ON-OFF VALVES IVS-IVFL SERIES

SERIES 01 - GROUP 8,9,10,12

Master handbook description: Guide to choice, use and maintenance of ON - OFF valves, IVS-IVFL series (English)

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Checked by: PR
Approved by: OS

DECLARATION OF CONFORMITY

Code: **DPED00333** REV. 00 Date: 01/03/2002

Series nr 1 **ON-OFF VALVES , IVS STAINLESS STEEL SERIES**

Groups**: 8, 9, 10, 11, 14, 15, 92**

We ITALVALVOLE S.A.S. of Spadon Oscar & C., via Amendola 125, 13836 Cossato (BI), declare that:
the product on-off valve, IVS stainless steel series, in the following diameters, ND 15 PS 16 – ND 20 PS 16 – ND 25 PS 16 - ND 32 PS 16 - ND 40 PS 16 – ND 50 PS 16 – ND 65 PS 10 – ND 80 PS 10 – ND 100 PS 6 – ND 125 PS 6 – ND 150 PS 6 – ND 200 PS 5, is in accordance with the directive 97/23/CE (directive PED) with classification under Art. 3.3.

DECLARATION OF CONFORMITY

Code.: **DEPD00433** REV. 00 Date: March 1st , 2002

Series nr 1 **ON-OFF VALVES, IVFL STAINLESS STEEL SERIES**

Groups: **12, 91**

We ITALVALVOLE S.A.S. of Spadon Oscar & C., via Amendola 125, 13836 Cossato (BI), declare that:
The product on-off valve, IVFL stainless steel series, in the following diameters, ND 15 PS 16 – ND 20 PS 16 – ND 25 PS 16 – ND 32 PS 16 - ND 40 PS 16 – ND 50 PS 16 – ND 65 PS 10 – ND 80 PS 10 – ND 100 PS 6 – ND 125 PS 6 – ND 150 PS 6, is in accordance with the directive 97/23/CE (directive PED) with classification under Art. 3.3.

ITALVALVOLE S.A.S.

Legale rappresentante
Legal representative

Firmato digitalmente da

OSCAR SPADON

SerialNumber = IT:SPDSCR44M19L436J
C = IT

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1 Foreword

On-off valves have been designed to satisfy all the different use requirements of present and future users. The materials used for the production of this series of valves make them applicable to textile, dyeing, chemical, food industry and, in general, to all those environments which cannot accept any material other than stainless steel further to humidity reasons.

The easy maintenance, the teflon seal on the rod, the use of forged and precision casting components make these valves one of the most industrialized product in this sector. ON-OFF valves, IVS-IVFL series, are available in ND 15 – 100 with precision casting body and ND 125 – 200 with electric welded body. IVS initials refer to the valve with angle pattern body, IVFL initials refer to 45° pattern body.

Classification according to directive 97/23/CE (PED) : Art. 3.3 .

Table 4 includes a list of fluid which are perfectly compatible with valves.

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

2 Technical Characteristics

General notice: ⇒ all the pressure values indicated hereinafter are gauge pressure values. Normal operation with pressure under shutter.

⇒ **valve destined to fluids of group 2 (directive 97/23/CE).**

ND: ⇒ 15 to 200 (ND 200 is for IVS series only)

Connections: ⇒ to be butt welded .

⇒ flanged in compliance with UNI PN 6, PN 10, PN 16, (flanges can be plane, pressed or revolving pressed)

⇒ GAS threaded, both internal and external

Pmax allowable (PS): ⇒ 16 bar (ND 15 to 50); 10 bar (ND 65 to 80); 6 bar (ND 100 to 150); 5 bar (ND 200).

Pmin allowable: ⇒ 0 bar.

Seal: ⇒ EPDM, EPDM lined with PTFE, PTFE-CARBON-GRAPHITE seal.

Tmax allowable: ⇒ 130 °C with EPDM seal; 150° seal EPDM lined with PTFE; 170 °C, PTFE-CARBO-GRAFITE seal

Tmin allowable.: ⇒ 0 °C (liquid phase).

