JC VALVES
The quality option

BALL VALVE ASSEMBLY AND MAINTENANCE PROCEDURE
REF. DOC.MMM500E Rev. 23 – May 2026

SFF & SFR SERIES



SFF / SFR
EN/ANSI/ASME/API/BS/NF

SFF
EN/DIN/BS/NF

CE

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REVIEW CONTROL

PROCEDURE REF.: DOC.MMM500E

REV.	DATE	CARRIED OUT BY	APPROVED BY	DESCRIPTION
0	12/03/2001	C. Gallardo	J. Tejedor	General adaptation to EC Directive
1	12/07/2001	JM. Camps	J. Tejedor	Orthographic correction
2	25/10/2001	C. Gallardo	J. Tejedor	Temp. Design. ANSI Class
3	16/05/2002	C. Gallardo	J. Tejedor	Add note page 8 / Add important note page 10 Change of material values chart " Din Thread Assembly ", page 15
4	08/05/2003	C. Gallardo	J. Tejedor	Add note (*) page 8
5	12/12/2003	C. Gallardo	J. Tejedor	Incorporation of the ATEX Declaration page 5
6	16/02/2005	J. Rubio	J. Tejedor	Update of improvements (add position 72 & 39)
7	14/06/2006	J. Rubio	J. Tejedor	Changes in Design Conditions, page 9
8 & 9	02/04/2008	J. Rubio	J. Tejedor	Updates in EN standards, pages 5-7 Add section "Environmental Considerations" page 8
10	05/05/2011	D. Grau	J. Tejedor	Update of Standards, working temperatures and drawings
11	27/03/2014	D. Grau	J. Tejedor	Update of Standards
12	11/12/2014	E. Hidalgo	J.Tejedor	Add Class 900 & 1500
13	21/07/2016	A. Velasco	J.Tejedor	Update of Directives
14	04/06/2020	D. Grau	J. Rubio	Add Fig. 615 & 630
15	02/01/2021	D. Grau	J. Rubio	General update, add Fig. 500Q SEAL +
16	06/09/2021	D. Grau	J. Rubio	Add class 900 and 1500
17	29/08/2022	D.Grau	J.Rubio	Corrections
18	25/01/2023	N.Berger	J.Rubio	Standards update
19	19/01/2024	D.Grau	J.Rubio	ATEX information
20	02/08/2024	D.Grau	J.Rubio	PE UHMW seat material
21	17/10/2024	D.Grau	J.Rubio	Environmental considerations
22	22/05/2025	D.Grau	J.Rubio	Valve Scope update
23	14/05/2026	D.Grau	J.Rubio	Update gland nut disassembly

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FERGO Armaturen GmbH
Blindeisenweg 31
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0.- NOMENCLATURE

SFF: Split body, Floating ball, Full bore.
SFR: Split body, Floating ball, Reduce bore.
DN: Nominal Diameter.
NPS: Nominal Pipe Size.
CE: Marking in accordance with European Regulations.
JC: JC Valves.
PN: Nominal Pressure.
CLASS: Nominal pressure in Imperial units according to ANSI standards.
RF: Raised Face Flange.
LMF: Large Male Face Flange.
SMF: Small Male Face Flange.
LFF: Large Female Face Flange.
SFF: Small Female Face Flange.
LTF: Large Tongue Face Flange.
STF: Small Tongue Face Flange.
LGF: Large Groove Face Flange.
SGF: Small Groove Face Flange.
FB: Full Bore.
RB: Reduce Bore.

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1.- APPLICABLE RANGE

The different valve models included in this manual are divided according to the regulations applicable to the design, resulting in two main groups that are classified as follows.

1.1.- ANSI Valves

RANGE	BORE	SEATS	FACE TO FACE	JC FIGURE	RATING	DESCRIPTION	NPS	FLANGES (B16.5)
ANSI/ASME/API/BS/NF	SFF FULL BORE	SOFT SEAT	LONG PATTERN	515	150#	Floating Ball Valve, Full Bore, Class 150 #, Soft Seat	1/2"- 8"	RF LMF SMF LFF SFF LTF STF LGF SGF
				530	300#	Floating Ball Valve, Full Bore, Class 300 #, Soft Seat	1/2"- 6"	
				560	600#	Floating Ball Valve, Full Bore, Class 600 #, Soft Seat	1/2"- 4"	
				590	900#	Floating Ball, Full Bore, Class 900 #, Soft Seat	1/2"- 2"	
				550	1500#	Floating Ball Valve, Full Bore, Class 1500 #, Soft Seat	1/2"- 2"	
				515Q SEAL +	150#	Floating Ball Valve, Full Bore, Class 150 #, Soft Seat	1/2"- 8"	
				530Q SEAL +	300#	Floating Ball Valve, Full Bore, Class 300 #, Soft Seat	1/2"- 6"	
		METAL SEAT		3515	150#	Floating Ball Valve, Full Bore, Class 150 #, Metal Seat	½" – 8" (**)	
				3530	300#	Floating Ball Valve, Full Bore, Class 300 #, Metal Seat	½" – 6" (**)	
				3560	600#	Floating Ball Valve, Full Bore, Class 600 #, Metal Seat	½" – 4" (**)	
				3590	900#	Floating Ball Valve, Full Bore, Class 600 #, Metal Seat	½" – 2" (**)	
				3550	1500#	Floating Ball Valve, Full Bore, Class 600 #, Metal Seat	½" – 2" (**)	
				3515Q SEAL +	600#	Floating Ball Valve, Full Bore, Class 150 #, Metal Seat	½" – 8" (**)	
				3530Q SEAL +	600#	Floating Ball Valve, Full Bore, Class 300 #, Metal Seat	½" – 6" (**)	
	SFR REDUCED BORE	SOFT SEAT		615	150#	Floating Ball Valve, Reduced Bore, Class 150 #, Soft Seat	1/2"- 8"	
				630	300#	Floating Ball Valve, Reduced Bore, Class 300 #, Soft Seat	1/2"- 6"	
				660	600#	Floating Ball Valve, Reduced Bore, Class 600 #, Soft Seat	1/2"- 4"	
				690	900#	Floating Ball Valve, Reduced Bore, Class 900 #, Soft Seat	1/2"- 2"	
				650	1500#	Floating Ball Valve, Reduced Bore, Class 1500 #, Soft Seat	1/2"- 2"	
		METAL SEAT		3615	150	Floating Ball Valve, Reduced Bore, Class 150 #, Metal Seat	½" – 8" (**)	
				3630	300	Floating Ball Valve, Reduced Bore, Class 300 #, Metal Seat	½" – 8" (**)	
				3660	600	Floating Ball Valve, Reduced Bore, Class 600 #, Metal Seat	½" – 6" (**)	
				3690	900	Floating Ball Valve, Reduced Bore, Class 900 #, Metal Seat	½" – 2" (**)	
				3650	1500	Floating Ball Valve, Reduced Bore, Class 1500 #, Metal Seat	½" – 2" (**)	

(**) Limitations on working pressure apply to metal-seated valves.

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1.2.- DIN Valves

RANGE	BORE	SEATS	FACE TO FACE	JC FIGURE	RATING	DESCRIPTION	DN	FLANGES
EN/DIN/BS/NF	SFF FULL BORE	SOFT SEATS	SHORT PATTERN SERIE 27	516	PN16	Floating Ball Valve, Full Bore, PN16, Soft Seat	65-200	Type A (FF) Type B (RF) Type C (Tongue) Type D (Groove) Type E (Spigot) Type F (Recess) Type G (O-ring Spigot) Type H (O-ring Groove)
				540	PN40	Floating Ball Valve, Full Bore, PN40, Soft Seat	15-150	
				516Q SEAL +	PN16	Floating Ball Valve, Full Bore, PN16, Soft Seat	65-200	
				540Q SEAL +	PN40	Floating Ball Valve, Full Bore, PN40, Soft Seat	15-150	
			LONG PATTERN SERIE 1	563	PN63	Floating Ball Valve, Full Bore, PN63, Soft Seat	15-100	
				599	PN100	Floating Ball Valve, Full Bore, PN100 Soft Seat	15-100	
				316	PN16	Floating Ball Valve, Full Bore, PN16, Soft Seat	65-200	
				340	PN40	Floating Ball Valve, Full Bore, PN40, Soft Seat	15-150	
				316Q SEAL +	PN16	Floating Ball Valve, Full Bore, PN16, Soft Seat	65-200	
				340Q SEAL +	PN40	Floating Ball Valve, Full Bore, PN40, Soft Seat	15-150	
		METAL SEATS	SHORT PATTERN SERIE 27	3516	PN16	Floating Ball Valve, Full Bore, PN16, Metal Seat	65-200 (**)	
				3540	PN40	Floating Ball Valve, Full Bore, PN40, Metal Seat	15-150 (**)	
				3516Q SEAL +	PN16	Floating Ball Valve, Full Bore, PN16, Metal Seat	65-200 (**)	
				3540Q SEAL +	PN40	Floating Ball Valve, Full Bore, PN40, Metal Seat	15-150 (**)	
			LONG PATTERN SERIE 1	3563	PN63	Floating Ball Valve, Full Bore, PN63, Metal Seat	15-100 (**)	
				3599	PN100	Floating Ball Valve, Full Bore, PN100 Metal Seat	15-100 (**)	
				3316	PN16	Flaoting Ball Valve, Full Bore, PN16, Metal Seat	65-200 (**)	
				3340	PN40	Floating Ball Valve, Full Bore, PN40, Metal Seat	15-150 (**)	
				3316Q SEAL +	PN16	Floating Ball Valve, Full Bore, PN16, Metal Seat	65-200 (**)	
				3340Q SEAL +	PN40	Floating Ball Valve, Full Bore, PN40, Metal Seat	15-150 (**)	

(**) Limitations on working pressure apply to metal-seated valves.

