

UNI-S83 / S84

3/4-way ball valve

Installation and
Operating manual

3/4-WAY BALL VALVE, 1000/ 800 PSI, WITH ISO DIRECT MOUNT
S83/ S84 SERIES/ PED Category II

English Version

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1. General Precautions

- a. **Material Selection:**

The possibility of material deterioration in service and the need for periodic inspections is depended on the contained fluid. Carbide phase conversion to graphite, oxidation of ferrite materials, decreasing in ductility of carbon steels at low temperature (even in applications above -29□) are among those items. Even information about corrosion data is provided in this user manual, the user is requested to take attention or consideration to determine the suitability of material in their application.
- b. **Pressure-Temperature rating:**

The Pressure-Temperature rating is considered for static pressure. Please refer to P & T rating section on page 9 for working precaution. The allowable temperature is between -29□ and 180□ do not exceed the temperature range to avoid danger accident happen.
- c. **Static electric effect:**

The ball valves are provided with anti-static devices for ball-stem-body when required. When service conditions require electrical continuity to prevent static discharge, the user is responsible for specifying static grounding.
- d. **Fire safe condition:**

In the type, we don't have the fire safe design products.
- e. **Liquids with high fluid velocity:**

When ball valves must be operated frequently on liquids with very high velocity, a check shall be made with the valve distributor or manufacturer for appropriate advice to minimize the possibility of seat deformation, especially when they are highly pressurized on high-temperature line.
- f. **Throttling service:** Ball valves are generally not recommended for throttling service, where both the fluid flow and the leading edge of the ball can damage or deform the resilient ball seats causing leakage. High fluid velocity or the presence of solid particles in suspension will further reduce seat life in throttling applications.
- g. Do not open the bonnet or cap when bearing pressure. Valve is not equipped with pressure access device. User should check it by other method through its piping system.
- h. Do not touch the surface of valve on high temperature.
- i. Not allowed for unstable fluid, otherwise specified with category III in Declaration of conformity or/and in this user manual.
- j. Lock design on the handle to avoid the valve operated by non-related people.
- k. According to the test, the RPTFE(+15% Glass) seat will abrade the ball as the valve were operated. The abnormal abrasion will cause the torque become larger, and the set actuator will not fit to operate. Pure PTFE or TFM1600 can solve the problem wile frequent operate.

2. Product Description

2.1 Feature

- a. Full Bore
- b. Thread/ SW/ BW ends for option
- c. Blowout proof stem design
- d. Anti-static devices for ball-stem-body (when required)
- e. Available in 3-way & 4-way
- f. Available in T-port, L-port, X (double L)-port or even I-port
- g. Heavy-duty body & end cap construction with traceable heat number.
- h. Pressure self-relief seat to prevent pressure built up.
- i. ISO5211 direct mount
- j. Stem Shape: DIN3337

2.2 Product specification

The scope of product specifications are as following

Item No.	PN	Art.3 Para3 of PED No CE Marking	Category I	Category II
S83/S84	55	DN 08, 10,15, 20, 25	---	DN 32, 40, 50, 65, 80, 100