Flow direction: ⇒ 2-way globe valve, with angle and oblique pattern body, unidirectional.

IVS valve with right-angle body, with visual indicator

Air connection: ⇒ 1/8” GAS.

Supply fluid: ⇒ instrument air.

Supply pipes: ⇒ Pipe inner diameter = 4 mm, min. outer diameter = 6 mm, able to bear the supply Pmax under the environment conditions of the plant where the valve has to be assembled.

P min. (supply): ⇒ 6 bar.

Air consumption (NC) ⇒ see table 2.

Versions: ⇒ with handwheel; with visual indicator; with inductive sensors; with magnetic sensors; with pneumatic and mechanic limit switches.

Working materials: ⇒ see working drawings and relevant tables.

Overall dimensions: ⇒ see overall dimensions drawings and relevant tables.

IVFL valve with 45° angle pattern body

2.1 Table 1: Kv of IVS-IVFL valves

ND		ΔP [bar]	Kv [m^3/h]	ND		ΔP [bar]	Kv [m^3/h]
15	IVS	1	4	65	IVS	1	74
	IVFL		4		IVFL		76
20	IVS	1	7	80	IVS	1	125
	IVFL		7.5		IVFL		132
25	IVS	1	9.5	100	IVS	1	----------
	IVFL		12		IVFL		----------
32	IVS	1	16	125	IVS	1	----------
	IVFL		19		IVFL		----------
40	IVS	1	29	150	IVS	1	----------
	IVFL		30		IVFL		----------
50	IVS	1	44	200	IVS	1	----------
	IVFL		45		IVFL		----------

2.2 Table 2: IVS-IVFL valve air consumption

DRIVE PRESSURE	STAINLESS STEEL VALVE AIR CONSUMPTION [Nl / cycle]				
	Servocontrol ∅ 70	Servocontrol ∅ 80	Servocontrol ∅ 125	Servocontrol ∅ 160	Servocontrol ∅ 210
6 bar	0,824	1,182	4,982	12,667	21,821

Note: “cycle” is to be referred to a complete opening and closing operation

2.3 Table 3: seal Δp of IVS-IVFL valves (bar)

∅ Servocontrol	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
	7	4										
70	5	5	3,5									
	16	14	9,5									
80			16	3,2	2,3	1,5						
				14	10	6,5						
125					16	14	3					
							8,5					
160							10	1,9	1,7	1,1	0,75	0,4
								7,5	4,5	3,5	2,5	1,5
210								10	6	5,5	3,7	2

2.4 Table 5: seal Δp of IVS-IVFL valves with PTFE-CARBON-GRAPHITE cap for stem

∅ Servocontrol	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50	ND 65
70	11	11	9,5				
80			11	11	10	6,5	
125					11	11	8,5
160							10

VALVE WITH STANDARD ΔP

VALVE WITH UNDERSIZED ΔP

VALVE WITH UPRATED ΔP

2.5 Table 4: Compatible fluids

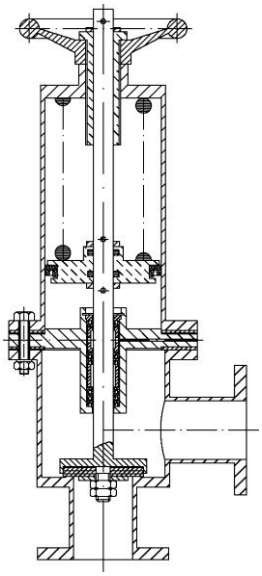
Type of fluid	Type of seal		
	EPDM	EPDM lined PTFE	PTFE GRAPHITE
Vinyl acetate	YES	YES	YES
Phenol	NO	YES	YES
Phosphoric acid 20% max.	YES	YES	YES
Phthalic acid	YES	YES	YES
Gallic acid	NO	YES	YES
Nitric acid 5% - 65% max	NO	YES	YES
Tannic acid	YES	YES	YES
Ethanol	YES	YES	YES
Methanol	YES	YES	YES
Propanol	YES	YES	YES
Aniline	NO	YES	YES
Sodium carbonate 20% max	YES	YES	YES
Borax (sodium tetraborate)	YES	YES	YES
Sodium carbonate	YES	YES	YES
Potassium chlorate 30% max	YES	YES	YES
Sodium chloride 20% max	YES	YES	YES
Potassium chloride 5% max	YES	YES	YES
Ethylene glycol	YES	YES	YES
Ammonium nitrate	YES	YES	YES
Copper nitrate	YES	YES	YES
Sodium nitrate	YES	YES	YES
Potassium sulphate 20% max at T=100° C	YES	YES	YES
Sodium sulphate	YES	YES	YES
Zinc sulphate 40% max at T=100° C	YES	YES	YES
Potassium sulphite 10% max	YES	YES	YES
Sodium sulphide	YES	YES	YES
Toluene	NO	YES	YES
Steam T_{max}=130 °C P = 2,7 bar	YES	YES	YES
Steam T_{max}=150 °C P = 4,8 bar	NO	NO	NO