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2.- GENERAL INFORMATION

2.1 Declaration of conformity (2014/68/EU)

JC FÁBRICA DE VÁLVULAS S.A.U DECLARES THAT:

The aforementioned ball valves, classified as pressure equipment, have been designed and manufactured in accordance with the requirements of the Pressure Equipment Directive 2014/68/EU.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

NOTIFIED BODY THAT CARRIED OUT THE INSPECTION:

BUREAU VERITAS INSPECCIÓN Y TESTING, S.L. (Notified Body nr 0056)

Camí de Ca n'Ametller, 34, 08195 Sant Cugat del Vallés - Barcelona - Spain
Quality System Approval Certificate reference number: **CE-0056-PED-H1-JCV001-17-ESP Rev. A**

For Categories I, Notified Body is not required.

CONFORMITY ASSESSMENT PROCEDURE FOLLOWED:

MODULE H1, ANNEX III of the DIRECTIVE 2014/68/EU & UKCA PESR 2016 No.1105

The CE marking must not be affixed for SEP equipment.

The aim of the declaration described above is in accordance with the following harmonized legislation:

Basic application standards: EN 12266-1:2012, API 598 ed.9 (2009), EN ISO 17292:2015, ASME B16.34-2013, ASME B16.10-2009, ASME B16.5-2013, ASME B16. 25-2012, EN 558: 2008, API 6D ed.24 (2014), API 600 ed.13 (2015), API 6FA ed.3 (1999), ISO 10497:2010, API 607 ed.6 (2010), EN 1983:2013, ISO 5211:2017.
For specific standards for each type of figure, consult JC technical datasheets. Other DIRECTIVES that apply to this product: ATEX 2014/34/EU.
NOTE: When ball valves have accessories that are affected by any Directive, they will be CE marked, if applicable, and the declaration of conformity of the valve itself must be accompanied by the manufacturer's declaration of the accessory.

2.2 Declaration of conformity (2014/34/EU)

JC FÁBRICA DE VÁLVULAS S.A.U DECLARES THAT:

In accordance with the analysis of risks carried out by the Quality Department of JC Fábrica de Válvulas S.A.U as stated in point 5 & 6 of standard UNE EN ISO 80079-36, the valves JC can be classified for use in potentially explosive atmospheres caused by mixture of air, gases, vapours, mists or suspended dusts within:
(Ref . expedient JC Fábrica de Válvulas S.A.U report Nº 201003 Rev.0)

GROUP II CATEGORY 2
EPL Gb & Db (Equipment Protection Level, not any effective source of ignition during normal operation and foreseeable malfunction)
APPROPRIATE TO INSTALE ON ZONES 1,2 AND 21,22.
NON-ELECTRICAL TYPE OF PROTECTION CONSTRUCTIONAL SAFETY "c"
(See EN 1127-1 and Directive 1999/92/EC for definitions)

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EQUIPMENT CONCERNED

All Ball Valves included in this manual.

ASSESMENT OF CONFORMITY PROCEDURE FOLLOWED

ANNEX VIII OF DIRECTIVE 2014/34/EU

MARKING

ATEX Directive marking: ⟨Ex⟩ **II 2 G D** (Notified body do not required)

IECEx marking (acc. ISO 80079-36): ⟨Ex⟩ ***II 2 G Ex h IIC T6 Gb;*** ⟨Ex⟩ ***II 2 D Ex h IIIC T85ºC Db*** *(not used in JC valves)*

The object of the declaration described above is in conformity with the relevant Union harmonization legislation: UNE EN ISO 80079-36, UNE EN ISO 80079-37 constructive security – protection c, EN 1127-1, Directive 1999/92/EC, Directive 2014/34/EU

OTHER DIRECTIVES THAT APPLY TO THIS PRODUCT

Pressure Equipment Directive 2014/68/EU

NOTE: The electrical accessories are not covered by this Declaration, anyone of them assembled to the valves JC must bear its particular CE ATEX mark and declaration.

2.3.- Applied Technical Standards

2.3.1 Valves denomination by class

Fire Safe Certificate:	BS 6755 Part 2 / API 607 / API 6FA / ISO 10497
Valve design:	API 6D / ANSI B 16.34 / EN 1983 / ISO 17292 / ISO 14313
Body Design:	ASME VIII Div 1
Shell thickness:	ASME B 16.34 / ISO 17292
Flanges:	ASME B 16.5
Face-to-face dimensions:	ASME B 16.10 / API 6D
Shell finishing quality:	MSS SP 55
Parts in contact with the fluid and bolting:	NACE MR 01.75
Marking:	EN 19 / API 6D / ISO 17292 / MSS SP 25
Pressure testing:	API 598 / ISO 5208 / EN 12266 / API 6D
Actuator mounting flange:	ISO 5211
Fugitive emissions:	EN 15848-1 & 2, TA LUFT

2.3.2 Valves denomination by PN

Fire Safe Certificate:	BS 6755 Part 2 / API 607 / API 6FA / ISO 10497
Valve design:	EN 1983 / ISO 17292
Body Design:	DIN 3840
Shell thickness:	ISO 17292
Flanges:	EN 1902-1
Face-to-face dimensions:	EN 558
Shell finishing quality:	MSS SP 55
Marking:	EN 19 / API 6D / ISO 17292 / MSS SP 25
Actuator mounting flange:	ISO 5211
Fugitive emissions:	EN 15848-1 & 2, TA LUFT

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2.4-Standard design conditions

2.4.1 SFF & SFR series for class-designated valves according to API 6D/ANSI B16.34/ISO 17292/EN 1983/ISO 14313.

2.4.1.1 Ball valve class 150 - ISO PN 20

CLASS 150	Unit	A216 WCB / PTFE	A351 CF8M / PTFE
Class	150		
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50/230 (see 2.4.)
Design Pressure	Psi/bar	285/19.6	275/19
Test Temp.	Room		
Test Pressure	Psi/bar	435/30	420/29

2.4.1.2 Ball valve class 300 - ISO PN 50

CLASS 300	Unit	A216 WCB / PTFE	A351 CF8M / PTFE
Class	300		
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50/230 (see 2.4.)
Design Pressure	Psi/bar	740/51	720/49.6
Test Temp.	Room		
Test Pressure	Psi/bar	1110/76.5	1079/74.4

2.4.1.3 Ball valve class 600 - ISO PN 100

CLASS 600	Unit	A216 WCB / PTFE	A351 CF8M / PTFE
Class	600		
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50/230 (see 2.4.)
Design Pressure	Psi/bar	1480/102	1440/99.3
Test Temp.	Room		
Test Pressure	Psi/bar	2219/153	2161/149

2.4.1.4 Ball valve class 900 - ISO PN 150

CLASS 900	Unit	A 105 / PTFE	A182 F316 / PTFE
Class	900		
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50/230 (see 2.4.)
Design Pressure	Psi/bar	2219/153	2160/148.9
Test Temp.	Room		
Test Pressure	Psi/bar	3336/230	3234/223

2.4.1.5 Ball valve class 1500 - ISO PN 250

CLASS 1500	Unit	A 105 / PTFE	A182 F316 / PTFE
Class	1500		
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50/230 (see 2.4.)
Design Pressure	Psi/bar	3703/255.3	3600/248.2
Test Temp.	Room		
Test Pressure	Psi/bar	5554/383	5400/372.3

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2.4.2 SFF Series for PN-designated valves according to ISO 17292 / EN 1983

2.4.2.1 Ball valve ISO PN16

ISO PN16	Unit	1.0619 / PTFE	1.4408 / PTFE
PN	bar	16	
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50 / 230 (see 2.4.)
Design Pressure	bar	16	16
Test Temp.	Room		
Test Pressure	bar	24	24

2.4.2.2 Ball valve ISO PN40

ISO PN40	Unit	1.0619 / PTFE	1.4408 / PTFE
PN	bar	40	
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50 / 230 (see 2.4.)
Design Pressure	bar	40	40
Test Temp.	Room		
Test Pressure	bar	60	60

2.4.2.3 Ball valve ISO PN63

ISO PN63	Unit	A 105 / PTFE	A182 F316 / PTFE
PN	bar	63	
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50 / 230 (see 2.4.)
Design Pressure	bar	63	63
Test Temp.	Room		
Test Pressure	bar	94,5	94,5

2.4.2.4 Ball valve ISO PN100

ISO PN100	Unit	A 105 / PTFE	A182 F316 / PTFE
PN	bar	100	
Design Temp.	ºC	-29 / 230 (see 2.4.)	-50 / 230 (see 2.4.)
Design Pressure	bar	100	100
Test Temp.	Room		
Test Pressure	bar	150	150

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2.5- Design conditions depending on the selection of materials

For valves supplied with materials other than those specified in the previous point, the working conditions are specified in the next table.

