B. S. 3-WAY BALL VALVES
FAMILY 03 - GROUP 70

Master handbook description: Guide to selection, operation and maintenance B. S. 3-way ball valves (English)

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1 Foreword

The quality of the materials used and the new constructive conception of the valve make this product safe, reliable and easy to manage. Fully realised in AISI 316, with gaskets in VITON , PTFE and PTFE + GRAPHITE.

Three-way ball valves can be used in multiple sectors.

They can also be used with chemically aggressive liquids. In table 2, the list of fluids perfectly compatible with the valves is attached.

For any other fluid or use, which has not been expressly indicated in this manual, contact directly our service department.

2 Legend

- $\Delta p_{allowable}$ (allowable differential pressure): maximum allowable value, at a given temperature, of the static differential pressure of a valve when it is in the closed position (EN 7363: 1997).

- **Allowable temperature:** operating temperature limit, prescribed for safety reasons.

- **Allowable pressure:** operating pressure limits, normally at the top of each chamber of the pressure equipment, prescribed for safety reasons (UNI EN 764: 1997).

- **ND:** is a nominal size alphanumeric designation for components of a piping system, used to provide a reference point.
  It includes the ND letters followed by a nondimensional whole number which is indirectly related to the physical dimension, expressed in millimetres, of the hole or the outer diameter of the final end of fittings (ISO 6708: 1995)

3 Technical Characteristics

General note: ⇒ each pressure value specified below is a value of relative pressure
⇒ **valve destined to fluids of group 2 (2014/68/UE directive).**

ND: ⇒ 3/8" – 1/2" – 3/4" – 1"– 1"1/4

Connections: ⇒ inner GAS thread
⇒ stub pipes fastened with clamp (for a fast disinstallation from the system)
⇒ Note: valves with special fittings arranged for series assembly are also available.

Pmax allowable: ⇒ 40 bar

Pmin allowable: ⇒ 0 bar.

Tmax allowable: ⇒ 150° C

Tmin allowable: ⇒ -10° C (in liquid state)

Building materials: ⇒ See drawings and tables attached to them (from page 24 to page 50)

Overall dimensions: ⇒ See overall dimensions drawings and relative tables (from page 7 to page 20)

The base version is that with gas threaded fittings, with gaskets placed on the 3 valve ports only and with a “T” passage ball (see page 7). Ball valves with Enveloping Gaskets and with “L” passage ball can also be provided.

The advantage in using a valve with enveloping gaskets is that inside the valve the amount of residues of the fluid passing through is very reduced.

3.1 Table 1: Actuation Torques Of 3-Way Ball Valves. Matching Our Actuators Series ITAL.

DN	**3/8"** DN11	**1/2"** DN15	**3/4"** DN20	**1"** DN25	**1"1/4** DN32
TORQUE (Nm)	7	8	10	12	24
Double Acting ITAL Size	10	10	20	20	30

3.2 Table 2: Fluids Compatible With 3-Way Ball Valves.

Vinyl acetate	Potassium chlorate 30% max
Phenol acetylene	Sodium chloride 20% max
Glycerol fatty acids	Potassium chloride 5% max
Phenol	Butyl ether
Phosphoric acid 20% max.	Petroleum ether
Phthalic acid	Dibenzile ether
Gallic acid	Dibutyl ether
Nitric acid 5% - 65% max	Ethylene glycol
Oleic acid	Ammonium nitrate
Stearic acid	Copper nitrate
Tannic acid	Sodium nitrate
Butanol	Ethylene perchlorate
Ethanol	Potassium sulphate 20% max at T=100 °C
Methanol	Sodium sulphate
Propanol	Zinc sulphate 40% max at T=100 °C
Aniline	Potassium sulphite 10% max
Sodium carbonate 20% max	Sodium sulphide
Borax (sodium tetraborate)	Toluene
Sodium carbonate	Steam (Tmax=140 °C)

Data shown in table 2, if not otherwise specified, are relevant to a temperature of 21°C.

The above-listed data are general and are not valid under all possible working conditions. These data may considerably vary depending upon various conditions, such as: temperature, concentration, fluid speed.

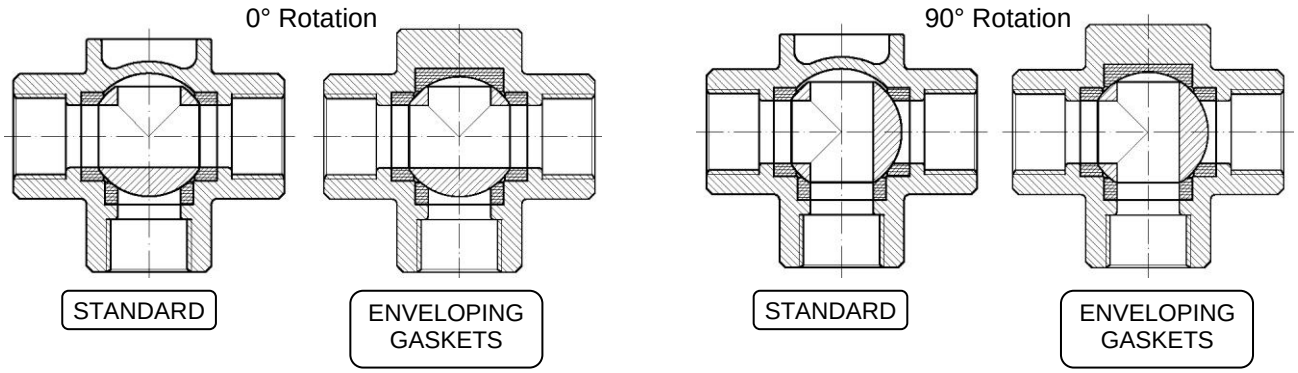
For more reliable and exhaustive information, please contact our service department.

3.3 Safety Notes

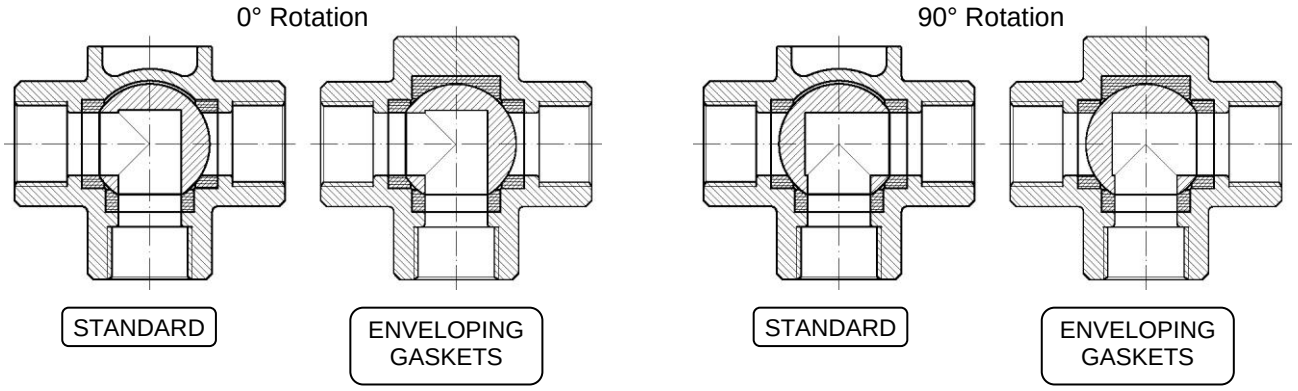
- The valve body, under maximum operating temperature conditions, depending on the system, may reach a temperature T equal to 150 °C. It is up to the installer to provide the system with the necessary safety guards and/or warning signals aiming at removing/indicating the risk of possible burns by the user.
- Whatever operation is to be performed on the valve, the fluid must neither be present in pipes, nor inside the valve.

3.4 Standard Assembling Scheme

3.4.1 Standard Assembling Scheme Of “T” Passage Valves

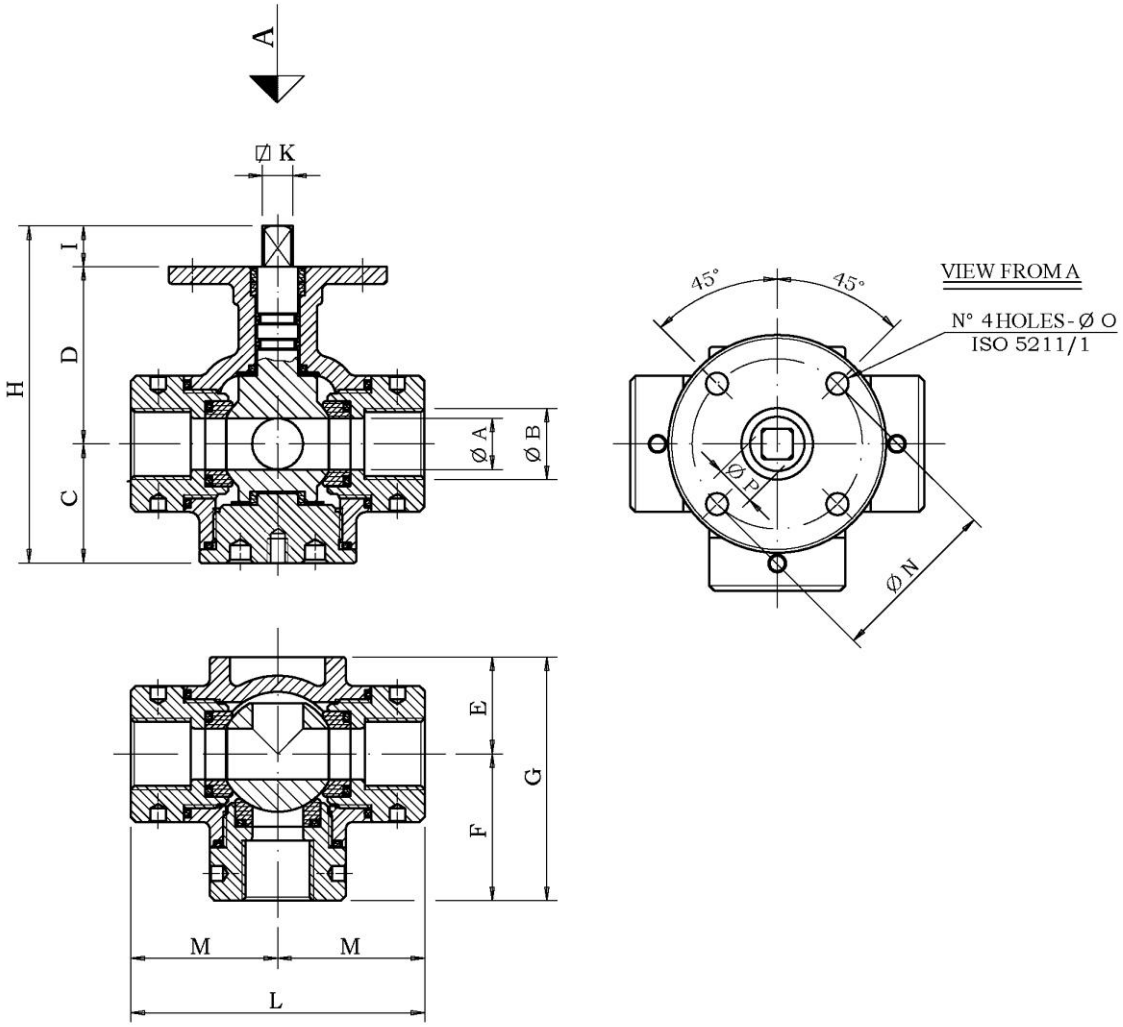


3.4.2 Standard Assembling Scheme Of “L” Passage Valves



3.5 3-Way Ball Valve Overall Dimensions

3.5.1 Threaded Bare Shaft (B. S.) 3-Way Ball Valve

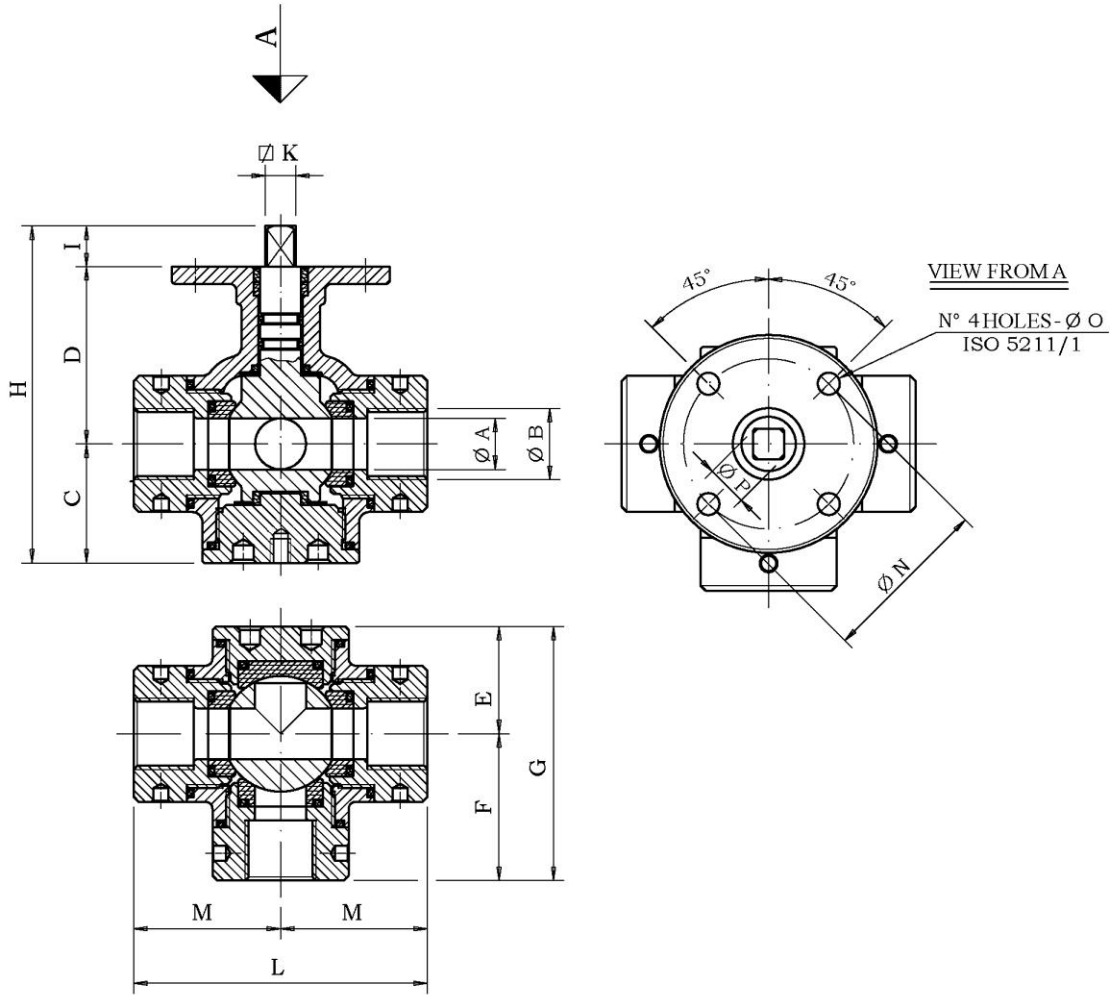


ND	3/8”	1/2”	3/4”	1”	1”1/4	
COD.	**6059**	**5476**	**5477**	**5478**	**6018**	"T" Ball
	- - - - -	**5706**	**5707**	**5708**	**6020**	"L" Ball
A	10	15	20	25	32	
B	3/8” GAS	1/2” GAS	3/4” GAS	1” GAS	1”1/4 GAS	
C	35	35	37	40	47	
D	52	52	57	62	72	
E	28,5	28,5	33	39	46	
F	43	43	44	54	62	
G	71.5	71.5	77	93	108	
H	99	99	106	114	135	
I	9	9	12	12	16	
K	9	9	9	9	14	
L	86	86	88	108	124	
M	43	43	44	54	62	
ISO	F05	F05	F05	F05	F05	
N	50	50	50	50	50	
O	7	7	7	7	7	
P	12	12	12	12	18	

Measurements are expressed in mm

DWG. No. 991009_1 Rev.:00

3.5.2 Threaded Bare Shaft (B. S.) 3-Way Ball Valve With Enveloping Gaskets

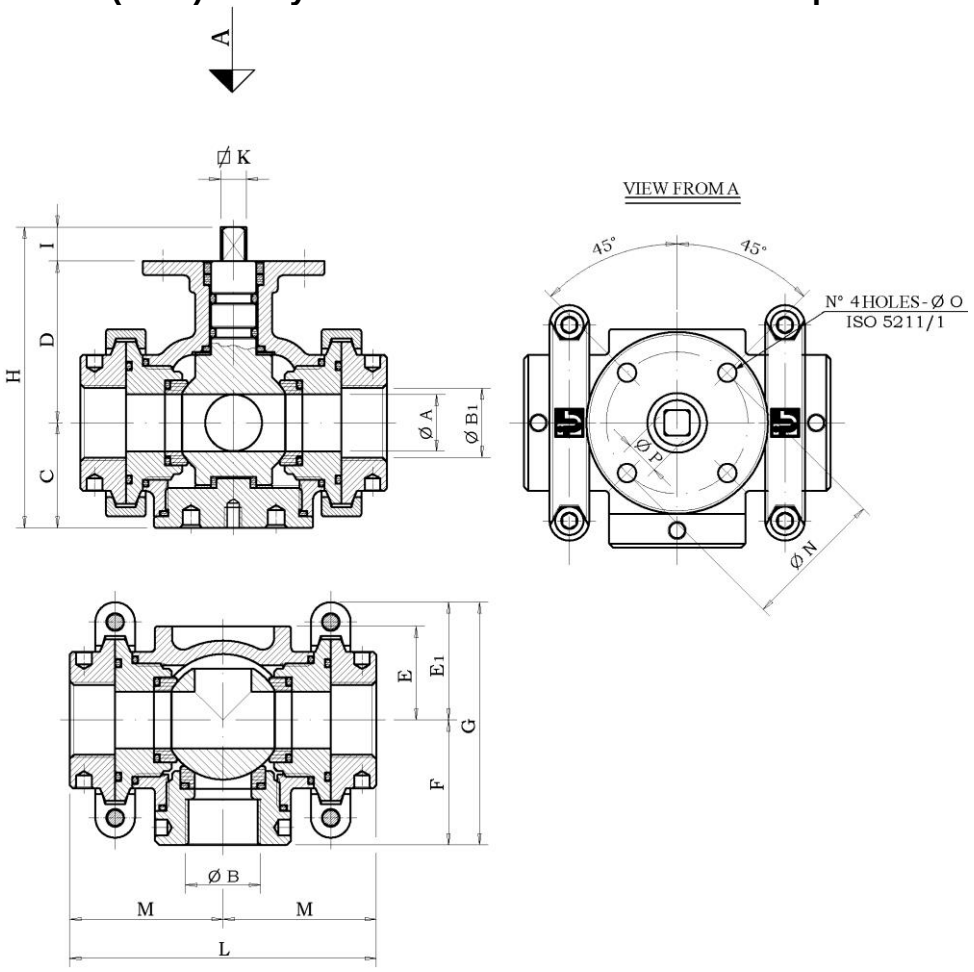


ND	3/8”	1/2”	3/4”	1”	1”1/4	
COD.	**6194**	**5510**	**5511**	**5512**	**6019**	"T" Ball
	- - - - -	**5709**	**5710**	**5711**	**6021**	"L" Ball
A	10	15	20	25	32	
B	3/8” GAS	1/2” GAS	3/4” GAS	1” GAS	1”1/4 GAS	
C	35	35	37	40	47	
D	52	52	57	62	72	
E	31,5	31,5	37	43	50	
F	43	43	44	54	62	
G	74.5	74.5	81	97	112	
H	99	99	106	114	135	
I	9	9	12	12	16	
K	9	9	9	9	14	
L	86	86	88	108	124	
M	43	43	44	54	62	
ISO	F05	F05	F05	F05	F05	
N	50	50	50	50	50	
O	7	7	7	7	7	
P	12	12	12	12	18	

Measurements are expressed in mm

DWG. No. 991009_2 Rev.:00

3.5.3 Bare Shaft (B. S.) 3-Way Ball Valve With Microfused Clamp



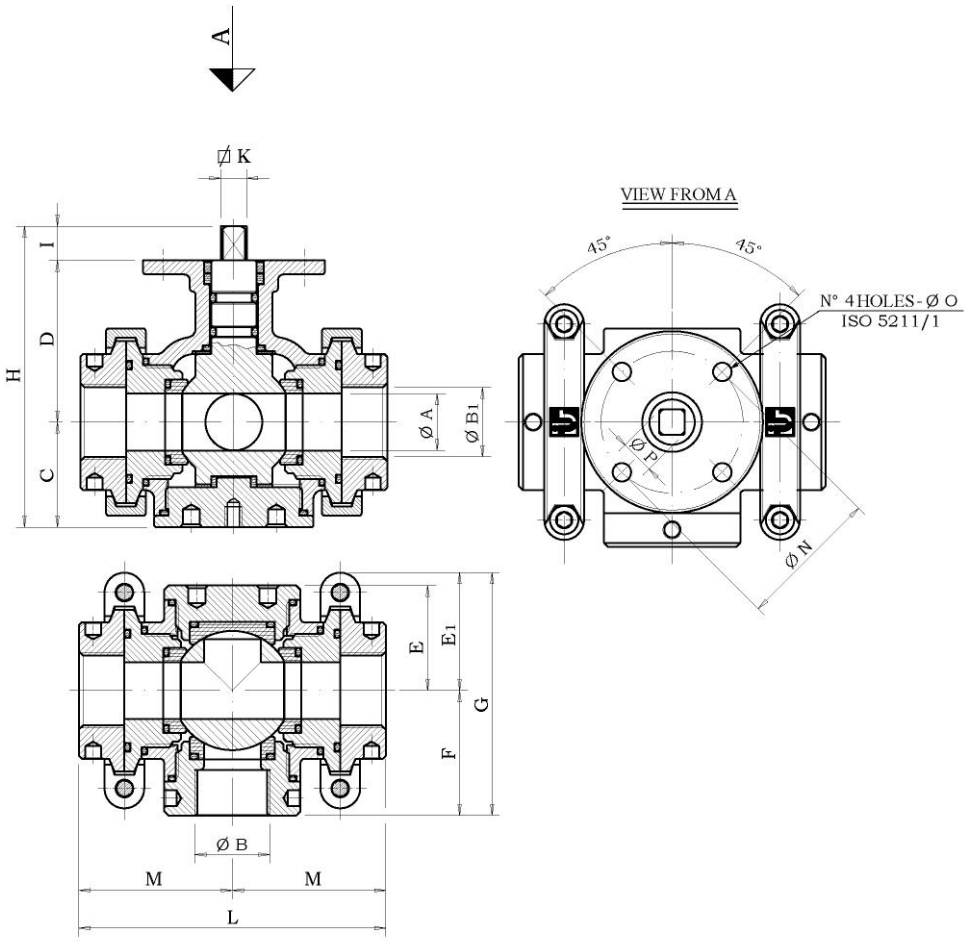
ND	1/2”-1/2”	3/4”-1/2”	3/4”-3/4”	1”-1”	1”1/4-1”1/4	
COD.	**6657**	**6611**	**6612**	**6639**	**6069**	"T" Ball
	6659	**6616**	**6617**	**6641**	**6071**	"L" Ball
A	15	20	20	25	32	
B	1/2" GAS	3/4” GAS	3/4” GAS	1” GAS	1”1/4 GAS	
B1	1/2" GAS	1/2" GAS	3/4” GAS	1” GAS	1”1/4 GAS	
C	35	37	37	40	47	
D	52	57	57	62	72	
E	28,5	33	33	39	46	
E1	36	41.5	41.5	41.5	45.5	
F	43	44	44	54	62	
G	79	85.5	85.5	95.5	108	
H	99	106	106	114	135	
I	9	12	12	12	16	
K	9	9	9	9	14	
L	97	108	108	135	162	
M	48.5	54	54	67.5	81	
ISO	F05	F05	F05	F05	F05	
N	50	50	50	50	50	
O	7	7	7	7	7	
P	12	12	12	12	18	

Measurements are expressed in mm

Dimension G is obtained adding dimension F to the greatest between dimensions E and E1

DWG. No. 010415_1 Rev.:00

3.5.4 Bare Shaft (B. S.) 3-Way Ball Valve With Microfused Clamp And Enveloping Gaskets



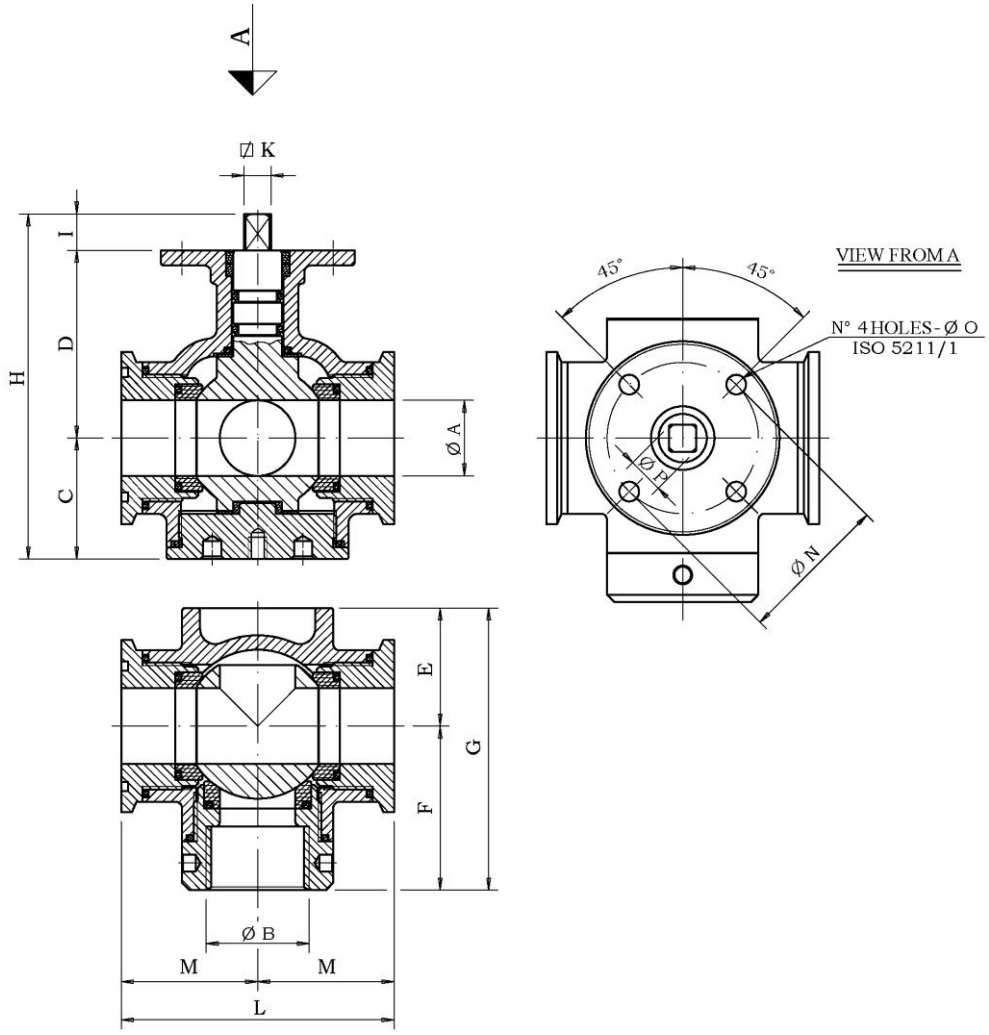
ND	1/2”-1/2”	3/4”-1/2”	3/4”-3/4”	1”-1”	1”1/4-1”1/4	
COD.	**6656**	**6613**	**6614**	**6640**	**6070**	"T" Ball
	6658	**6618**	**6619**	**6642**	**6072**	"L" Ball
A	15	20	20	25	32	
B	1/2" GAS	3/4” GAS	3/4” GAS	1” GAS	1”1/4 GAS	
B1	1/2" GAS	1/2" GAS	3/4” GAS	1” GAS	1”1/4 GAS	
C	35	37	37	40	47	
D	52	57	57	62	72	
E	31,5	37	37	43	50	
E1	36	41.5	41.5	41.5	45.5	
F	43	44	44	54	62	
G	79	85.5	85.5	97	112	
H	99	106	106	114	135	
I	9	12	12	12	16	
K	9	9	9	9	14	
L	97	108	108	135	162	
M	48.5	54	54	67.5	81	
ISO	f05	F05	F05	F05	F05	
N	50	50	50	50	50	
O	7	7	7	7	7	
P	12	12	12	12	18	