All data indicated under table 4, if not otherwise indicated, are relevant to a temperature of 21°C.
All data have a general meaning and are not valid for all the possible working conditions. These data may considerably vary depending upon various conditions, such as: temperature, concentration, fluid speed.
For a deeper and thorough information, please get in touch with the technical department.
Any use of the valve on explosive, easily inflammable, comburant and poison gases is strictly forbidden.
Any use of the valve on liquids made of: chlorine, fluorine, bromine, iodine and derivative elements is strictly forbidden.
Any deviation from such prohibitions may be issued, by our technical department, upon written special request.

2.6 Safety notes

- The VALVE body, under the maximum operating temperature depending upon the system, may reach a temperature T equal to 170° C. It is up to the engineer to provide the system with the necessary safety guards and/or warning signals aiming at removing/indicating the risk of burns by the user.
- On each valve 2 peepholes have been made (located on the intermediate body). Their scope is to signal any loss from the stem seal. They are extremely important as they limit the passage of fluid into the air circuit and warn about the loss, preventing the instrument air to be contaminated. It is up to the engineer to provide the system with the necessary safety guards and/or warning signals aiming at removing/indicating the risk of contact with the fluids (that might be dangerous) by the user.
- Important note: never blow compressed air or other fluid into the two inspection holes for an reason; if they should be accidentally stopped you must disassemble the valve for a complete maintenance.
- During whatever operation made on the valve, the fluid shall not be present inside the piping.

2.7 Types of IVS - IVFL VALVES manufactured since 1973 (Dwg. Nr. 980179)



POS.1

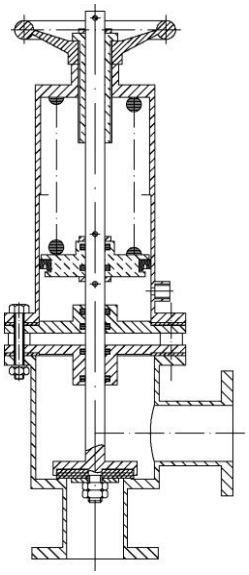
Spare parts : spare part code includes all the VALVE gaskets

VALVES MANUFACTURED:

From 1973 to 1974

From ND 15 to ND 200

The VALVES that had been manufactured up to 1974 had electric-welded body and servo control. The seal on the stem was made through U type lip seals. The piston was made of a DE type gasket.



POS.2

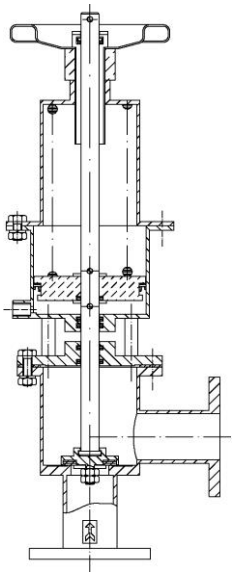
Spare parts: the spare part code includes all the VALVE gaskets

MANUFACTURED VALVES:

From 1975 to 1979

from ND 15 to ND 200

The VALVES that have been manufactured from 1975 to 1979 were similar to the previous ones (Pos.1). The stem seals on the stem have been replaced by VITON O-Ring gaskets.



