in case of a 3 way valve, after placing the *body seal (14)* in the *body (1)* and the *seat (4)* in the *body blind (65)*, joint the *body blind (65)* with the *body (1)* by means of *body bolts (15)*.
g. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats (4)* and the *ball (3)*.
h. 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.