SEAT MATERIAL -->	*PTFE*		*G.F. + PTFE*		*S.S. + PTFE*		*C.G. + PTFE*		*NYLON*		*DEVLON*		*PEEK*		*TT99*		*KEL-F*		*PE UHMW*	
BODY MATERIAL	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.	Min. Temp.	Max. Temp.
WCB, A105, 1.0619	-29°C	230°C	-29°C	230°C	-29°C	260°C	-29°C	260°C	-29°C	100°C	-29°C	125°C	-29°C	260°C	-29°C	270°C	-29°C	200°C	-29°C	80°C
LF2, LCC, LCB	-46°C	230°C	-46°C	230°C	-46°C	260°C	-46°C	260°C	-46°C	100°C	-46°C	125°C	-46°C	260°C	-46°C	270°C	-46°C	200°C	-46°C	80°C
CF8M, CF3M, F316, F304, F44, F51, F53, F55, CD3MN, N06022, N06625, N08825, N04400, 1.4408	-50°C	230°C	-50°C	230°C	-50°C	260°C	-50°C	260°C	-50°C	100°C	-50°C	125°C	-50°C	260°C	-50°C	270°C	-50°C	200°C	-50°C	80°C

2.6-Service conditions

2.6.1 The selection of construction materials, seats, gaskets and internal parts, determine the limits of pressure and working temperature. The correct selection of these parts is important for the correct use and safety in the process. Consult the technical datasheet or the manufacturer for other materials or working conditions.

2.6.2 The pressure/temperature limits can be found marked on the plates affixed to the valve body. It is the responsibility of the user to respect the design pressure and temperature limits of the valve. In case of doubt, consult the reference sales representative of JC Fábrica de Válvulas.

2.6.3 The valve surface can be extremely low (-196ºC) or high (538ºC) depending on the service conditions. Direct contact with the valve may cause damage, always use appropriate protective measures.

2.6.4 For high temperature services, take into account that the dirt accumulated on the surface can reach its ignition temperature. In this case, a surface cleaning should be considered as part of preventive maintenance.

2.6.5 The valves included in this manual can work with fluids type 1 and 2 in liquid and gaseous state according to the definition made by the directive 2014/68/EU and reflected in the EC regulation No 1272/2008.

2.6.6 When valves work with highly dangerous type 1 fluids, additional safety elements such as “Double Packing” and/or leak detection elements are recommended. The use of valves without the additional safety devices intended for Group 1, will be the responsibility of the user or purchaser, as well as the convenience or not of installing leak detection systems.

WARNING!!
When using fluids that can harm people's health, the environment, or damage to property, please use the necessary safety elements to prevent risks!!

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss

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2.7-Environmental considerations

In accordance with the premises established by the ISO 14001 Standard and the environmental policy of JC Fábrica de Valves:

The recyclability of the components that are part of JC valves is as follows:

*** Recyclable components:**
Metal parts, PTFE (pure), plastic plug (Low Density Polyethylene).
These materials can be recycled directly. No special treatment is required to manage the materials once the valve's useful life has ended.

*** Non-recyclable components:**
PTFE mixed with other compounds (fiberglass, graphite, etc ...), nylon, graphite and graphite mixed with metal.
These materials require special treatment once the valve's life cycle has ended.
In some countries, it will be necessary to contact a specialized company for their treatment.

2.8-Additional safety instruction for the use of ball valve in potentially explosive atmospheres

Marking and classification

2.8.1 On the valve nameplate there is a laser marking with the relevant information for use in potentially explosive atmospheres, more information can be found in ATEX declaration of conformity:

- CE marking.
- The symbol; Ex
- The equipment category (1,2,3).
- The symbol of the group equipment and explosive atmosphere for which it is intended (Group II)
- The symbol "Ex h" type of protection according to EN 80079-36
- The symbol indicating the temp. Class or the Max surface temp. in °C or both.
- The EPL (Gb for GAS e Db for DUST).

2.8.2 The actuators are suitable for being applied on equipment belonging to GROUP II Category 2, suitable for zones 1 / 2 GAS and 21 / 22 DUST.

- Temperature Class: T6
- Type protection: Ex h (with constructional Safety "c")
- GAS Group: "IIC"
- DUST Group IIIC.
- EPL: Gb (for Gas), Db (Dust).

Prevention and safety

2.8.3 Make sure the product supplied perfectly matches the application requirements. Upon receipt of the product, make sure the packaging is still in perfect condition and does not show any sign of damage due to transportation.

2.8.4 When the valve is to handle hot fluids or fluids where exothermic reactions may take place, the end user must take all the necessary measures to ensure that the hot surface of the valve cannot provide a source of ignition to the surrounding gas, vapor, mist or dust atmosphere. A possible temperature elevation in case of high cycling frequency must also be considered.

2.8.5 Before putting into use or during operation with a dangerous fluid, ensure that no release of the fluid to atmosphere can take place.

2.8.6 In case of actuated valves, ensure no brittle materials are used for the bracket & coupling.

Sales Partner:
FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss

• Tel. : +49 (0) 21 31/15 39 28-0
• Fax: +49 (0) 21 31/15 39 28-99

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2.8.7 Valve handling dangerous fluids has to be protected against inopportune operating and damage due to collision.

2.8.8 The risk assessment of the actuated packages has been performed supposing the maximum tangential velocity of the moving parts is less than 1m/s. If the actual velocity exceeds 1m/s, a new conformity assessment is required.

2.8.9 Add electric or non electric accessories only if they comply with EX regulations and come with a Conformity and Classification Declaration suitable for the installation area. Every time you add an accessory, please verify whether or not you need to carry out the risk analysis required by the Directive above.

2.8.10 To prevent or reduce the risk of ignition, ensure that the electrical resistance between connections and valve is 10 Ω max according to the UNI EN 12266-2.

2.8.11 Installation:

- The operator must ensure that only personnel qualified to work in a potentially hazardous area are allowed to carry out maintenance appropriate to the category of the equipment in use.
- If required personnel need to have authorization for working in hazardous area, and wear appropriate clothes.
- The installer must only use tooling appropriate to the working area, see EN 1127-1 Annex A.
- Installation has to be carried out at ambient temperature.
- During installation ensure that no metallic shocks / impacts are made to the equipment or the adjacent pipework.
- Ensure that the equipment is suitably earthed, through the pipe or individually.
- The installer should thoroughly follow the operating and safety instructions provided for each individual item of equipment.

2.8.12 Maintenance:

- The operator must ensure that only personnel qualified to work in a potentially hazardous area are allowed to carry out maintenance appropriate to the category of the equipment in use.
- If required personnel need to have authorization for working in hazardous area, and wear appropriate clothes.
- The end user must ensure that only tooling appropriate to the working area is used, see EN 1127-1 Annex A.
- All equipment must only be fitted with manufacturer's original spare parts.
- Maintenance has to be carried out at ambient temperature (also for internal parts, allow required cooling down)
- Ensure maintenance of painting without creating electric discontinuity.
- Prevent dust accumulation.
- In compliance with EN 80079-36 Standards, art. 7.1, dust deposits trapped in narrow spaces between moving parts can become a source of ignition in time, even if the moving parts have a very slow rotating speed.

WARNING!!
Any change or modification not expressly approved by JC applied to the product after its placing on the market causes the loss of presumption of conformity to the EX regulations.

2.8.13 The data and specifications in this Manual can be changed at any time and with no notice to improve the quality of the product.

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3.- TRANSPORT

3.1 All valves must be transported in suitable packaging to ensure proper preservation of the product during transport.

3.2 All flange faces must be clean, covered with a protector and will be protected by a covering to avoid damage during transport.

3.3 Valves delivered to the mainland will be transported on a shrink-wrapped pallet to protect the product from dirt, dust and rain. The pallet must not exceed 700 kg. Alternatively, the seaworthy packing explained in the following point may be used.

3.4 Valves shipped by sea transport must be packed in fully closed wooden boxes, Kraft paper will be used and placed in plastic bags, special care will be taken to secure the valves in order to prevent them from moving and avoid damage during their transport.

Valves should be arranged in such a way as to ensure uniform weight distribution. Filling material should be used in empty areas and the valves should be blocked to prevent movement.

Desiccant bags will be included in order to protect the valves from moisture.

4.- INSPECTION ON RECEPTION AND STORAGE

4.1 All valves will be examined on reception to ensure that they have not being damaged during transport. Any evidence and the supplier will immediately be informed of any damages observed.

4.2 Valves are supplied in open position as a protective measure to prevent any foreign element from damaging the ball, except those with a single acting actuator that closes in case of lack of air or electric power cut (Actuator normally closed).

WARNING!
Valves will be stored in a covered place protected from weather conditions and foreign elements.