Measurements are expressed in mm

Dimension G is obtained adding dimension F to the greatest between dimensions E and E1

DWG. No. 010415_2 Rev.:00

3.5.5 Bare Shaft (B. S.) 3-Way Ball Valve Arranged For Assembly

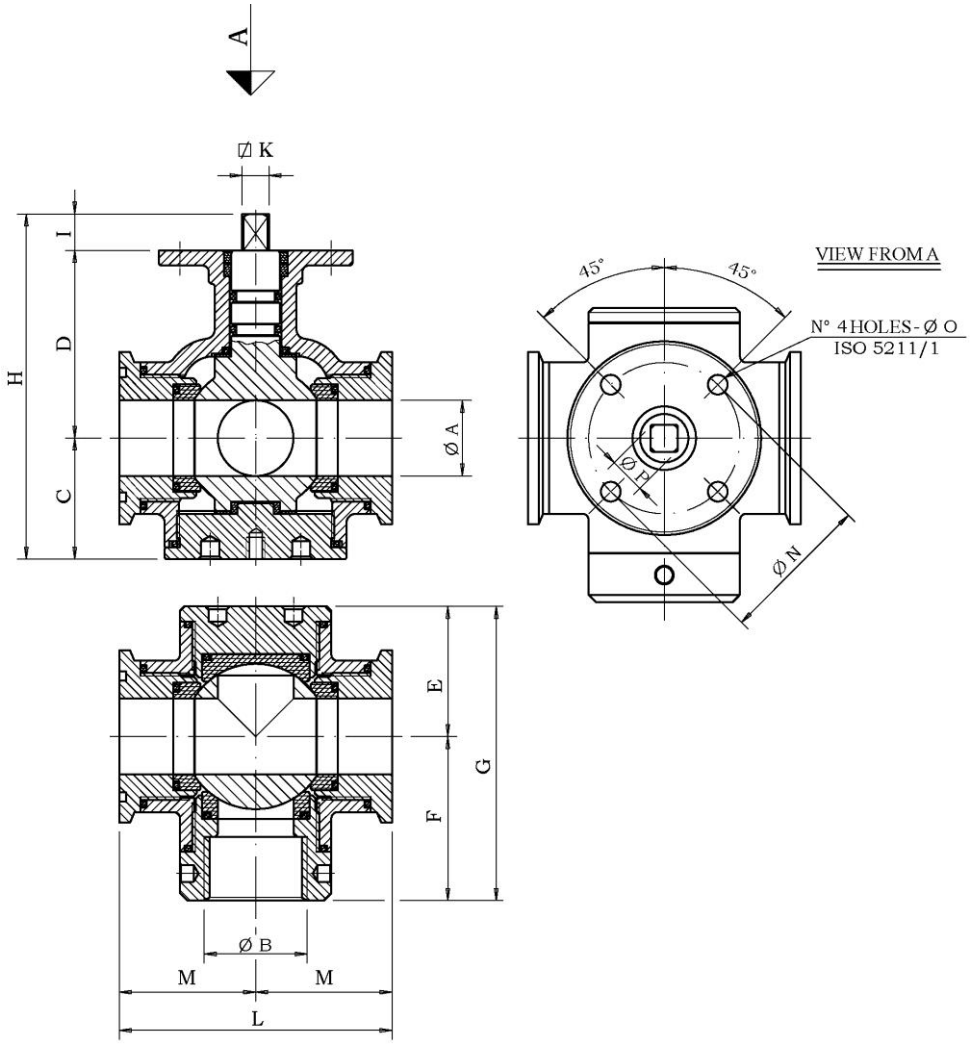


ND	1/2”	1”	1”1/4	
COD.	**6660**	**5540**	**6030**	"T" Ball
	6662	**5724**	**6032**	"L" Ball
A	15	25	32	
B	1/2” GAS	1” GAS	1”1/4 GAS	
C	35	40	47	
D	52	62	72	
E	28.5	39	46	
F	43	54	62	
G	71,5	93	108	
H	99	114	135	
I	9	12	16	
K	9	9	14	
L	67	94	112	
M	33.5	45	56	
ISO	F05	F05	F05	
N	50	50	50	
O	7	7	7	
P	12	12	18	

Measurements are expressed in mm

DWG. No. 010418_1 Rev.:00

3.5.6 Bare Shaft (B. S.) 3-Way Ball Valve Arranged For Assembly With Enveloping Gaskets

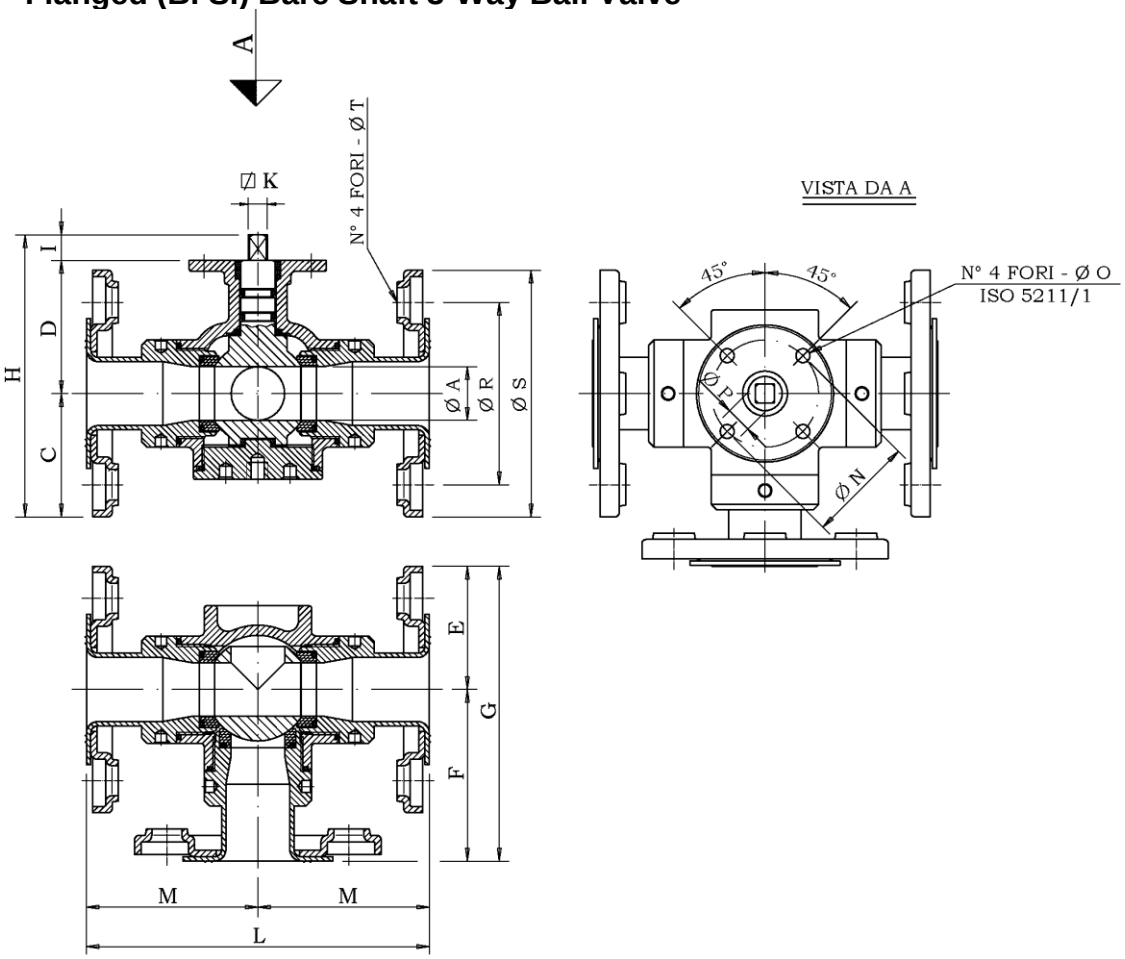


ND	1/2”	3/4”	1”	1”1/4	
COD.	**6655**	**6615**	**5541**	**6031**	"T" Ball
	6661	**0**	**5725**	**6033**	"L" Ball
A	15	20	25	32	
B	1/2” GAS	3/4” GAS	1” GAS	1”1/4 GAS	
C	35	37	40	47	
D	52	57	62	72	
E	31.5	37	43	50	
F	43	44	54	62	
G	74,5	81	97	112	
H	99	106	114	135	
I	9	12	12	16	
K	9	9	9	14	
L	67	76	90	112	
M	33.5	38	45	56	
ISO	F05	F05	F05	F05	
N	50	50	50	50	
O	7	7	7	7	
P	12	12	12	18	

Measurements are expressed in mm

DWG. No. 010418_2 Rev.:00

3.5.7 Flanged (B. S.) Bare Shaft 3-Way Ball Valve

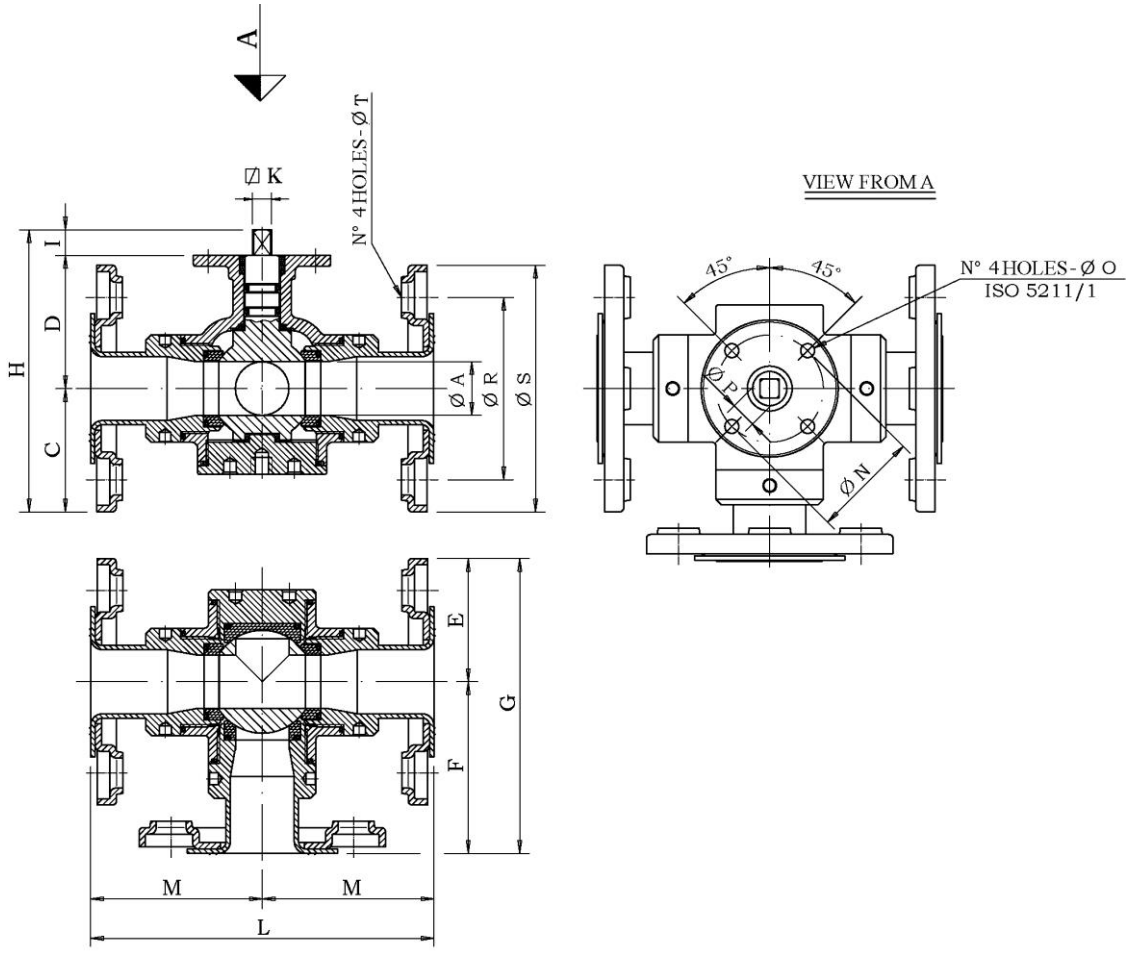


ND	1”	
COD.	**5538**	"T" Ball
	5722	"L" Ball
A	25	
C	57.5	
D	62	
E	57.5	
F	80	
G	137.5	
H	131.5	
I	12	
K	9	
L	160	
M	80	
ISO	F05	
N	50	
O	7	
P	12	
R	85	
S	115	
T	14	

Measurements are expressed in mm

DWG. No. 991012_1 Rev.:00

3.5.8 Flanged (B. S.) Bare Shaft 3-Way Ball Valve With Enveloping Gaskets

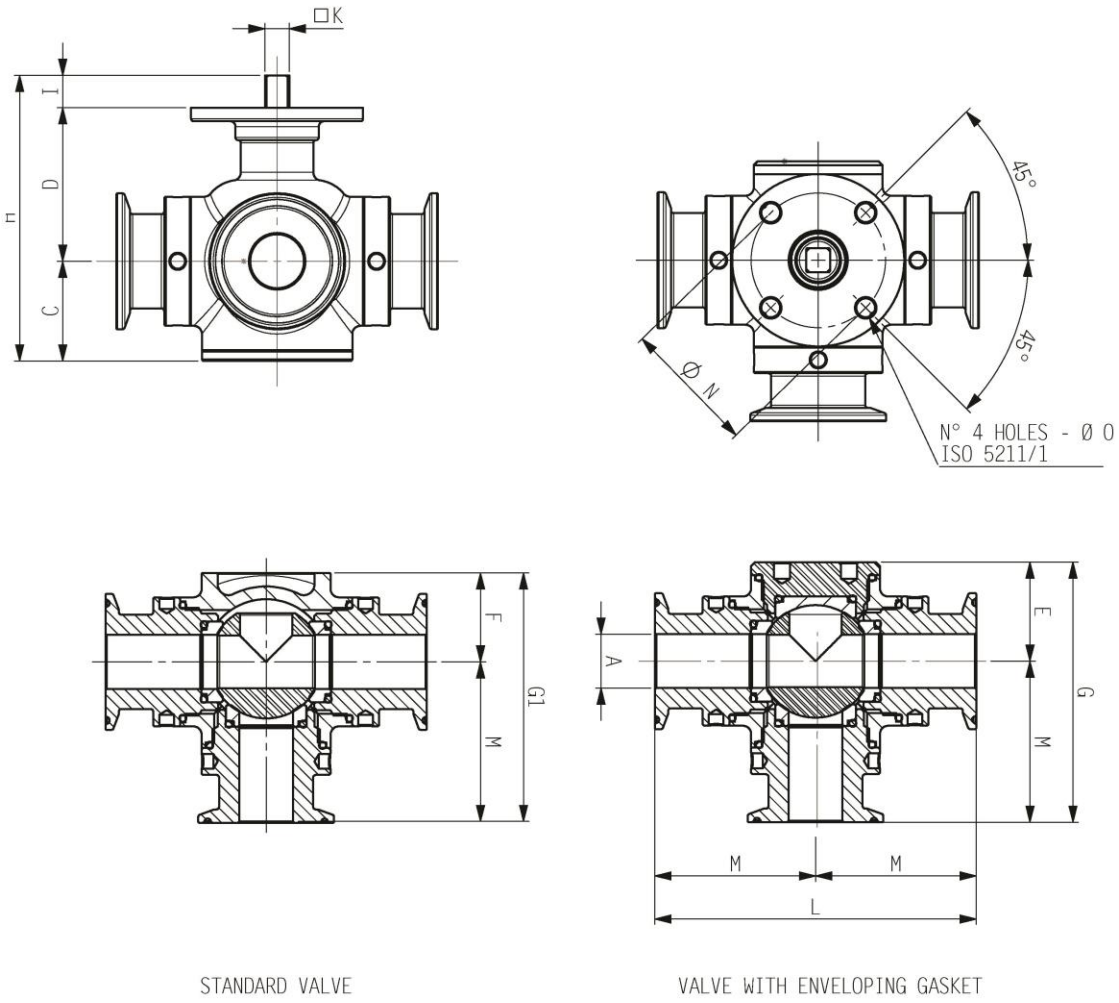


ND	1”	
COD.	**5539**	"T" Ball
	5723	"L" Ball
A	25	
C	57.5	
D	62	
E	57.5	
F	80	
G	137.5	
H	131.5	
I	12	
K	9	
L	160	
M	80	
ISO	F05	
N	50	
O	7	
P	12	
R	85	
S	115	
T	14	

Measurements are expressed in mm

DWG.No. 991012_2

3.5.9 Bare Shaft 3-Way Ball Valve (AN) CLAMP



STANDARD VALVE

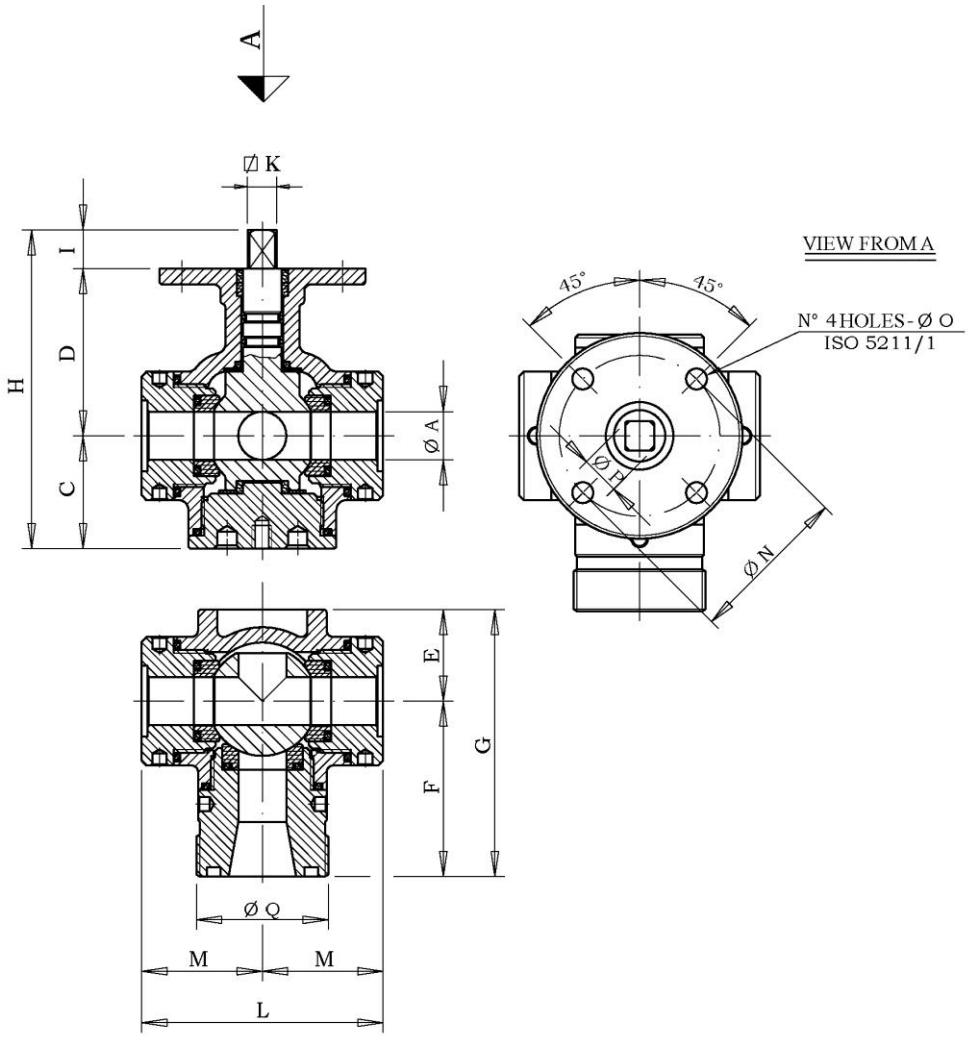
VALVE WITH ENVELOPING GASKET

ND	1/2"	3/4"	1”	1”1/4
Ø A	15	20	25	32
C	35	37	40	47
D	52	57	62	72
E	31,5	37	43	50
F	28,5	33	39	46
G	87,5	97	108	125
G1	84,5	93	104	121
H	87	94	102	119
I	9	12	12	16
□ K	9	9	9	14
L	102	120	130	150
M	56	60	65	75
ISO 5211/1	F05	F05	F05	F05
Ø N	50	50	50	50
Ø O	7	7	7	7

Measurements are expressed in mm

DWG No. 130307_0

3.5.10 Box Model (B. S.) Bare Shaft 3-Way Ball Valve

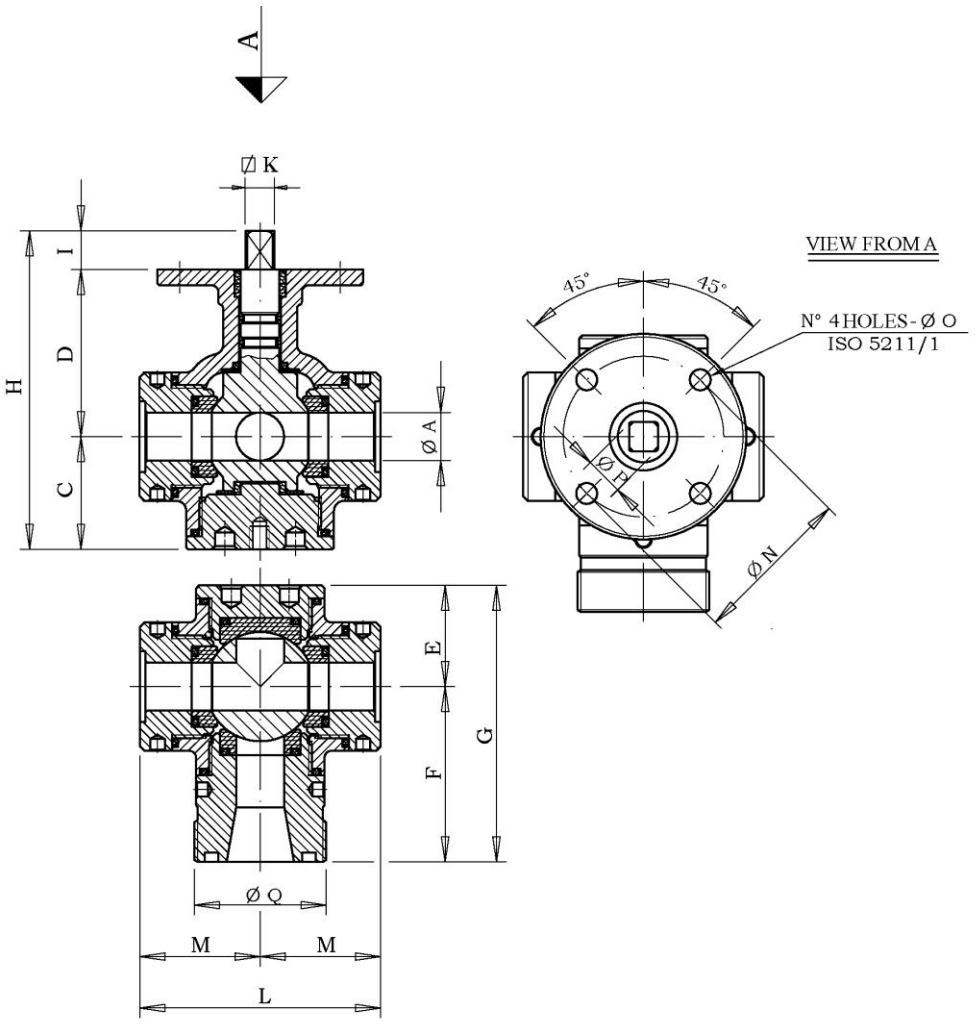


ND	1/2”	
COD.	**5530**	"T" Ball
	5714	"L" Ball
A	15	
C	35	
D	52	
E	28.5	
F	54.5	
G	83	
H	99	
I	9	
K	9	
L	75	
M	37.5	
ISO	F05	
N	50	
O	7	
P	12	
Q	1”1/4 GAS	

Measurements are expressed in mm

DWG. No. 991013_1

3.5.11 Box Model (B. S.) Bare Shaft 3-Way Ball Valve With Enveloping Gaskets

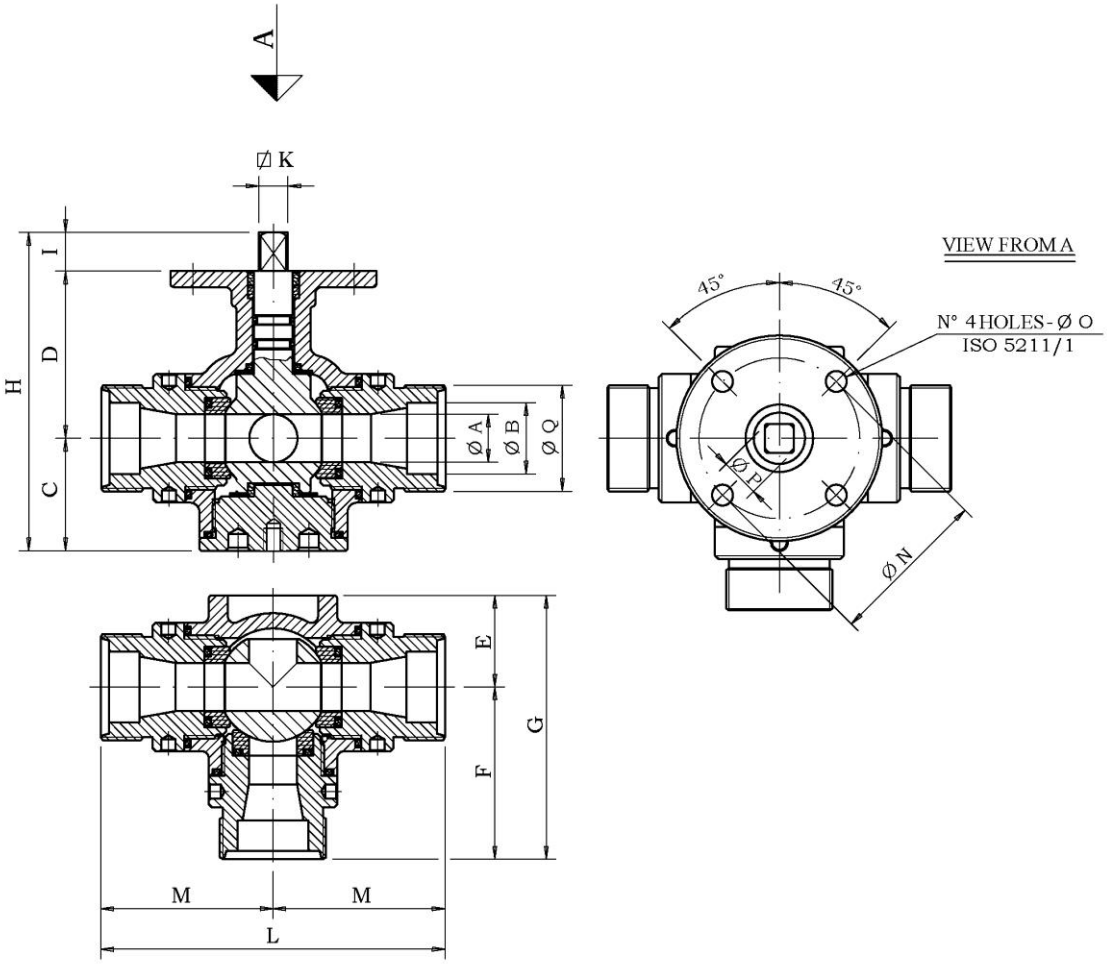


ND	1/2”	
COD.	**5531**	"T" Ball
	5715	"L" Ball
A	15	
C	35	
D	52	
E	31.5	
F	54.5	
G	86	
H	99	
I	9	
K	9	
L	75	
M	37.5	
ISO	F05	
N	50	
O	7	
P	12	
Q	1”1/4 GAS	

