Installation, Operation & Maintenance Instruction (Flanged End Ball Valves)

1. **Scope: This instruction applies to 2-PC Body Flanged End Ball Valves.**
   Mounting Pad: KV-041, KV-042, KV-061, KV-062, KV-04J, KV-04K, KV-04M, KV-04N, KV-06J, KV-06K, KV-06M, KV-06N, KV-04A, KV-04C, KV-06A, KV-06C
   Direct Mount: KV-L41, KV-L42, KV-L61, KV-L62, KV-L4J, KV-L4K, KV-L4M, KV-L4N, KV-L6J, KV-L6K, KV-L6M, KV-L6N, KV-L4A, KV-L4C, KV-L6A, KV-L6C
2. **Warning (Restrictions on Use)**
   a. Temperature and Pressure Limit
   - The normal maximum operating pressure at maximum or minimum operating temperature is shown on nameplate.
   - The operating temperature is within -29^0C to 200^0C(if shell is WCB),or -40^0C to 200^0C(if shell is stainless steel) for PTFE or RTFE seat and sealing. Other seat and sealing operating temperature shall be checked with KI Industries.
   - The nominal pressure (PN) rating describes maximum working pressure in cold operating temperature (e.g. PN40 describes maximum working pressure 40 bar at -39^0C～40^0C).

   b. Don't throttling operation
   - Don't leave the ball partly open (throttling operation) where the pressure drop and/or flow rate damage to the valve seats and/or ball.
3. **Installation**
   a. Remove the protective cover on both flange end, and clean or flush the valve in fully open position.
   b. Prior to mounting, flush and clean the pipeline and valve to remove all accumulated extraneous maters.
   c. During the handing process, do not use the valve stem or handle (wheel) as a fulcrum for the lifting cable to avoid collapse and accidental injury.
   d. The valve may be fitted in any position and direction in the pipeline.
   e. Make sure the pipeline at the installation point is not bent down and/or tension, use a pipe hanger or supports for the purpose to eliminate any deviation of the piping.
   f. Tighten the flange bolt crosswise using the stipulated torque, to see bellow table A.

Table A: Torque figure for Flange Bolt tighten

Material & Unit / Bolt Size	Alloy Steel (B7)		Stainless Steel	
	IN-LB	N.M	IN-LB	N.M
5/16-18UNC/M8	240	27.2	100	11.3
3/8-16UNC	420	47.5	160	18.1
7/16-14UNC/M10	660	74.7	280	31.7
1/2-13UNC/M12	1000	113.2	400	45.3
9/16-12UNC/M14	1460	165.2	580	65.6
5/8-11UNC/M16	2010	227.4	800	90.5
3/4-10UNC/M20	3580	405.1	1400	158.4
7/8-9UNC/M22	5770	652.9	2250	254.6
1-8UNC/M24	8650	978.7	3250	367.7
1,1/8-8UNC/M28	12700	1437.0	4000	452.6

Table B: Torque figure for Stem Nut tighten

Valve Size	IN-LB	N.M
1/2 "	70～80	8.0～9.0
3/4 "	70～80	8.0～9.0
1 "	90～100	9.0～11.3
1-1/4 "	90～100	9.0～11.3
1-1/2 "	140～160	15.8～18.1
2 "	140～160	15.8～18.1
2-1/2 "	180～200	20.4～22.6
3 "	180～200	20.4～22.6
4 "	250～270	28.3～30.6
5 " ～6 "	300～350	34.0～39.6
8 "	580～630	65.6～71.3
10 "	800～850	90.5～96.2

4. **Operation and Use**
   a. Flush the ball valve and pipeline thoroughly again before operation.
   b. The operation of the valve consists of turning the stem(by manual or automated means)1/4 turn(900)clockwise to close, and 1/4 turn counter-clockwise to open.

c. When the handle (if used) and/or stem flats or groove are in line with the pipe, the valve is open.

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d. Operating torque requirements will vary depending on the length of time between cycles, media in the system, line pressure and type of valve seat. The figures in the following table C are based on PTFE seats with clean water as the media.

Table C: Torque Value

△ P difference-pressure unit: inch-lb/nm

Size\△P		75Psi	150Psi	300Psi	700Psi
		5Bar	10Bar	20Bar	50Bar
1/2 "	DN15	35/4.0	35/4.0	35/4.0	35/4.0
3/4 "	DN20	46/5.2	46/5.2	46/5.2	46/5.2
1 "	DN25	77/8.7	77/8.7	77/8.7	84/9.5
1-1/4 "	DN32	91/10.3	91/10.3	105/11.9	119/13.4
1-1/2 "	DN40	126/14.3	126/14.3	168/19.0	196/22.2
2 "	DN50	196/22.2	231/26.1	252/28.5	287/32.5
2-1/2 "	DN65	315/35.6	364/41.2	406/45.9	504/57.1
3 "	DN80	434/49.1	504/57.1	560/63.4	805/91.1
4 "	DN100	700/79.2	840/95.1	1050/118.8	1400/158.4
5 "	DN125	1520/171.2	1600/180.8	1840/208	2560/288.8
6 "	DN150	2000/225.6	2160/244	2400/271.2	3600/406.4
8 "	DN200	2800/316	3040/343.2	3440/388	5280/596
10 "	DN250	5840/659.2	6800/767.2	7760/876	11360/1282.4

5. Maintenance

Long life and maintenance-free of valves can be maintained under normal working conditions and in accordance with pressure/temperature and corrosion data chart.