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

4.4 Valves must retain the protective end caps until just before installation to prevent the entry of elements that could damage the internal sealing.

4.5 For long term storage, the internal parts of the carbon steel valves will be sprayed with a rustproof protection.

4.6 Valves will be stored indoors to protect the packing from moisture, condensation, rain, dust, sand, salty air, etc. During storage the temperature of the valve should be kept above the dew point.

4.7 It is recommended to store stainless steel and carbon steel valves separately to avoid possible oxidation due to contamination of the stainless steel.

4.8 Degreased valves will keep the original factory packaging until installation. In case of inspection, it is recommended to handle the valve in a clean dust-free environment and to handle the valve with gloves to avoid contamination of the surface due to hand grease. Do not use compressed air near the valve without making sure that it has not been lubricated with oil.

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss

• Tel. : +49 (0) 21 31/15 39 28-0
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5.- INSTALLATION

5.1 Handling and transport of the valves must be carried out with extreme caution and using the necessary and appropriate means depending on their size and weight, in order to avoid risks to the people who handle them.

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

5.2 Check the condition of the valve to first detect possible damage caused during transport or handling.
Also inspect the inside of the valve and the inside of the pipe connected to it. It is very important to check that there are no foreign elements that could damage the valve seats, as these are an essential part for the correct operation of the valve.

WARNING!!
When it is certain or presumed that the valve will be installed at a collection point for waste, such as welding slag, oxides or scale, filters or protective grids will be installed, temporarily or as a definitive element, in the line before the connection to the valve.

5.3 Before installation, check that the valve is in open position to avoid possible damage to the sealing surfaces. In cases where this is not possible, because they have single acting actuators with failure to close, extreme precautions will be taken to avoid damaging the ball surface.

5.4 Make sure before the installation of the direction of flow for those valves that are directional. The direction of flow will be indicated by an arrow engraved on the body or fixed to it by a plate. If there is no indication, the valve is bidirectional and has no preferred direction.

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

5.6 The valve can be installed with the stem in any position, but it is recommended that it is installed with the stem vertically and facing upwards.

WARNING!!
The valves must not withstand stresses from the pipeline. The assembly must be carried out with correct alignment and parallelism to ensure that they are not subjected to unexpected stresses.

5.7 Make sure when installing the valve that the flange gasket that will connect with the valve is assembled correctly, following the gasket manufacturer's instructions, as well as compatibility with the fluid flowing through the pipeline.

IMPORTANT!
After installation, carry out a final check of the valve by opening and closing it to ensure its perfect operation.

IMPORTANT!
Never leave the valve in an intermediate position that is not fully open or fully closed.

WARNING!!
Make sure that the fluid used in the cleaning operations of the installation, and the way it is carried out, are compatible with the installed valve.

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss

• Tel. : +49 (0) 21 31/15 39 28-0
• Fax: +49 (0) 21 31/15 39 28-99

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5.8. Once the final cleaning operations prior to start-up have been completed, if protective filters have been installed, they can be removed or, on the contrary, if the user considers that there can be rust or scale formations, they will be left as permanent.

IMPORTANT!
When ball valves are intended for end-of-line use, the hydrostatic test pressure of the line must be limited to 1.1 the Rating pressure.

6.- PREVENTIVE MAINTENANCE

6.1 Preventive maintenance operations consist basically of a periodic inspection of the correct operation of the valve.

6.2 The valves must be operated routinely, at least once every 6 months, and depending on the fluid or application of the valve, as well as its responsibility, action and control plans must be established in shorter periods of time.

6.3 It is the responsibility of the user to establish appropriate action plans for the working conditions and fluids used!

WARNING !!
Valves should never be left open or closed for a long period of time.

6.4 A very high increase in torque may be due to the inclusion of foreign particles in the seats. Therefore, without forcing the operation of the valve, it is necessary to proceed to the inspection of the seats, in order to avoid damage to the ball.

6.5 It is advisable to replace the gaskets and seats when a thorough inspection of the installation is carried out.

7.- MAINTENANCE OPERATIONS

PRECAUTIONS BEFORE DISASSEMBLY !!

7.1 Make sure that the line has been closed and that there is no pressure inside.
Actuate the valve several times in order to relieve the pressure and drain the valve cavity.

WARNING!!
Wear suitable protective clothing for the fluid. (Comply with the safety regulations established by your company!)

7.2 Remove the valve from the line, in closed position and clean it from any possible fluid remains.

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

The manufacturer is not responsible for the malfunction of the valve if original JC parts are not used !!.

7.3 The JC valves included in this manual do not require external lubrication.

7.4 The replacement of gaskets and seats can be done with simple hand tools, but requires extreme care in handling both gaskets and sealing surfaces.

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41468 Neuss

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• Fax: +49 (0) 21 31/15 39 28-99

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• info@fergo.eu
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8.- CAUSES OF REPAIR AND REPLACEMENT OF PARTS. ALL FIGURES EXCEPT SEAL +

8.1 LEAKAGE THROUGH THE PACKING

8.1.1 The stem packing system is designed for high durability. The installed disc springs compensate for the small loss of tightness in the packing due to wear. A small leak through the packing can be solved with a simple re-tightening of the packing.

8.1.2 If leakage is observed through the packing, open the tab of the lock washer (46), apply lubricant oil type WD40, or similar, and tighten the gland nut (7) 1/8 turn.

Repeat this operation if leakage continues. Then put the tab back to its original position. If there is still leakage, replace the packing (11).

8.2 LEAKAGE THROUGH THE BODY SEAL

8.2.1 If leakage is observed through the body gasket (13), the body gasket must be replaced. Follow the instructions in point 8.5.

8.3 LEAKAGE THROUGH THE PACKING IN VALVES WITH DOUBLE PACKING

8.3.1 If leakage is detected in the stem packing lantern ring, as an emergency measure follow the instructions in point 8.1. The two packing rings and stem O-rings must then be replaced. Follow point 8.6 "Changing the packing in valves with double packing".

8.4.- CHANGING THE PACKING

8.4.1 We recommend that when the packing change is necessary, the seats, body gasket and stem thrust washers are also replaced. However, if, due to process needs, it is not possible to disassemble the valve from the line, follow the following sequence:

DISASSEMBLY

8.4.2 Check that there is no pressure in the installation.

8.4.3 Remove the handle (6) or actuator, open the tab of the locking washer (46), to remove the gland nut (7).
Before removing the gland nut (7), apply lubricant oil type WD40, or similar. Wait a few minutes and then remove the gland nut.
Remove the locking washer (46), the disk springs (8) and the spacer ring (41), if any.

8.4.4 Remove the stop (9), marking its upper face for re-assembly, the thrust washer (18) and the gland ring (10). Remove the packing (11) without damaging the stem and body surfaces.

ASSEMBLY

8.4.5 Fit a new packing (11).

8.4.6 Place the packing ring (10), the new thrust washer (18), the stop (9) with its marked face on top, the spacer ring (41) if any, the disk springs (8), the locking washer (46) and tighten the gland nut (7) to the torque specified in point 8.

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss

• Tel. : +49 (0) 21 31/15 39 28-0
• Fax: +49 (0) 21 31/15 39 28-99

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8.4.7 Before installing the handle or actuator, pressure test the valve to verify the tightness of the packing. If leakage is detected, see point 8.1. Finish by bending the tab of the locking washer (46).

8.4.8 Assemble the handle (6) or actuator.

8.5 CHANGE OF SEATS, PACKING AND SEALS

DISASSEMBLY

8.5.1 Check that there is no pressure in the installation.

8.5.2 Remove the valve from the line. If the transported fluid is harmful or flammable, all precautions must be taken to avoid accidents.

8.5.3 Remove the studs (5) or hex-nuts (28) of the body-body connector, bearing in mind that there may be fluid trapped in the body cavity. Separate the body connector (2) from the body (1).

8.5.4 Remove the seat (5) from the body connector and the gasket (13) from the body-body connector. In the case of metal seat valves, also remove the O-ring (33), the graphite gasket (54), the ring (29) and the spring washer (32).

8.5.5 Turn the ball (3) to the closed position and remove it from the body. Clean the external surfaces of the bore and slot, checking that the pressure relief hole located at the bottom is not blocked.

Check the outer surface of the ball, especially the area in contact with the seats and the transition radius between the outer surface and the bore. If the balls surface or slot is damaged, replace the ball with a new one.

8.5.6 Remove the seat (5) from the body. In the case of metal seat valves, also remove the O-ring (33), the graphite gasket (54), the ring (29) and the spring washer (32).

8.5.7 Remove the stem (4). For this operation, follow sections 7.4.2 and 7.4.3. Then, extract the stem from the inside of the body. Remove the fiberglass filled PTFE thrust washer (12). The stem incorporates one or two (according to the figures) O-rings (72) that must be replaced.

8.5.8 Clean the internal surfaces of the body and body connector, specially the seat housing areas, body gasket, thrust washer and packing.

8.5.9 Clean and check the stem. Check that the antistatic device works by pressing the balls into their housing and checking that they return to their position. If any ball is blocked or the stem surface is damaged, replace the stem with a new one.