Measurements are expressed in mm

DWG. No. 991013_2

3.5.12 Line Model (B. S.) Bare Shaft 3-Way Ball Valve

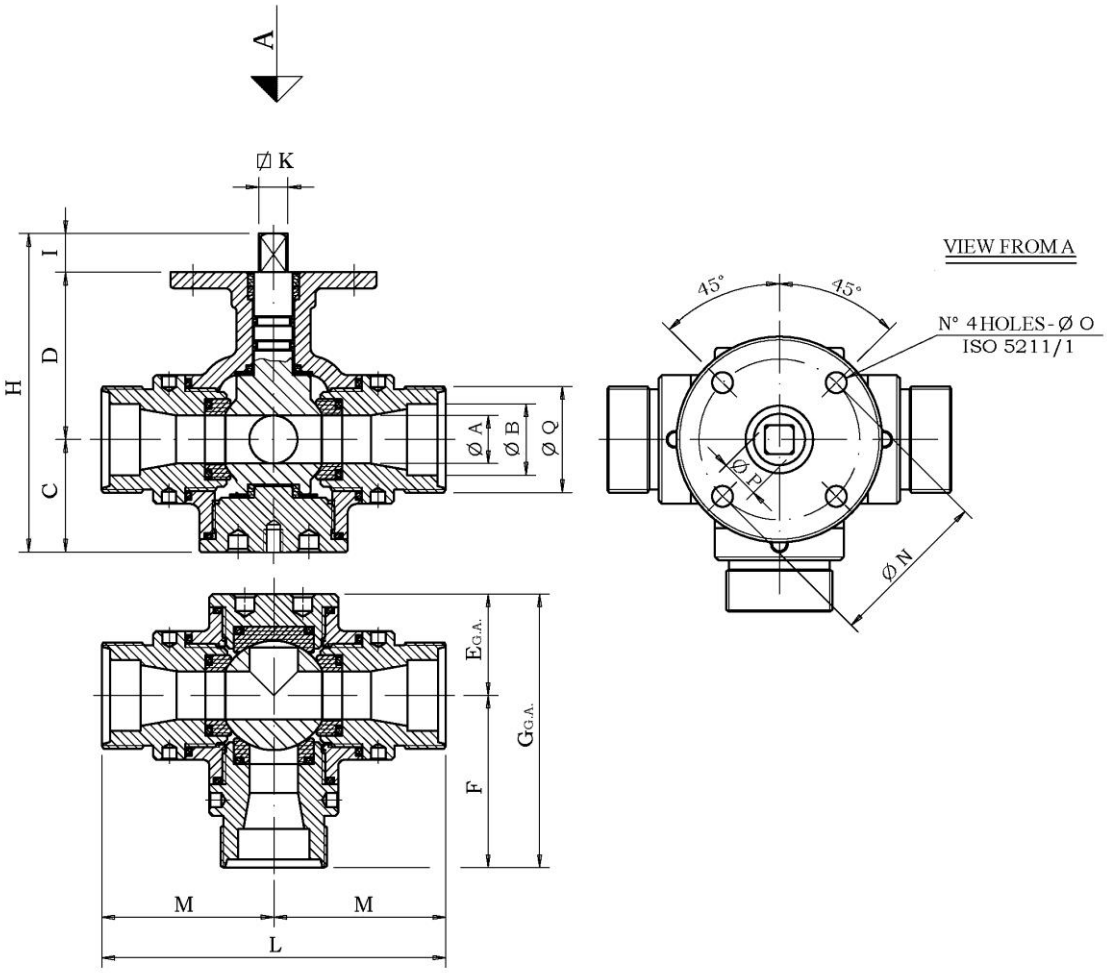


ND	1/2”	
COD.	**5528**	"T" Ball
	5712	"L" Ball
A	15	
B	22.1	
C	35	
D	52	
E	28.5	
F	53.5	
G	82	
H	99	
I	9	
K	9	
L	107	
M	53.5	
ISO	F05	
N	50	
O	7	
P	12	
Q	M33x1.5	

Measurements are expressed in mm

DWG. No. 991014_1

3.5.13 Line Model (B. S.) Bare Shaft 3-Way Ball Valve With Enveloping Gaskets



ND	1/2”	
COD.	**5529**	"T" Ball
	5713	"L" Ball
A	15	
B	22.1	
C	35	
D	52	
E	31.5	
F	53.5	
G	85	
H	99	
I	9	
K	9	
L	107	
M	52.5	
ISO	F05	
N	50	
O	7	
P	12	
Q	M33x1.5	

Measurements are expressed in mm

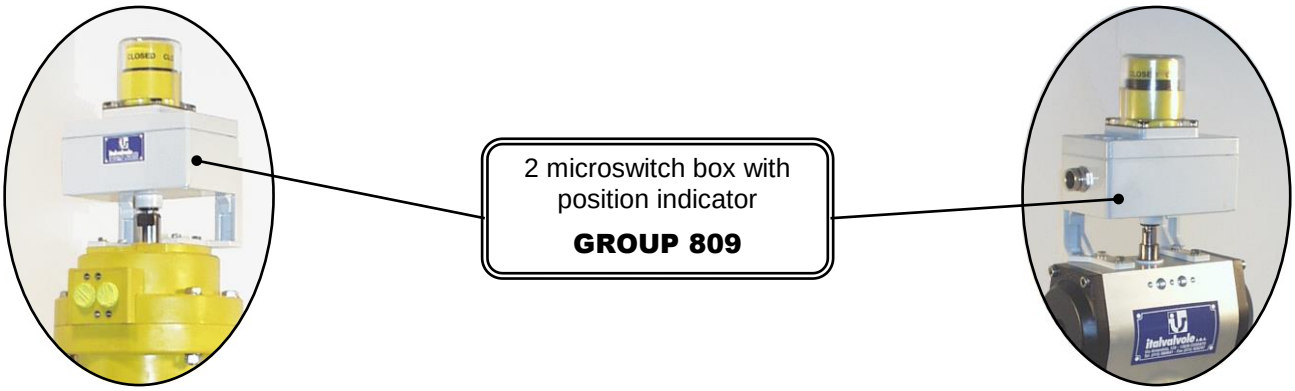
DWG. No. 991014_2

4 Fittings

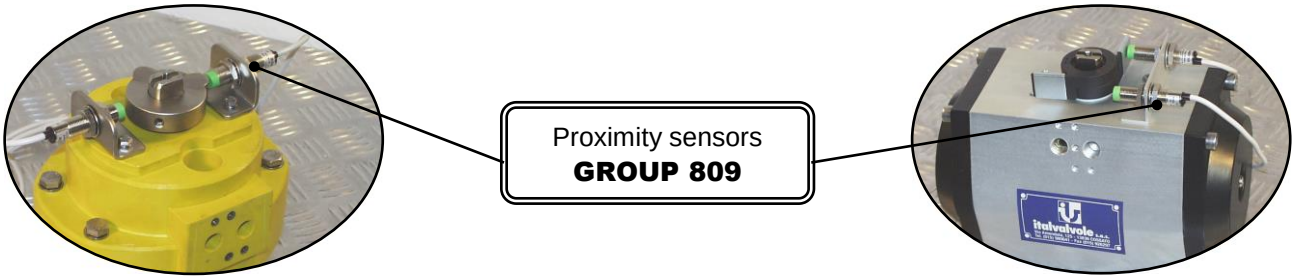
Pneumatic actuators series ITAL (double-acting or single-acting) are used 3-way ball valves operation for.

Furthermore, to satisfy particular customer's needs, these actuators can be supplied with fittings, such as:

- 2 microswitch box with position indicator.
- Proximity sensors (inductive or magnetic)
- Electric valves.
- Position indicator.



2 microswitch box with position indicator
GROUP 809



Proximity sensors
GROUP 809

Electric valves
GROUP 852

Position indicator
GROUP 869

5 Storage, Assembly, Check And Maintenance

5.1 Transport, Storage And Handling

3-way ball valves, during transport and assmenbly, must be handled very carefully. Shocks and anomalous stresses must be avoided.

Valves are delivered with dust-proof protections on all connections and these protections shall not be removed up to their installation.

Valves shall be stored in areas which are not exposed to the sunshine, so as to prevent inner gaskets from getting dry and old before time.

Storage temperatures shall range between 0 °C and + 50 °C.

5.2 Assembly Instructions

5.2.1 General

The valve installation on the system shall be carried out by qualified personnel only, within the mechanical and pneumatic fields, provided with all the equipment normally used in the industrial hydraulic and pneumatic plant engineering. The personnel shall always wear proper accident prevention garments, taking particular care to the protection of face, eyes and hands.

In any case the valve must not be disassembled or modified, under pain of revocation of each type of guarantee.

Before installation, it is necessary to remove protections from the valve body.

5.2.2 Valve With Male Threaded Connection Assembly

In the event that the body has male threaded connections, it is necessary to coat these areas with PTFE seal tape to ensure a perfect seal; furthermore, it is necessary to tighten connections to the prescribed torque, as specified later on, in table 3. Caution: the installer must verify that all parts connected to the valve support the tightening torque requested.

5.2.3 Valve With Female Threaded Connections Assembly

In case the body has female threaded connections, it is necessary to coat connection pipe terminals with PTFE seal tape to ensure a perfect seal; moreover, it is necessary to tighten connections to the prescribed torque, as specified later on, in table 3. Caution: the installer must verify that all parts connected to the valve support the tightening torque requested.

5.2.4 Valve With Flanged Connections Assembly

In case the body has flanged connections, it is necessary to tighten to the torque prescribed by the manufacturer of the system the fastening screws used to join flanges together.

5.3 Operation Test

Before starting up the system and after any repair or overhaul, the following operation test shall be carried out:

1) Send fluid into the valve at the operating pressure, (check that it is always lower than the value of maximum allowable pressure, specified on the body), make sure that there is fluid passage in the open port.
2) Introduce air into the servo control (to switch the valve) and verify, from fluid passage, the correct valve switching.
3) Introduce air into the servo control to return the valve to starting conditions.
4) Repeat the operation 4/5 times.
5) Check that there are no valve leakages.

5.4 Troubleshooting

Troubleshooting operations must always be performed by skilled personnel, equipped for hydraulic and pneumatic operations and provided with proper safety clothing, paying particular attention to the protection of eyes, hands and face.

In the event of malfunctions or valve leakages, valve operation must be stopped immediately and it is necessary to carry out the following inspections (**caution:** during troubleshooting, the valve must not be removed or changed of position from the system where it works. No component belonging to the valve must be disassembled or loosed.):

- disconnect the air circuit; disconnect the air supplying pipe (with air off), to make sure that no air is present inside the piping.
- check with a pressure gauge that the inlet fluid pressure is not higher than the maximum allowable pressure, specified on the valve body.

In case no faults result from this test, it is necessary to remove the valve from the system; first check that both valve connections and valve bottom are correctly tightened; if that is the case, check the inner parts of the valve, disassembling it following the instructions at paragraphs 6.1, 6.4, 6.5 and 6.8 of this manual.

5.5 Scheduled Maintenance

Scheduled maintenance operations shall be carried out apart from the ones due to possible failures, which always need an immediate intervention.

The interval between a maintenance operation and the following corresponds to the shortest time interval ranging between 60.000 cycles and three years; it consists of a complete valve disassembly, with replacement of all gaskets and a complete cleaning of all the other components. For disassembly and reassembly operations refer to paragraphs 6.1, 6.4, 6.5 and 6.8.

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6 Disassembly And Reassembly Instructions. 3-Way Ball Valve Exploded Views, Components And Spare Parts

6.1 Disassembly, Gasket Replacement And Reassembly Instructions For Threaded B. S. 3-Way Ball Valves

For disassembly and reassembly operations of the N. C. valve refer to Dwg. 991015.

All disassembly and reassembly operations must be performed by skilled personnel in industrial pneumatic and hydraulic operations, provided with all the safety and working equipment. Before starting any operation on systems and valves, get reliable and exhaustive information about operating temperature and pressure values, as well as on special conditions, if any.

Every time it is necessary to operate on valves, it is compulsory to remove completely the fluid inside the valve.

NOTE: Read the procedures thoroughly before starting any operation.

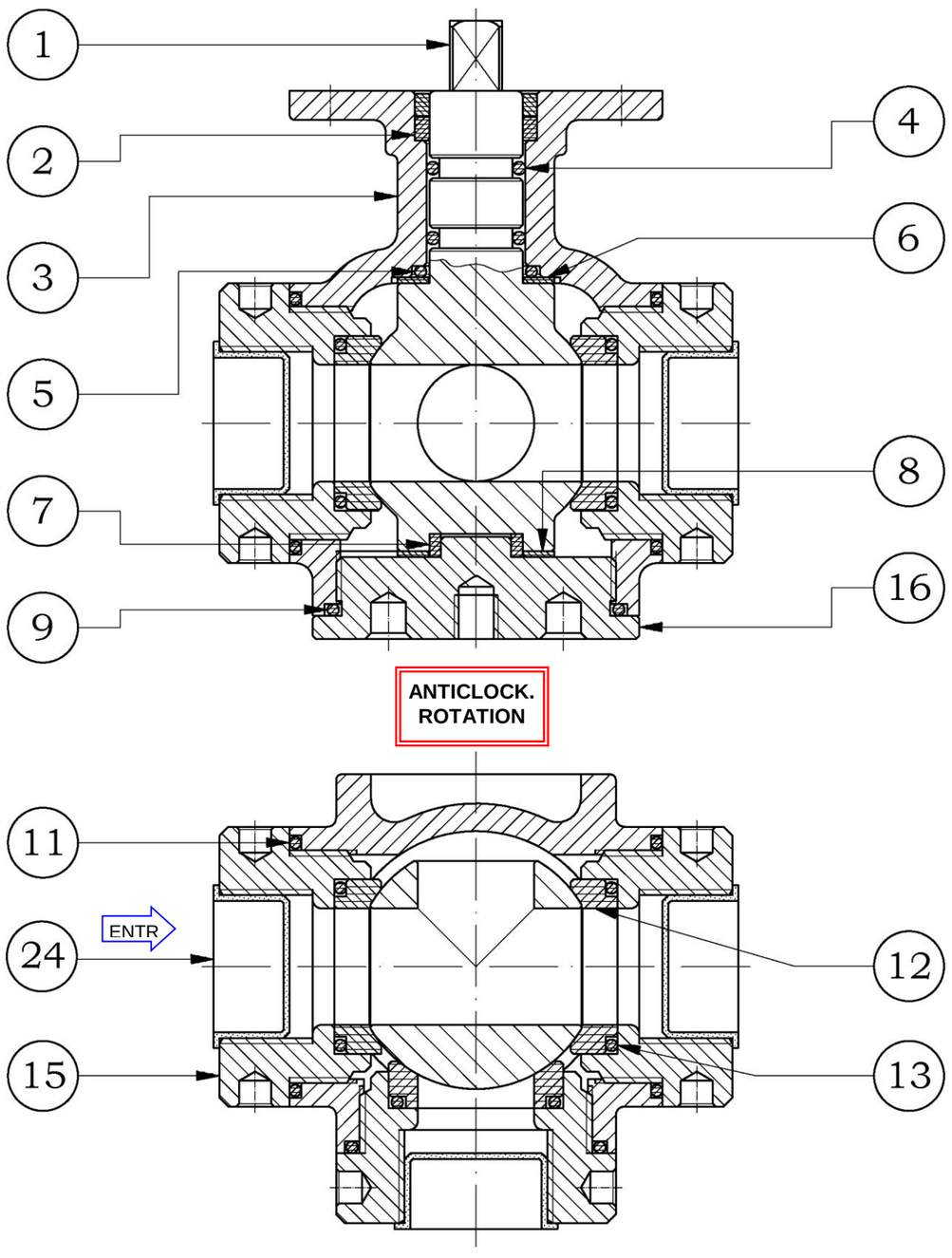
6.1.1 Disassembly

1) Unscrew and remove heads (15).
2) Extract seals (12) and O-Rings (13).
3) Remove O-Rings (11).
4) Unscrew and remove the bottom (16).
5) Extract sliding bush (8) and guide bush (7).
6) Remove O-Ring (9).
7) Extract the shaft with ball (1) from the valve body (3).
8) Remove O-Rings (4), O-Ring (5) and sliding bush (6) from the shaft with ball (1).
9) Extract guide bushes (2) from the valve body (3).

6.1.2 Maintenance And Assembly

1) Clean all components with care.
2) Fit guide bushes (2) into the valve body (3).
3) Fit sliding bush (6), O-Ring (5) and O-Rings (4) onto the shaft with ball (1).
4) Fit the shaft with ball (1) into the valve body (3).
5) Tighten the bottom (16) to the prescribed torque (as specified in table 3), after putting into the correct position O-Ring (9), sliding bush (8) and guide bush (7).
6) Tighten heads (15) to the prescribed torque (as specified in table 3), after putting into the correct position O-Rings (13), seals (12) and O-Rings (11).

6.2 Exploded View, Components And Spare Parts For Threaded B. S. 3-Way Ball Valves



COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATER.	GR.	CODE					
					ND 3/8”	ND 1/2”	ND 3/4”	ND 1”	ND 1”1/4	
1	1	Shaft complete with ball	AISI 316	564	-	ALBE990084	ALBE990085	ALBE990086	ALBE990704	LP*
					ALBE991030	ALBE980924	ALBE980925	ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952		BGD001979		BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980934		CLSF980935	CLSF980936	CLSF990715	
4	2	O-Ring gasket	VITON	548	OR002037VI		OR00115VI		OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI		535		OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922		BSSC980923		BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI		OR03187VI	OR003206VI	OR003262VI	
11	3	O-Ring gasket	VITON	548	OR03131VI		OR03156VI	OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705	
13	3	O-Ring gasket	VITON	548	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI	
15	3	Head	AISI 316	866	TSVS991024	TSVS980931	TSVS980932	TSVS980933	TSVS990708	
16	1	Bottom	AISI 316	756	FOND980928		FOND980929	FOND980930	FOND990712	
24	3	Cylindrical cap	Polyethyl.	505	T01ST00160	T01ST00190	T01ST00250	T01ST00310	T01ST00395	

* L ball passage = LP

** T ball passage = TP

GROUP 105

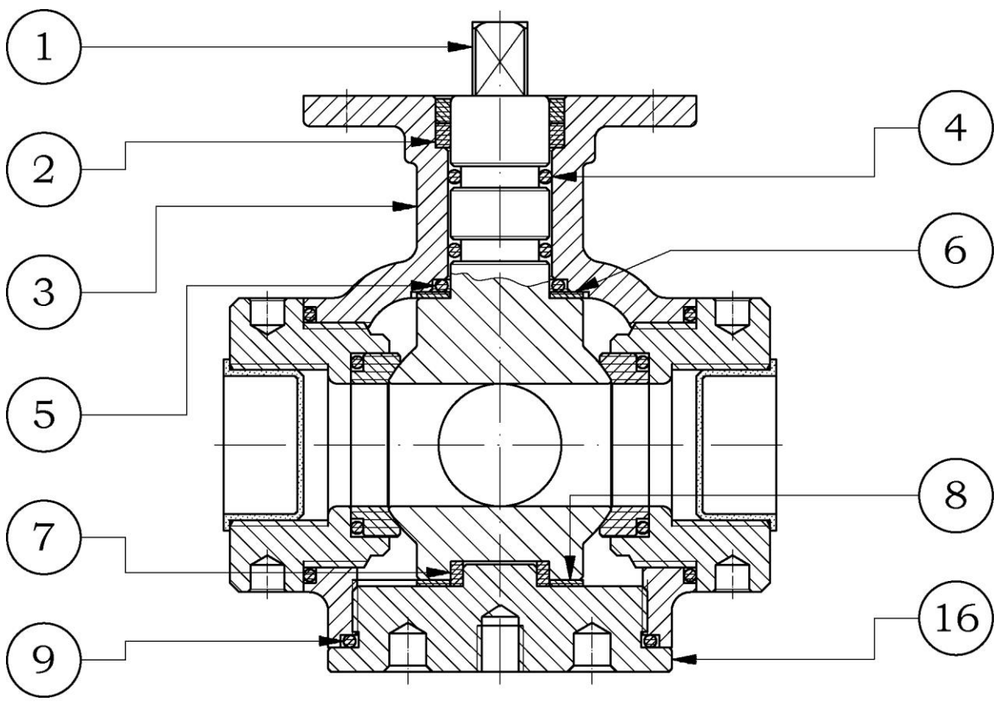
COMPLETE SET OF THREADED BARE SHAFT 3-WAY BALL VALVE SPARE PARTS PRODUCED FROM 1998 FROM ND 3/8” TO ND 1”1/4

SPARE PARTS TABLE

SPARE PART CODE		6066	6155	6156	6157	6158
PART No.	Q.ty	ND 3/8“	ND 1/2“	ND 3/4“	ND 1”	ND 1”1/4
2	2	BGD001952		BGD001979		BSGD990713
4	2	OR002037VI		OR00115VI		OR03068VI
5	1	OR00115VI		535		OR00128VI
6	1	BSSC980922		BSSC980923		BSSC990714
7	1	BGD001952				BGD001979
8	1	BSSC980923				BSSC990714
9	1	OR03150VI		OR03187VI	OR003206VI	OR003262VI
11	3	OR03131VI		OR03156VI	OR03168VI	OR003206VI
12	3	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	3	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI

DWG. No. 991015

6.3 Exploded View, Components And Spare Parts For Threaded B. S. 3-Way Ball Valves With Enveloping Gaskets

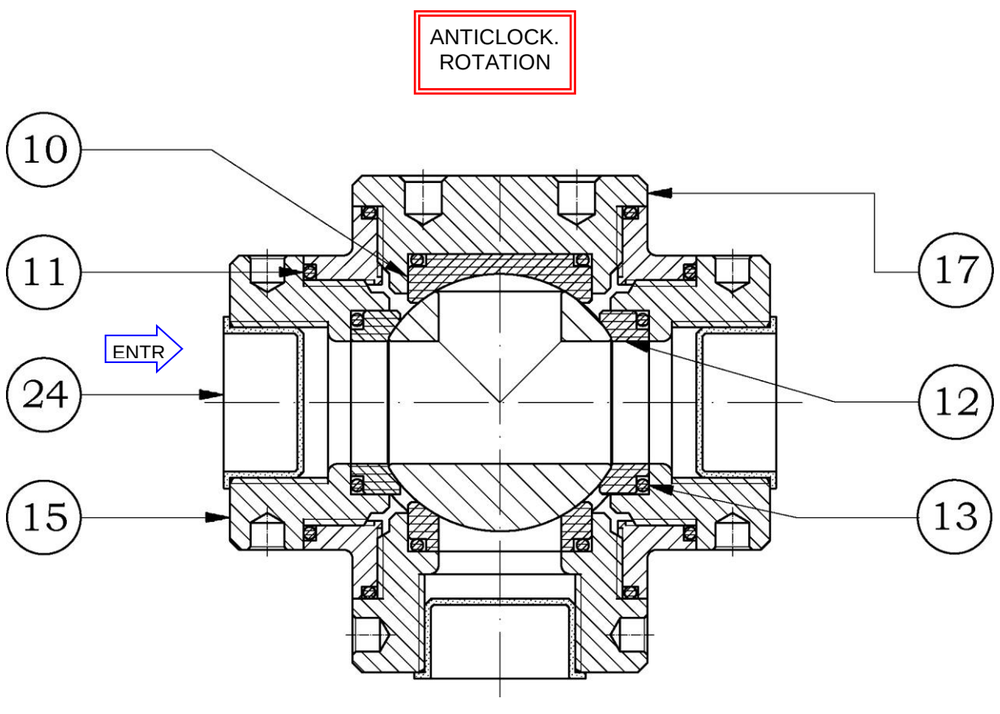


COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATER.	GR.	CODE					
					ND 3/8”	ND 1/2”	ND 3/4”	ND 1”	ND 1”1/4	
1	1	Shaft complete with ball	AISI 316	564	-	ALBE990084	ALBE990085	ALBE990086	ALBE990704	LP*
					ALBE991030	ALBE980924	ALBE980925	ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952		BGD001979		BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980949		CLSF980950	CLSF980951	CLSF990716	
4	2	O-Ring gasket	VITON	548	OR002037VI		OR00115VI		OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI		535		OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922		BSSC980923		BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI		OR03187VI	OR003206VI	OR003262VI	
10	1	Blank seal	TEFLON	511	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706	
11	4	O-Ring gasket	VITON	548	OR03131VI		OR03156VI	OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705	
13	4	O-Ring gasket	VITON	548	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI	
15	3	Head	AISI 316	866	TSVS991024	TSVS980931	TSVS980932	TSVS980933	TSVS990708	
16	1	Bottom	AISI 316	756	FOND980928		FOND980929	FOND980930	FOND990712	
17	1	Blank head	AISI 316	866	TSVS991085	TSVS980937	TSVS980938	TSVS980939	TSVS990711	
24	3	Cylindrical cap	Polyethyl.	505	T01ST00160	T01ST00190	T01ST00250	T01ST00310	T01ST00395	

* L ball passage = LP

** T ball passage = TP



DWG. No. 991016

GROUP 105

COMPLETE SET OF SPARE PARTS FOR THREADED BARE SHAFT 3-WAY BALL VALVES WITH ENVELOPING GASKETS PRODUCED FROM 1998 FROM ND 3/8” TO ND 1”1/4

SPARE PARTS TABLE

SPARE PART CODE		6321	6159	6160	6161	6162
PART No.	Q.ty	ND 3/8“	ND 1/2“	ND 3/4“	ND 1”	ND 1”1/4
2	2	BGD001952		BGD001979		BSGD990713
4	2	OR002037VI		OR00115VI		OR03068VI
5	1	OR00115VI		535		OR00128VI
6	1	BSSC980922		BSSC980923		BSSC990714
7	1	BGD001952				BGD001979
8	1	BSSC980923				BSSC990714
9	1	OR03150VI		OR03187VI	OR003206VI	OR003262VI
10	1	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706
11	4	OR03131VI		OR03156VI	OR03168VI	OR003206VI
12	3	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	4	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI

6.4 Disassembly, Gasket Replacement And Reassembly Instructions For Threaded B. S. 3-Way Ball Valves With E. G.s (Enveloping Gaskets)

For disassembly and reassembly operations of the N. C. valve refer to Dwg. 991016.

All disassembly and reassembly operations must be performed by skilled personnel in industrial pneumatic and hydraulic operations, provided with all the safety and working equipment. Before starting any operation on systems and valves, get reliable and exhaustive information about operating temperature and pressure values, as well as on special conditions, if any.

Every time it is necessary to operate on valves, it is compulsory to remove completely the fluid inside the valve.

NOTE: Read the procedures thoroughly before starting any operation.

