

MANUAL

AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

AL 33-K - Class 400

- 3 pieces floating
- Full bore: NPS 3"
- Reduced bore: NPS 4"
- SW, BW, NPT, BSPP

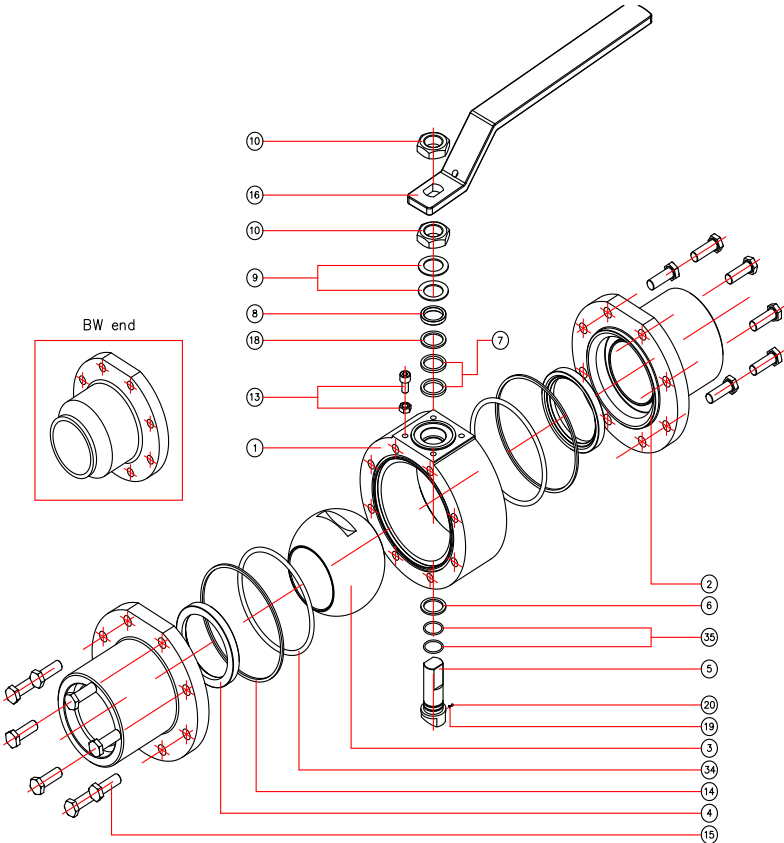


Table 1

Pos.	Quant.	Description
1	1	Body 1
2	2	Body 2
•• 3	1	Ball
• 4	2	Seat
•• 5	1	Stem
• 6	1	Stem seal
• 7	1	Stem packing
•• 8	1	Gland packing
•• 9	2	Spring washer
•• 10	2	Stem nut
13	2	Stop bolt
• 14	2	Body seal 1
15	16	Body bolt
16	1	Handle
• 18	1	Thrust washer
•• 19	1	Spring
•• 20	1	Antistatic ball
• 34	2	Body seal 2
• 35	2	Stem O-ring

- 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 6 (Maintenance)

MANUAL

AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

AL 33-K - Class 600

- 3 pieces floating
- Full bore: NPS 2" - 2 1/2"
- Reduced bore: NPS 2 1/2" - 3"
- SW, BW, NPT, BSPP