POS.3

Spare parts : spare part code include all the VALVE gaskets

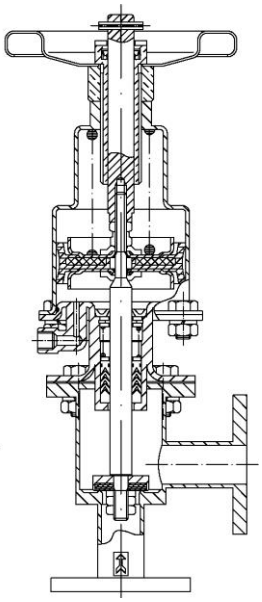
PRODUCED VALVES:

From 1980 to 1988 - From ND 15 to ND 50

From 1980 to 1990 - ND 65

From 1980 to 1992 - From ND 80 to ND 200

In the valves that have been manufactured from 1980 to 1992 the servo control was shaped in a different way. DE type seals and springs have been replaced. The stem seal was made through VITON O-Ring type gaskets.



POS.4

Spare parts : for spare parts two codes exist, the first one including the servo-control side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

From 1989 to 1996 - From ND 15 to ND 50

From 1991 to 2002 - ND 65

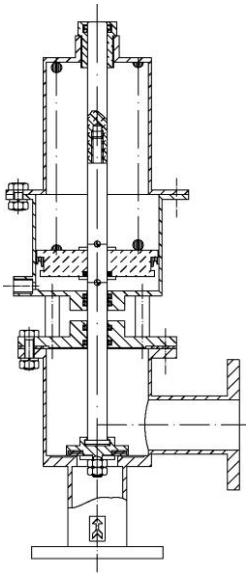
From 1993 to 2003 - ND 80

From 1993 to 2004 - ND 100

From 1993 - From ND 125 to ND 200

The valves that have been manufactured from 1989 to 1996 show substantial modifications. The servo control is made of forged components. DE gaskets have been replaced with TDUOP gaskets. The stem seal is made through PTFE stuffing box. The springs have been replaced.

NOTE: Types from ND 125 to ND 200 are being manufacturing at present.



POS.5

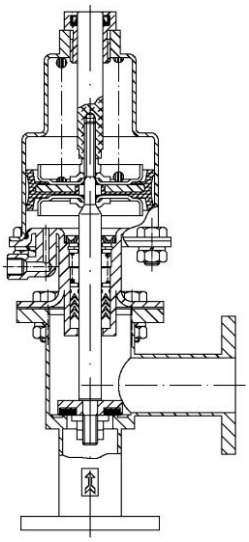
Spare parts : the spare part code includes all the VALVE gaskets

VALVES MANUFACTURED :

From 1991 to 1992

From ND 80 to ND 200

From 1991 to 1992 a series of valves without handwheel and fitted with a visual indicator has been manufactured. They were similar to those that had been produced up to 1992. Types from ND 80 to ND 200 have been manufactured.



POS.6

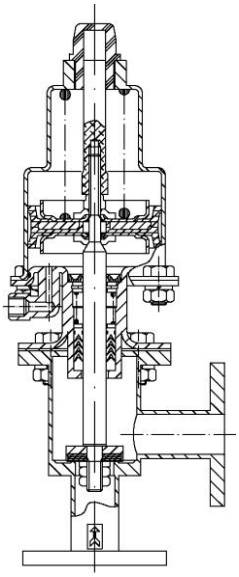
Spare parts : for spare parts two codes exist: the first one including the servo-control side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

From 1991 to 1992

From ND 15 to ND 65

From 1991 to 1992 a series of valves from ND 15 to ND 65 fitted with visual indicator has been manufactured. They were similar to those that had been manufactured after 1989, position 4.