6.4.1 Disassembly

1) Unscrew and remove heads (15).
2) Unscrew and remove the blank head (17).
3) Extract seals (12), blank seal (10) and O-Rings (13).
4) Remove O-Rings (11).
5) Unscrew and remove the bottom (16).
6) Remove sliding bush (8) and guide bush (7).
7) Extract O-Ring (9).
8) Remove the shaft with ball (1) from the valve body (3).
9) Extract O-Rings (4), O-Ring (5) and sliding bush (6) from the shaft with ball (1).
10) Extract guide bushes (2) from the valve body (3).

6.4.2 Maintenance And Assembly

1) Clean all components with care.
2) Fit guide bushes (2) into the valve body (3).
3) Fit sliding bush (6), O-Ring (5) and O-Rings (4) onto the shaft with ball (1).
4) Fit the shaft with ball (1) into the valve body (3).
5) Tighten the bottom (16) to the prescribed torque, (as specified in table 3), after putting into the correct position O-Ring (9), sliding bush (8) and guide bush (7).
6) Tighten heads (15) and blank head (17) to the prescribed torque, (as specified in table 3), after putting into the correct position O-Rings (13), seals (12), blank seal (10) and O-Rings (11).

6.5 Disassembly, Gasket Replacement And Reassembly Instructions For B. S. 3-Way Ball Valves With Clamp

For disassembly and reassembly operations of the N. C. valve refer to Dwg. 010416.

All disassembly and reassembly operations must be performed by skilled personnel in industrial pneumatic and hydraulic operations, provided with all the safety and working equipment. Before starting any operation on systems and valves, get reliable and exhaustive information about operating temperature and pressure values, as well as on special conditions, if any.

Every time it is necessary to operate on valves, it is compulsory to remove completely the fluid inside the valve.

NOTE: Read the procedures thoroughly before starting any operation.

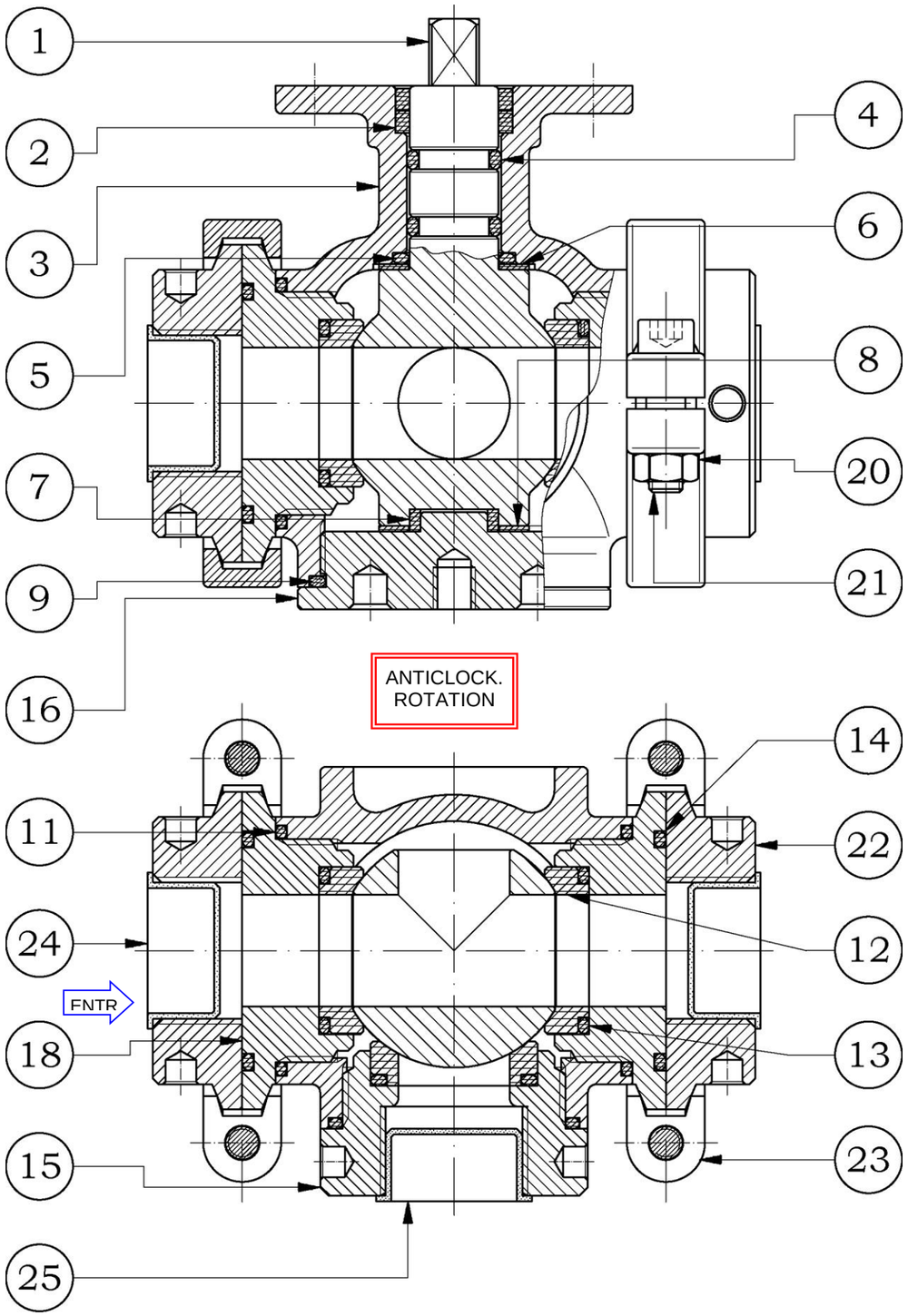
6.5.1 Disassembly

1) Unscrew and remove T.C.C.E. (hexagon slot cap screws) screws (21) and relevant nuts (20).
2) Remove clamps (23) and heads (22).
3) Extract O-Rings (14).
4) Unscrew and remove head (15) and heads (18).
5) Extract seals (12) and O-Rings (13).
6) Extract O-Rings (11).
7) Unscrew and remove the bottom (16).
8) Remove sliding bush (8) and guide bush (7).
9) Extract O-Ring (9).
10) Remove the shaft with ball (1) from the valve body (3).
11) Remove O-Rings (4), O-Ring (5) and sliding bush (6) from the shaft with ball (1).
12) Remove guide bushes (2) from the valve body (3).

6.5.2 Maintenance And Assembly

1) Clean all components with care.
2) Fit guide bushes (2) into the valve body (3).
3) Fit sliding bush (6), O-Ring (5) and O-Rings (4) onto the shaft with ball (1).
4) Fit the shaft with ball (1) into the valve body (3).
5) Tighten the bottom (16) to the prescribed torque, (as specified in table 3), after putting into the correct position O-Ring (9), sliding bush (8) and guide bush (7).
6) Tighten head (15) and heads (18) to the prescribed torque, (as specified in table 3), after putting into the correct position O-Rings (13), seals (12) and O-Rings (11).
7) Replace heads (22), after putting O-Rings (14) into their housings.
8) Replace correctly clamps (23).
9) Put in position nuts (20)
10) Tighten T.C.C.E. screws (21) to the prescribed torque, (as specified in table 3), to fasten clamps.

6.6 Exploded View, Components And Spare Parts For B. S. 3-Way Ball Valves With Microfused movable Clamp



DWG. No. 010416

COMPONENTS TABLE

P.	Q.	DESCRIPTION	MATER.	GR.	CODE					
					ND 1/2"–1/2"	ND 3/4"–1/2"	ND 3/4"–3/4"	ND 1" – 1"	ND 1"1/4–1"1/4	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	ALBE990085		ALBE990086	ALBE990704	LP*
					ALBE980924	ALBE980925		ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952	BGD001979		BGD001979	BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980934	CLSF980935		CLSF980936	CLSF990715	
4	2	O-Ring gasket	VITON	548	OR002037VI	OR00115VI			OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	535			OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	BSSC980923			BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI	OR03187VI		OR003206VI	OR003262VI	
11	3	O-Ring gasket	VITON	548	OR03131VI	OR03156VI		OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR980915	GUAR980916		GUAR980917	GUAR990705	
13	3	O-Ring gasket	VITON	548	OR03075VI	OR03100VI		OR03118VI	OR003162VI	
14	2	O-Ring gasket	VITON	548	OR03112VI	OR03150VI			OR03181VI	
15	1	Head	AISI 316	866	TSVS980931	TSVS980932		TSVS980933	TSVS990708	
16	1	Bottom	AISI 316	756	FOND980928	FOND980929		FOND980930	FOND990712	
18	2	Clamp head with micr. seat	AISI 316	866	TSVSXX0761	TSVS010071		TSVS980992	TSVS990733	
20	4	Hexagon nut	AISI 304	501	D06055884					
21	4	T.C.C.E. screw	AISI 304	551	TCCE06254					
22	2	Micr. movable clamp head	AISI 316	866	TSVSXX0763	TSVS010075	TSVS010076	TSVS980990	TSVS990816	
23	4	Microfused clamp	AISI 304	512	M304XX0407	M304XX0408			M304990836	
24	2	Cylindrical cap	POLYETH.	505	T01ST00190	T01ST00190	T01ST00250	T01ST00310	T01ST00395	
25	1	Cylindrical cap	POLYETH.	505		T01ST00250				

* L ball passage = LP

** T ball passage = TP

GROUP 105

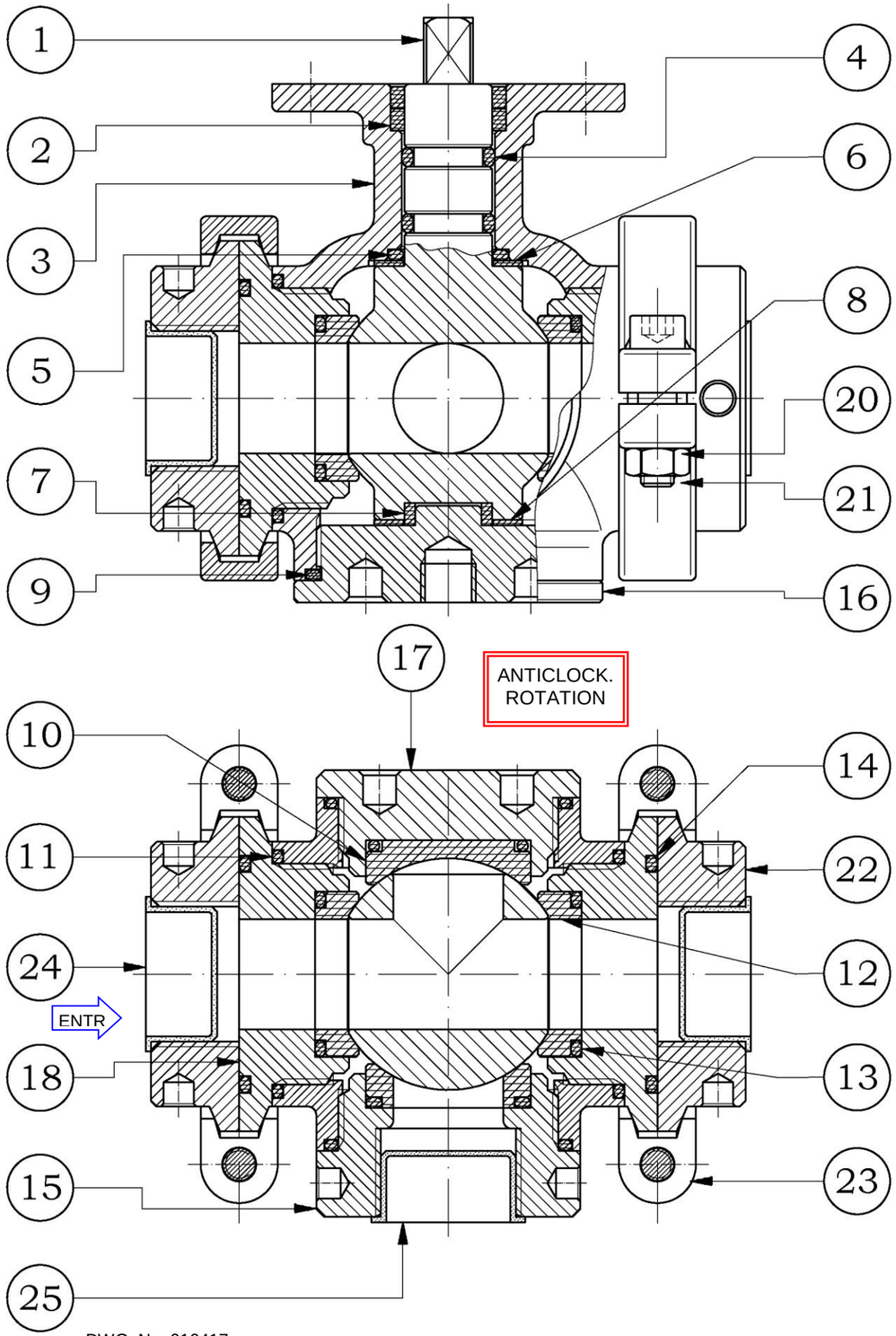
POSITION 3

COMPLETE SET OF SPARE PARTS FOR BARE SHAFT 3-WAY BALL VALVES WITH CLAMP PRODUCED FROM THE BEGINNING OF THE YEAR 2001 FROM ND 1/2" TO ND 1"1/4

SPARE PARTS TABLE

SPARE PART TABLE		6935	6929	6930	6931
PART No.	Q.ty	ND 1/2"	ND 3/4"	ND 1"	ND 1"1/4
2	2	BGD001952	BGD001979		BSGD990713
4	2	OR002037VI	OR00115VI		OR03068VI
5	1	OR00115VI	535		OR00128VI
6	1	BSSC980922	BSSC980923		BSSC990714
7	1	BGD001952			BGD001979
8	1	BSSC980923			BSSC990714
9	1	OR03150VI	OR03187VI	OR003206VI	OR003262VI
11	3	OR03131VI	OR03156VI	OR03168VI	OR003206VI
12	3	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	3	OR03075VI	OR03100VI	OR03118VI	OR003162VI
14	2	OR03112VI	OR03150VI		OR03181VI

6.7 Exploded View, Components And Spare Parts For B. S. 3-Way Ball Valves With Microfused movable Clamp And Enveloping Gaskets



DWG. No. 010417

COMPONENTS TABLE

P.	Q.	DESCRIPTION	MATER.	GR.	CODE					
					ND 1/2"–1/2"	ND 3/4"–1/2"	ND 3/4"–3/4"	ND 1" – 1"	ND 1"1/4–1"1/4	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	ALBE990085		ALBE990086	ALBE990704	LP*
					ALBE980924	ALBE980925		ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952	BGD001979		BGD001979	BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980949	CLSF980950		CLSF980951	CLSF990716	
4	2	O-Ring gasket	VITON	548	OR002037VI	OR00115VI			OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	535			OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	BSSC980923			BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI	OR03187VI		OR003206VI	OR003262VI	
10	1	Blank seal	TEFLON	511	GUAR980918	GUAR980919		GUAR980920	GUAR990706	
11	4	O-Ring gasket	VITON	548	OR03131VI	OR03156VI		OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR980915	GUAR980916		GUAR980917	GUAR990705	
13	4	O-Ring gasket	VITON	548	OR03075VI	OR03100VI		OR03118VI	OR003162VI	
14	2	O-Ring gasket	VITON	548	OR03112VI	OR03150VI			OR03181VI	
15	1	Head	AISI 316	866	TSVS980931	TSVS980932		TSVS980933	TSVS990708	
16	1	Bottom	AISI 316	756	FOND980928	FOND980929		FOND980930	FOND990712	
17	1	Blank head	AISI 316	866	TSVS980937	TSVS980938		TSVS980939	TSVS990711	
18	2	Clamp head with micr. seat	AISI 316	866	TSVSXX0761	TSVS010071		TSVS980992	TSVS990733	
20	4	Spring washer	AISI 304	503	DO6O55884					
21	4	T.C.C.E. screw	AISI 304	551	TCCE06254					
22	2	Micr. movable clamp head	AISI 316	866	TSVSXX0763	TSVS010075	TSVS010076	TSVS980990	TSVS990816	
23	4	Clamp	AISI 304	512	M304XX0407	M304XX0408			M304990836	
24	2	Cylindrical cap	Polyeth.	505	T01ST00190	T01ST00190	T01ST00250	T01ST00310	T01ST00395	
25	1	Cylindrical cap	Polyeth.	505		T01ST00250				

* L ball passage = LP

** T ball passage = TP

GROUP 105 (ball valve spare parts)

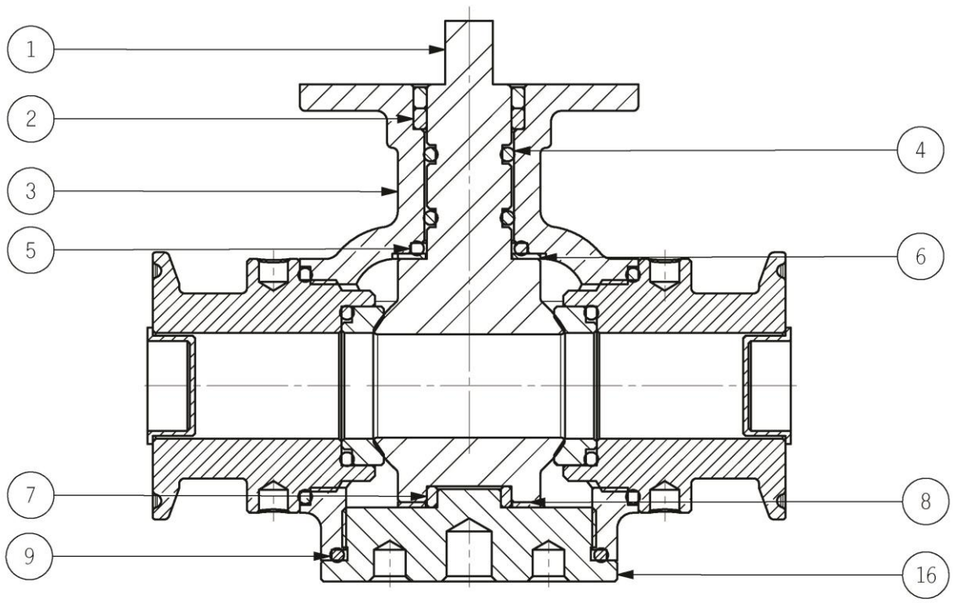
POSITION 3

COMPLETE SET OF SPARE PARTS FOR B. S. 3-WAY BALL VALVES WITH CLAMP AND ENVELOPING GASKETS PRODUCED FROM THE BEGINNING OF THE YEAR 2001 FROM ND 1/2" TO ND 1"1/4

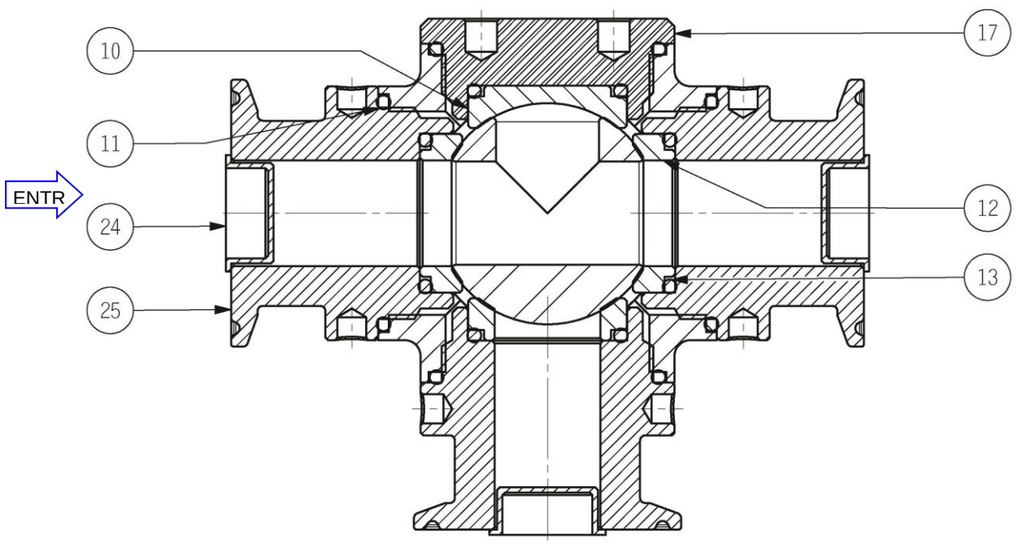
SPARE PARTS TABLE

SPARE PART CODE		6936	6932	6933	6934
PART No.	Q.ty	ND 1/2"	ND 3/4"	ND 1"	ND 1"1/4
2	2	BGD001952	BGD001979		BSGD990713
4	2	OR002037VI	OR00115VI		OR03068VI
5	1	OR00115VI	535		OR00128VI
6	1	BSSC980922	BSSC980923		BSSC990714
7	1	BGD001952			BGD001979
8	1	BSSC980923			BSSC990714
9	1	OR03150VI	OR03187VI	OR003206VI	OR003262VI
10	1	GUAR980918	GUAR980919	GUAR980920	GUAR990706
11	4	OR03131VI	OR03156VI	OR03168VI	OR003206VI
12	3	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	4	OR03075VI	OR03100VI	OR03118VI	OR003162VI
14	2	OR03112VI	OR03150VI		OR03181VI

6.8 Exploded View, Components And Spare Parts For B. S. 3-Way Ball Valves With Clamp And Enveloping Gaskets



ANTICLOCK ROTATION



COMPONENTS TABLE

P.	Q.	DESCRIPTION	MATER.	GR.	CODE					
					ND 3/8”	ND 1/2”	ND 3/4”	ND 1”	ND 1”1/4	
1	1	Shaft complete with ball	AISI 316	564	-	ALBE990084	ALBE990085	ALBE990086	ALBE990704	LP*
					ALBE991030	ALBE980924	ALBE980925	ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952		BGD001979		BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980934		CLSF980935	CLSF980936	CLSF990715	
4	2	O-Ring gasket	VITON	548	OR002037VI		OR00115VI		OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI		535		OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922		BSSC980923		BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI		OR03187VI	OR003206VI	OR003262VI	
10	1	Blank seal	TEFLON	511	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706	
11	4	O-Ring gasket	VITON	548	OR03131VI		OR03156VI	OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705	
13	4	O-Ring gasket	VITON	548	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI	
16	1	Bottom	AISI 316	756	FOND980928		FOND980929	FOND980930	FOND990712	
17	1	Blank head	AISI 316	866	TSVS991085	TSVS980937	TSVS980938	TSVS980939	TSVS990711	
24	3	Cylindrical cap	Polyeth.	505	T01ST00160	T01ST00190	T01ST00250	T01ST00310	T01ST00395	
25	3	Head	AISI 316	866		TSVS090460	TSVS090461	TSVS090626	TSVS130210	

* L ball passage = LP

** T ball passage = TP

GROUP 105

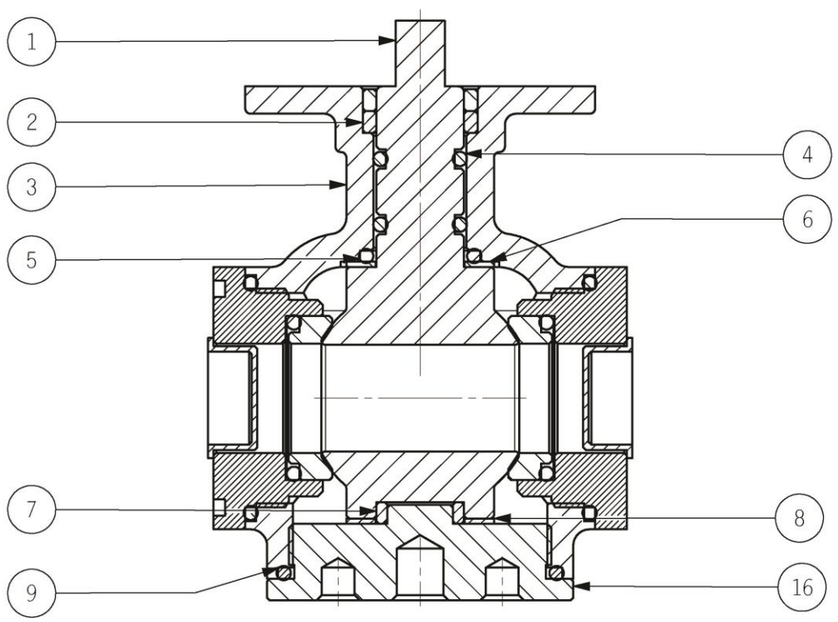
COMPLETE SET OF SPARE PARTS FOR CLAMP E.G. BARE SHAFT 3-WAY BALL VALVES PRODUCED FROM ND 3/8” TO ND 1”1/4

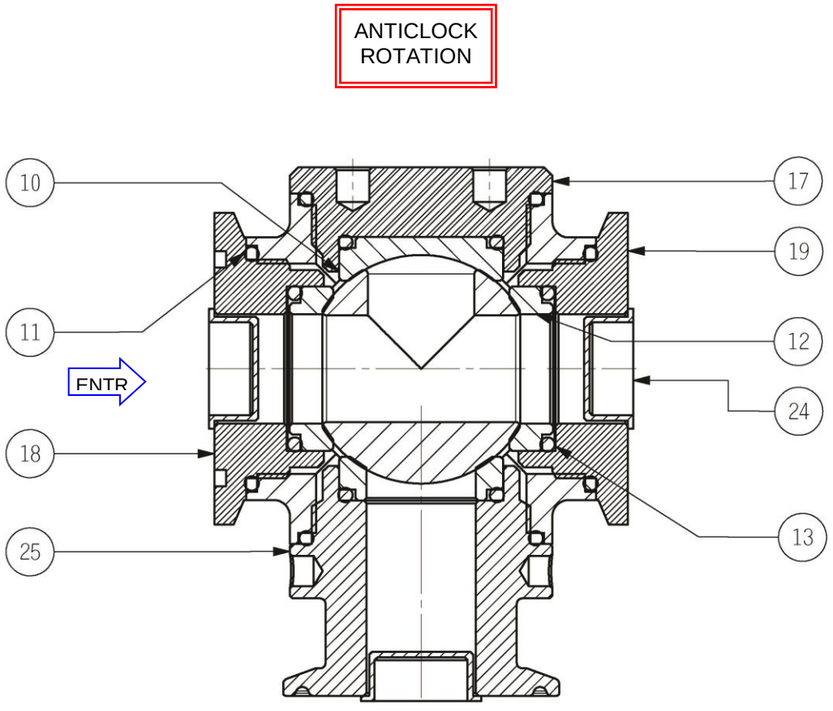
SPARE PARTS TABLE

SPARE PART CODE		6321	6159	6160	6161	6162
PART.No	Q.ty	ND 3/8“	ND 1/2“	ND 3/4“	ND 1”	ND 1”1/4
2	2	BGD001952		BGD001979		BSGD990713
4	2	OR002037VI		OR00115VI		OR03068VI
5	1	OR00115VI		535		OR00128VI
6	1	BSSC980922		BSSC980923		BSSC990714
7	1	BGD001952				BGD001979
8	1	BSSC980923				BSSC990714
9	1	OR03150VI		OR03187VI	OR003206VI	OR003262VI
10	1	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706
11	4	OR03131VI		OR03156VI	OR03168VI	OR003206VI
12	3	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	4	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI

Dwg. No 140173_0

6.9. Exploded View, Components And Spare Parts For B. S. 3-Way Ball Valves With CLAMP And Enveloping Gaskets (predispose Microfused Movable Clamp)