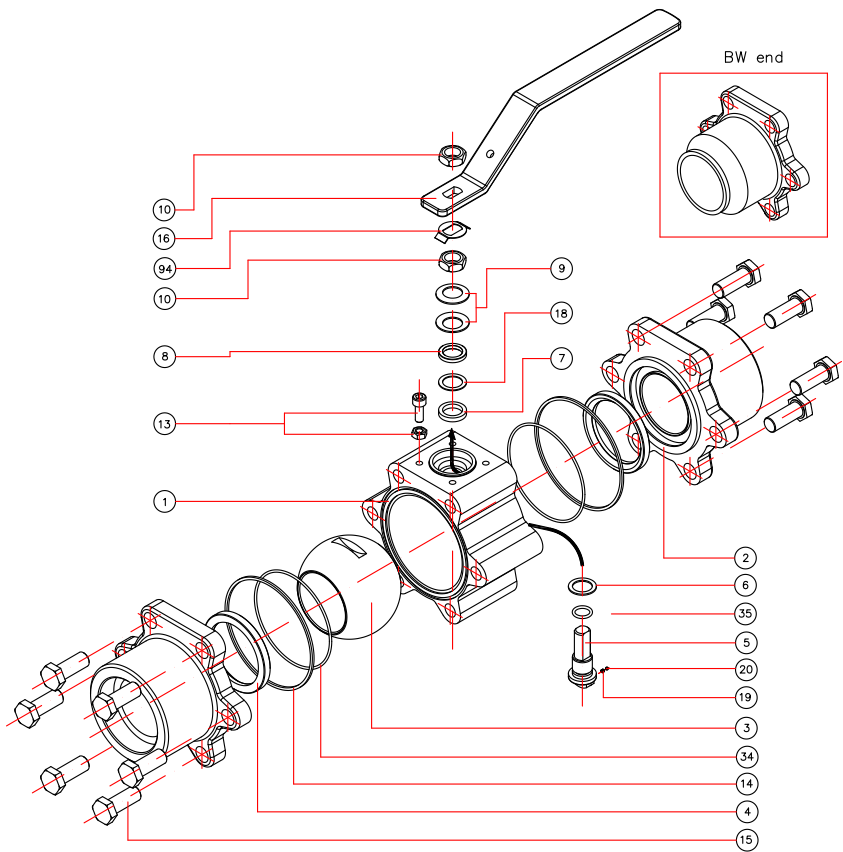


Table 1

Pos.	Quant.	Description
1	1	Body 1
2	2	Body 2
•• 3	1	Ball
• 4	2	Seat
•• 5	1	Stem
• 6	1	Stem seal
• 7	1	Stem packing
•• 8	1	Gland packing
•• 9	2	Spring washer
•• 10	2	Stem nut
13	2	Stop bolt
• 14	2	Body seal 1
15	12	Body bolt
16	1	Handle
• 18	1	Thrust washer
•• 19	1	Spring
•• 20	1	Antistatic ball
• 34	2	Body seal 2
• 35	1	Stem O-ring
94	1	Stop washer

- 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 6 (Maintenance)

MANUAL

AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

AL 33-K - Class 800

- 3 pieces floating
- Full bore: NPS 1/4" - 1 1/2"
- Reduced bore: NPS 1/2" - 2"
- SW, BW, NPT, BSPP

