BALL VALVE ASSEMBLY AND MAINTENANCE PROCEDURE

REF. DOC.MMM900N Rev.1 – March 2014

SERIES M

DIN / ANSI

CE

Ex II 2 G D c

REVIEW CONTROL

PROCEDURE REF.DOC.MMM900N

REV.	DATE	CARRIED OUT BY	APPROVED BY	DESCRIPTION
0	12/05/2013	E.Hidalgo	J.Tejedor	Initial Edition
1	27/03/2014	D.Grau	J.Tejedor	Update standards

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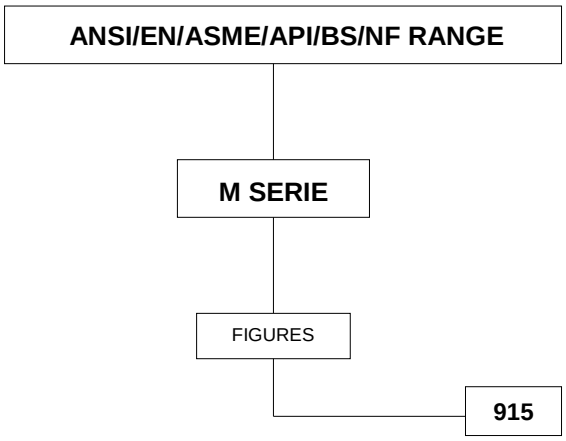
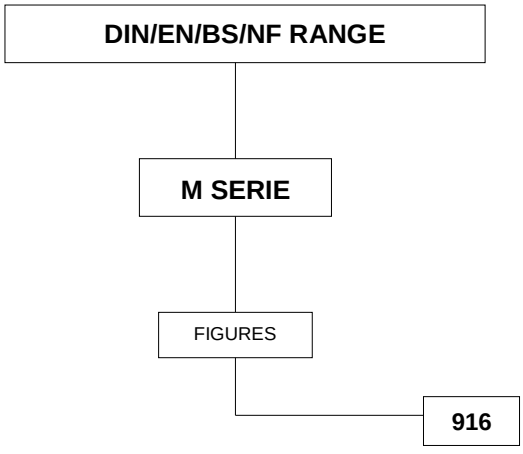
1.- APPLICABLE RANGE





2.- GENERAL INFORMATION

2.1 STATEMENT

JC's M Series Ball Valves have been designed and manufactured for the use, circulation and control of fluids in those industrial processes in which conditions are suitable for the performance levels of the valves, according to the applicable standards.

Steel & Stainless Steel Valves DN greater than 25 – 1"

JC Fábrica de Válvulas, S.A states that JC valves covered by this certificate have been designed and manufactured according to the following European Directive requirements:

- European Pressure Equipment Directive 97/23 EC: Evaluation Procedure of Conformity Mod H1, certified by Bureau Veritas nº:
  Fig.916: CE-0056 PED-H1D-JCV 003-11-ESP. Rev.A
  Fig.915: CE-0056 PED-H1D-JCV 004-11-ESP. Rev.A
- Directive 94/9 EC ATEX, classification Group II, Cat 2 for use in explosive atmospheres, areas 1,2 & 21,22. Evaluation of conformity according to Appendix VIII. Marking CE Ex II2GDc.

Applied harmonized and non-harmonized technical Standards:

- EN 10213, EN 19, EN 12266-1, EN 10204. EN 1983, others, see JC's Catalogue and Assembly & Maintenance Procedures.
- EN 13463-1, EN 1127-1.

Steel & Stainless Steel Valves DN smaller than 40 – 1 ½"

JC Fábrica de Válvulas, S.A states that JC valves covered by this certificate have been designed and manufactured according to the following European Directive requirements:

- European Pressure Equipment Directive 97/23 EC: classified according article 3, part 3, cat SEP, must not carry the CE label.
- Directive 94/9 EC ATEX, classification Group II, Cat 2 for use in explosive atmospheres, areas 1, 2 & 21,22. Evaluation of conformity according to Appendix VIII. Marking CE Ex II2GDc.