2.3 Material of construction & Common dimension

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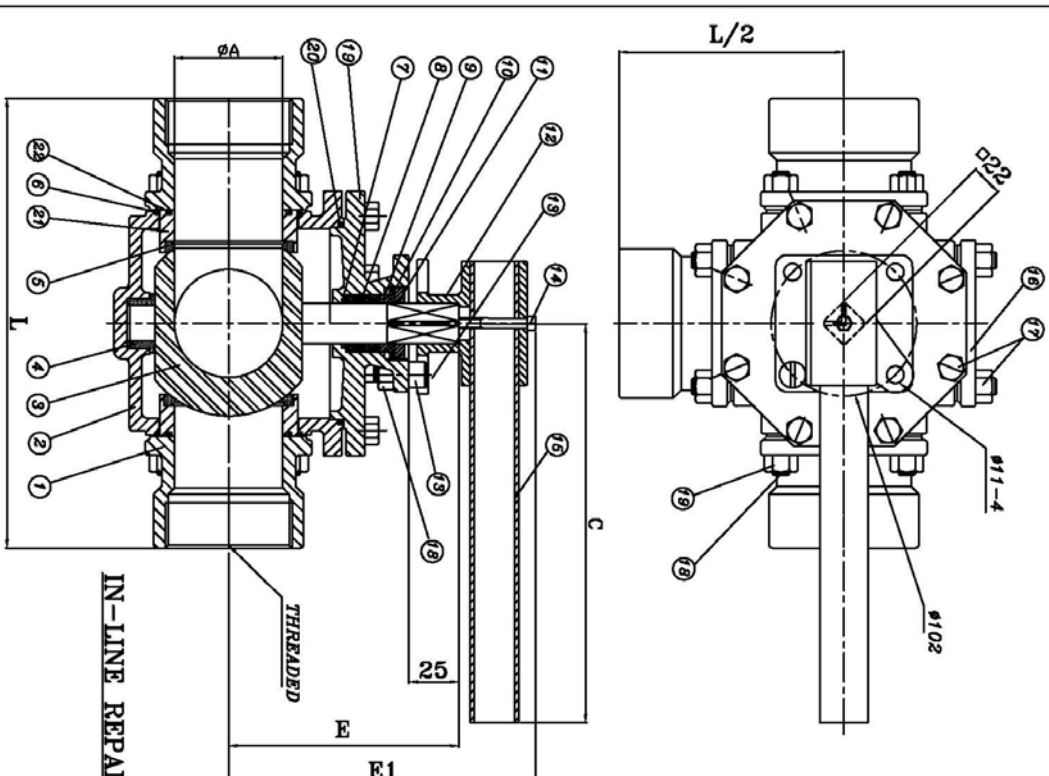
NO.	NAME OF PARTS	MATERIALS	OPTION
1	END CAP	A351 Gr. CF8M	A216 Gr. WC8
1A	SEAT HOUSING	A351 Gr. CF8M	A216 Gr. WC8
1B	HOUSING GASKET	PTFE	
2	GASKET	PTFE	
3	BODY	A351 Gr. CF8M	A216 Gr. WC8
4	BALL	SS 316	
5	SEATS	PTFE	
6	STEM	SS 316	
7	THRUST WASHER	RP-TiE	
8	O-RING	VTION	
9	STEM PACKING	PTFE	
10	GLAND	SS 304	
11	BELLEVAILE WASHER	SS 301	
12	STEM NUT	SS 304	
13	NUT STOP	SS 304	
14	SPACE WASHER	SS 304	
15	PLATEAU WASHER	SS 304	
16	HANDLE NUT	SS 304	
17	HANDLE	SS 304	
18	COVER	PLASTISOL	
19	STOP PIN	SS 304	
20	PIN	SS 316	

SIZE	A	B	C	d1	d2	E	F	G	H	K	L	R	S	T	N	Port
1/4	37.5	9.5	130	6.0	6.0	62	36	42	9	43.5	87	11.1	14.2	10	17.5	11
3/8	37.5	9.5	130	6.0	6.0	62	36	42	9	43.5	87	11.1	17.5	12	20	12
1/2	42	11	130	6.0	6.0	64	36	42	9	52	104	12.7	21.7	15	22.5	15
3/4	48.5	14	165	6.0	7.1	82	42	50	11	55.5	111	14.3	27.1	20	28.5	20
1	55.5	14	165	6.0	7.1	89	42	50	11	63.5	127	15.9	33.8	25	34.5	25
1 1/4	63	17	205	7.1	9.2	98	50	70	14	69.5	139	17.5	42.5	31.8	43.5	31.8
1 1/2	73.5	16	205	7.1	9.2	108	50	70	14	79.5	159	19.1	48.6	38	49.5	38
2	92.5	21	325	9.2	11.4	140	70	102	17	95	190	22.2	61.1	50	61.5	50

- Available in stainless steel or carbon steel
- Body & end are investment cast
- Self adjusting stem packing
- Available in 3 way & 4 way
- Available in T-port or L-port
- 4 piece ball seats
- Blow-out proof stem design

- Full bore and standard(reduce) bore
- 100% air tested under water at 80-100 psi
- Working pressure 800 psi
- Temperature range -20 to 450°F
- ISO 5211 direct mounting pad / connection DIN 3337
- End cap type : threaded , socket weld , butt weld