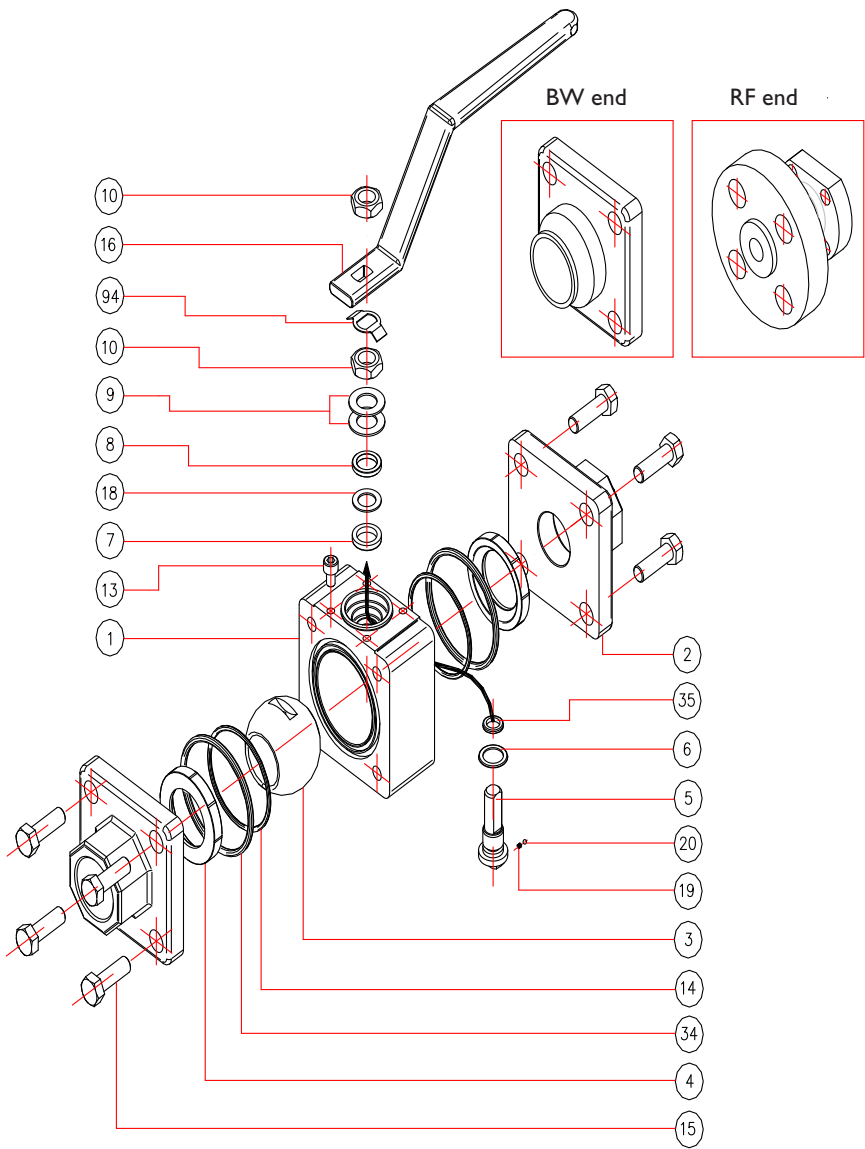


Table 1

Pos.	Quant.	Description
1	1	Body 1
2	2	Body 2
•• 3	1	Ball
• 4	2	Seat
•• 5	1	Stem
• 6	1	Stem seal
• 7	1	Stem packing
•• 8	1	Gland packing
•• 9	2	Spring washer
•• 10	2	Stem nut
13	2	Stop bolt
• 14	2	Body seal 1
15	8	Body bolt
16	1	Handle
• 18	1*	Thrust washer
•• 19	1	Spring
•• 20	1	Antistatic ball
• 34	2	Body seal 2
• 35	1	Stem O-ring
94	1	Stop washer

* FB: 2 up to NPS 1/2"
RB: 2 up to NPS 3/4"

- 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 6 (Maintenance)

MANUAL

AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

AL 33-K - Class 900 / Class 1500 / Classs 2500

- 3 pieces floating
- Class 900-1500: NPS 1/4" - 2"
- Class 2500: NPS 1/4" - 1"
- RF, RTJ, SW, BW, NPT, BSPP