Applied harmonized and non-harmonized technical Standards:

- EN 10213, EN 19, EN 12266-1, EN 10204, EN 1983, others, see JC's Catalogue and Assembly & Maintenance Procedures.
- EN 13463-1, EN 1127-1.

The electrical and mechanical extras are not covered by this statement and will have to carry their own in order to be assembled with JC valves.

The suitability of the materials and the design of the type of valve in terms of their working conditions is the responsibility of the end user of the valve.

2.2 M SERIES FOR CONSTRUCTIONS ANSI/EN/ASME/API/BS/NF

DESCRIPTION OF THE APPLICABLE VALVES

Module H1 (ISO EN 9001)

Series	Body	Ball	Bore	Class	JC Fig.	DN	Flanges
M	"Split body"	Floating	Full	150#	915	1½" - 8"	RF

APPLICABLE TECHNICAL STANDARDS

EN 19: Marking of general purpose industrial valves.
EN 1503-2: Valves - Materials for bodies, bonnets and covers - Part 2: Steels other than those specified in European Standards.

Valves design	ASME B 16.34
Body design	ASME VIII Div 1
Shell thickness	ASME B 16.34 / EN 1256-1
Flanges	ASME B 16.5 / EN 1092-1
Face-to-face dimensions	ACCORDING MANUFACTURER
Surface finish	MSS SP 55
Parts in contact with the fluid & bolting	NACE MR 01.75
Marking	EN 19 / API 6D / BS ISO 17292 / EN 1983
Pressure testing	API 598 / EN 12266 / ISO 5208 / NF EN 1759-1/NF EN 1092-1
Actuator mounting flange	ISO - EN 5211

2.3 M SERIES FOR CONSTRUCTIONS DIN/EN/BS/NF

DESCRIPTION OF THE APPLICABLE VALVES

Module H1 (ISO EN 9001)

Series	Body	Ball	Bore	ISO PN	JC Fig.	DN	Flanges
M	"Split body"	Floating	Full	16	916	25-200	C Form

APPLICABLE TECHNICAL STANDARDS

EN 19: Marking of general-purpose industrial valves.
EN 1503-2: Valves - Materials for bodies, bonnets and covers - Part 1: Steels specified in European Standards.

Valves design:	DIN EN 1983 / BS EN 17292
Body design:	DIN 3840
Shell thickness:	EN 1256-1
Flanges:	EN 1092-1
Face to face dimensions:	ACCORDING MANUFACTURER
Surface finish:	MSS SP 55
Parts in contact with the fluid & bolting	NACE MR 01.75
Marking:	BS EN 17292 / DIN EN 1983
Pressure testing:	DIN 3230 / EN 12266 / ISO 5208
Actuator mounting flange:	DIN 3337 / ISO - EN 5211

2.4 SCOPE OF INSTALLATION ACCORDING TO THE TYPE OF FLUID (DANGEROUS FOR THE ENVIRONMENT OR HUMAN HEALTH)

GROUP 1 CLASSIFICATION

- The incorporation of additional safety elements "Double packing" is recommended for the range of products included in Group 1.

- The use of valves without additional safety devices in Group 1 will be the responsibility of the user or the purchaser, as well as the advisability of installing leakage detection systems.

GROUP 2 CLASSIFICATION

- Carbon Steel valves will not be used in corrosive fluids lines.

Warning!!
When the use of fluids that could cause damage to human's health, environment or property is expected, then the necessary safety elements to prevent risks must be used!

ENVIRONMENTAL CONSIDERATIONS:

According to the premises marked by the ISO 14000 Regulations and the environmental policy of JC Fábrica de Válvulas.

The recyclability of the components that form part of JC valves is the following:

Recyclable components:

Metal parts, PTFE (hard), plastic plug (low-density polyethylene).

Non-recyclable components:

PTFE mixed with other compounds (Glass-fiber, graphite, etc…), nylon, graphite and graphite mixed with metal.