POS.7

Spare parts : for spare parts two codes exist: the first one including the servo-control side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

From 1993 to 1996 - from ND 15 to ND 50

From 1993 to 2002 - ND 65

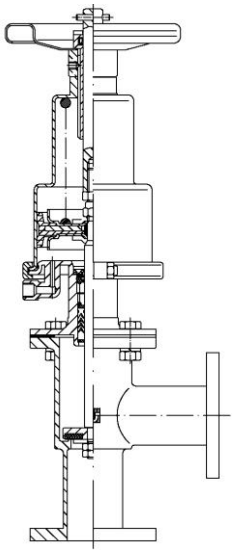
From 1993 to 2003 - ND 80

From 1993 to 2004 - ND 100

From 1993 - from ND 125 to ND 200

From 1993 to 1996 a series of valves similar to those that have been produced after 1989 has been manufactured and fitted with visual indicator. The position indicator is protected by a transparent plastic cap.

NOTE: Types from ND 125 to ND 200 are being manufacturing at present.



POS.8

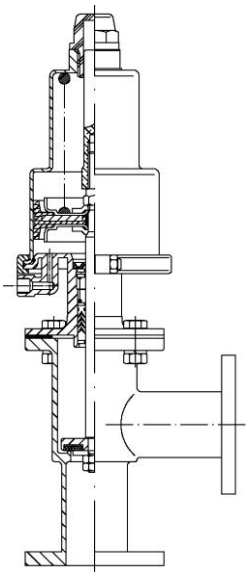
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

After 1996 to 2002

From ND 15 to ND 50

The valves manufactured from 1996 have undergone further modifications. The valve body has been carried out through precision casting. The servo control is tightened by means of a precision casting clamp.



POS.9

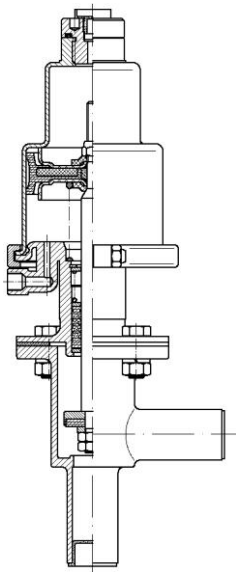
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

After 1996 to 2002

From ND 15 to ND 50

Valves with precision casting body and clamp for the servo control tightening have been manufactured since 1996, which are fitted with a visual indicator. The position indicator is protected by means of a transparent plastic cap.



POS.10

Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

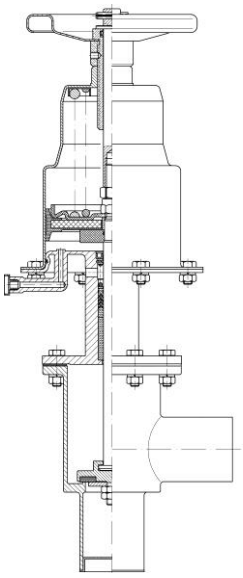
VALVES MANUFACTURED :

Since 1996 to 2002 - from ND 15 to ND 50

Since 1996 to 2002 - ND 65

Since 1999 - ND 80

Since 1996 to 2002 for the ND 15 to 50 type, since 1996 to 2002 for the ND 65 type and since 1999 for the ND 80 type a series of valves normally open has been manufactured. These valves shall close whenever air enters the servo control.



POS.11

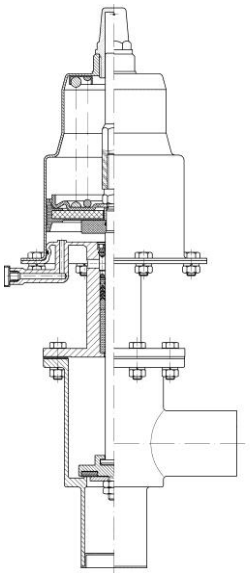
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

Since 1996 ..... - ND 50

Since 1996 to 2002 - ND 65

Since 1996 valves have been produced, which are fitted with an uprated servo control so as to get higher differential pressures.
The servo control having a diameter just higher than the standard one shall be assembled on the valve.



POS.12

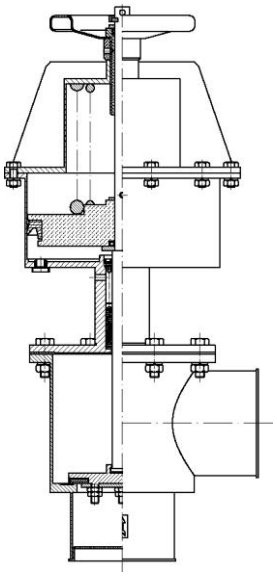
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

Since 1996 ..... - ND 50

Since 1996 to 2002 - ND 65

Valves belonging to this position have the same characteristics of those under pos. 11, except than these are fitted with a visual indicator.