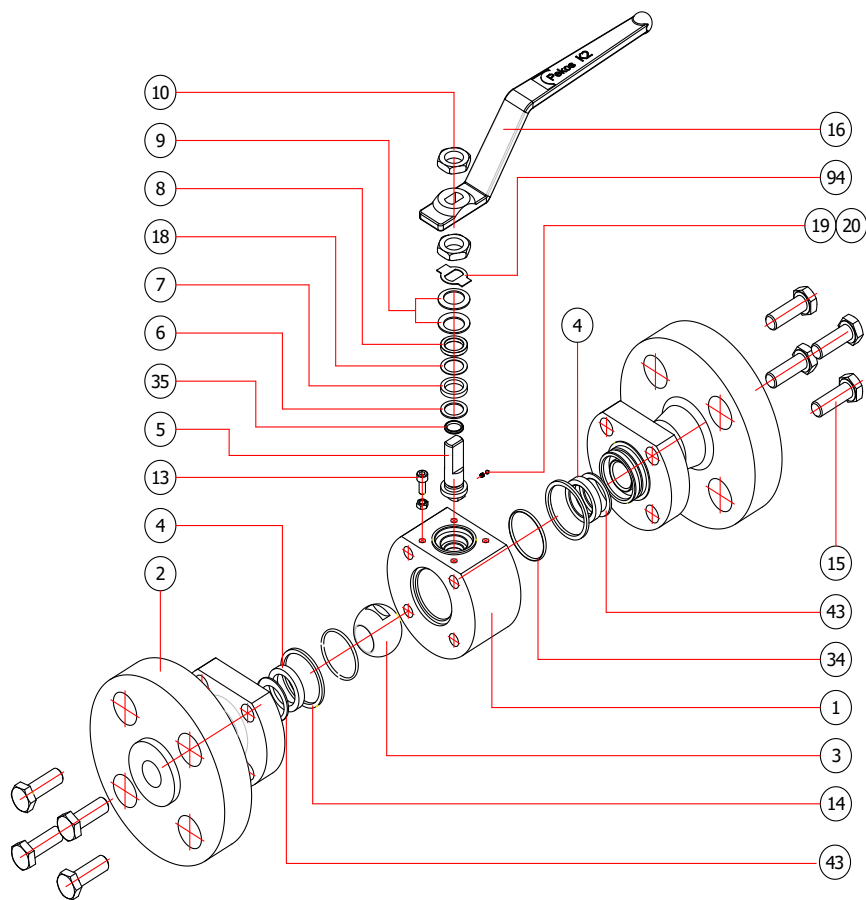


Table 1

Pos.	Quant.	Description
1	1	Body 1
2	2	Body 2
•• 3	1	Ball
• 4	2	Seat
•• 5	1	Stem
• 6	1	Stem seal
• 7	1	Stem packing
•• 8	1	Gland packing
•• 9	2	Spring washer
•• 10	2	Stem nut
13	2	Stop bolt
• 14	2	Body seal 1
15	-	Body bolt
16	1	Handle
• 18	1/2	Thrust washer
•• 19	1	Spring
•• 20	1	Antistatic ball
• 34	2	Body seal 2
• 35	1	Stem O-Ring
• 43	2	Seat Seal
94	1	Stop washer

- 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 6 (Maintenance)

MANUAL

AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

1. Scope

This manual is intended as a guide to assist customers or end-users in the correct storage, installation and maintenance of AL 33-K floating valves.

2. Applicability

This manual is applicable to AL 33-K floating ball valves as per norm ANSI three pieces with full or reduced bore, according to valve types at page I-4.

3. Storage

3.1 Supplying conditions

Carbon steel ball valves are supplied with a phosphatising treatment to protect against corrosion. These conditions are standard, but they can be changed on demand.

3.2 Maintenance during the 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 are bidirectional, so fluid can run in both directions.
- e. Valves can be mounted in any position in standard pipes 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.

4.1 Threaded connections

Use conventional sealings; PTFE, etc.

4.2 Welded connections - Class 800

Socket and butt welding:

- a. Weld four points in both end caps (2).
- b. Remove the body I (1) and complete the welding.
- c. Place the body I (1) and put the bolts (15).

Welded or integrated extension:

- a. With the valve in open position, weld in four points in both end caps (2).
- b. Finish the welding without disassembling the valve.

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4.2 Welded connections - Class 400 / Class 600 / Class 900 / Class 1500 / Class 2500

Please notice that the body (1) cannot be disassembled from the line for its maintenance. The valve must be extracted as a whole.

- With the valve in open position, weld in four points in both end caps (2).
- Finish the welding without disassembling the valve.

4.3 Flanged connections - Class 800

Join the pipes by means of bolts and nuts.

5. Operation

During operation, the valves must finish the open or closed position to assure the long life of the seats. If the valve remains in an intermediate position could be damaging to the soft seats.

5.1 Manual operation

The open and closed operation is carried out by turning the handle a quarter turn (90°). The valve is in open position when the handle is in line with the pipe and the valve. The valve is closed when the handle is perpendicular to the pipe.

5.2 Automatic operation

The valve can be operated automatically by: pneumatic actuator (double or single effect); hydraulic actuator, electric actuator or gear box. If a gear box is used, a stop is not included in the valve because it is part of the gear box.

6. Maintenance

It is recommended to inspect 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.

6.1 Valves revision

AL 33-K ball valves do not need lubrication and **the packing does not need maintenance.**

Seats (4), stem seal (6), stem packing (7), body seals (14 and 34), stem o-ring (35), ball (3) and stem (5) can be replaced easily using common tools (also Seat seal (43) for Class 900 / 1500 / 2500). **As replacement parts is advisable to follow the instructions below table I in page I-4.** 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.