2.5 DESIGN CONDITIONS

SERIE M
FOR CLASS-DESIGNATED VALVES
ACCORDING API 6D / ANSI B 16.34 / BS EN ISO 17292 / EN 1983

CLASS 150 - ISO PN 20

	Unit	A216 WCB	A351 CF8M
Class	Psig	150	
Design Temp.	ºC	-29 / 230 (see Note 1)	-50 / 230 (see Note 1)
Design Pressure	Psi / N/mm²	285 / 1.965	275 / 1.896
Test Temp.		Ambient	
Test Pressure	Psi / N/mm²	428 / 2.947	412 / 2.844
Casting quality factor		0.8	

SERIE M
FOR PN-DESIGNATED VALVES
ACCORDING DIN EN 1983 / BS EN ISO 17292

ISO PN 16

	Unit	1.0619	1.4408
PN	Bar	16	
Design Temp.	ºC	-20 / 230 (see Note 1)	-50 / 230 (see Note 1)
Design Pressure	Bar / N/mm²	16 / 1.6	16 / 1.6
Test Temp.		Ambient	
Test Pressure	Bar / N/mm²	24 / 2.4	24 / 2.4
Safety Factor (Casting)		PN (2), PE (1.5)	

Note 1: Seats in PTFE. For other seat materials consult JC's Catalogue or the manufacturer.

3.- INSPECTION ON RECEPTION AND STORAGE

All valves will be examined on reception to ensure that they have not suffered any damages during transport, if they have, inform the supplier immediately.

Valves will be supplied in open position as a measure of protection to avoid that no foreign body can damage the ball.

WARNING !!
Valves will be stored under cover and protected from inclement weather conditions and foreign bodies.

Valves will not be unpacked until they are to be definitively installed, except for inspection purposes. After inspection they will be packed again.

4.- INSTALLATION

The handling and transport of the valves must be carried out with extreme precaution and using the necessary and adequate means on the basis of their size and weight, to avoid any risks to the people handling them.

WARNING !!
Do not use the wrench to hold the valve during handling, assembly or transport.

Check the state of the valve to see if there is any damage been caused by the transport and/or handling.
Likewise, check the inside of the valve and the inside of the pipe that connects up to the valve. It is of utmost importance that there are no foreign bodies that can damage the the valve seats, as these parts are fundamental for the correct functioning of the valve.

WARNING !!
If you know that the valve will be installed at a collection point for waste, such as welding slag, rust or scale, then, protective filters or screens must be used on the line, temporarily or definitively (depending on the installation) before connecting with the valve.

The valve must be installed in such a way that it is accessible for the necessary periodic inspections and maintenance to guarantee the performance levels for which it has been designed.

JC Standard M Series constructions up to –20ºC have been designed without fluid direction preference.

The valve can be installed with the stem facing any position, even though, it is recommended that this is done in a vertical position with the stem facing upwards.

WARNING !!
The installation must be made with a correct alignment and parallelism in order to ensure that they are not put under unexpected stress.

Make sure when installing the valve that the flange seal that connects up to the valve is correctly fitted, following the seal manufacturer's instructions and making sure it is compatible with the circulating fluid in the pipe.

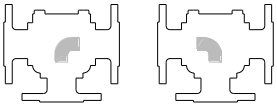
IMPORTANT!
After the installation, run a final check on the valve, opening and closing it to make sure that it is perfectly working.

WARNING !!
Make sure that the fluid used in the cleaning operation and the way the cleaning is done is compatible with the installed valve.

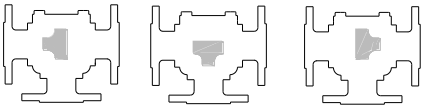
Once the final cleaning operation is done prior to bringing the valve on line, if filters have been installed they can be removed or, on the other hand, if the end user considers that rust or scale formations may have been formed, then, filters should be left permanently.

Valves of three or four ways must be installed in the correct position according to what they are destined to. The entrance and exit is deduced by the position indicator (30). Connections: DIN-2501 or ANSI B16.5.