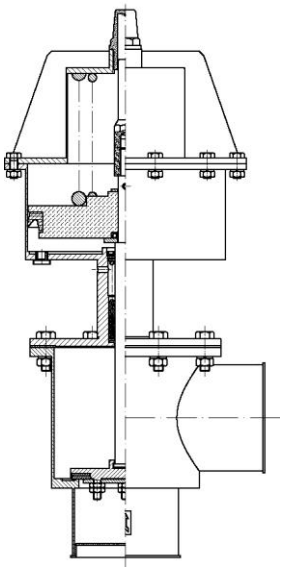
POS.13

Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

Since 1996 - From ND 80 to ND 200

Since 1996 a series of valves from ND 80 to ND 200 has been manufactured, which are fitted with an uprated servo control so as to get differential pressures higher than the standard ones.
The servo control that is used is completely electro-welded. Furthermore, the piston gasket consists of a DE rather than a TDUOP.



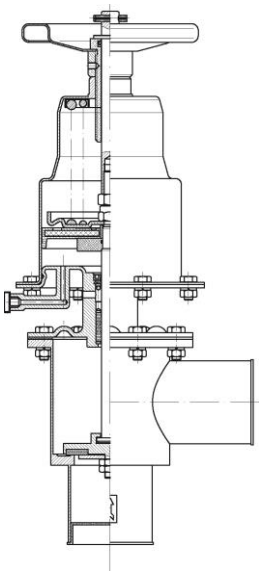
POS.14

Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

Since 1996 - From ND 80 to ND 200

The valves belonging to this position have the same characteristics of those under pos. 13 with the sole exception that these last have been fitted with a visual indicator.



POS.15

Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

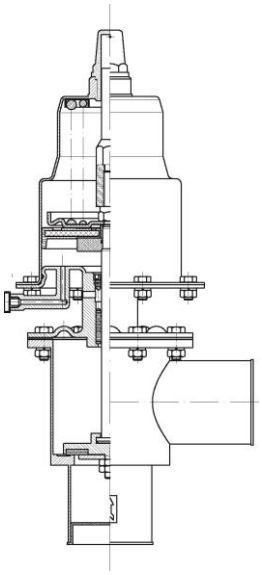
VALVES MANUFACTURED

Since 2002 - ND 65

Since end 2003 - ND 80

From half 2004 - ND 100

Since 2003 for ND 65 and since end 2003 for ND 80 e da metà 2004 per il DN 100 new solutions are introduced on valves DN 65-80; their body is now produced with investement casting technology. In addition, the same servocontrol is use both on IVS and IVFL valves. For body gasket it is used a nylon reinforced EPDM gasket Since the beginning of 2004 for ND is that the former are equipped with a single-lip TDUOP



POS.16

Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

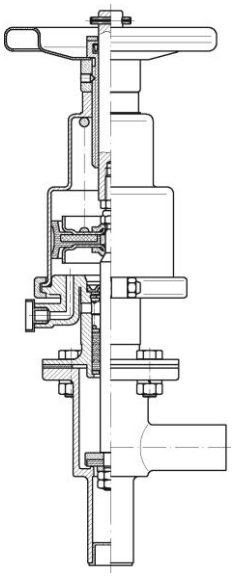
VALVES MANUFACTURED

Since 2002 - DN 65

Since end 2003 - ND 80

From half 2004 - ND 100

The valves belonging to this position have the same characteristics of those under pos. 15, with the sole exeption that thes cast have been fitted with a visual indicator. Since the beginning of 2004 for ND is that the former are equipped with a single-lip TDUOP



POS.17

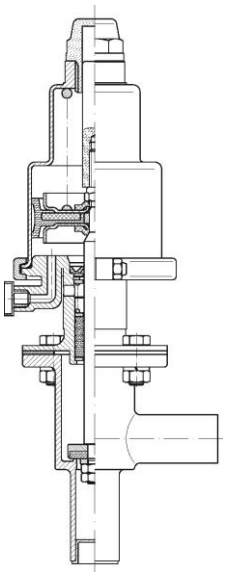
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

From 2003 to start 2004

From ND 15 to ND 50

The valves produced from 2003 TO beginning 2004 have same characteristics than the valves produced from 1996 of the position 8 further modification has been achievement of the intermediate body with the upper part of the same realised in microfusion.