Warning:

✶ Ball Valves can trap pressurized fluids in the Ball cavity when closed position.

✶ Prior to maintenance, relieve the line pressure and put ball in open position.

a. Re-tighten packing

- Should a leakage occur at the gland packing, retighten the stem (gland) nut (13).
- Take care that the stem nut (13) are not tighten too much. Normally the leakage can be stopped by simply turning the stem nut (13) by 300 to 600.

b. Replacement of seats and seals.

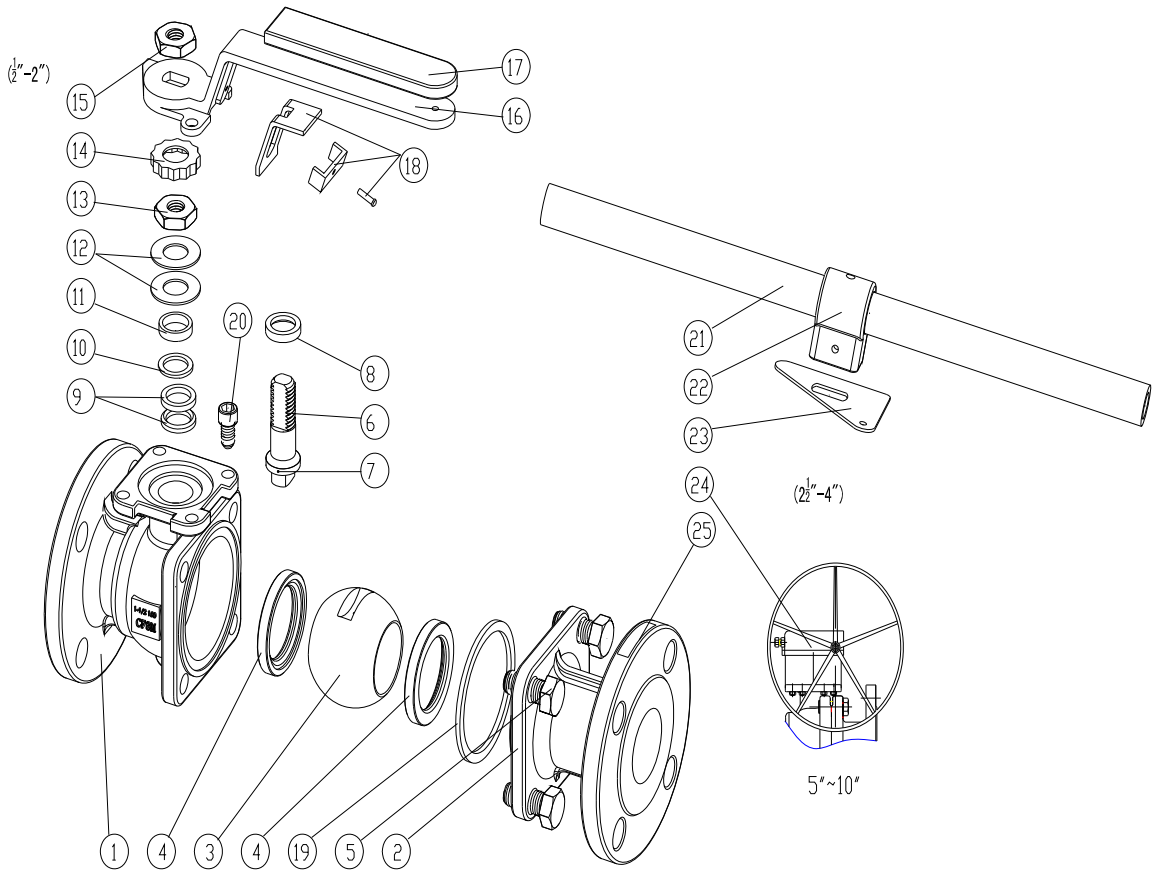
Disassembly

- Place the valve in half-open position and flush the line to remove any hazardous material from the valve body.
- Place the valve in close position, remove both counter flange bolts & nuts and lift valve from line.
- Remove handle nut (15), handle (16) or actuator set, stop-lock-cap (14), stem nut (13), Belleville washer (12), gland (11), bush(10).
- Remove body bolt (5) or stud nut to allow end cap (2), separated from body (1), remove body gasket (19).
- Make sure ball in ”Close” position, thus the ball (3) can be taken out easily from body, then take out body ball seat.
- Push stem (6) down into the body cavity and remove, then remove stem seal-ring (8), V-stem

packing (9) from the body.

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Caution: Use care to avoid scratching the surface of stem and packing chamber.



Reassembly

- Reassembly process is reverse sequence of disassembly.
- Clean and inspect all parts, full replacement of all soft parts (seats and seals) are strongly recommended.
- Tighten the body bolt (5) crosswise using the stipulated torque figure (see table A)
- Tighten the stem nut (13) using the table B stipulated torque figure.
- Cycle the valve slowly with gentle back and forth motion to build gradually to full quarter turn.
- If possible, test the valve before placing it back to line for service.