ASSEMBLY

8.5.10 Check that the spare parts are original JC, in the same materials and with the same dimensions as the parts to be replaced.

8.5.11 For valves manufactured before 1983, or for valves of the so-called PN (DIN) Fire-safe series, the spare parts may be different from the current ones. Also, the stems have changed their length. If in doubt, consult your regular supplier.

WARNING!!
If the valve needs to be degreased (Oxygen Service, Hydrogen Peroxide, etc.), consult the manufacturer.

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss

• Tel. : +49 (0) 21 31/15 39 28-0
• Fax: +49 (0) 21 31/15 39 28-99

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• info@fergo.eu
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8.5.12 Insert the thrust washer (12) on the stem (4). There are two thrust washers in the spare parts kit. In some nominal diameters they are the same; if they are different, this washer (12) is the thickest.

8.5.13 Place the O-ring (72) (two according to the figures) in the stem groove.

8.5.14 Insert the stem (4) into its housing through the inside of the body.

8.5.15 Assemble the packing and the other parts according to sections 8.4.5 and 8.4.6.

8.5.16 Fit a new seat (5) in the body.

8.5.17 Rotate the stem to the closed position so that it can be inserted in the slot of the ball. Fit the ball (3) in the closed position, checking that there is no play between the slot and the stem. On metal seated valves, lightly grease the ball surface before assembly.

8.5.18 Insert in the body connector, the other seat (5) and the gasket (13) into the housing of the body. On metal seat valves, also fit parts (33), (54), (29) and (32).

8.5.19 Fit the body connector (2) on the body. In some nominal diameters, the body connector has a specific position, due to the fact that the number of studs of the body-body connector is not equal to or a multiple of the number of studs in the flanges. Check that the holes of both flanges are in the same position with respect to the axis of symmetry of the valve.

8.5.20 Tighten the nuts (28) or bolts (15) depending on the type of valve, following the appropriate sequence according to point 12.

8.5.21 Fit the handle (6) or actuator.

8.5.22 Before reassembling the valve in the line, test it in half-open position to verify the tightness of the packing and body gasket, then close it and test the tightness of the seats.

8.6.- CHANGE OF PACKING IN VALVES WITH DOUBLE PACKAGING

We recommend that when the packing change is necessary, the seats, body gasket, O-rings and stem thrust washers are also changed. However, if, due to process needs, it is not possible to disassemble the valve from the line, follow the following sequence:

DISASSEMBLY

8.6.1 Check that there is no pressure in the installation.

8.6.2 Disassemble the handle (6) or actuator, open the tab of the locking washer (46), remove the packing nut (7). Before removing the gland nut (7), apply lubricant oil type WD40, or similar. Wait a few minutes and then remove the gland nut.
Remove the locking washer (46), the disc springs (8) and the spacer ring (41), if any.

8.6.3 Remove the stop (9), marking its upper face for assembly and the thrust washer (18).

8.6.4 Remove the bolts (933.1) with their washers (127) to separate the neck (68) from the valve body. Remove the gasket (40).

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss
• Tel. : +49 (0) 21 31/15 39 28-0
• Fax: +49 (0) 21 31/15 39 28-99
• www.fergo.eu
• info@fergo.eu
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8.6.5 Remove the stem (4) from the neck and continue removing the parts in the following order:
- The packing ring (10) and the O-ring (72.1)
- The graphite ring (11)
- The press sleeve (64) or lantern
- The other graphite ring (11)

8.6.6 Continue disassembling the following parts of the stem:
- O-ring (72.2)
- Thrust washer (12)
- The two O-rings (72)

8.6.7 Remove the guide bushing (39) from the body.

ASSEMBLY

8.6.8 Before reassembling the spare parts, clean them carefully, as well as their housings:
- From the cap on the body
- From the O-rings in the stem
- From the graphite rings, etc. on the reel

8.6.9 Place the guide bushing (39) in its seat in the body, lightly greased.

8.6.10 Fit the o-rings (72) and (72.2) on the stem (4), lightly greased.

8.6.11 Place the friction seal (12) on the stem and insert it on the reel (68).

8.6.12 Place the gasket (40) in its position in the body.

8.6.13 Assemble the reel and stem assembly on the body (1), put the locking washers (127) on the bolts and tighten them.

8.6.14 Assemble the parts in the reel packing housing in the following order:
- Fully insert a graphite ring (11).
- Insert the lantern ring (64) and a second graphite ring (11).
- Fit the bushing (10) with its O-ring (72.1).
- Place the thrust washer (18), the stop (9), the supplement ring (41), the packing springs (8), the locking washer (46), the packing nut (7), tightening it according to the indicated torque at point 8.

8.6.15 Before installing the handle or actuator, test the valve with pressure to verify the tightness of the packing. If leakage is detected, proceed as indicated in point 7.1.1.

8.6.16 Assemble the handle (6) or actuator.

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FERGO Armaturen GmbH
Blindeisenweg 31
41468 Neuss
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• Fax: +49 (0) 21 31/15 39 28-99
• www.fergo.eu
• info@fergo.eu
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9.- MAXIMUM GLAND NUT TIGHTNESS TORQUE IN Nm.

NOMINAL DIAMETER (1)	PTFE PACKING	GRAPHITE PACKING
15 (1/2")	20	22
20 (3/4")	20	22
25 (1")	20	22
32 (1-1/4")	25	25
40 (1-1/2")	40	40
50 (2")	40	40
65 (1-1/2")	65	70
80 (3")	75	80
100 (4")	80	80
125 (5")	85	90
150 (6")	90	90
200 (8")	210	230

(1) Corresponds to the ball bores diameter for reduced bore valves.

10.- CAUSES OF REPAIR AND REPLACEMENT OF PARTS. SEAL + FIGURES

10.1 LEAKAGE THROUGH THE PACKING

10.1.1 The stem packing system is designed for high durability. The installed disc springs compensate for the small loss of tightness in the packing due to wear. A small leak through the packing can be solved with a simple re-tightening of the packing.

10.1.2 If leakage is observed through the packing, tighten the screws (912) of the gland nut (7) 1/8 turn. Repeat this operation if leakage continues. If there is still leakage replace the packing (11).

10.2 LEAKAGE THROUGH THE BODY – BODY CONNECTOR

10.2.1 If leakage is observed through the body gasket (13), the body gasket must be replaced. Follow the instructions in point 10.5.

10.3.- CHANGE OF THE PACKING

10.3.1 We recommend that when the packing change is necessary, the seats, body gasket, O-rings and stem thrust washers are also replaced. However, if, due to process needs, it is not possible to disassemble the valve from the line, follow this sequence:

DISASSEMBLY

10.3.2 Check that there is no pressure in the installation.

10.3.3 Disassemble the handle (6) or actuator, remove the stop (9), marking its upper face for assembly, remove the locking washer (471).

To remove the flange (60) loosen and first remove the 4 screws (912, 14), remove the springs (8) and the gland ring (10.1).

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FERGO Armaturen GmbH
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41468 Neuss

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• Fax: +49 (0) 21 31/15 39 28-99

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10.3.4 Extract the graphite packing (11.1) without damaging the stem and body surfaces, for this it is recommended to use a plastic o-ring remover or some tool with a lower hardness than steel.

10.3.5 Remove the gland (10) and then the PTFE packing rings (11).

ASSEMBLY

10.3.6 Fit a new packing (11).

10.3.7 Fit the gland (10) and then the graphite packing ring (11.1). Fit the press ring (10.1) and the disc springs (8). Assemble and tighten the gland flange (60) using the screws (912, 14) until it allows the assembly of the locking washer (471).
Assemble the stop (9) of the valve making sure that it is in the same position as when it was removed.

10.3.8 Before installing the handle or actuator, test the valve under pressure to verify the tightness of the packing. If leakage is detected, see point 10.1.

10.3.9 Assemble the handle (6) or actuator.

10.4 CHANGE OF SEATS, PACKAGING AND SEALS

DISASSEMBLY

10.4.1 Check that the installation is without pressure.

10.4.2 Remove the valve from the line. If the transported fluid is harmful or flammable, all precautions must be taken to avoid accidents.

10.4.3 Unscrew the studs (15) or nuts (28) from the body – body connector, bearing in mind that there may be fluid trapped in the body cavity. Separate the body connector (2) from the body (1).

10.4.4 Remove the seat (5) from the body connector and the gasket (13) from the body – body connector. In the case of metal seat valves, also remove the O-ring (33), the graphite gasket (54), the ring (29) and the spring washer (32).

10.4.5 Turn the ball (3) to the closed position and remove it from the body. Clean the external surfaces of the bore and slot, checking that the pressure relief hole located at the bottom is not blocked.

Check the outer surface of the ball, specially the area in contact with the seats and the transition radius between the outer surface and the bore. If the surface or slot of the ball is damaged, replace the ball with a new one.

10.4.6 Remove the seat (5) from the body. In the case of metal seat valves, also remove the O-ring (33), the graphite gasket (54), the ring (29) and the spring washer (32).