Dwg. No 140174_0

COMPONENTS TABLE

P.	Q.	DESCRIPTION	MATER.	GR.	CODE					
					ND 3/8"	ND 1/2"	ND 3/4"	ND 1"	ND 1"1/4	
1	1	Shaft complete with ball	AISI 316	564	-	ALBE990084	ALBE990085	ALBE990086	ALBE990704	LP*
					ALBE991030	ALBE980924	ALBE980925	ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952		BGD001979		BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980949		CLSF980950	CLSF980951	CLSF990716	
4	2	O-Ring gasket	VITON	548	OR002037VI		OR00115VI		OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI		535		OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922		BSSC980923		BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI		OR03187VI	OR003206VI	OR003262VI	
10	1	Blank seal	TEFLON	511	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706	
11	4	O-Ring gasket	VITON	548	OR03131VI		OR03156VI	OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705	
13	4	O-Ring gasket	VITON	548	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI	
16	1	Bottom	AISI 316	756	FOND980928		FOND980929	FOND980930	FOND990712	
17	1	Blank head	AISI 316	866	TSVS991085	TSVS980937	TSVS980938	TSVS980939	TSVS990711	
18	1	Head	AISI 316	866	-	TSVSXX0761	TSVS980991	TSVS990733	-	
19	1	Head	AISI 316	866	-	TSVSXX0762	TSVS980992	TSVS990734	-	
24	3	Cylindrical cap	Polyeth.	505	T01ST00160	T01ST00190	T01ST00250	T01ST00310	T01ST00395	
25	1	Head	AISI 316	866	-	TSVS090460	TSVS090461	TSVS090626	TSVS130210	

* L ball passage = LP

** T ball passage = TP

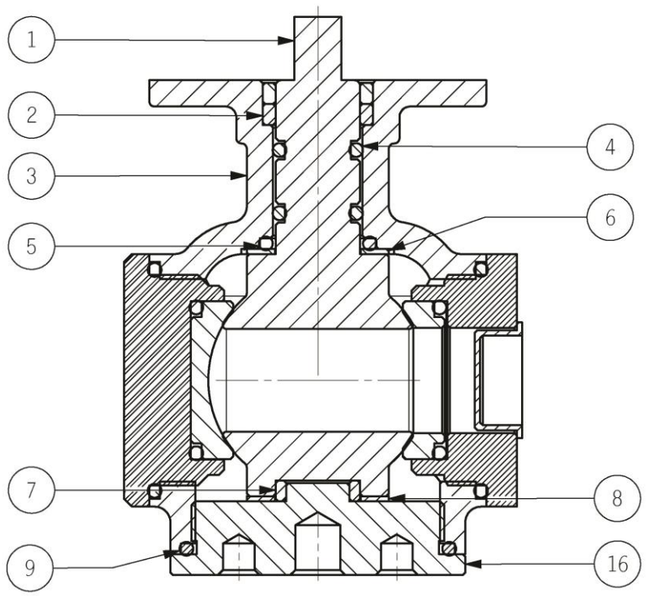
GROUP 105

COMPLETE SET OF SPARE PARTS FOR CLAMP E.G. BARE SHAFT 3-WAY BALL VALVES (predispose Microfused Movable Clamp)PRODUCED FROM ND 3/8" TO ND 1"1/4

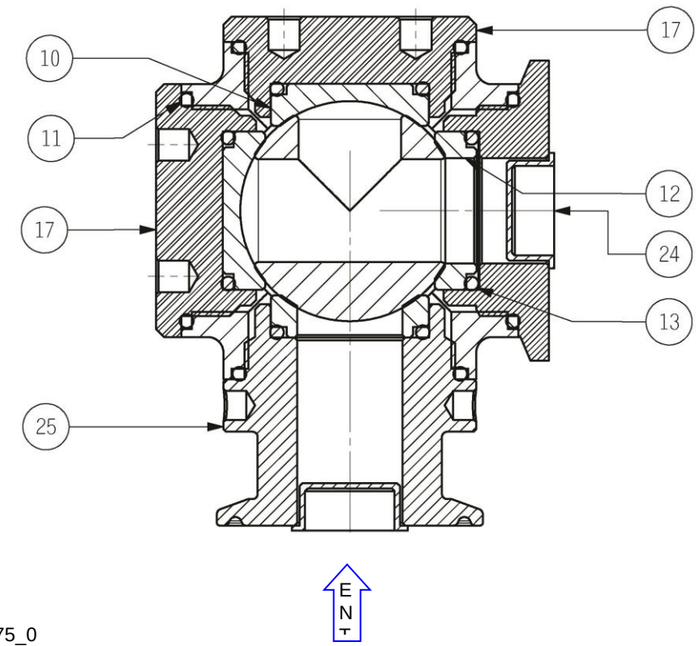
SPARE PARTS TABLE

SPARE PART CODE		6321	6159	6160	6161	6162
PART.No	Q.ty	ND 3/8"	ND 1/2"	ND 3/4"	ND 1"	ND 1"1/4
2	2	BGD001952		BGD001979		BSGD990713
4	2	OR002037VI		OR00115VI		OR03068VI
5	1	OR00115VI		535		OR00128VI
6	1	BSSC980922		BSSC980923		BSSC990714
7	1	BGD001952				BGD001979
8	1	BSSC980923				BSSC990714
9	1	OR03150VI		OR03187VI	OR003206VI	OR003262VI
10	1	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706
11	4	OR03131VI		OR03156VI	OR03168VI	OR003206VI
12	3	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	4	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI

6.9 Expl. View, Components And Spare Parts For B. S. 3-Way Ball Valves With CLAMP And Enveloping Gaskets (pred. Microfused mov. Clamp) – Closed sx/dx



CLOCK ROTATION



Dwg No 140175_0

COMPONENTS TABLE

P.	Q.	DESCRIPTION	MATER.	GR.	CODE					
					ND 3/8”	ND 1/2”	ND 3/4”	ND 1”	ND 1”1/4	
1	1	Shaft complete with ball	AISI 316	564	-	ALBE990084	ALBE990085	ALBE990086	ALBE990704	LP*
					ALBE991030	ALBE980924	ALBE980925	ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952		BGD001979		BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980949		CLSF980950	CLSF980951	CLSF990716	
4	2	O-Ring gasket	VITON	548	OR002037VI		OR00115VI		OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI		535		OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922		BSSC980923		BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952				BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923				BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI		OR03187VI	OR003206VI	OR003262VI	
10	2	Blank seal	TEFLON	511	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706	
11	4	O-Ring gasket	VITON	548	OR03131VI		OR03156VI	OR03168VI	OR003206VI	
12	2	Seal	TEFLON	511	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705	
13	4	O-Ring gasket	VITON	548	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI	
16	1	Bottom	AISI 316	756	FOND980928		FOND980929	FOND980930	FOND990712	
17	2	Blank head	AISI 316	866	TSVS991085	TSVS980937	TSVS980938	TSVS980939	TSVS990711	
19	1	Head	AISI 316	866	-	TSVSXX0762	TSVS980992	TSVS990734	-	
24	2	Cylindrical cap	Polyeth.	505	T01ST00160	T01ST00190	T01ST00250	T01ST00310	T01ST00395	
25	1	Head	AISI 316	866	-	TSVS090460	TSVS090461	TSVS090626	TSVS130210	

* L ball passage = LP

** T ball passage = TP

GROUP 105

COMPLETE SET OF SPARE PARTS FOR CLAMP E.G. BARE SHAFT 3-WAY BALL VALVES
(predispose Microfused Movable Clamp) – CLOSED SX/DX ,PRODUCED FROM ND 3/8” TO ND 1”1/4

SPARE PARTS TABLE

SPARE PART CODE		16175	16176	16177	16178	16179
PART.No	Q.ty	ND 3/8“	ND 1/2“	ND 3/4“	ND 1”	ND 1”1/4
2	2	BGD001952		BGD001979		BSGD990713
4	2	OR002037VI		OR00115VI		OR03068VI
5	1	OR00115VI		535		OR00128VI
6	1	BSSC980922		BSSC980923		BSSC990714
7	1	BGD001952				BGD001979
8	1	BSSC980923				BSSC990714
9	1	OR03150VI		OR03187VI	OR003206VI	OR003262VI
10	2	GUAR991084	GUAR980918	GUAR980919	GUAR980920	GUAR990706
11	4	OR03131VI		OR03156VI	OR03168VI	OR003206VI
12	2	GUAR991034	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	4	OR03068VI	OR03075VI	OR03100VI	OR03118VI	OR003162VI

6.11 Disassembly, Gasket Replacement And Reassembly Instructions For B. S. 3-Way Ball Valves With Clamp And Enveloping Gaskets

For disassembly and reassembly operations of the N. C. valve refer to Dwg. 010417.

All disassembly and reassembly operations must be performed by skilled personnel in industrial pneumatic and hydraulic operations, provided with all the safety and working equipment. Before starting any operation on systems and valves, get reliable and exhaustive information about operating temperature and pressure values, as well as on special conditions, if any.

Every time it is necessary to operate on valves, it is compulsory to remove completely the fluid inside the valve.

NOTE: Read the procedures thoroughly before starting any operation.

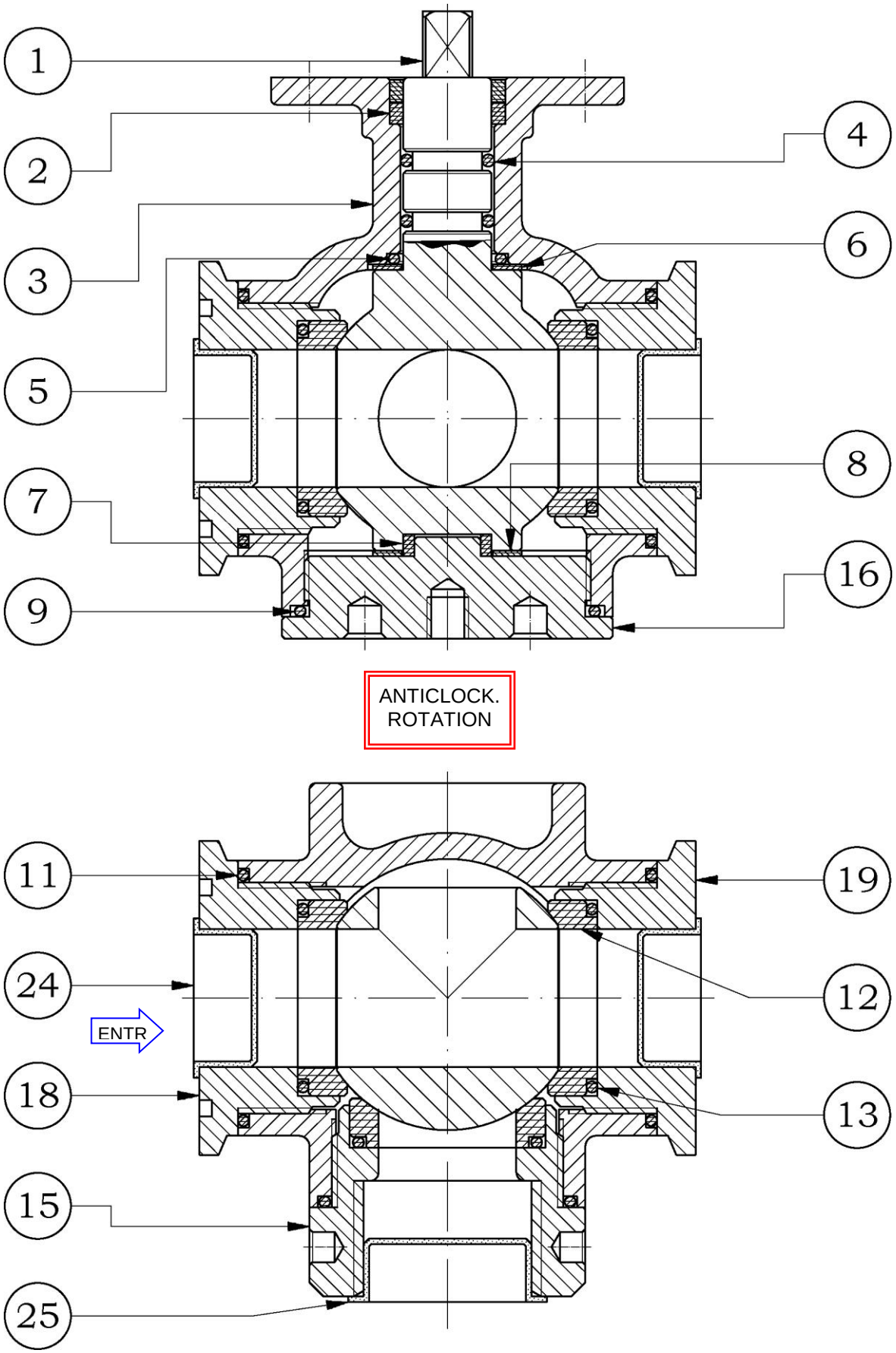
6.11.1 Disassembly

1) Unscrew and remove T.C.C.E. screws (21) and relevant nuts (20).
2) Remove clamps (23) and heads (22).
3) Extract O-Rings (14).
4) Unscrew and remove head (15) and heads (18).
5) Unscrew and remove blank head (17).
6) Extract seals (12), blank seal (10) and O-Rings (13).
7) Extract O-Rings (11).
8) Unscrew and remove the bottom (16).
9) Remove sliding bush (8) and guide bush (7).
10) Extract O-Ring (9).
11) Remove the shaft with ball (1) from the valve body (3).
12) Remove O-Rings (4), O-Ring (5) and sliding bush (6) from the shaft with ball (1).
13) Remove guide bushes (2) from the valve body (3).

6.11.2 Maintenance And Assembly

1) Clean all components with care.
2) Fit guide bushes (2) into the valve body (3).
3) Fit sliding bush (6), O-Ring (5) and O-Rings (4) onto the shaft with ball (1).
4) Fit the shaft with ball (1) into the valve body (3).
5) Tighten the bottom (16) to the prescribed torque, (as specified in table 3), after putting into the correct position O-Ring (9), sliding bush (8) and guide bush (7).
6) Tighten head (15), heads (18) and blank head (17) to the prescribed torque, (as specified in table 3), after putting into the correct position O-Rings (13), seals (12), blank seal (10) and O-Rings (11).
7) Replace heads (22), after putting O-Rings (14).
8) Replace correctly clamps (23).
9) Put in position nuts (20).
10) Tighten T.C.C.E. screws (21) to the prescribed torque, (as specified in table 3), to fasten clamps.

6.12 Exploded View, Components And Spare Parts For B. S. 3-Way Ball Valves Arranged For Assembly



DWG. No. 010419

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GR.	CODE			
					ND 1/2"	ND 1"	ND 1"1/4	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	ALBE990086	ALBE990704	LP*
					ALBE980924	ALBE980926	ALBE990703	TP**
2	2	Guide bush	TEFLON	581	BGD001952	BGD001979	BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980934	CLSF980936	CLSF990715	
4	2	O-Ring gasket	VITON	548	OR002037VI	OR00115VI	OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	535	OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	BSSC980923	BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952		BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923		BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI	OR003206VI	OR003262VI	
11	3	O-Ring gasket	VITON	548	OR03131VI	OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR980915	GUAR980917	GUAR990705	
13	3	O-Ring gasket	VITON	548	OR03075VI	OR03118VI	OR003162VI	
15	1	Head	AISI 316	866	TSVS980931	TSVS980933	TSVS990708	
16	1	Bottom	AISI 316	756	FOND980928	FOND980930	FOND990712	
18	1	Head	AISI 316	866	TSVSXX0761	TSVS980991	TSVS990733	
19	1	Head	AISI 316	866	TSVSXX0762	TSVS980992	TSVS990734	
24	2	Cylindrical cap	POLYETH	505	T01ST00160	T01ST00255	T01ST00325	
25	1	Cylindrical cap	POLYETH	505	T01ST00190	T01ST00310	T01ST00395	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 010419 of page

GROUP 105 (ball valve spare parts)

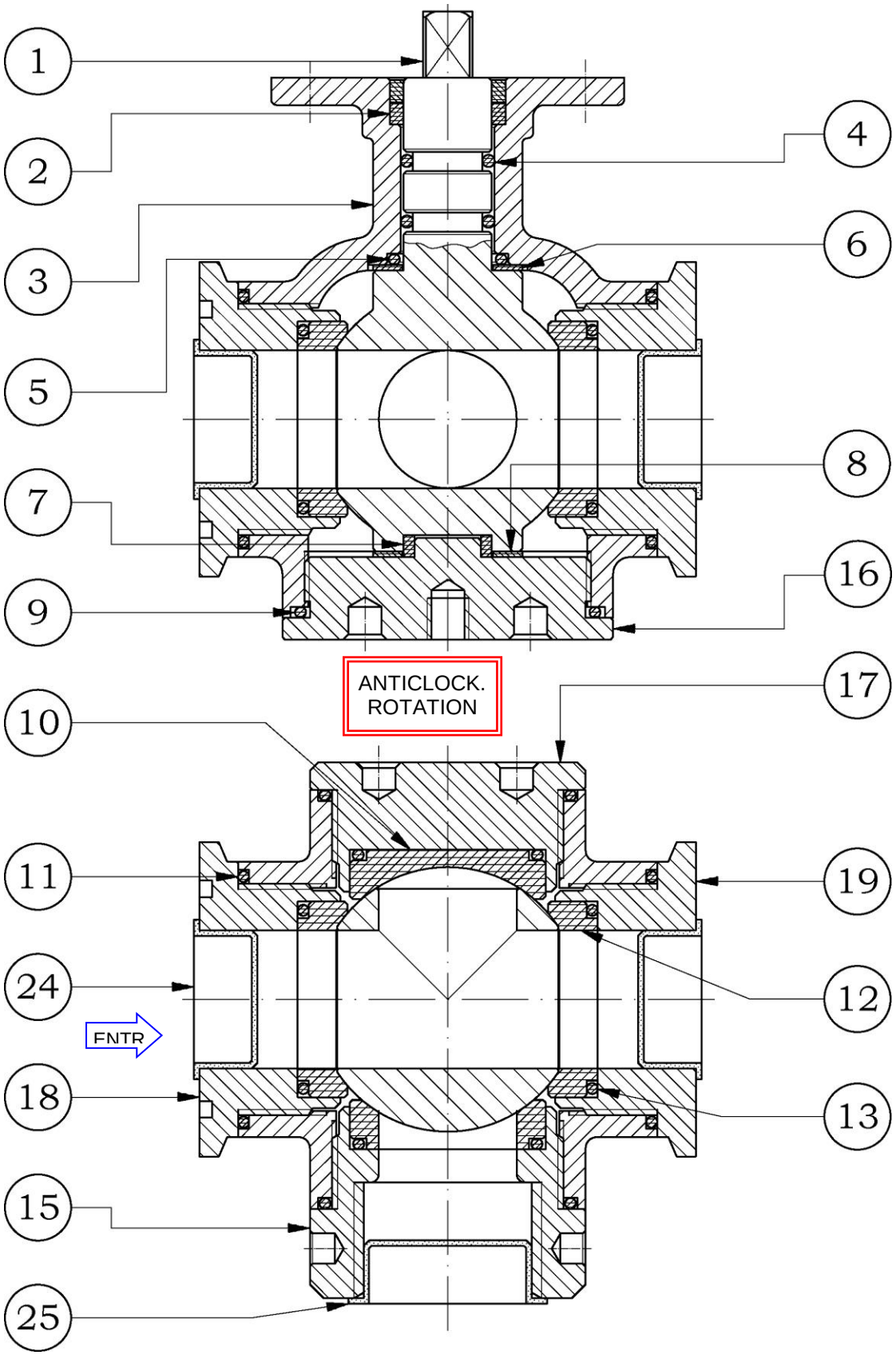
POSITION 2

COMPLETE SET OF SPARE PARTS FOR BARE SHAFT 3-WAY BALL VALVES ARRANGED FOR ASSEMBLY PRODUCED FROM THE HALF OF THE YEAR 2000 FROM ND 1/2" TO ND 1"1/4

SPARE PARTS TABLE

SPARE PART CODE		**6155**	**6157**	**6158**
PART No.	Q.ty	ND 1/2"	ND 1"	ND 1"1/4
2	2	BGD001952	BGD001979	BSGD990713
4	2	OR002037VI	OR00115VI	OR03068VI
5	1	OR00115VI	535	OR00128VI
6	1	BSSC980922	BSSC980923	BSSC990714
7	1	BGD001952		BGD001979
8	1	BSSC980923		BSSC990714
9	1	OR03150VI	OR003206VI	OR003262VI
11	3	OR03131VI	OR03168VI	OR003206VI
12	3	GUAR980915	GUAR980917	GUAR990705
13	3	OR03075VI	OR03118VI	OR003162VI

6.13 Exploded View, Components And Spare Parts For B. S. 3-Way Ball Valves Arranged For Assembly With Enveloping Gaskets



DWG. No. 010420

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GR.	CODE				
					ND 1/2"	ND 3/4"	ND 1"	ND 1"1/4	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	ALBE990085	ALBE990086	ALBE990704	PL*
					ALBE980924	ALBE980925	ALBE980926	ALBE990703	PT**
2	2	Guide bush	TEFLON	581	BGD001952	BGD001979		BSGD990713	
3	1	Machined body	AISI 316	752	CLSF980949	CLSF980950	CLSF980951	CLSF990716	
4	2	O-Ring gasket	VITON	548	OR002037VI	OR00115VI		OR03068VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	535		OR00128VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	BSSC980923		BSSC990714	
7	1	Guide bush	TEFLON	581	BGD001952			BGD001979	
8	1	Sliding bush	TEFLON	581	BSSC980923			BSSC990714	
9	1	O-Ring gasket	VITON	548	OR03150VI	ORO3187VI	OR003206VI	OR003262VI	
10	1	Blank seal	TEFLON	511	GUAR980918	GUAR980919	GUAR98920	GUAR990706	
11	4	O-Ring gasket	VITON	548	OR03131VI	OR03156VI	OR03168VI	OR003206VI	
12	3	Seal	TEFLON	511	GUAR980915	GUAR980916	GUAR980917	GUAR990705	
13	4	O-Ring gasket	VITON	548	OR03075VI	OR03100VI	OR03118VI	OR003162VI	
15	1	Head	AISI 316	866	TSVS980931	TSVS980932	TSVS980933	TSVS990708	
16	1	Bottom	AISI 316	756	FOND980928	FOND980929	FOND980930	FOND990712	
17	1	Blank head	AISI 316	866	TSVS980937	TSVS980938	TSVS980939	TSVS990711	
18	1	Head	AISI 316	866	TSVSXX0761	TSVS010071	TSVS980992	TSVS990733	
19	1	Head	AISI 316	866	TSVSXX0762	TSVS010072	TSVS980992	TSVS990734	
24	2	Cylindrical cap	POLYET.	505	T01ST00160	T01ST00220	T01ST00255	T01ST00325	
25	1	Cylindrical cap	POLYET.	505	T01ST00190	T01ST00250	T01ST00310	T01ST00395	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 010420 of page 32

GROUP 105 (ball valve spare parts)

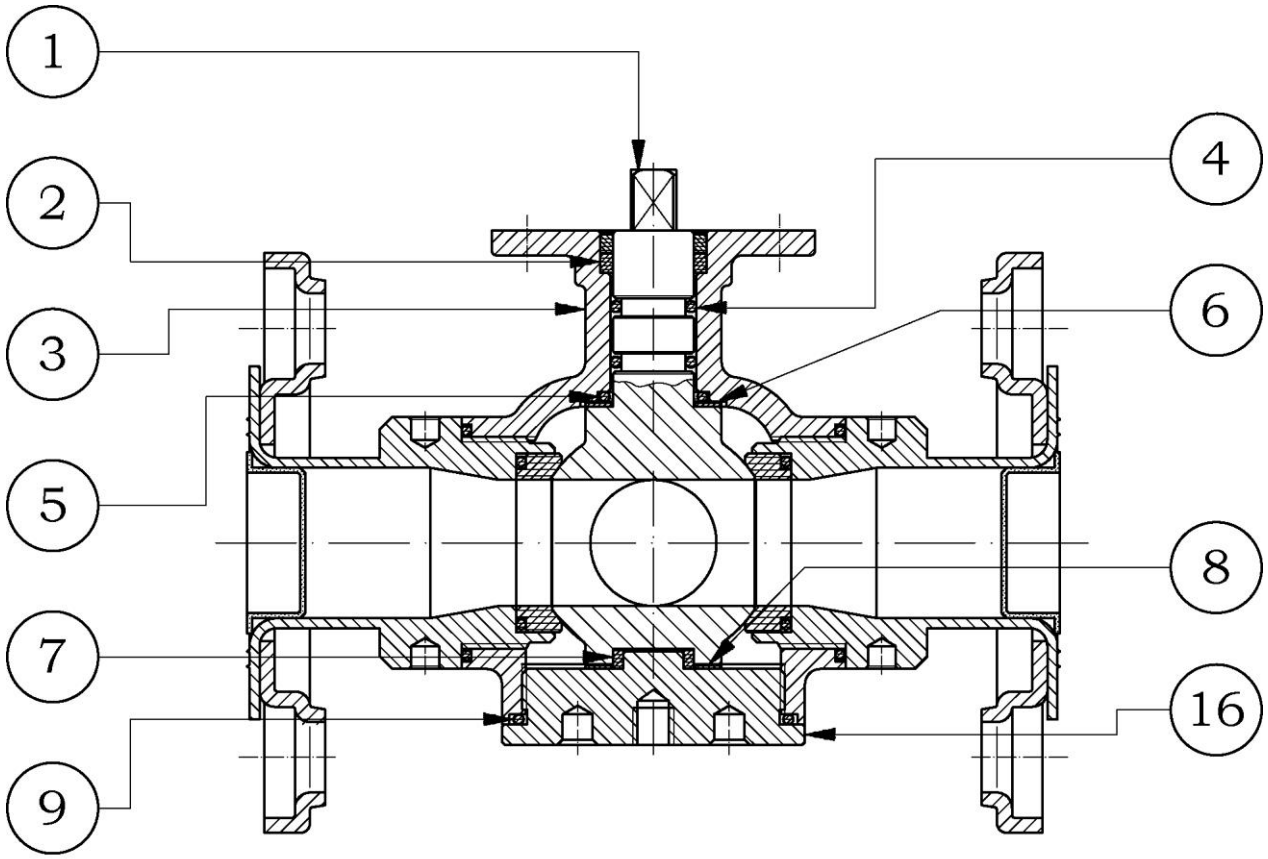
POSITION 2

COMPLETE SET OF SPARE PARTS FOR BARE SHAFT 3-WAY BALL VALVES ARRANGED FOR ASSEMBLY WITH E. G.s PRODUCED FROM THE HALF OF THE YEAR 2000 FROM ND 1/2" TO ND 1"1/4