POS.18

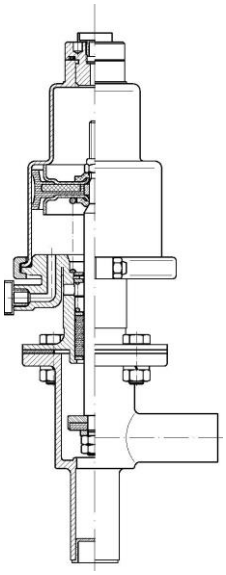
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

From 2003 fino ad inizio 2004

From ND 15 to ND 50

The valves produced from 2003 TO 2004 have same characteristics than the valves produced from 1996 of the position 9 further modification has been achievement of the intermediate body with the upper part of the same realised in microfusion.



POS.19

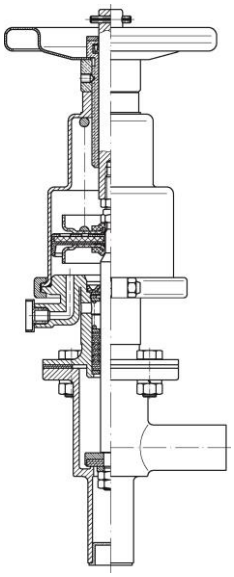
Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets.

VALVES MANUFACTURED :

From 2003 fino ad inizio 2004

From ND 15 to ND 50

The valves produced from 2003 TO beginning 2004 have same characteristics than the valves produced from 1996 of the position 10 further modification has been achievement of the intermediate body with the upper part of the same realised in microfusion.



POS.20

Spare Parts: spare parts are identified by two codes for servocontrol side and body side seals.

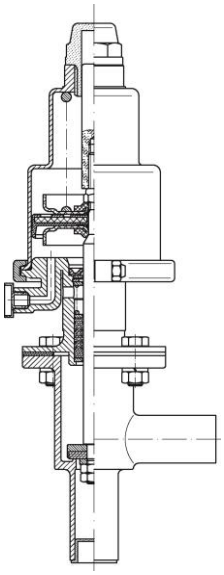
VALVES MANUFACTURED:

Since the beginning of 2004

From DN 15 to DN 50

The only difference between the valves manufactured since the beginning of 2004 and those of the previous version, Position 17, is that the former are equipped with a single-lip TDUOP seal, the latter with a double-lip TDUOP seal.

Furthermore, the brass spacer, which served for centering the TDUOP itself, is no longer used.



POS.21

Spare Parts: spare parts are identified by two codes for servocontrol side and body side seals.

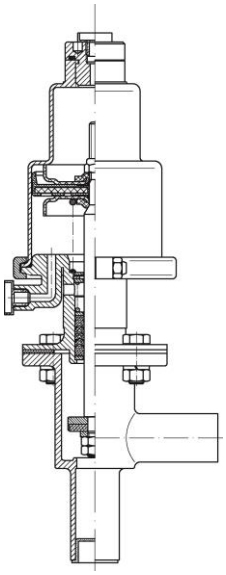
VALVES MANUFACTURED:

Since the beginning of 2004

From DN 15 to DN 50

The only difference between the valves manufactured since the beginning of 2004 and those of the previous version, Position 18, is that the former are equipped with a single-lip TDUOP seal, the latter with a double-lip TDUOP seal.

Furthermore, the brass spacer, which served for centering the TDUOP itself, is no longer used.