6.2 Stem leakage

The packing system of the stem (5) of AL 33-K ANSI 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:

- If the valve contains handle, loosen the first stem nut (10) and remove the handle (16).
- Remove the stop washer (94) (does not apply for Class 400) and loosen the stem nut (10) using a tubular key.
- Remove the spring washers (9), the gland packing (8), the stem packing (7) and the thrust washer (18) and replace them. If it is necessary to replace the stem o-ring (35) and the stem seal (6), the body 2 (2) has to be disassembled to remove the stem (5).
- Reassemble the pieces accordingly as it is indicated in point 7.

6.3 Body leakage

These ANSI floating ball valves are constructed in 3 pieces, body I (1) and two body2 (2). Body bolts should be checked (see page 8-9) 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 ends (2) prior to dismantling, to ensure a correct alignment when reassembling.
Remove body bolts (15) and disassemble body2 (2).
- Substitute the body seals (14 and 34).
- Reassemble the pieces accordingly as it is indicated in point 7.
- Repeat the same operation with the other body 2 (2).

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Class 400 / 600 / 900 / 1500 / 2500

6.4 Seat leakage - Class 800

If leakage occurs, seats (4) must be replaced as it is shown:

- Maintaining the valve in closed position; loosen and remove body bolts (15) and remove body2 (2) from body1 (1) to check the ball (3) and the seats (4). To remove the ball (3), if necessary, bang it with a soft tool gently.
- Check the rest of components, and replace them if necessary.
- Assemble the pieces accordingly as it is indicated in point 7.

6.4 Seat leakage - Class 400 / Class 600 / Class 900 / Class 1500 / Class 2500

Please notice that the body (1) cannot be disassembled from the line for its maintenance. The valve must be extracted as a whole.

If leakage occurs, seats (4) must be replaced as it is shown:

- Cut the valve off the pipe. Maintaining the valve in closed position; loosen and remove body bolts (15) and remove body2 (2) from body1 (1) to check the ball (3) and the seats (4). To remove the ball (3), if necessary, bang it with a soft tool gently.
- Check the rest of components, and replace them if necessary.
- Assemble the pieces accordingly as it is indicated in point 7.

7. Re-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.
- Put the stem seal (6) and the stem o-ring (35) onto the stem (5). Check the antistatic devices (pos. 19, 20).
- Assemble the stem (5) into the valve as the arrow shows in the principal figure.
- Assemble the following components in the stem (5) in this order: stem packing (7), thrust washer (18), gland packing (8), spring washers (9) and stem nut (10), putting the stem (5) in closed position.
- Introduce carefully the ball (3) into the body 1 (1) aligning the ball groove with the stem.
- Put the body seals (14 and 34) into their housing of the body (1).
- Put the seats (4) into the body 1 (1). For Class 900 / 1500 / 2500 also Seat seal (43).
- Maintaining the valve in its closed position and ensuring that alignment marks are matched, joint the body 1 (1) and the body 2 (2). Assemble the body bolts (15) evenly tighten in diagonal using a torque wrench and the values indicated at page 8-9.
- Put the stop washer (94) (does not apply for Class 400).
- Put the handle (16) into its housing in the stem (5), and tighten the stem nut (10).
- Introduce the stop bolts (13) in the body 1 (1) and tighten them.
- Slowly cycle the valve until completing 1 cycle to ensure coupling between the seats (4) and the ball (3).
- Carefully cycle the valve twice in order to check the correct working. Stem 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.

If the valves are automatic:

- Reassemble the actuator. If necessary, check the stops.
- Firstly. Valve in open position and check if the ball is totally open.
- Secondly. Valve in closed position and check the closure.
- Valves with electric actuators must be tested beginning in an intermediate open-closed position. It is done to check that the electric connection and the rotation are right. If it is in a bad position, switch off the electric actuator immediately and change the direction. Torque and limit switch limiters are not effective if the rotation is incorrect.

MANUAL

AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

Bolt tightening specifications (Nm)

NOTE: Torque only for bolted valve components and with lubricated Bolt/Studbolt.