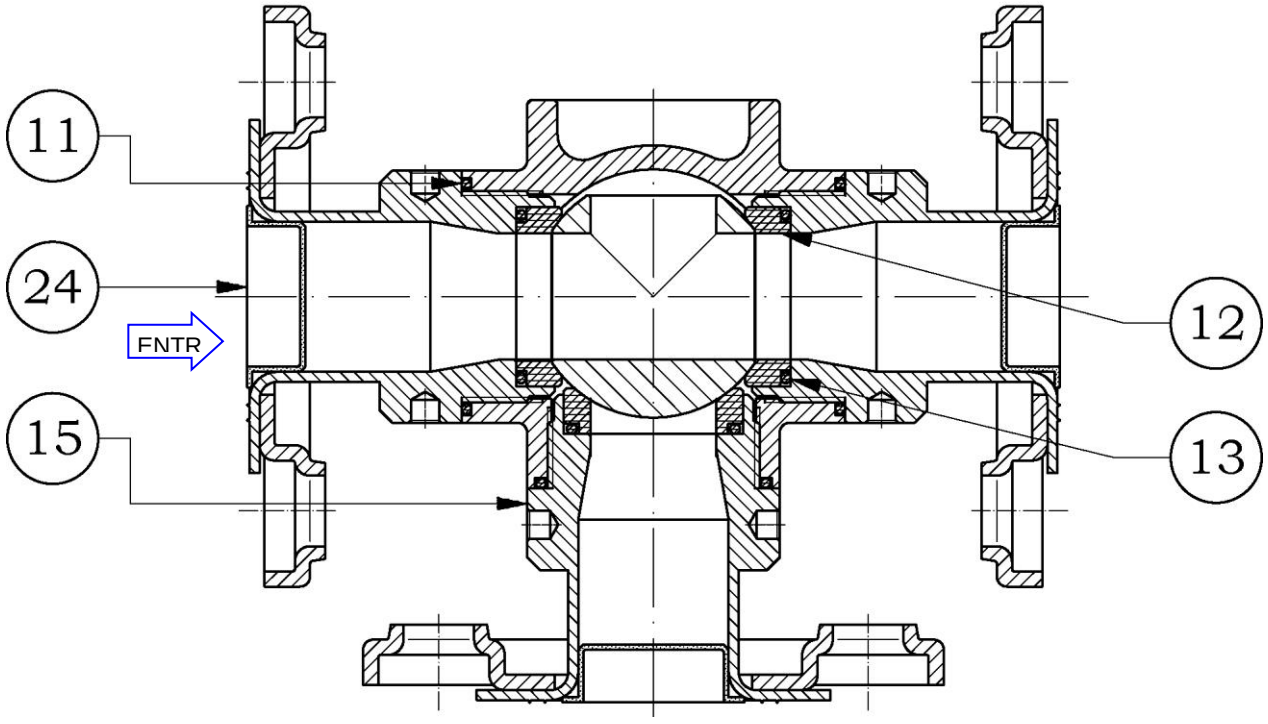
SPARE PARTS TABLE

SPARE PART CODE		**6159**	**6160**	**6161**	**6162**
PART N°	Q.ty	ND 1/2"	ND 3/4"	ND 1"	ND 1"1/4
2	2	BGD001952	BGD001979		BSGD990713
4	2	OR002037VI	OR00115VI		OR03068VI
5	1	OR00115VI	535		OR00128VI
6	1	BSSC980922	BSSC980923		BSSC990714
7	1	BGD001952			BGD001979
8	1	BSSC980923			BSSC990714
9	1	OR03150VI	ORO3187VI	OR003206VI	OR003262VI
10	1	GUAR980918	GUAR980919	GUAR980920	GUAR990706
11	4	OR03131VI	OR03156VI	OR03168VI	OR003206VI
12	3	GUAR980915	GUAR980916	GUAR980917	GUAR990705
13	4	OR03075VI	OR03100VI	OR03118VI	OR003162VI

6.14 Exploded View, Components And Spare Parts For Flanged B. S. 3-Way Ball Valves



ANTICLOCK. ROTATION



DWG. No. 991048

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	CODE ND 1”	
1	1	Shaft complete with ball	AISI 316	564	ALBE990086	LP*
					ALBE980926	TP**
2	2	Guide bush	TEFLON	581	BGD001979	
3	1	Machined body	AISI 316	752	CLSF980936	
4	2	O-Ring gasket	VITON	548	OR00115VI	
5	1	O-Ring gasket	VITON	548	535	
6	1	Sliding bush	TEFLON	581	BSSC980923	
7	1	Guide bush	TEFLON	581	BGD001952	
8	1	Sliding bush	TEFLON	581	BSSC980923	
9	1	O-Ring gasket	VITON	548	OR003206VI	
11	3	O-Ring gasket	VITON	548	OR03168VI	
12	3	Seal	TEFLON	511	GUAR980917	
13	3	O-Ring gasket	VITON	548	OR03118VI	
15	3	Head	AISI 316	866	TSVS980998	
16	1	Bottom	AISI 316	756	FOND980930	
24	3	Cylindrical cap	POLYETH.	505	T01ST00310	

* L ball passage = LP
** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 991048 of page 34

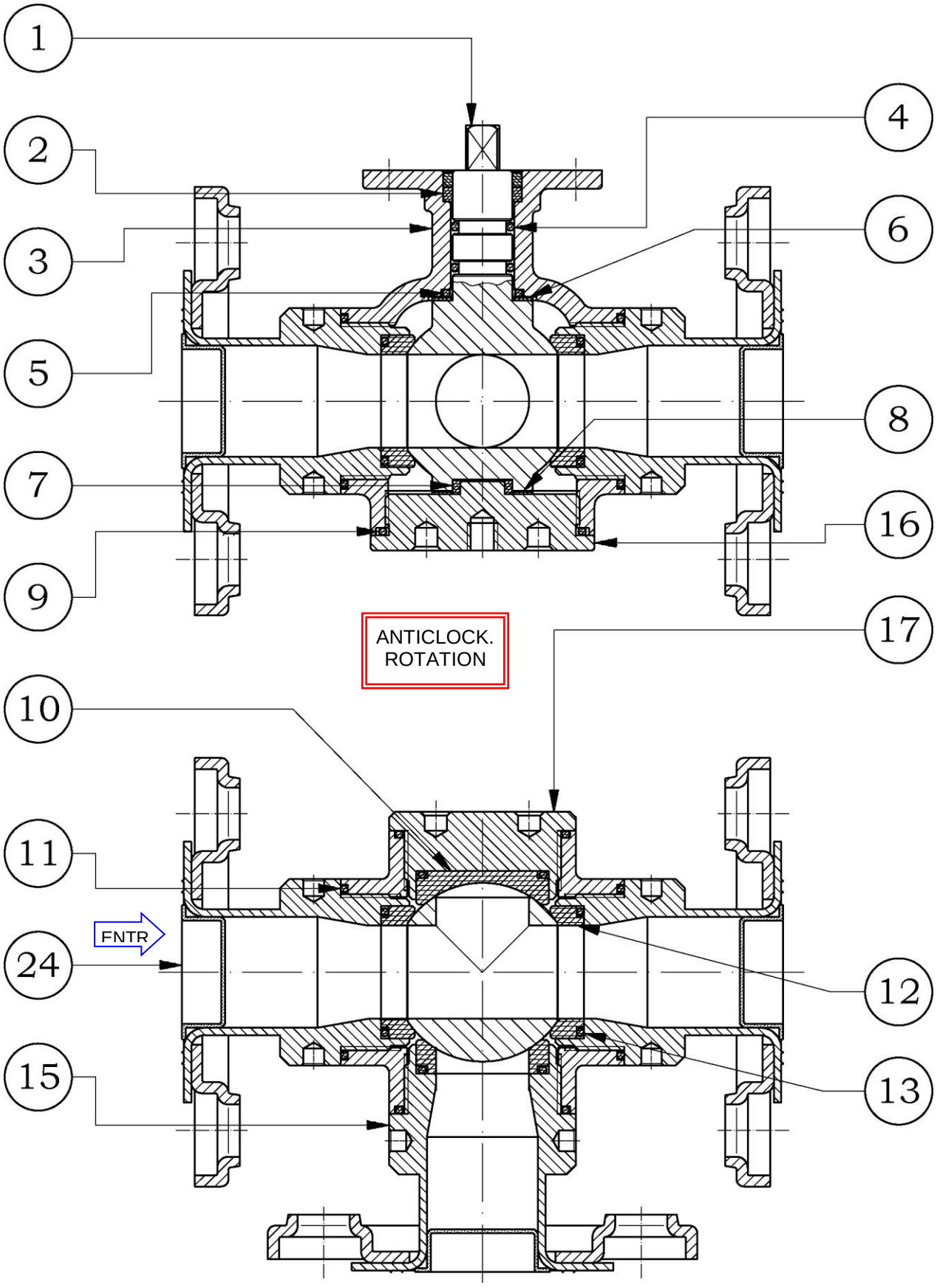
GROUP 105 (ball valve spare parts)

COMPLETE SET OF SPARE PARTS FOR FLANGED BARE SHAFT 3-WAY BALL VALVES PRODUCED FROM 1998 ND 1”

SPARE PARTS TABLE

SPARE PART CODE		**6157**
PART No.	Q.ty	ND 1”
2	2	BGD001979
4	2	OR00115VI
5	1	535
6	1	BSSC980923
7	1	BGD001952
8	1	BSSC980923
9	1	OR003206VI
11	3	OR03168VI
12	3	GUAR980917
13	3	OR03118VI

6.15 Exploded View, Components And Spare Parts For Flanged B. S. 3-way Ball Valves



DWG. No. 991049

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	CODE ND 1”	
1	1	Shaft complete with ball	AISI 316	564	ALBE990086	LP*
					ALBE980926	TP**
2	2	Guide bush	TEFLON	581	BGD001979	
3	1	Machined body	AISI 316	752	CLSF980951	
4	2	O-Ring gasket	VITON	548	OR00115VI	
5	1	O-Ring gasket	VITON	548	535	
6	1	Sliding bush	TEFLON	581	BSSC980923	
7	1	Guide bush	TEFLON	581	BGD001952	
8	1	Sliding bush	TEFLON	581	BSSC980923	
9	1	O-Ring gasket	VITON	548	OR003206VI	
10	1	Blank seal	TEFLON	511	GUAR980920	
11	3	O-Ring gasket	VITON	548	OR03168VI	
12	3	Seal	TEFLON	511	GUAR980917	
13	3	O-Ring gasket	VITON	548	OR03118VI	
15	3	Head	AISI 316	866	TSVS980998	
16	1	Bottom	AISI 316	756	FOND980930	
17	1	Blank head	AISI 316	866	TSVS980939	
24	3	Cylindrical cap	POLYETH.	505	T01ST00310	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 991049 of page 36

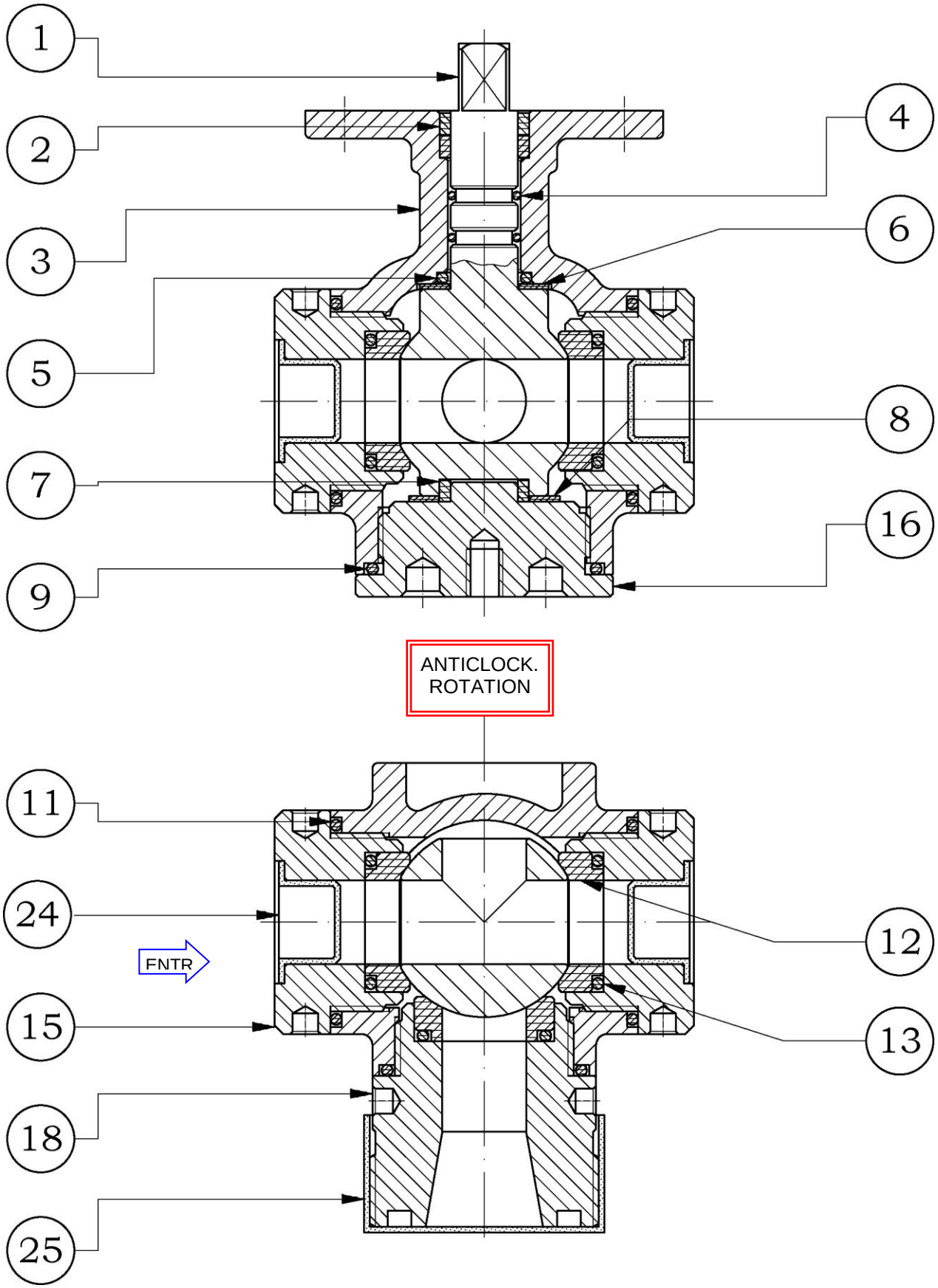
GROUP 105 (ball valve spare parts)

COMPLETE SET OF SPARE PARTS FOR FLANGED BARE SHAFT 3-WAY BALL VALVES WITH E. G.s PRODUCED FROM 1998 – ND 1”

SPARE PARTS TABLE

SPARE PART CODE		**6161**
PART No.	Q.ty	ND 1”
2	2	BGD001979
4	2	OR00115VI
5	1	535
6	1	BSSC980923
7	1	BGD001952
8	1	BSSC980923
9	1	OR003206VI
10	1	GUAR980920
11	3	OR03168VI
12	3	GUAR980917
13	3	OR03118VI

6.16 Exploded View, Components And Spare Parts For Box Model B. S. 3-Way Ball Valves



DWG. No. 991050

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	CODE ND 1/2"	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	LP*
					ALBE980924	TP**
2	2	Guide bush	TEFLON	581	BGD001952	
3	1	Machined body	AISI 316	752	CLSF980934	
4	2	O-Ring gasket	VITON	548	OR002037VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	
7	1	Guide bush	TEFLON	581	BGD001952	
8	1	Sliding bush	TEFLON	581	BSSC980923	
9	1	O-Ring gasket	VITON	548	OR03150VI	
11	3	O-Ring gasket	VITON	548	OR03131VI	
12	3	Seal	TEFLON	511	GUAR980915	
13	3	O-Ring gasket	VITON	548	OR03075VI	
15	2	Head	AISI 316	866	TSVS980993	
16	1	Bottom	AISI 316	756	FOND980928	
18	1	Head	AISI 316	866	TSVS980997	
24	2	Cylindrical cap	POLYETH.	505	T01ST00160	
25	1	External guard	POLYETH.	505	T013PT0032	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 991050 of page 38

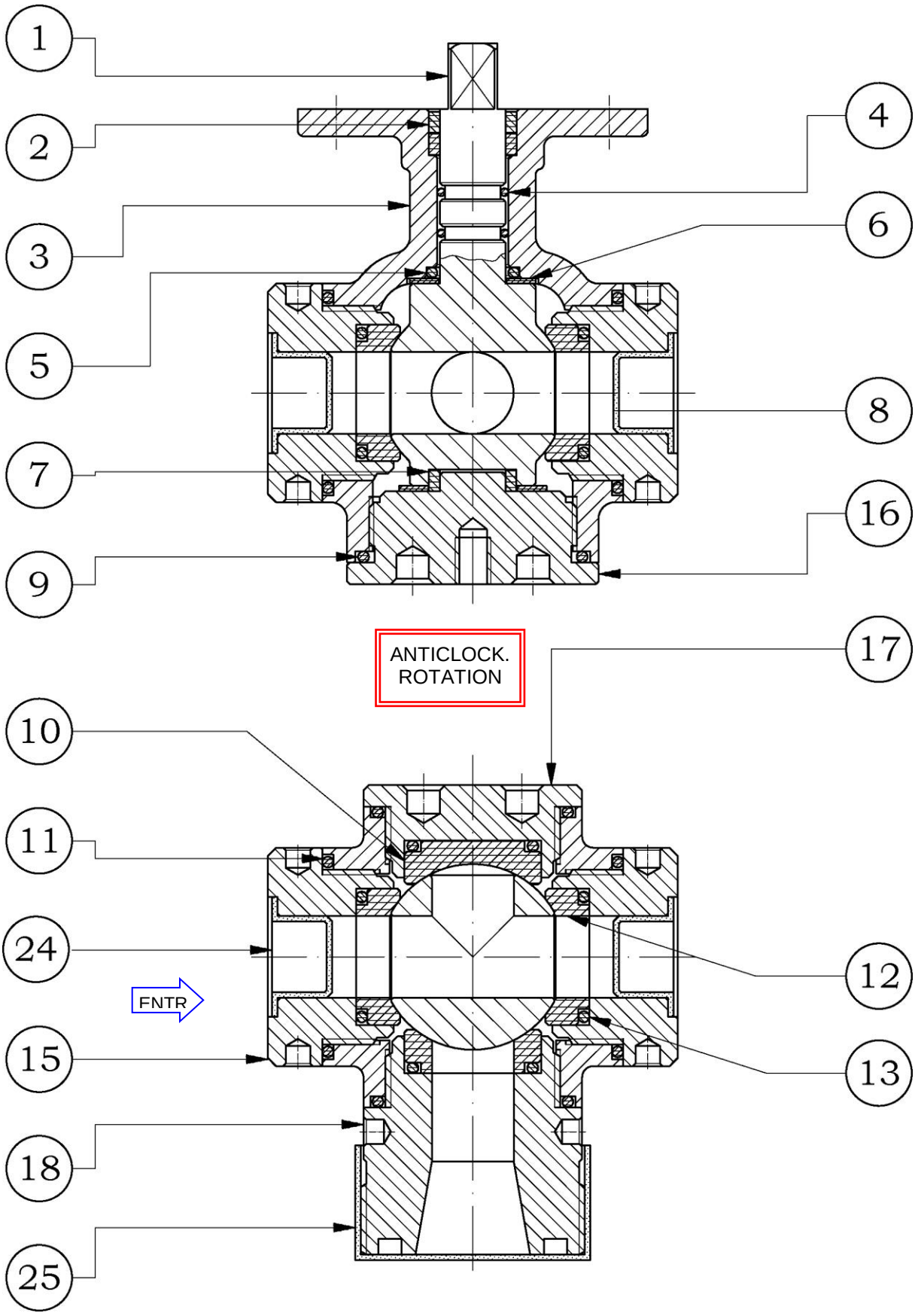
GROUP 105 (ball valve spare parts)

COMPLETE SET OF SPARE PARTS FOR BOX MODEL BARE SHAFT 3-WAY BALL VALVES PRODUCED FROM 1998 – ND 1/2"

SPARE PARTS TABLE

SPARE PART CODE		**6155**
PART No.	Q.ty	ND 1/2"
2	2	BGD001952
4	2	OR002037VI
5	1	OR00115VI
6	1	BSSC980922
7	1	BGD001952
8	1	BSSC980923
9	1	OR03150VI
11	3	OR03131VI
12	3	GUAR980915
13	3	OR03075VI

6.17 Exploded View, Components And Spare Parts For Box Mod. B. S. 3-Way Ball Valves With Enveloping Gaskets



DWG. No. 991051

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	CODE ND 1/2”	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	LP*
					ALBE980924	TP**
2	2	Guide bush	TEFLON	581	BGD001952	
3	1	Machined body	AISI 316	752	CLSF980949	
4	2	O-Ring gasket	VITON	548	OR002037VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	
7	1	Guide bush	TEFLON	581	BGD001952	
8	1	Sliding bush	TEFLON	581	BSSC980923	
9	1	O-Ring gasket	VITON	548	OR03150VI	
10	1	Blank seal	TEFLON	511	GUAR980918	
11	4	O-Ring gasket	VITON	548	OR03131VI	
12	3	Seal	TEFLON	511	GUAR980915	
13	4	O-Ring gasket	VITON	548	OR03075VI	
15	2	Head	AISI 316	866	TSVS980993	
16	1	Bottom	AISI 316	756	FOND980928	
17	1	Blank head	AISI 316	866	TSVS980937	
18	1	Head	AISI 316	866	TSVS980997	
24	2	Cylindrical cap	POLYETH.	505	T01ST00160	
25	1	External guard	POLYETH.	505	T013PT0032	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 991051 of page 40

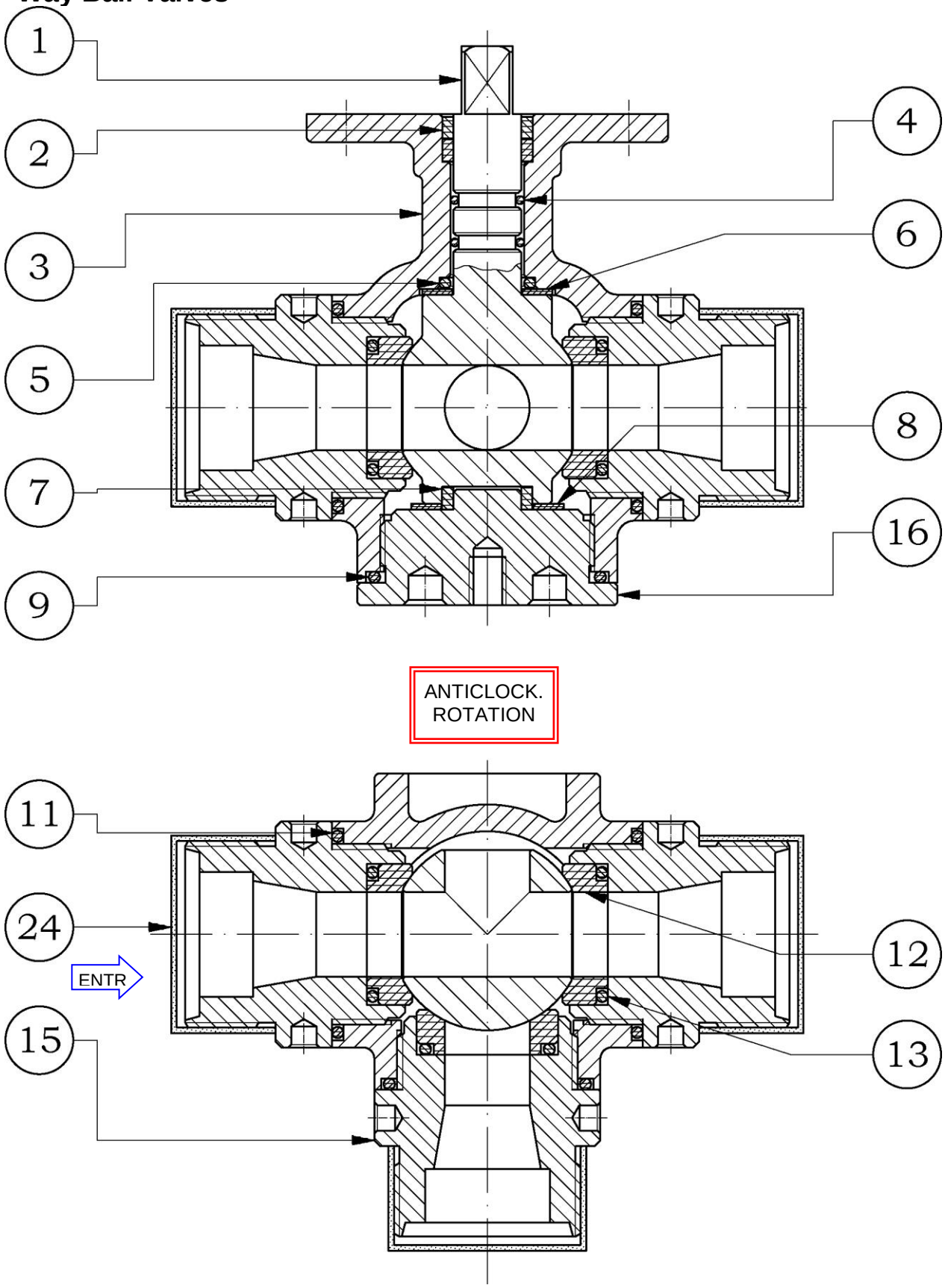
GROUP 105 (ball valve spare parts)

COMPLETE SET OF SPARE PARTS FOR BOX MOD. BARE SHAFT 3-WAY BALL VALVES WITH E. G.s PRODUCED FROM 1998 – ND 1/2”

SPARE PARTS TABLE

SPARE PART CODE		**6159**
PART No.	Q.ty	ND 1/2”
2	2	BGD001952
4	2	OR002037VI
5	1	OR00115VI
6	1	BSSC980922
7	1	BGD001952
8	1	BSSC980923
9	1	OR03150VI
10	1	GUAR980918
11	4	OR03131VI
12	3	GUAR980915
13	4	OR03075VI

6.18 Exploded View, Components And Spare Parts For Line Mod. B. S. 3-Way Ball Valves



DWG. No. 991052

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	CODE ND 1/2”	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	LP*
					ALBE980924	TP**
2	2	Guide bush	TEFLON	581	BGD001952	
3	1	Machined body	AISI 316	752	CLSF980934	
4	2	O-Ring gasket	VITON	548	OR002037VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	
7	1	Guide bush	TEFLON	581	BGD001952	
8	1	Sliding bush	TEFLON	581	BSSC980923	
9	1	O-Ring gasket	VITON	548	OR03150VI	
11	3	O-Ring gasket	VITON	548	OR03131VI	
12	3	Seal	TEFLON	511	GUAR980915	
13	3	O-Ring gasket	VITON	548	OR03075VI	
15	3	Head	AISI 316	866	TSVS980995	
16	1	Bottom	AISI 316	756	FOND980928	
24	3	External guard	POLYETH.	505	T013PT0025	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 991052 of page 42