NAME	3 way ball valve	DWG.	%	DATE	SEP.10.2009



IN-LINE REPAIRABLE

NAME	3 way ball valve	DWG.	Shawn	DATE	SEP.14.2009
	(2-1/2" - 4")				

- Available in stainless steel or carbon steel
- Body & end caps are investment cast
- Self adjusting stem packing
- Available in 3 way & 4 way
- Available in T-port or L port
- 4 piece ball seats
- Blow-out proof setrn design
- 100% air tested under water at 100 psi
- Working pressure 600 psi
- Temperature range -20 to 450°F
- ISO 5211 direct mounting pad / conection DIN 3337
- Threaded end cap : ANSI B2.1(NPT),DIN269(BSP),BS21(BSP)

Unit : mm

SIZE	A	C	E	E1	L	H	S	T	N	
2 1/2"	62	400	144	200	294	265	22.2	73.9	85	78
3"	76	500	182	218	317	290	25.4	89.9	90	84
4"	96	650	182	238	369	345	32	115.2	100	117.3

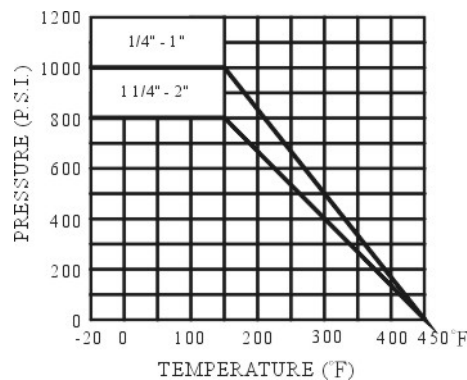
ITEM	NAME OF PARTS	MATERIALS OPTION
1	END CAP	ASTM A351 Gr. CF8M / ASTM A216 WCB
2	BODY	ASTM A351 Gr. CF8M / ASTM A216 WCB
3	BALL & STEM	SS 316 / SS 316 / PTFE+STAINLESS
4	HOUSING	PTFE+STAINLESS
5	SEATS	PTFE
6	GASKET	PTFE
7	O-RING	VITON
8	STEM PACKING	PTFE
9	GLAND WASHER	SS 304 / SS 304 / PTFE
10	BELLEVILLE WASHER	SS 301 / SS 301 / SS 304
11	GLAND	SS 304 / SS 304 / ASTM A351 Gr. CF8
12	HANDLE HEAD	ASTM A351 Gr. CF8 / SS 304 / SS 304
13	STOP PIN	SS 304 / SS 304 / CARBON STEEL
14	BOLT	SS 304 / ASTM A351 Gr. CF8M / CARBON STEEL
15	LEVER	SS 304 / SS 304 / CARBON STEEL
16	BLANK END	ASTM A351 Gr. CF8M / SS 304
17	CONNECTION BOLTS	SS 304 / SS 304 / SS 304
18	END CAP BOLTS	SS 304 / SS 304 / SS 304
19	BOLT NUTS	SS 304 / SS 304 / SS 304
18	STOP PIN NUT	SS 304 / A351 Gr. CF8M / PTFE
19	BONNET	PTFE / ASTM A216 WCB
20	BONNET GASKET	PTFE
21	SEAT HOUSING	ASTM A351 Gr. CF8M / PTFE
22	BONNET GASKET	PTFE / ASTM A216 WCB

3. Design Specification

Items	Standards/Codes
Standards of Design (P-T rating)	ANSI B16.34
Testing	API 598
Mounting Pad	ISO-5211 direct
Material of Casting (Body, Cap, Ball)	ASTM A351
Bolt and Nut	ISO-3506 (A2-70)
Steel Casting	MSS SP-55

4. Pressure Temperature Ratings

The pressure-temperature rating of ball valves are determined, not only by valve shell materials, but also by sealing materials used for ball seats, stem packing, and body seal. Sealing materials may be high molecule, elasticity and hardness, however, the choice is limited by the characteristics of the service fluid, temperature, pressure, velocity of fluid, frequency of valves operation and sizes of ball valves etc, Followings are the general rating charts for non-shock fluid service for floating ball valves distinguished by sizes and seating materials, please refer to section 1, General precaution.



5. Delivery Condition and Storage

- a. Packing condition: Is there any damaged during the transportation.
- b. The bolts of cap and yoke: to make sure the bolt does not loose tightness when it arrived.