10.4.7 Remove the stem (4). For this operation, follow sections 10.4.2, 10.4.3, 10.4.4 and 10.4.5. Then, remove the stem from the inside of the body. Remove the fiberglass filled PTFE thrust washer (12).

10.4.8 Clean the interior body and body connector surfaces, specially the housing areas of the seat, body gasket, thrust washer and gasket.

10.4.9 Clean and check the stem. Check that the antistatic device works by pressing the balls into their housing and checking that they return to their position. If any ball is blocked or the stem surface is damaged, replace the stem.

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41468 Neuss

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ASSEMBLY

10.4.10 Check that the spare parts are original JC, in the same materials and with the same dimensions as the parts to be replaced.

WARNING!
If the valve needs to be degreased (Oxygen Service, Hydrogen Peroxide, etc.), consult the manufacturer.

10.4.11 Insert the thrust washer (12) in the stem (4).

10.4.13 Insert the stem (4) into its housing inside the body.

10.4.14 Assemble the packing and other parts according to sections 10.4.6 and 10.4.7.

10.4.15 Fit a new seat (5) in the body.

10.4.16 Rotate the stem to the closed position so that it can enter the slot of the ball. Assemble the ball (3) in the closed position, checking that there is no play between the slot and the stem. On metal seated valves, lightly grease the ball surface before assembly.

10.4.17 Insert in the body connector the other seat (5) and the gasket (13) in the body housing. On metal seat valves, also fit parts (33), (54), (29) and (32).

10.4.18 Fit the body connector (2) on the body. In some nominal diameters, the body connector has a specific position, due to the fact that the number of bolts in the body connector is not equal to or a multiple of the number of bolts in the flanges. Check that the holes of both flanges are in the same position with respect to the axis of symmetry of the valve.

10.4.19 Tighten the nuts (28) or studs (15) depending on the type of valve, following the appropriate sequence according to point 12.

10.4.20 Assemble the handle (6) or actuator.

10.4.21 Before reassembling the valve in the line, test it in half-open position to verify the tightness of the packing and body gasket, then close it and test the tightness of the seats.

11.- NUTS AND BOLTS TIGHTENING TORQUE CHART VALUES IN MKG.

THREAD	TORQUE (Nm)	
	8.8	A4-70
M6	12	9
M8	30	21
M10	59	42
M12	104	73
M14	165	116
M16	257	181
M20	502	353

THREAD	TORQUE (Nm)		
	B7M/L7M	B8/B8M	L7/B7
3/8"	40	17	48
7/16"	55	28	78
1/2"	70	43	118
9/16"	110	61	167
5/8"	165	85	231
3/4"	270	150	400
7/8"	430	242	651
1"	720	363	970
1-1/8"	930	515	1421

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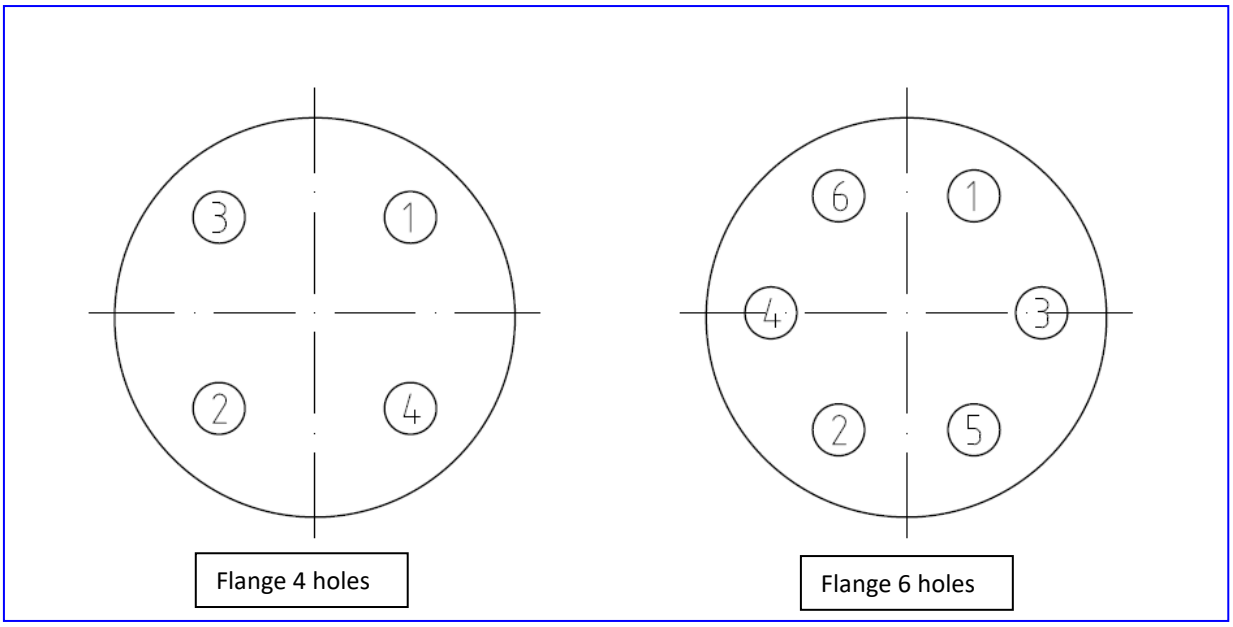
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12.- FLANGE BOLT TIGHTENING SEQUENCE

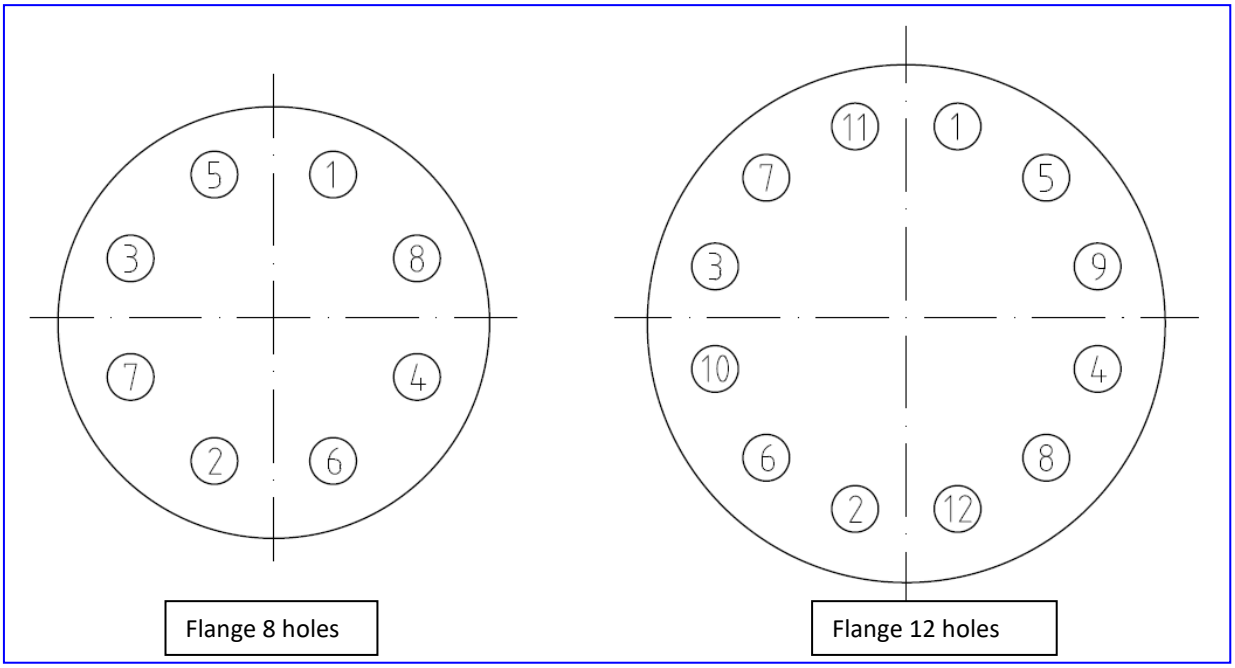
12.1 To proceed with the tightening of the flange bolting, the order specified in the following images must be followed.

As a general rule, the tightening process must follow a star pattern so that the next stud or nut to be tightened will be the one located on the opposite side.