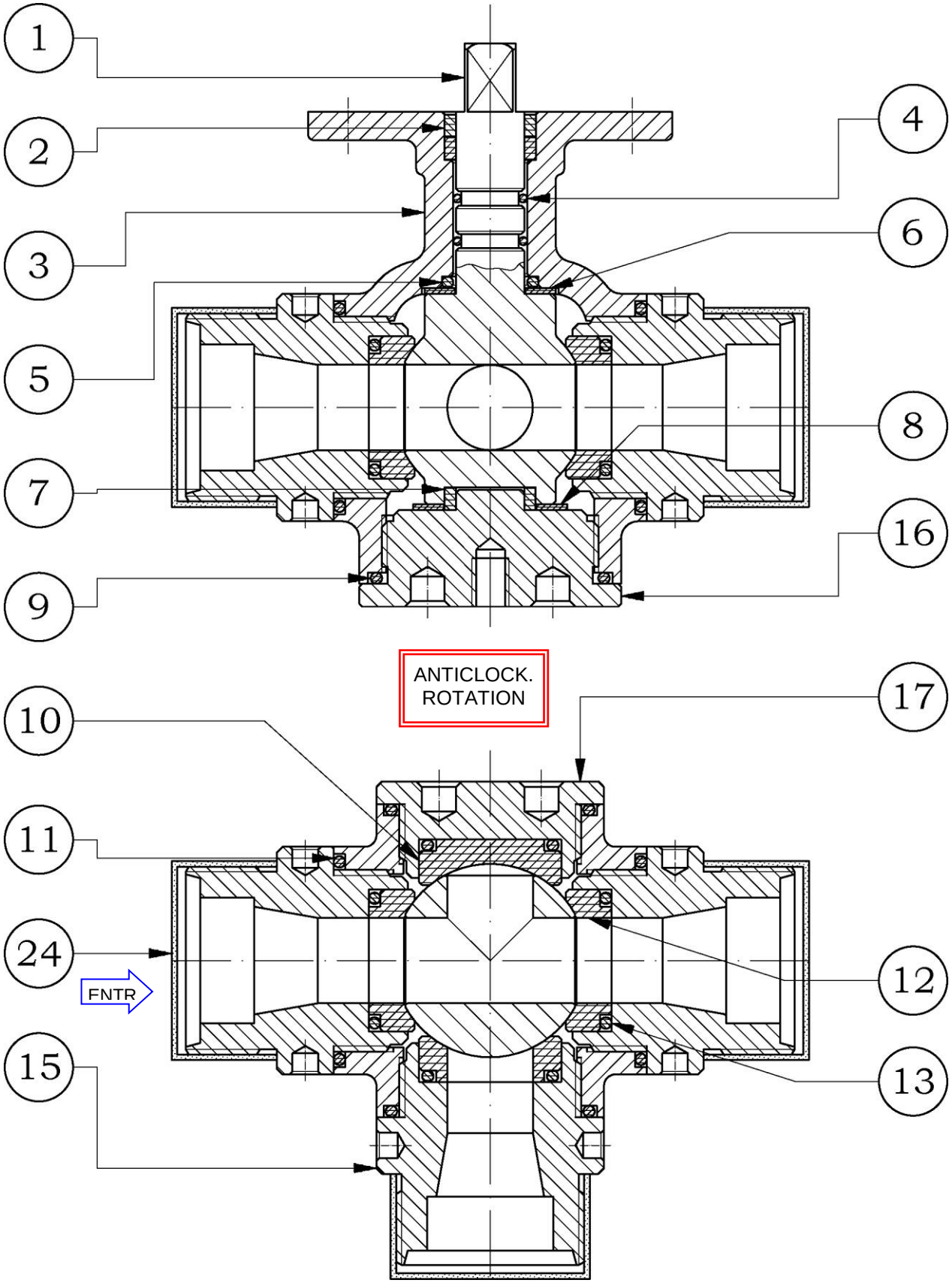
GROUP 105 (ball valve spare parts)

COMPLETE SET OF SPARE PARTS FOR LINE MOD. BARE SHAFT 3-WAY BALL VALVES PRODUCED FROM 1998 – ND 1/2”

SPARE PARTS TABLE

SPARE PART CODE		**6155**
PART No.	Q.ty	ND 1/2”
2	2	BGD001952
4	2	OR002037VI
5	1	OR00115VI
6	1	BSSC980922
7	1	BGD001952
8	1	BSSC980923
9	1	OR03150VI
11	3	OR03131VI
12	3	GUAR980915
13	3	OR03075VI

6.19 Exploded View, Components And Spare Parts For Line Mod. B. S. 3-Way Ball Valves With Enveloping Gaskets



DWG. No. 991053

COMPONENTS TABLE

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	CODE ND 1/2”	
1	1	Shaft complete with ball	AISI 316	564	ALBE990084	LP*
					ALBE980924	TP**
2	2	Guide bush	TEFLON	581	BGD001952	
3	1	Machined body	AISI 316	752	CLSF980949	
4	2	O-Ring gasket	VITON	548	OR002037VI	
5	1	O-Ring gasket	VITON	548	OR00115VI	
6	1	Sliding bush	TEFLON	581	BSSC980922	
7	1	Guide bush	TEFLON	581	BGD001952	
8	1	Sliding bush	TEFLON	581	BSSC980923	
9	1	O-Ring gasket	VITON	548	OR03150VI	
10	1	Blank seal	TEFLON	511	GUAR980918	
11	3	O-Ring gasket	VITON	548	OR03131VI	
12	3	Seal	TEFLON	511	GUAR980915	
13	3	O-Ring gasket	VITON	548	OR03075VI	
15	3	Head	AISI 316	866	TSVS980995	
17	1	Blank head	AISI 316	866	TSVS980937	
16	1	Bottom	AISI 316	756	FOND980928	
24	3	External guard	POLYETH.	505	T013PT0025	

* L ball passage = LP

** T ball passage = TP

NOTE: The above-listed components refer to the drawing no. 991053 of page 44

GROUP 105

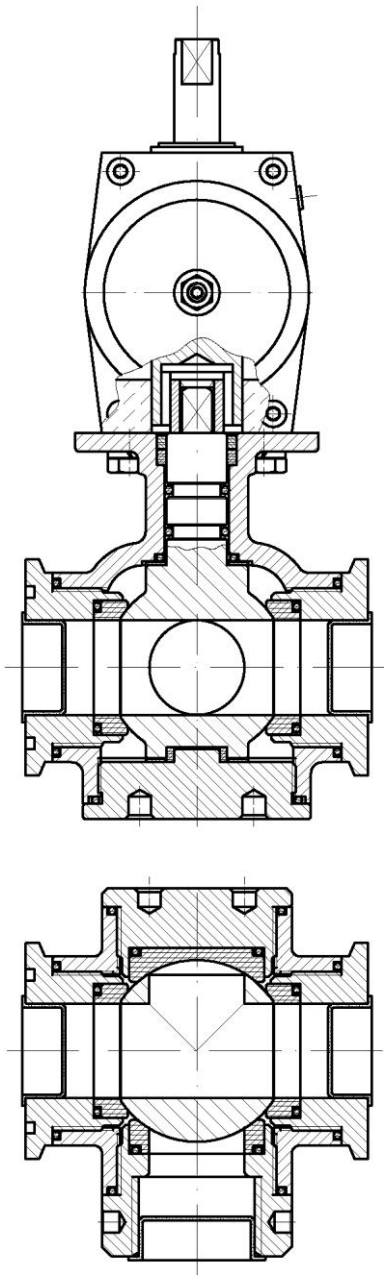
COMPLETE SET OF SPARE PARTS FOR LINE MOD. BARE SHAFT 3-WAY BALL VALVES WITH ENVELOPING GASKETS PRODUCED FROM 1998 – ND 1/2”

SPARE PARTS TABLE

SPARE PART CODE		**6155**
PART No.	Q.ty	DN 1/2”
2	2	BGD001952
4	2	OR002037VI
5	1	OR00115VI
6	1	BSSC980922
7	1	BGD001952
8	1	BSSC980923
9	1	OR03150VI
10	1	GUAR980918
11	3	OR03131VI
12	3	GUAR980915
13	3	OR03075VI

7 Serial Assemblies Of Pneumatic 3-Way Ball Valves

7.1 Pneumatic B. S. 3-Way Ball Valves Arranged For Assembly



GROUP 72

Given the compactness of this model, in the event it is used for serial assembly, we recommend to use Pneumatic Actuators ITAL series.

In the next page the serial assembly scheme of this valve is shown, together with the list of components necessary to realize it.

7.2 Serial Assembly Of Pneumatic B. S. 3-Way Ball Valves Arranged For Assembly

Components necessary for the serial assembly of 3-way Ball Valves

n = number of valves to be serially assembled.

(1) O-Ring gasket: a number equal to “n + 1“ is necessary.

(2) End head without O-Ring housing: “1unit“ is necessary.

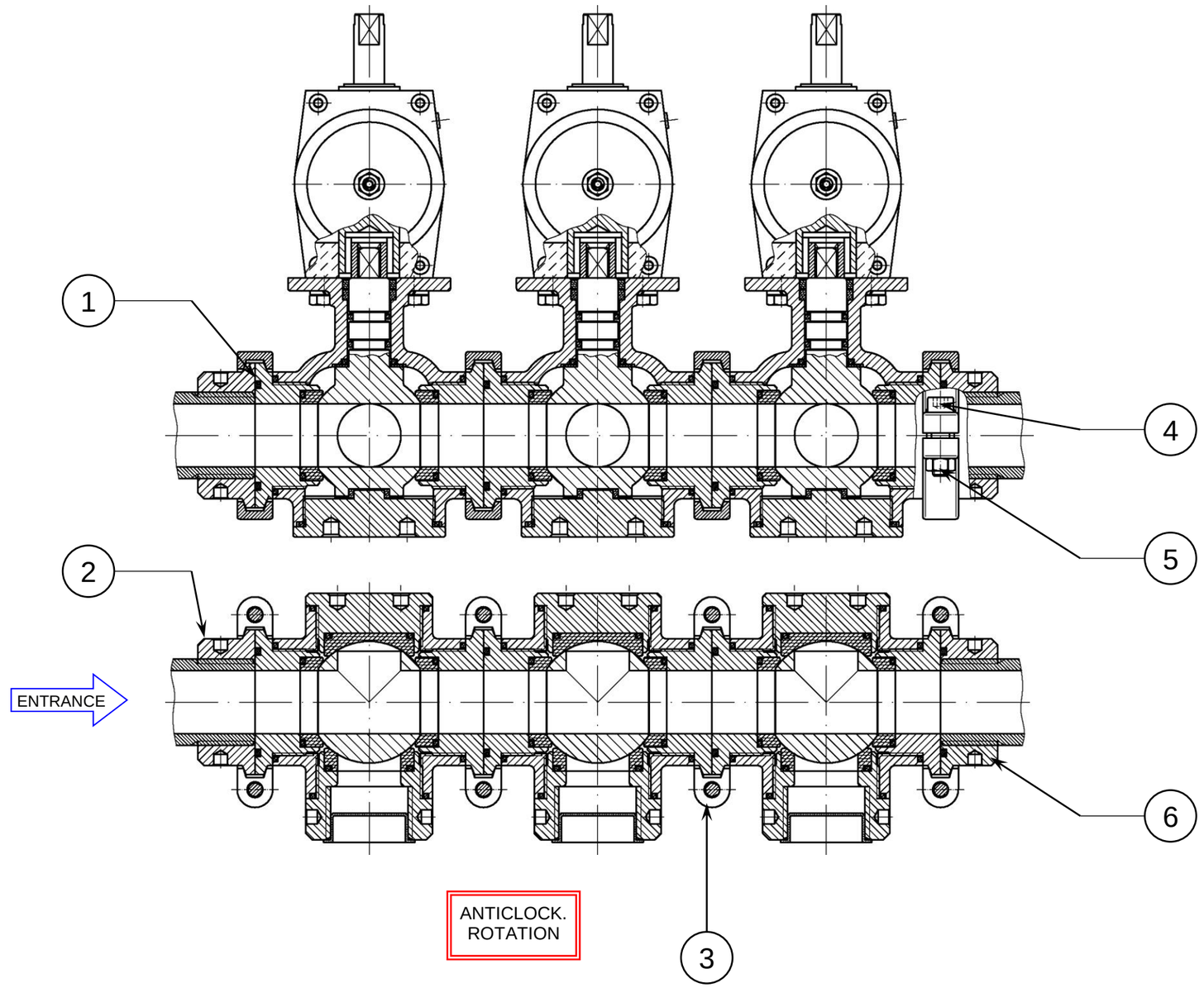
(3) Clamp: a number equal to “2n + 2“ is necessary.

(4) TCCE Screw: a number corresponding to “2n + 2“ is necessary.

(5) Hexagon nut: a number equal to “2n + 2“ is necessary.

(6) End head with O-Ring housing: “1 unit“ is necessary.

Components no. 1 – 2 – 6: are provided on customer’s request.



PART No.	COMPONENT CODE			
	ND 1/2”	ND 3/4”	ND 1”	ND 1” 1/4
1	OR03112VI	OR03150VI		OR03181VI
2	TSVSXX0763	TSVS010076	TSVS980990	TSVS990816
3	M304XX0407	M304XX0408		M304990836
4	TCCE06254			
5	D06055884			
6	TSVS010138	TSVS010077	TSVSXX0152	TSVSXX0153

DWG. No. 010421

7.3 Serial Assembly Of Pneumatic Flanged B. S. 3-Way Ball Valves

Components necessary for the serial assembly of Flanged 3-way Ball Valves.

n = number of valves to be serially assembled.

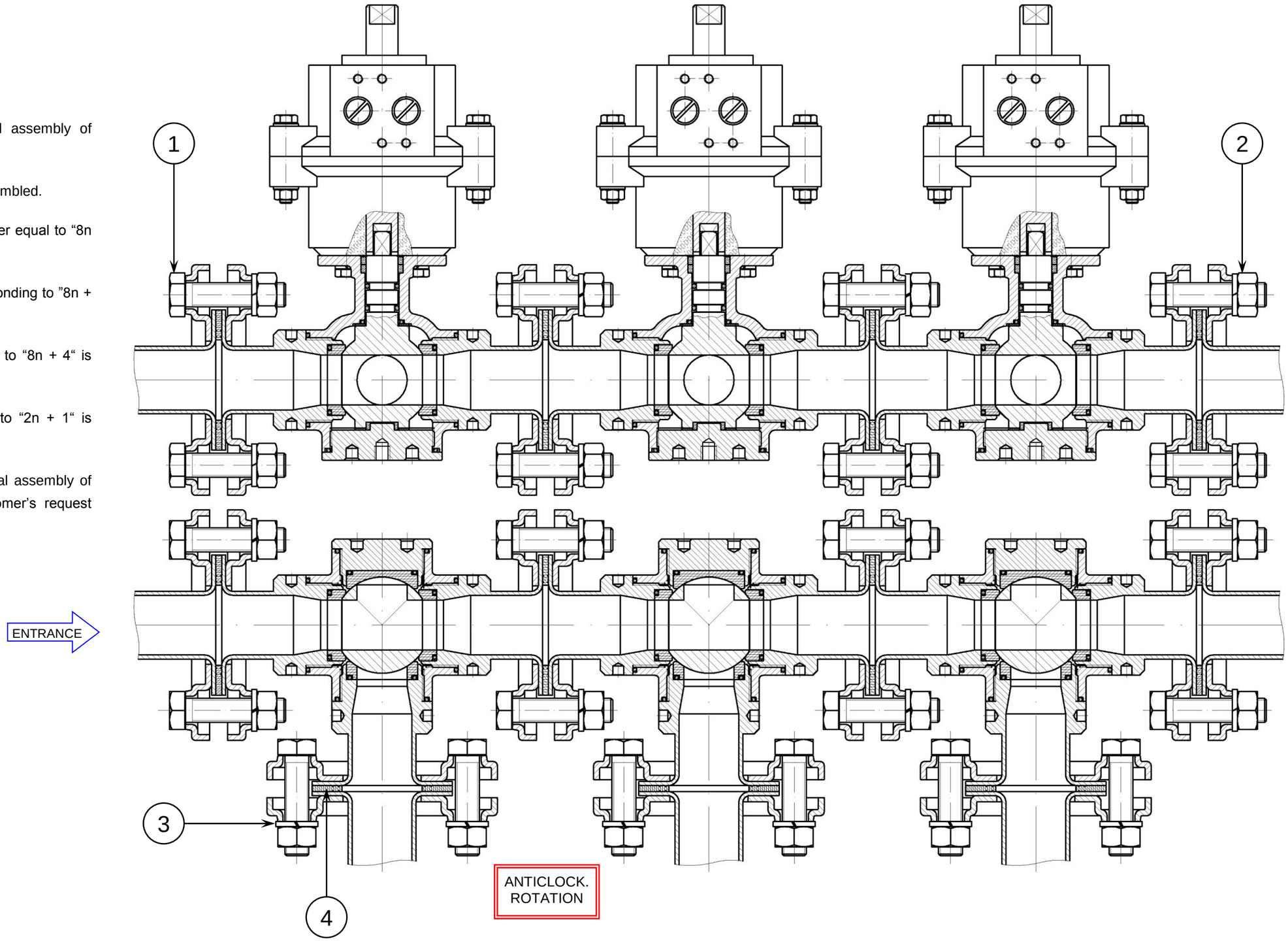
(1) hexagonal-head screw: a number equal to “8n + 4“ is necessary.

(2) hexagon nut: a number corresponding to ”8n + 4“ is necessary.

(3) spring washer: a number equal to “8n + 4“ is necessary.

(4) seal: a number corresponding to “2n + 1“ is necessary.

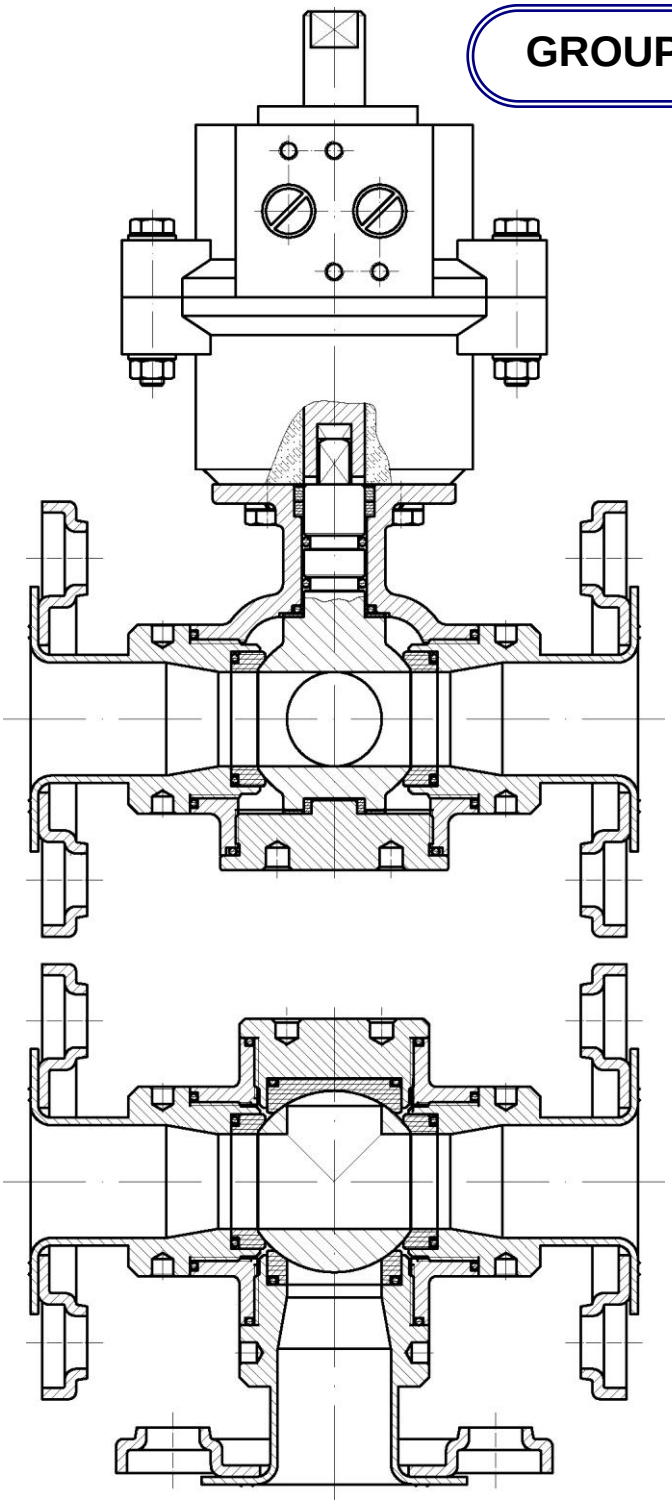
All components necessary for the serial assembly of valves are supplied on specific customer’s request only.



DWG. No. 990927

7.4 Pneumatic Flanged B. S. 3-Way Ball Valves

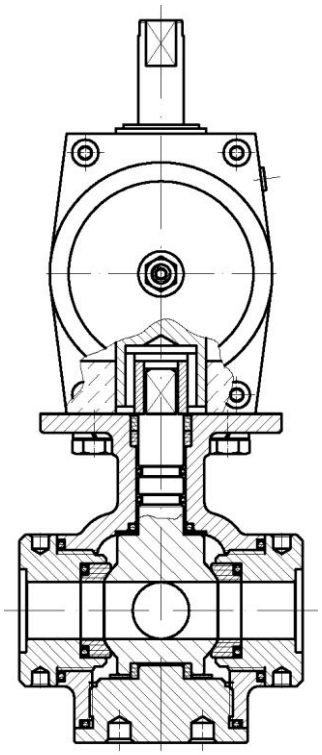
GROUP 72

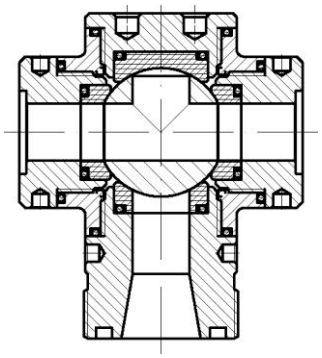


It is possible to install on this type of valve the Pneumatic Actuators ITAL series.

In the following page the serial assembly scheme of this valve is shown, together with the list of components necessary to realize it.

7.5 Pneumatic Box Mod. B. S. 3-Way Ball Valves





GROUP 72

Given the compactness of this model, in the event it is used for serial assembly, we recommend to use Pneumatic Actuators ITAL series.

In the next page the serial assembly scheme of this valve is shown, together with the list of components necessary to realize it.

7.6 Serial Assembly Of Pneumatic Box Mod. B. S. 3-Way Ball Valves

Components necessary for the serial assembly of Box model 3-way ball valves.

n = number of valves to be serially assembled.

(1) spring washers: “8 units“ are necessary.

(2) hexagon nuts: “8 units“ are necessary.

(3) intermediate flange: a number equal to “n – 1“ is necessary.

(4) square-way stop nut: a number corresponding to “n“ is requested.

(5) straight-way flanged stub pipes: “2 units“ are necessary.

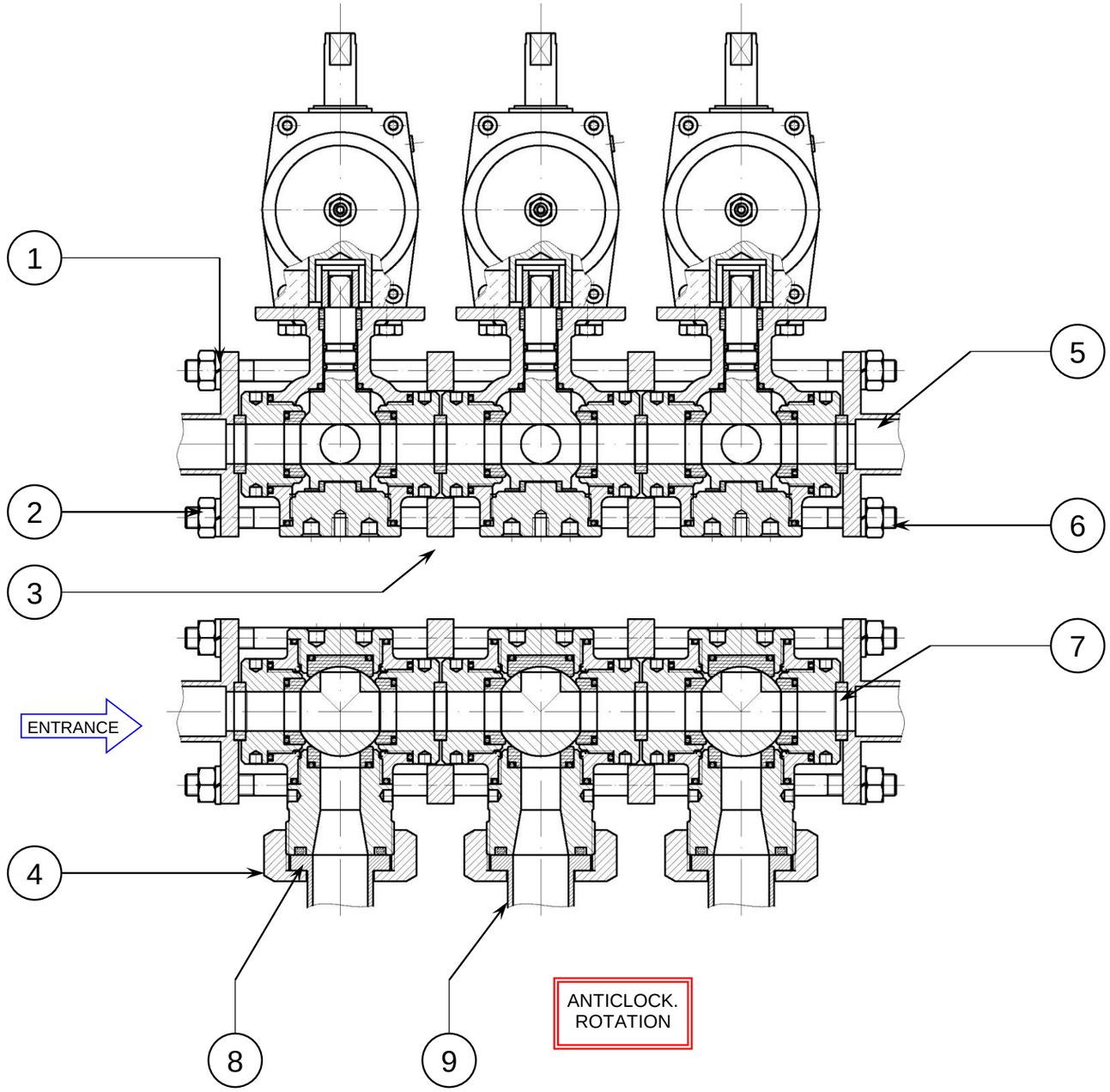
(6) tie rods with threaded ends: “4 units“ are requested (the length of tie rods depends on the number of valves which are serially assembled).

(7) seal: a number equal to “n + 1“ is necessary.

(8) O-Ring gasket: a number corresponding to “n“ is necessary.

(9) square-way flanged stub pipe: a number equal to “n“ is needed.

All components necessary for the serial assembly of valves are supplied on customer’s request only.



DWG. No. 990928

7.7 Serial Assembly Of Pneumatic Line Mod. B. S. 3-Way Ball Valves

Components necessary for the serial assembly of Linea model 3-way Ball Valves.

n = number of valves to be serially assembled.

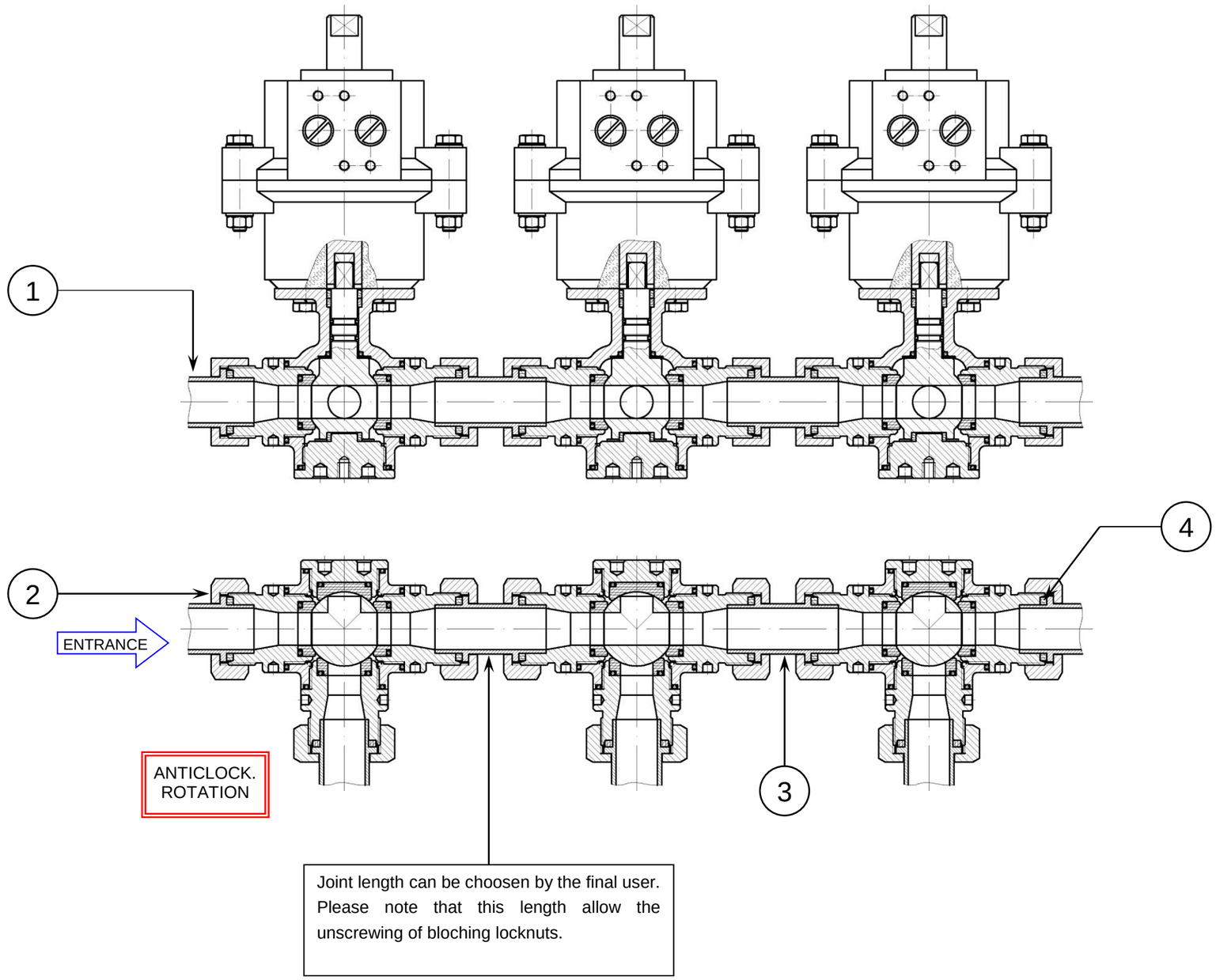
(1) flanged stub pipe: a number equal to “n + 2“ is necessary.