	L7M/B7M		B8M CL.2 / B8 CL.2		A2-70 / A4-70 F60/F51	
	MIN	MAX	MIN	MAX	MIN	MAX
M6	5,09	5,73	6,39	7,19	4,17	4,69
M8	11,99	13,48	15,04	16,92	9,81	11,03
M10	23,30	26,21	29,23	32,88	19,06	21,45
M12	40,12	45,14	50,33	56,63	32,83	36,93
M14	63,55	71,49	79,72	89,69	51,99	58,49
M16	97,04	109,17	121,74	136,96	79,40	89,32
M18	134,57	151,39	168,82	189,92	110,10	123,86
M20	188,02	211,52	235,88	265,36	153,83	173,06
M22	253,93	285,67	253,93	285,67	207,76	233,73
M24	323,16	363,55	323,16	363,55	264,40	297,45
M27	468,62	527,20	383,42	431,35	383,42	431,35
M30	652,05	733,55	533,49	600,18	533,49	600,18
M33	877,79	987,52	550,62	619,44	718,19	807,97
M36	1150,24	1294,02	721,52	811,70	941,11	1058,74
M39	1473,77	1657,99			1205,81	1356,54
M42	1852,75	2084,34			1515,88	1705,37
M45	2291,55	2577,99			1874,90	2109,27
M48	2794,56	3143,88			2286,46	2572,26
M52	3572,67	4019,25			2923,09	3288,48
M56	4483,06	5043,45			3667,96	4126,46
M60	5536,12	6228,13			4529,55	5095,74
M64	6742,20	7584,97			5516,34	6205,89
M68	8111,68	9125,64			6636,83	7466,43
M76	11382,31	12805,10			9333,50	10500,19

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AL 33-K

Class 400 / 600 / 900 / 1500 / 2500

Bolt tightening specifications (Nm)

NOTE: Torque only for bolted valve components and with lubricated Bolt/Studbolt.

	B8MA CL.1A / B8 CL.1		B7		L7		660	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
M6	1,90	2,14	6,67	7,50	6,71	7,55	5,42	6,09
M8	4,47	5,03	15,69	17,65	15,80	17,77	12,75	14,34
M10	8,68	9,77	30,50	34,31	30,71	34,55	24,78	27,88
M12	14,95	16,82	52,52	59,09	52,89	59,50	42,67	48,01
M14	23,69	26,65	83,19	93,59	83,76	94,24	67,59	76,04
M16	36,17	40,69	127,03	142,91	127,92	143,91	103,22	116,12
M18	50,16	56,43	176,16	198,18	177,38	199,56	143,13	161,02
M20	70,08	78,84	246,13	276,90	247,84	278,82	199,98	224,98
M22	94,65	106,48	332,42	373,97	334,73	376,57	270,09	303,85
M24	120,45	135,50	423,04	475,92	425,98	479,22	343,72	386,68
M27	174,67	196,50	613,47	690,16	617,73	694,95	498,45	560,75
M30	243,04	273,41	853,59	960,28	859,51	966,95	693,54	780,23
M33	327,18	368,07	1149,11	1292,75	1157,09	1301,73	933,65	1050,36
M36	428,73	482,32	1505,77	1693,99	1516,23	1705,76	1223,44	1376,37
M39	549,31	617,98	1929,30	2170,46	1942,69	2185,53	1567,55	1763,50
M42	690,57	776,89	2425,41	2728,59	2442,26	2747,54	1970,65	2216,98
M45	854,12	960,89	2999,85	3374,83	3020,68	3398,27	2437,38	2742,05
M48	1041,61	1171,81	3658,33	4115,62	3683,74	4144,20	2972,39	3343,94
M52	1331,63	1498,08	4676,95	5261,56	4709,42	5298,10	3800,02	4275,02
M56	1670,96	1879,83	5868,74	6602,33	5909,49	6648,18	4768,35	5364,39
M60	2063,46	2321,39	7247,28	8153,19	7297,61	8209,81	5888,41	6624,47
M64	2513,00	2827,13	8826,15	9929,42	8887,44	9998,37	7171,25	8067,65
M68	3023,44	3401,37	9660,27	10867,80			8627,87	9706,36
M76	4263,19	4796,09	13576,00	15273,00			12106,64	13619,97