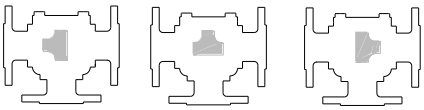
3 WAY "L" PORT



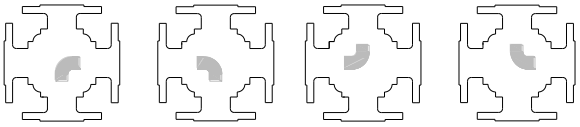
3 WAY "T" PORT



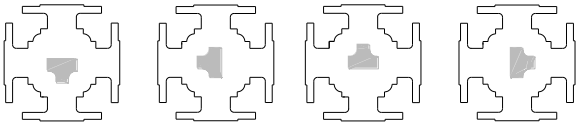
3 WAY INVERTED "T" PORT



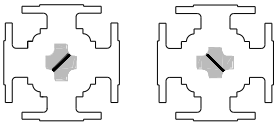
4 WAY "L" PORT



4 WAY "T" PORT



4 WAY "X" PORT



5.- PREVENTIVE MAINTENANCE

The preventive maintenance operation consists of a periodic inspection to ensure that the valve is working correctly.

Valves must be opened and closed at least once every six months, and depending on the fluid and /or application of the valve, shorter periods will have to be established.

The user will be responsible of establishing the adequate opening and closing schemes that are appropriate for the working conditions and fluids used in the valve.

WARNING!!
Never leave the valves open or closed for a long period of time.

A very high torque increase may be due to foreign bodies in the seats. Therefore, without forcing the valve, you should proceed to the inspection of the seats, in order to avoid damage to the ball.

It is advisable to replace the seals and seats when an in-depth revision of the installation is made.

6.- MAINTENANCE OPERATIONS

PRECAUTIONS BEFORE DISASSEMBLY!!

Make sure that the line has been closed and depressurised.
Open and close the valve several times in order to release the pressure and drain the valve cavity.

WARNING !!
Wear protective clothing adequate to the circulating fluid.
(Comply with the safety guidelines of your Company!)

Remove the valve from the line in closed position and clean off any remaining fluid.

Any replacement of parts must be done using original JC spare parts!!

The manufacturer will not be responsible of the malfunctioning of the valve if original JC spare parts are not used !!.

7.- REASONS FOR PARTS REPAIR AND REPLACEMENT

7.1 LEAKAGE THROUGH THE PACKING

If leakage is detected through the packing, tighten the gland nut (12) by an eighth of a turn.

Repeat this operation if leakage persists. If leakage continues, then replace the packing (8).

7.2 LEAKAGE THROUGH THE BODY SEAL

If leakage is detected through the body seal (19 or 74), then the seal must be replaced.
Follow the instructions of point 7.4.

7.3 CHANGE OF THE PACKING

We recommend that when changing the packing, the seats, body seal and stem thrust washers are also replaced. However, if it is not possible to dissassembly the valve from the line due to process needs, then follow the sequence below:

7.3.1 DISASSEMBLY

Check that the installation is not under pressure.

Remove the wrench (14) or actuator, remove the gland nut (12), the disk springs (10), the position indicator (11T - 11L). Remove the stop (9.1), marking its top side for re-assembly, then the thrust washer (13), the gland ring (9) and finally remove the gland packing rings pos. (8)

7.3.2 ASSEMBLY

Check that the interior of the housing of the packing is complete clean and free of particles that can damage the surface of the stem or housing. Place the new gland packing rings (8), the gland ring (9), the new thrust washer (13), the stop (9.1) with the marked side facing upwards, the disk springs (10), the position indicator (11T – 11L) and tighten the gland nut (12) up to the torque indicated in point 8.

7.4 CHANGE OF SEATS, PACKING AND SEALS

7.4.1 DISASSEMBLY

Make sure that the installation is not under pressure.

Disassembly the valve from the line. If the circulating fluid is noxious or inflammable, precautions must be taken to avoid possible accidents.

Completely unscrew the bolts (15.1) of the body - side cover (2.1), bearing in mind that there may be fluid trapped in the body cavity. Separate the side cover (2.1) from the body (1).

Remove the seat (4) from the side cover (2.1) and the seal (19) from the body-cover.

Partially unscrew the bolts (15) from the body connectors (2) adjacent to the side-cover.

Turn the ball (3) in such a way that you can remove it from the body (you must turn the ball until the keyhole notch is aligned with the stem of the side cover (2.1).

Clean the exterior surfaces of the bore and slot, checking that the pressure release hole at the bottom is not blocked.
Check the external side of the ball, specially the area in contact with the seats and the radius of transition between the external surface and the bore. If the surface of the ball or slot are damaged, then replace the ball with a new one.