(2) end stop nut: a number corresponding to “n + 2“ is requested.

(3) joint: a number equal to “n – 1“ is required.

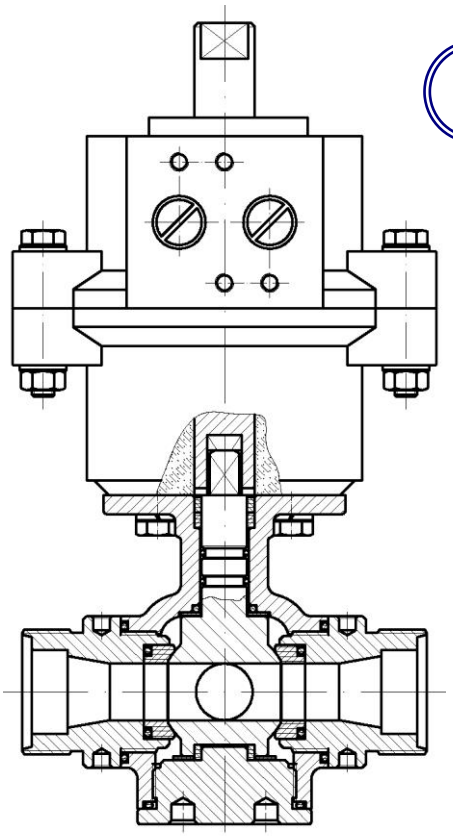
(4) seal: a number equal to “3n“ is needed.

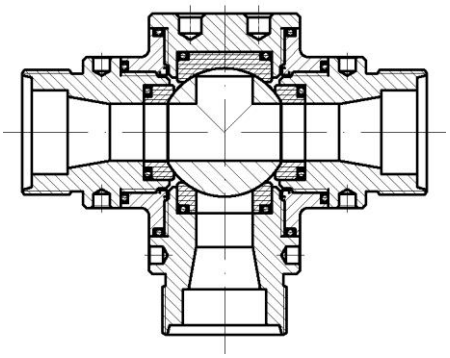
All components necessary for the serial assembly of valves are supplied on customer’s request only.



DWG. No. 990929

7.8 Pneumatic Line Mod. B. S. 3-Way Ball Valves





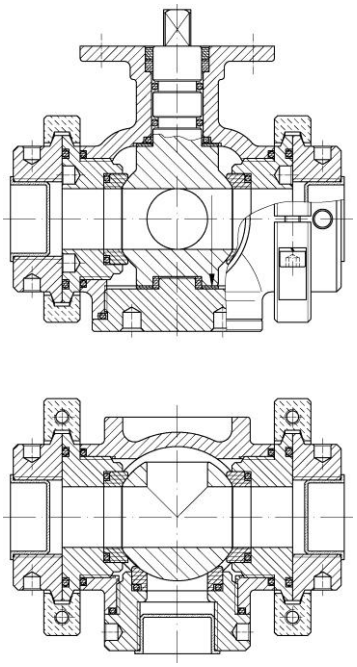
GROUP 72

It is possible to install on this type of valve the Pneumatic Actuators ITAL series.

In the following page the serial assembly scheme of this valve is shown, together with the list of components necessary to realize it.

8 3-Way Ball Valves History

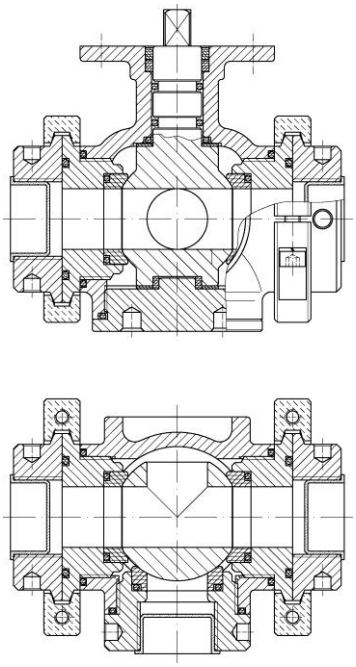
8.1 B. S. 3-Way Ball Valves With Clamp History



POSITION 1

Produced from 1998 to the half of the year 2000.

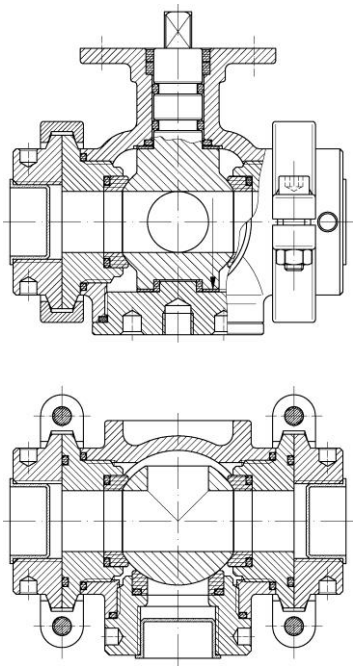
These valves were characterised by a clamp in anodized aluminium. Furthermore, the two gasket holding side heads had two holes on the bearing surface to fasten the two side heads to the valve body. These holes allowed the fluid passing through the valve to deposit in them**.**



POSITION 2

Produced from the half of the year 2000 to the first months of the year 2001.

These valves were characterised by a clamp in anodized aluminium. The two holes on the bearing surface of the two side heads have been eliminated so as to reduce fluid residues inside the valve. For the head fastening, millings have been made on the rim against which clamps press. Furthermore, the size of the O-Rings, sealing the above-mentioned surfaces, has been reduced.



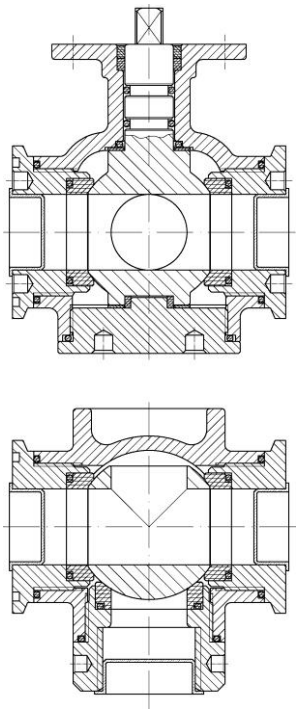
POSITION 3

Produced from the first months of the year 2001 up to today.

The clamp in anodized aluminium has been replaced with the microfused clamp in AISI 304; moreover, the outer diameter of the two side heads, for ND 3/4“, has increased; the codes of the two side heads have been modified.

DWG. No. 010423

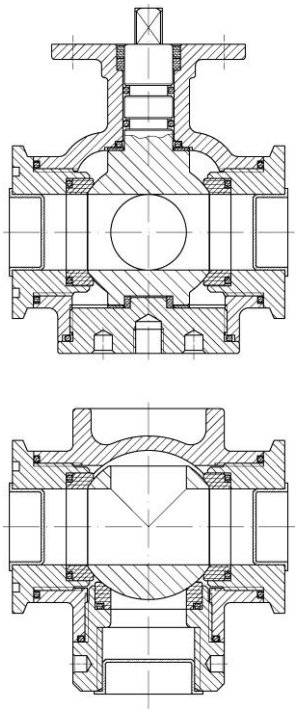
8.2 B. S. 3-Way Ball Valves Arranged For Assembly History



POSITION 1

Produced from 1998 to the half of the year 2000.

The two gasket holding side heads had two holes on the bearing surface to fasten the two side heads to the valve body. These holes allowed the fluid passing through the valve to deposit in them.



POSITION 2

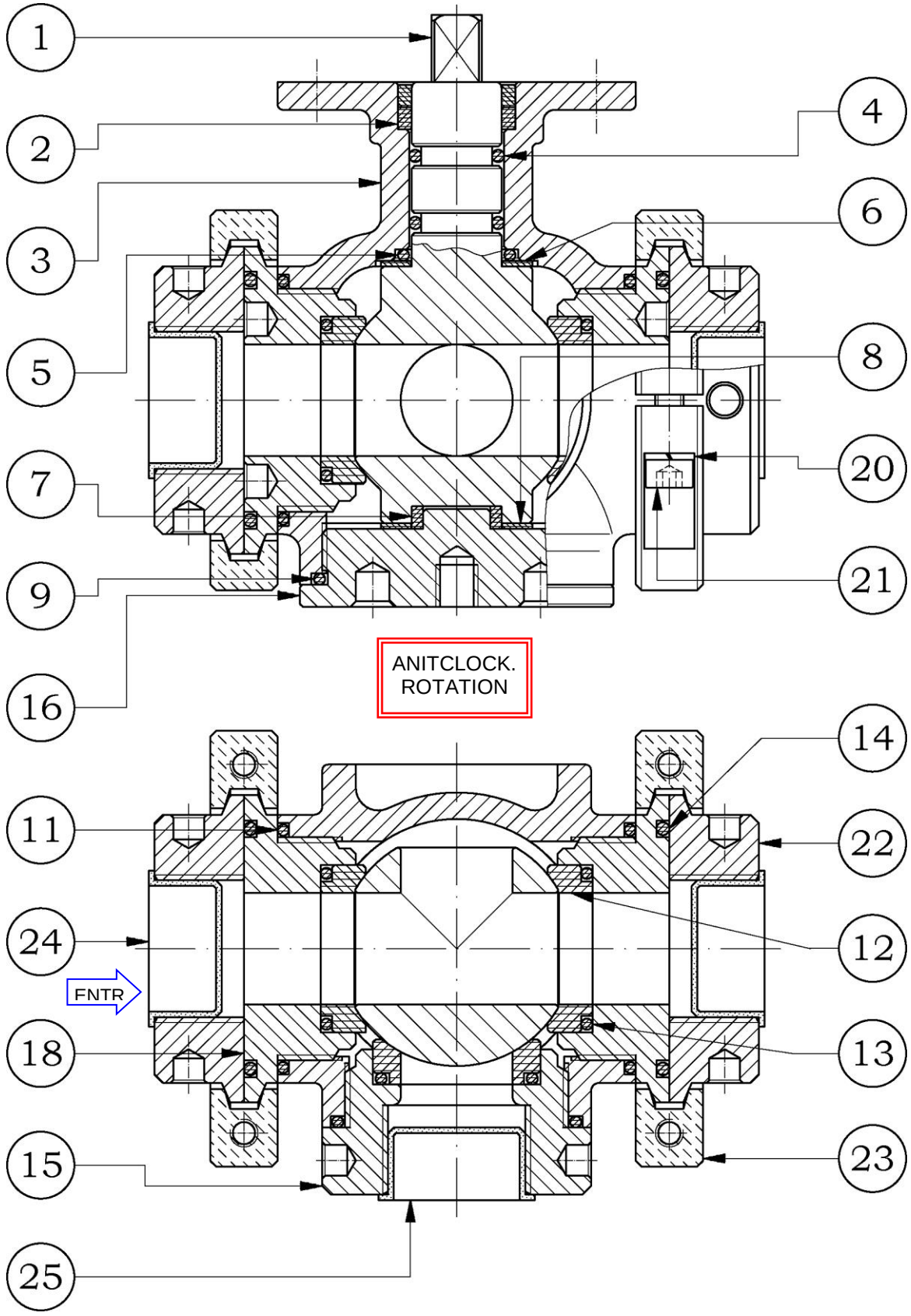
Produced from the half of the year 2000 up to today.

The two holes on the bearing surface of the two side heads have been eliminated so as to reduce fluid residues inside the valve. For the head fastening, millings have been made on the rim against which clamps press. Furthermore, the size of the O-Rings, sealing the above-mentioned surfaces, has been reduced.

Moreover, beginning from the first months of the year 2001, the outer diameter of the side heads, for ND 3/4“, has increased and the codes of the side heads have been changed.

DWG. No. 010424

8.3 Spare Parts For B. S. 3-Way Ball Valves With Clamp Produced Up To The Half Of The Year 2000



DWG. No. 991017

COMPONENTS TABLE FOR 3-WAY BALL V.S WITH CLAMP PRODUCED TO THE HALF OF THE YEAR 2000

PART	Q.ty	MATERIAL	GROUP	CODE			
				ND ¾" – 1/2"	ND 3/4" – 3/4"	ND 1" – 1"	ND 1"1/4–1"1/4
14	2	VITON	548	OR03156VI		OR03175VI	OR003206VI
18	2	AISI 316	866	TSVS980987		----------	----------
20	4	AISI 304	501	RE0500304			----------
21	4	AISI 304	551	TCCE05254			----------
22	2	AISI 316	866	TSVS980989	TSVS980989	----------	----------
23	4	AISI 304	512	GARL981011		GARL981012	----------

Components not listed in table are the same as those of the valves currently shown at page 27

GROUP 105 (ball valve spare parts)
POSITION 1

COMPLETE SET OF SPARE PARTS FOR B. S. 3-WAY BALL VALVES WITH CLAMP PRODUCED TO THE HALF OF THE YEAR 2000

SPARE PART CODE		**6163**	**6164**	**6165**
PART No.	Q.ty	ND 3/4"	ND 1"	ND 1"1/4
2	2	BGD001979		BSGD990713
4	2	OR00115VI		OR03068VI
5	1	535		OR00128VI
6	1	BSSC980923		BSSC990714
7	1	BGD001952		BGD001979
8	1	BSSC980923		BSSC990714
9	1	OR03187VI	OR003206VI	OR003262VI
11	3	OR03156VI	OR03168VI	OR003206VI
12	3	GUAR980916	GUAR980917	GUAR990705
13	3	OR03100VI	OR03118VI	OR003162VI
14	2	OR03156VI	OR03175VI	OR003206VI

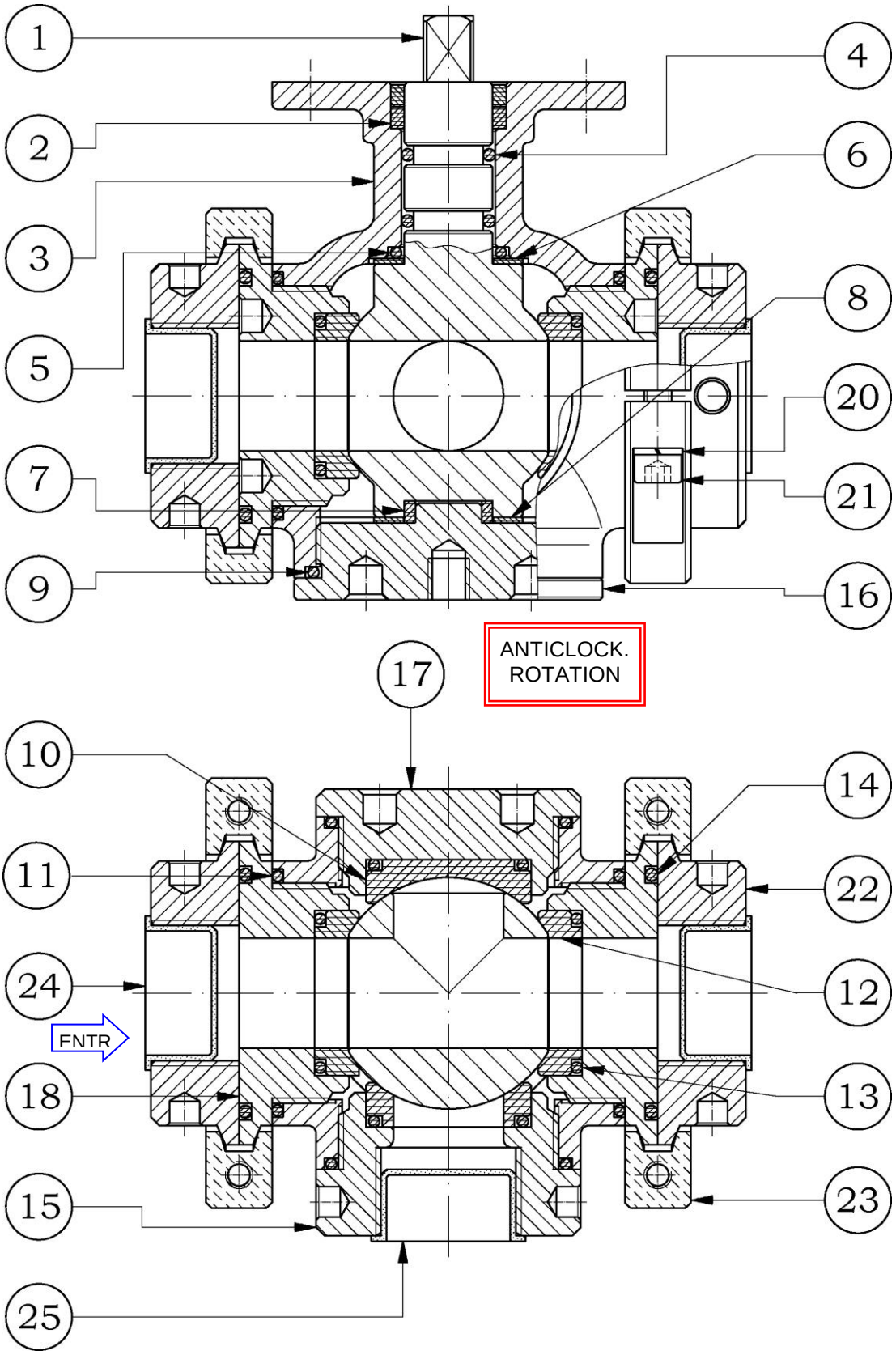
CODE TABLE FOR B. S. 3-WAY BALL VALVES WITH CLAMP PRODUCED TO THE HALF OF THE YEAR 2000

ND	**"T" PASSAGE BALL V. CODE**	**"L" PASSAGE BALL V. CODE**
3/4" 1/2"	**5532**	**5716**
3/4" 3/4"	**5533**	**5717**
1" 1"	**5534**	**5718**

Codes of not listed valves are the same as those of page 9

NOTE: The above-listed components refer to the drawing no. 991017 of page 56

8.4 Spare Parts For B. S. 3-Way Ball Valves With Clamp And E. G.s Produced To The Half Of The Year 2000



DWG. No. 991018

COMPONENTS TABLE FOR 3-WAY BALL VALVES WITH CLAMP AND E. G.s PRODUCED TO THE HALF OF THE YEAR 2000

PART	Q.ty	MATERIAL	GROUP	CODE			
				ND 3/4"–1/2"	ND 3/4"–3/4"	ND 1" – 1"	ND 1"1/4–1"1/4
14	2	VITON	548	OR03156VI		OR03175VI	OR003206VI
18	2	AISI 316	866	TSVS010071		----------	----------
20	4	AISI 304	503	RE0500304			----------
21	4	AISI 304	551	TCCE05254			----------
22	2	AISI 316	866	TSVS980989	TSVS980988	----------	----------
23	4	AISI 304	512	GARL981011		GARL981012	----------

Components not listed in table are the same as those of the valves shown at page 28

GROUP 105 (ball valve spare parts)
POSITION 1

COMPLETE SET OF SPARE PARTS FOR B. S. 3-WAY BALL VALVES WITH CLAMP AND E. G.s PRODUCED TO THE HALF OF THE YEAR 2000

SPARE PARTS TABLE

SPARE PART CODE		**6166**	**6167**	**6168**
PART No.	Q.ty	ND 3/4"	ND 1"	ND 1"1/4
2	2	BGD001979		BSGD990713
4	2	OR00115VI		OR03068VI
5	1	535		OR00128VI
6	1	BSSC980923		BSSC990714
7	1	BGD001952		BGD001979
8	1	BSSC980923		BSSC990714
9	1	OR03187VI	OR003206VI	OR003262VI
10	1	GUAR980919	GUAR980920	GUAR990706
11	4	OR03156VI	OR03168VI	OR003206VI
12	3	GUAR980916	GUAR980917	GUAR990705
13	4	OR03100VI	OR03118VI	OR003162VI
14	2	OR03150VI		OR03181VI

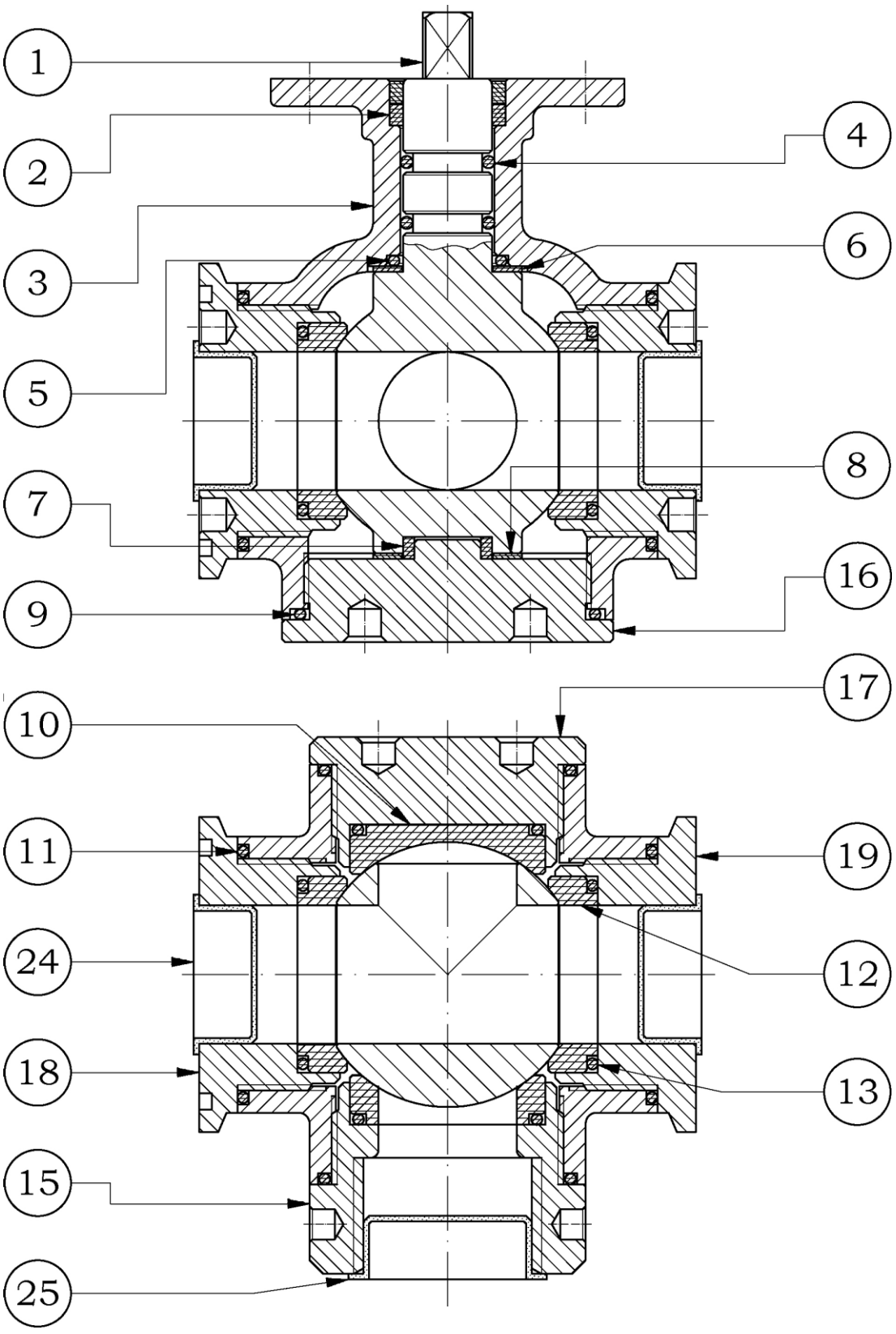
CODES TABLE FOR B. S. 3-WAY BALL VALVES WITH CLAMP AND E. G.s PRODUCED TO THE HALF OF THE YEAR 2000

ND	**"T" PASSAGE BALL V. W/ E. G.s CODE**	**"L" PASSAGE BALL V. W/ E. G.s CODE**
3/4" 1/2"	**5535**	**5719**
3/4" 3/4"	**5536**	**5720**
1" 1"	**5537**	**5721**

CODES OF NOT LISTED VALVES ARE THE SAME AS THOSE OF PAGE 10

NOTE: The above-listed components refer to the drawing no. 991018 of page 58

8.5 Spare Parts For B. S. 3-Way Ball Valves Arranged For Assembly Produced To The Half Of The Year 2000



DWG. NO. 991047

COMPONENTS TABLE FOR 3-WAY BALL VALVES WITH E. G.s ARRANGED FOR ASSEMBLY PRODUCED TO THE HALF OF THE YEAR 2000

PART	Q.ty	MATERIAL	GROUP	CODE
				ND 3/4"–1/2"
18	2	AISI 316	866	TSVS980987
19	2	AISI 304	501	TSVS010047

Components and NDs not listed in table are the same as those of the valves shown at page 33

NOTE: THE SPARE PARTS OF THESE VALVES ARE THE SAME AS THOSE OF THE VALVES SHOWN AT PAGE 33

CODES TABLE FOR B. S. 3-WAY BALL VALVES WITH E. G.s ARRANGED FOR ASSEMBLY PRODUCED TO THE HALF OF THE YEAR 2000

ND	"T" PASSAGE BALL V. W/ E. G.s CODE
3/4"	**6606**

CODES OF NOT LISTED VALVES ARE THE SAME AS THOSE OF PAGE 12

9 Table 3: tightening torques

For this table, refer to the drawing no. 010417 at paragraph 6.7

Combination of components	Tightening torque for ball valve threaded couplings [$Kg_f \cdot m$]				
	ND 3/8"	ND 1/2"	ND 3/4"	ND 1"	ND 1" 1/4
P. 3 P. 16	20	20	38	43.5	60
P. 3 P. 15	10	10	20	22.5	43.5
P. 3 P. 17	10	10	20	22.5	43.5
P. 3 P. 18	10	10	20	22.5	43.5
P. 20 P. 21		0,65			
System connection	2.2	3.3	5.5	9.9	16.1

10 Disposal

After use, for the valve disposal, it is necessary to disassemble the valve and separate the different materials the valve is composed of, according to the tables annexed to the valve working drawings, then dispose of the different materials in compliance with the laws in force.

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