Flange 4 holes

Flange 6 holes



Flange 8 holes

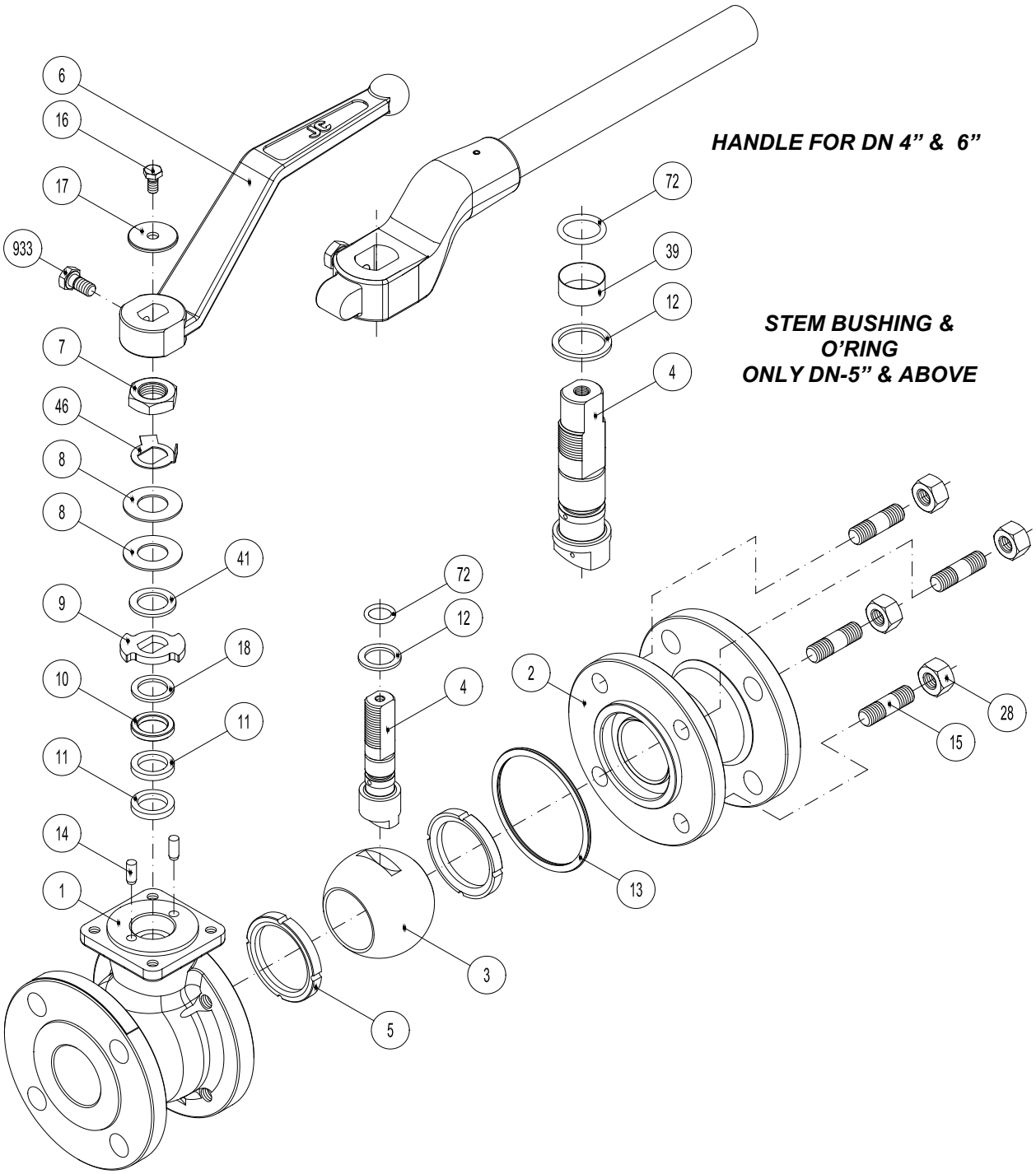
Flange 12 holes

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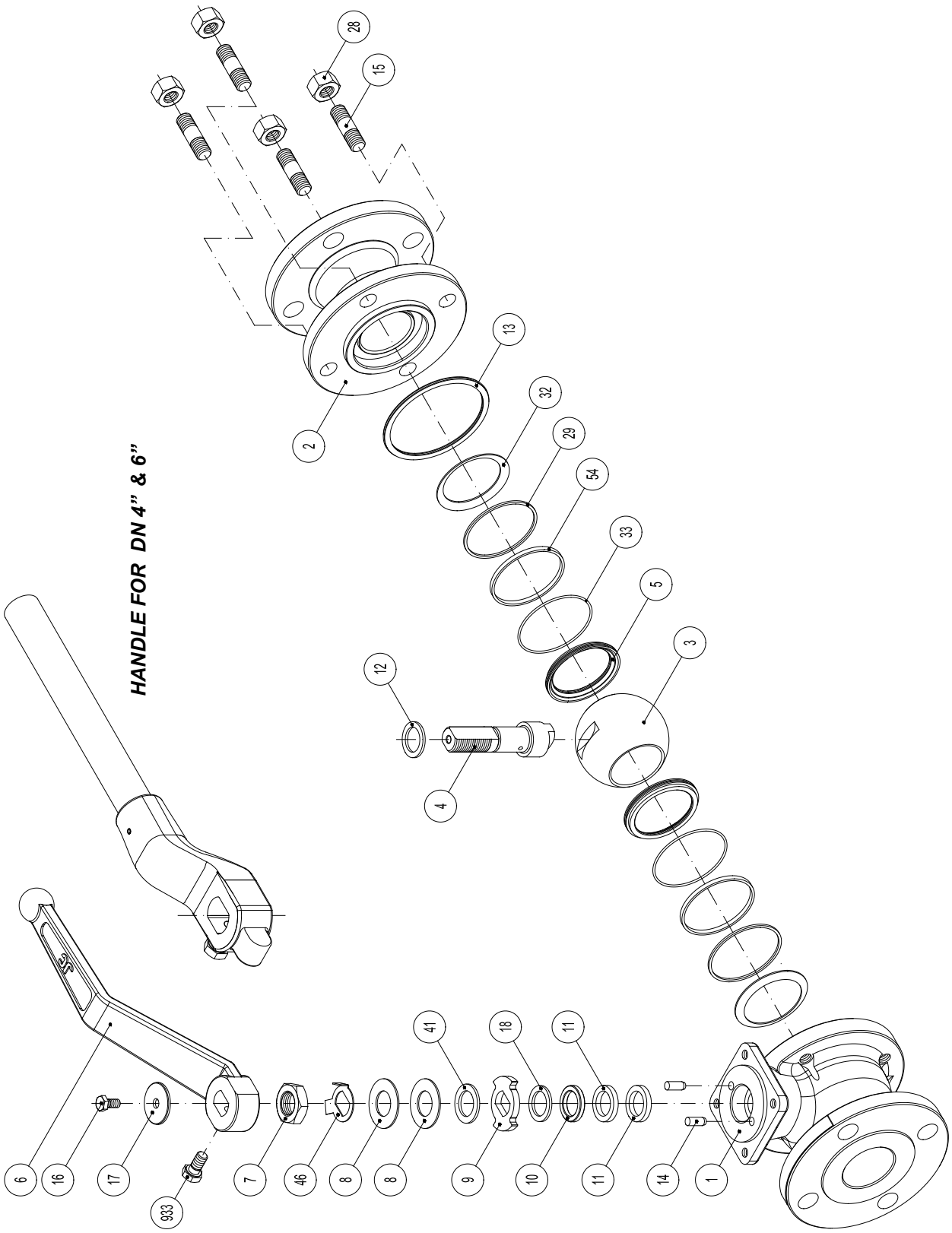
13.- SOFT SEAT VALVE