Separate the three body connectors (2) from the body (1). Remove the three seats (5) from the body connectors and the three seals (74) of the body-side cover.

Disassemble the stem (5). For this operation follow points 7.3.1 and 7.3.2. Then, remove the stem through the interior of the body. Remove the thrust washer (6). The stem has an O'ring (72) that will have to be replaced.

7.4.2 ASSEMBLY

Before assembling the parts, check that they have not suffered any damage and that the cleaning of these parts and interior of the valves has been completed.

Check that the spare parts are JC original, made of the same materials and with the same dimensions as the parts being replaced.

WARNING !!
If the valve has to be degreased (Oxigen, Hydrogen, Peroxide, etc. services) please contact the manufacturer.

Insert the thrust washer (6) into the stem (5). The spare parts set includes two thrust washers. In some nominal diameters they are the same, in case they are different, this thrust washer (6) is the one with the thicker gauge.
Fit the O-ring (72) into the stem slot.

Insert the stem (5) into its housing through the inside of the body.

Assemble the packing and the other parts according to points 7.3 & 7.4.

Turn the stem in such a way that the ball can be introduced into its body housing (1). Introduce the ball (3) in its housing, checking that there is no movement between the ball and the stem.

Fit the four new seats (4) in the body connectors (2) and side cover (2.1).

Fit the new seals (74) and the new o-rings (52) and the new seats (4) on the three body cvonnectors (2). Adjust them to the body using the bolts (15) (following the adequate sequence) so that the ball is situated between the three seats. Move the lever to situate the ball in its place.

Check that the flange holes are in the same position with regard to the valve's axis of symmetry.

Place in the side cover (2.1), the new body cover seal (19) in the body housing, the new O-ring (52.1) in its housing and the new seat (4) of the side cover (2.1). Place the side cover (2.1) over the body screwing it following the adequate sequence.

Check that the ball turns with no difficulty. Check the position of the holes of the body connectors so that the flange holes are correctly situated regarding the valve's axis of symmetry.

Assemble the side cover (2.1) or fourth way, if it applies, with its seat (4), O-rings (19 & 52.1) and bolts.

Check that the ball turns without difficulty and tighten the bolts of the body connectors and side cover following the adequate sequence.

Assemble the wrench (14) or actuator.

Before re-assembling the valve on the line, in half open position, check the tightness of the packing and body connectors and then close it to check the tightness of the seats.

8.- MAXIMUM GLAND NUT TIGHTNESS TORQUE IN m.Kp.

NOMINAL DIAMETER	PTFE PACKING
25	1.6 to 2.5
32	2.5 to 4
40	2.5 to 4
50	5 to 6.5
65	5 to 7.5
80	5 to 6.5
100	6 to 8
125	6.5 to 9
150	17 to 21
200	17 to 21

9.- TIGHTNESS TORQUE CHART OF THE BOLTS/NUTS OF THE BODY-BODY CONNECTOR VALUES IN MKG.