Valves must store in an indoor warehouse to avoid dusts and other foreign object, do not exposed in an open space without to put a cover over or take off the packing under an unnecessary situation.

6. Installation and Operation

6.1 Handling

During the ball valve installation, it must follow the procedure to handle at the both side of the bodies. If using cable for big size valve, be make sure the cable must be strong enough to ensure the safety during the installation.

6.2 Cleaning

Even the valves was transported under a clean environment, operator must check is there any foreign body or dusts inside the bore. If yes, clean it before installation. Operator clean the valves by water, compression air, or steam (automation valve shall be cleaned only with water or steam, the compression air is not allowed.) For cleaning operation, first step is put the valve bore perpendicular to the ground and clean, ensure all the dusts can be removed from the bore. The second step is checking and cleaning all the connecting pipe bore and connection area. No flush, rust and foreign bodies allow to avoid the blocking and leakage.

6.3 Valve Installation (Install to the pipeline system)

a. Direction

Most of the valves do not restrict the flow direction.

b. End caps welding

In S83, multi-way ball valve type, welding ends (SW or BW) are asked to dismantle and weld to the pipe line first. After the temperature cool down, fabricate the complete valve. This will prevent the soft kits such as gasket, seats, stem packing, thrust washer from damaging by the high temperature while welding. Most of time the new gasket are required for keep from leaking.

c. Position

The body, cap and gasket are in the connection area of ball valve and pipeline. The bear weight ability and gradient are very important to the pipe installation. Do not make the pressure from the pipeline and stress to concentrate on the connecting area of body and cap. It will cause the deformed and leakage, and the ball, seat, and stem will stick, leaking, and damaged.

d. Systems hydrostatic test

Before delivery, valves are tested 1.5 times the allowable pressure at ambient temperature. After installation, the piping system may subject to system tests, as condition not to exceed the above mentioned pressure.

6.4 Actuator installation

The ball valves are provided with ISO 5211 actuator attachment. Following is the flange type against sizes of the ball valves.

SIZE	Mounting Pad
Full	
DN08	F03/ F04
DN10	F03/ F04
DN15	F03/ F04
DN20	F04/ F05
DN25	F04/ F05
DN32	F05/ F07
DN40	F05/ F07
DN50	F07/ F10
DN065	F10
DN080	F10
DN100	F10

The sizes of actuator and setting of the input power or pressure of actuator are depended on the operation torque. The following table lists the maximum torque valves of each flange type. User is recommended to refer to the instruction of actuator supplier. Overload torque applied by the actuator may transfer the un-intended load to ball valve itself or to the piping joints. Setting of the input power or pressure of the actuator is better not to exceed 1.5 times of the operation torque data.

Torque Values (Nm) for S83/S84, 3/4-way ball valve, 4 seats					
Size		non-grease		with-grease	
Full Bore	Standard bore	Break Torque at 0 psi	Break Torque at 800 psi	Break Torque at 0 psi	Break Torque at 800 psi
1/4"~3/8"	1/4"~1/2"	15.4	19.2	10.3	15.4
1/2"	3/4"	16.0	21.8	12.8	18.0
3/4"	1"	19.2	28.2	15.4	23.1
1"	1-1/4"	37.2	51.3	32.1	43.6
1-1/4"	1-1/2"	14.0	77.0	34.6	55.2
1-1/2"	2"	61.6	87.2	55.2	74.4
2"	\	96.2	192.4	71.8	128.3
2-1/2"	\	128.0		134.7	179.6
3"	\	250.1		147.5	320.7
4"	\	320.7		237.3	423.3

d. Systems hydrostatic test

Before delivery, valves are tested 1.5 times the allowable pressure at ambient temperature. After installation, the piping system may subject to system tests, as condition not to exceed the above mentioned pressure.

6.5 Operation

- a. For manual operation, shift the handle in counter clockwise and clockwise for changing the flow

7. Put into service

- 7.1 After install to the pipeline, it is necessary to check the function of the product. Thus, operate the valve about 3 times to ensure the function.
- 7.2 The whole pipeline system may be tested with a proper pressure. User shall take care that the testing pressure shall not be exceeded 1.5 times the allowed working pressure.
- 7.3 After pressure testing, user shall operate the valve again about 3 times to ensure the function.