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14.- METAL SEAT VALVE

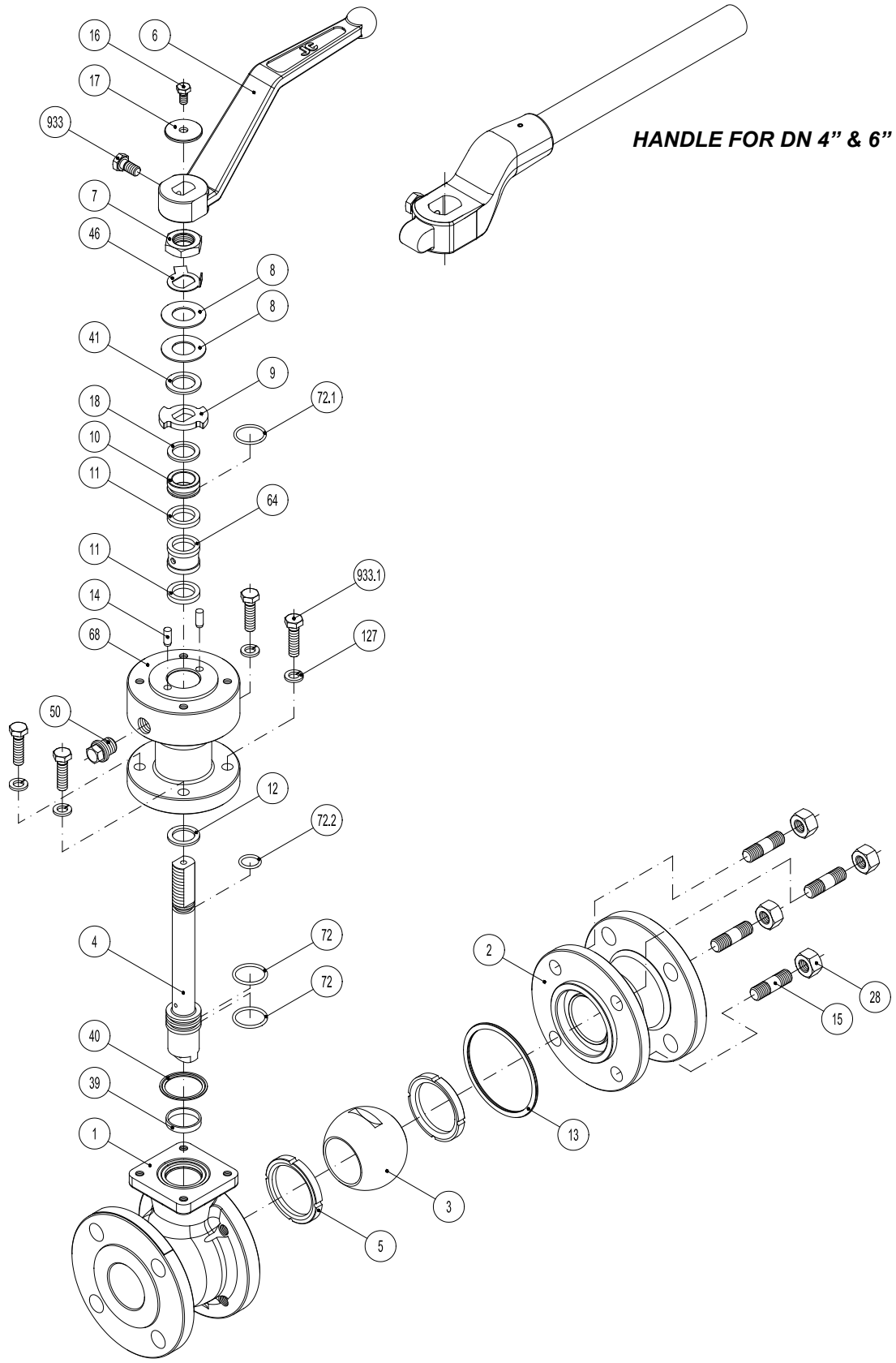


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15.- DOUBLE PACKING VALVE



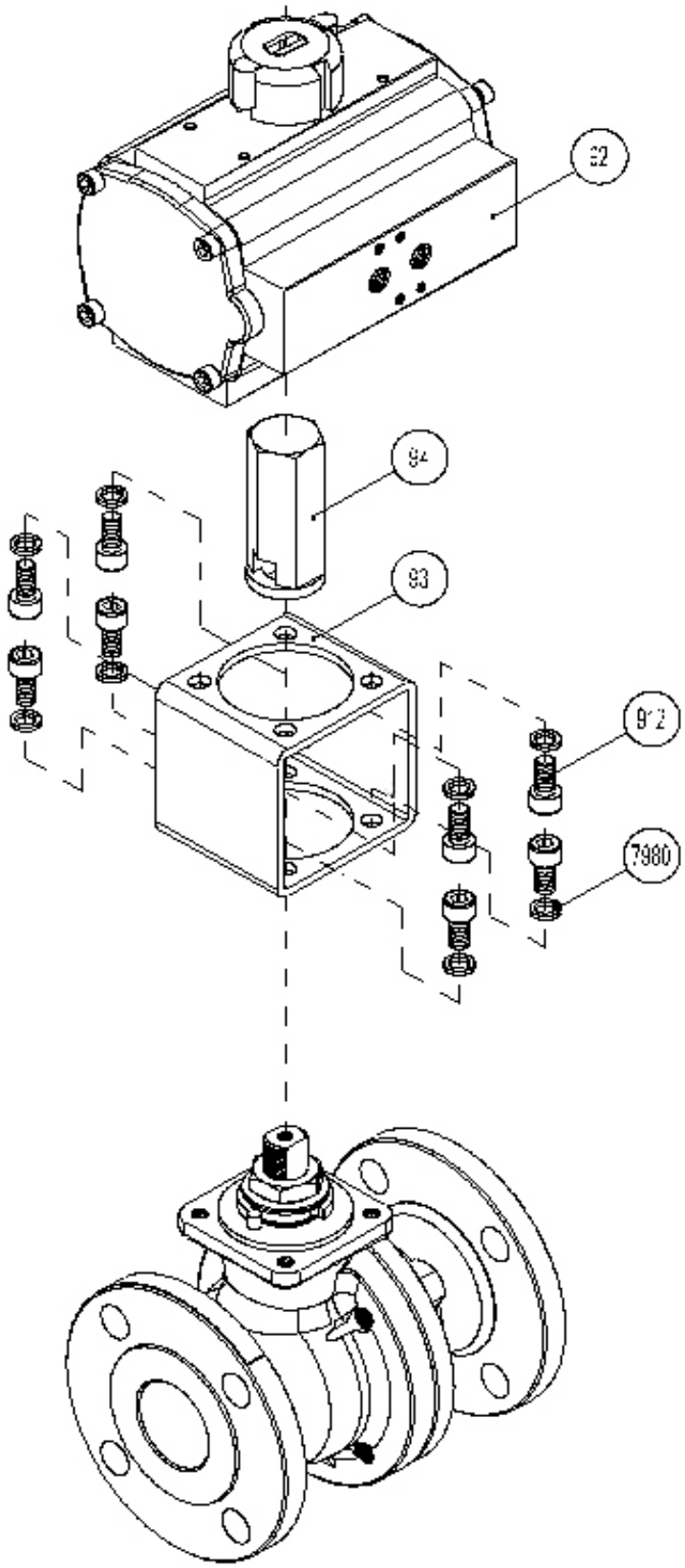
HANDLE FOR DN 4" & 6"

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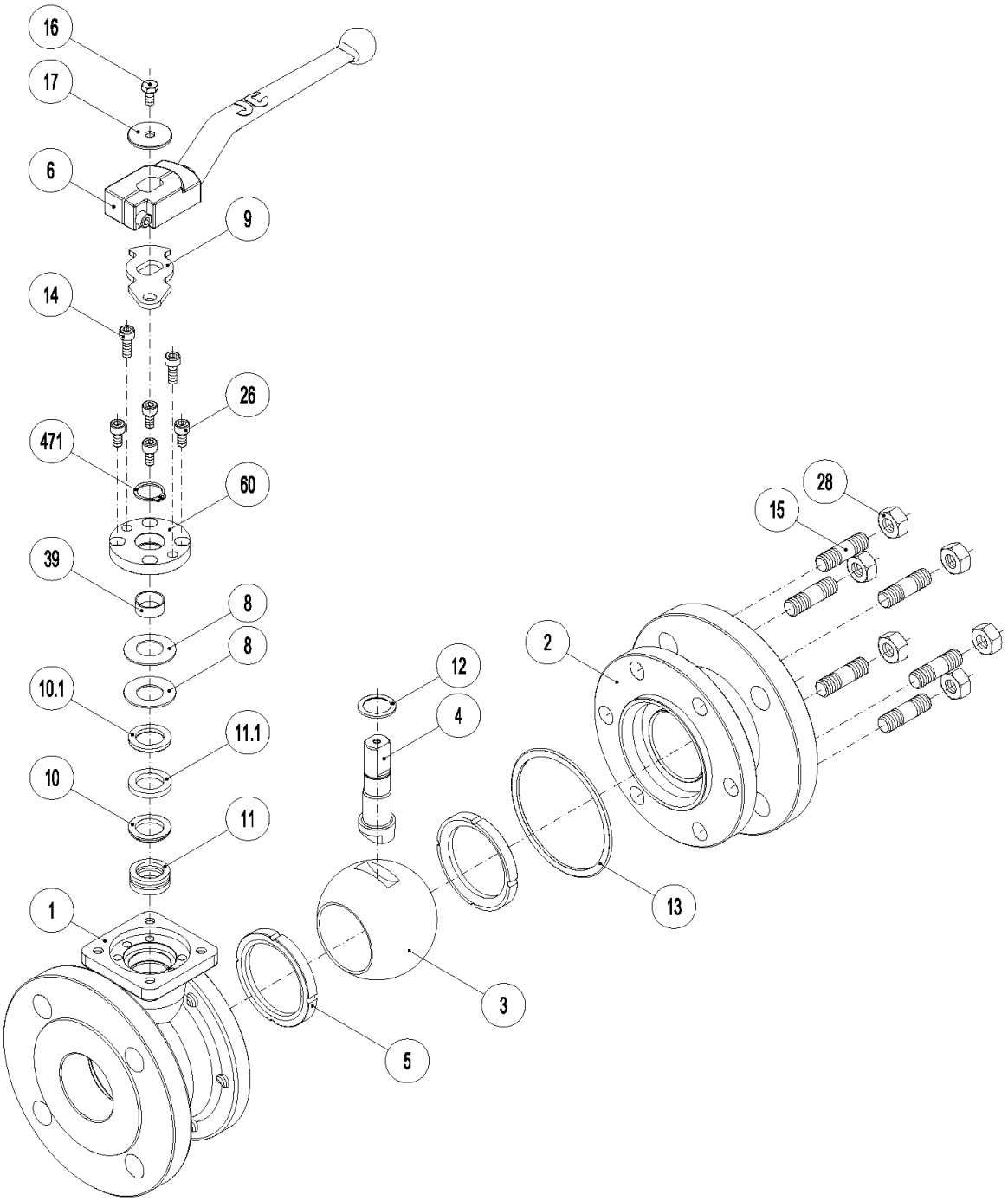
16.- AUTOMATED VALVE



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17.- SEAL + SOFT SEAT VALVE



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