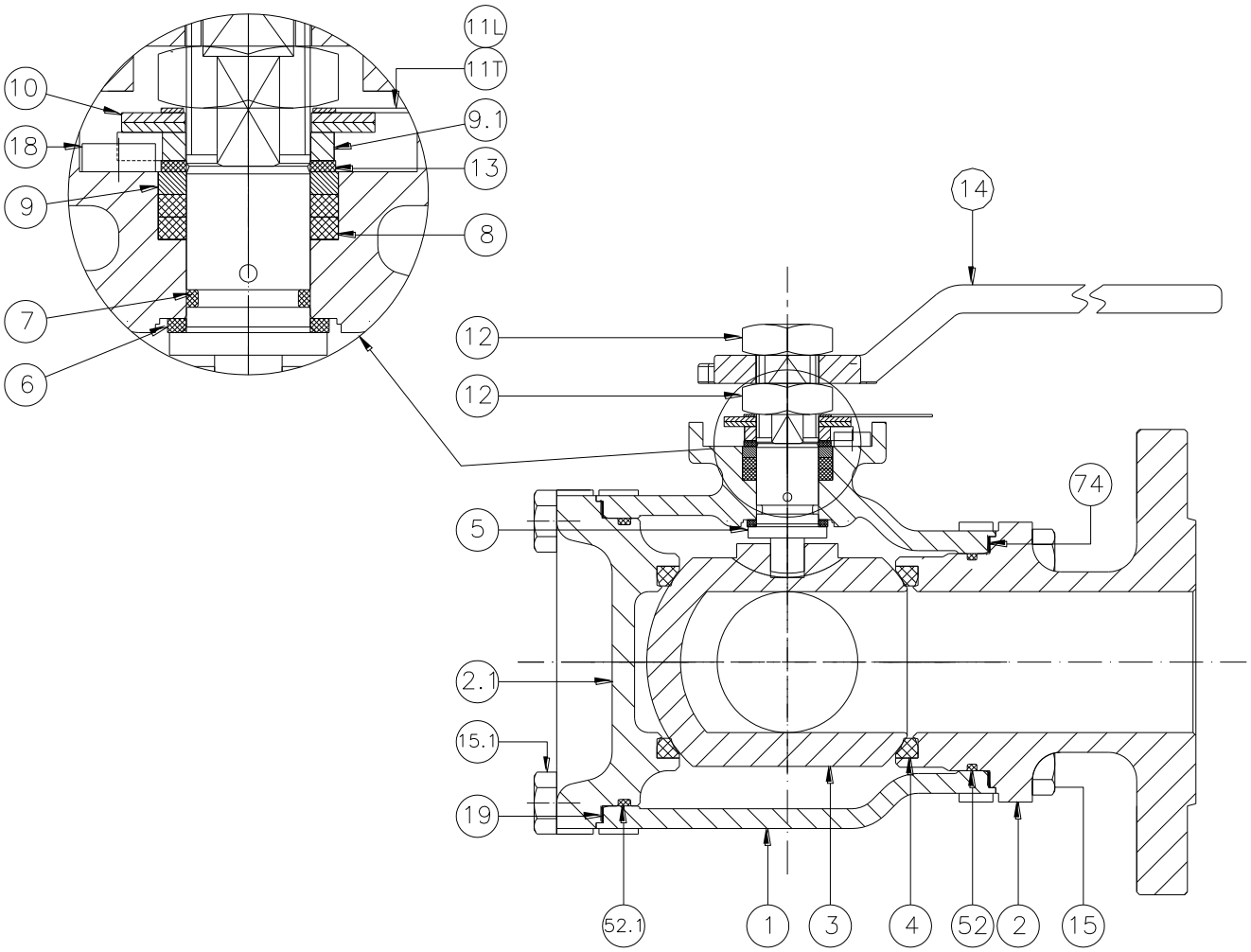
METRIC THREAD FOR DIN CLASS (*) **UNC THREAD FOR ANSI CLASS (**)**

Elastic limit 0.2% (Kg/mm²)	64	45
Material	8.8	A4.70
ØStud		
M.6	1.2	0.9
M.8	3	2.1
M.10	5.9	4.2
M.12	10.4	7.3
M.14	16.5	11.6
M.16	25.7	18.1
M.20	50.2	35.3

Elastic limit 0.2% (Kg/mm²)	21	55	72.4	55
Material	B8/B8M	L7M	B7	B7M
ØStud				
3/8”	1.57	4	5.44	4
7/16”	2	5.5	7.4	5.5
1/2”	2.6	7	9.5	7
9/16”	4.2	11	15	11
5/8”	6.3	16.5	22.5	16.5
3/4”	10	27	37	27
7/8”	16.8	44	59	43
1”	25	65	87	72
1.1/8”	35	93	125	93
1.1/4”	48	128	171	128
1.3/8”	70	167	223	167
1.1/2”	95	247	330	247

(*) CALCULATION WITH LUBRICATION WITH SAE 10 AND LOAD NOT HIGHER THAN 80% OF THE ELASTIC LIMIT.
(**) CALCULATION WITH A FRICTION COEFFICIENT OF 0.12 AND 75% OF THE ELASTIC LIMIT.

10.- SOFT SEATED VALVE *Serie 916- 915 - 3 WAY*



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