8. Dangers of inappropriate use

- 8.1 Never uses the product exceed its allowed condition, such as pressure, temperature and fluid.
- 8.2 If the product has any inappropriate use, the product was damage however there are no signals occurs immediately. User shall change the product to avoid danger in the future.

9. Maintenance

9.1 Maintenance frequency

The maintenance frequency is determined upon the application of ball valve. User shall consider the time interval depend on the kinds of fluid, flow velocity, operation frequency, high-pressure effect and high-temperature effect etc.

The soft kits need to be replaced are seat, gasket (bonnet gasket), stem packing, thrust washer, O-ring, and stem housing.

9.2 Disassembly

9.2.1 The user should check the service kit of S83, if available in the local market, if not, please do not disassembly the valve, otherwise, please make an order from the original manufactory for the service kit. (suggestion: every time dismantle the ball valve, we suggest replacing the new seals and seats of the valve to prevent from leaking before assembling)

9.2.2 To dismantle the valve must follow the procedure and drawings and be take care as mentioned below.

9.2.3 It doesn't matter where is the position of valve located, usually it contained the seal up fluid, so operator must be very carefully when remove the valve on the pipe. It must operate the ball a little and let the fluid come out slowly, it also need to watch out the poisonous and inflammability objects if there is any.

9.2.4 To dismantle the valve body, release the end cap carefully. It must be take care to dismantle the ball to avoid the seat retainer fall down from end cap.

9.2.5 To lift the ball by hoist, it must make the protection on corner to avoid the ball damaged by metal contacted. The right position for store the valve is put the open end on to the ground. This procedure is protecting the surface of the ball.

9.3 Parts inspection, maintenance and replacement:

9.3.1 Check the surface of ball is it scraped? It may use the PT for inspection if necessary. If there is any damaged on the surface, than found out the root cause such as the dirt fluid...etc. It must avoid the damage factors as far as possible.

9.3.2 The damaged of the ball surface, to gauge is it located on the contacting area of ball and ball seat? If it is the case, than the ball must take a fine milling. If it cause a heavy damaged, than it must welded and re-machined again. If it cannot be repaired than change a new ball.

9.3.3 If the scraped area is not at the location described in the item above, than it must re-fine milling the damage area again. Otherwise, the ball will damage the soft seat during the open and close operation or it will dig out the ball seat and cause a heavy damage to ball and seat.

9.3.4 Check the wall thickness of valve body and cap. The minimum thickness shall be maintained in according to EN12516-1 table 10.

9.3.5 To inspect the surface of soft seat, has it any scrape mark, concave, dusts (including weld dregs, iron bit, sands...etc.), abrasion, abnormal press scrape, and a tiny scrape. Usually, the scrape mark and damage by dusts will occur the same time as ball damaged. It is the root cause for leakage. If leakage occur before repairing, than suggest to change a new soft seat (PTFE or RTFE). The mark from press or fine scrape is happen in an abnormal operation pressure. It must reconsider to choice a right valve.

9.3.6 The stem packing may be replaced by the new parts after dismantle the valve. User shall make sure that your distributor able to serve the same packing of your valve if you do not have a service pack. **To tight the gland nut, please see Section 10 for torque data.**

9.3.7 To do the final inspection for a valve, it must operate 10 times to ensure all the parts are assembled correctly. To ensure the torque in a same value during the open/close operation. If the torque is not the same in operation, than it may has some parts in a not corrected position or interference. It must dismantle and re-assembly. Otherwise, it is easy to damage if let this valve works on a pipeline under higher pressure.

9.4 Assembly

For assembly process, it takes the opposite way of dismantle process. The the stopper must be located at the right place, otherwise, the operation will be opposite.

9.5 Heating jacket

Most of time, the heating jacket was not asked to clean. When clean the heating jacket, make sure the heating media was stop flowing, and release the pressure of the heating media. Make sure the temperature was no higher than 37°C (100°F).

10. Torque Data

Stem nut, body & end bolt (Nm)

Size (Full)	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
Stem Nut (Nm)	10	18	18	25	25	30	108	108	108
Bolt Torques	17	17	20	35	45	55	60	68	120

Ret til ændringer forbeholdes / subject to changes / Änderungen vorbehalten