POS.22

Spare parts : for spare parts two codes exist: the first one including the servocontrol side gaskets, the second one including the body side gaskets

VALVES MANUFACTURED:

From 2004

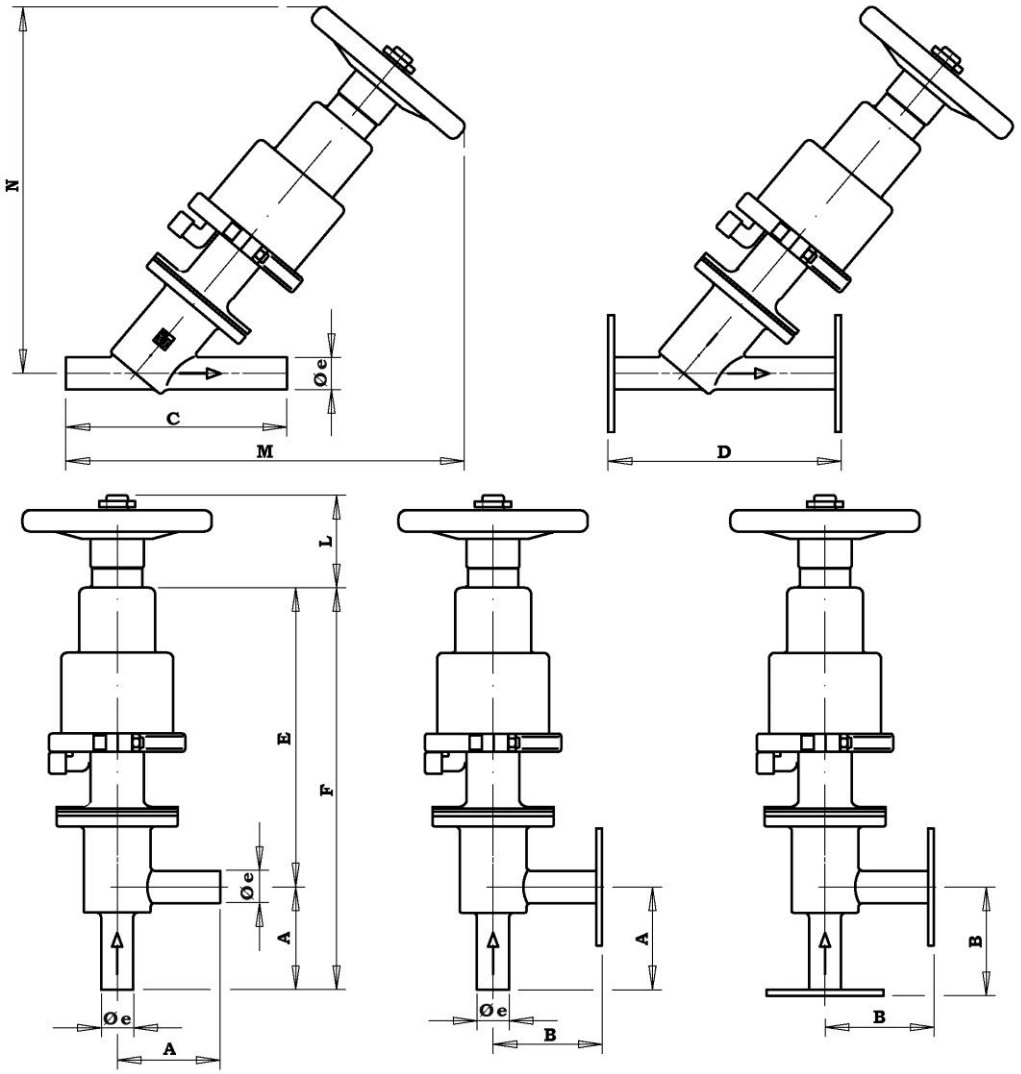
From ND 15 to ND 50

The only difference between the valves manufactured since the beginning of 2004 and those of the previous version, Position 19, is that the former are equipped with a single-lip TDUOP seal, the latter with a double-lip TDUOP seal.

Furthermore, the brass spacer, which served for centering the TDUOP itself, is no longer used.

2.8 Overall dimensions of IVS-IVFL VALVES

2.8.1 IVS-



IVFL with handwheel; groups: 8-9-10-12

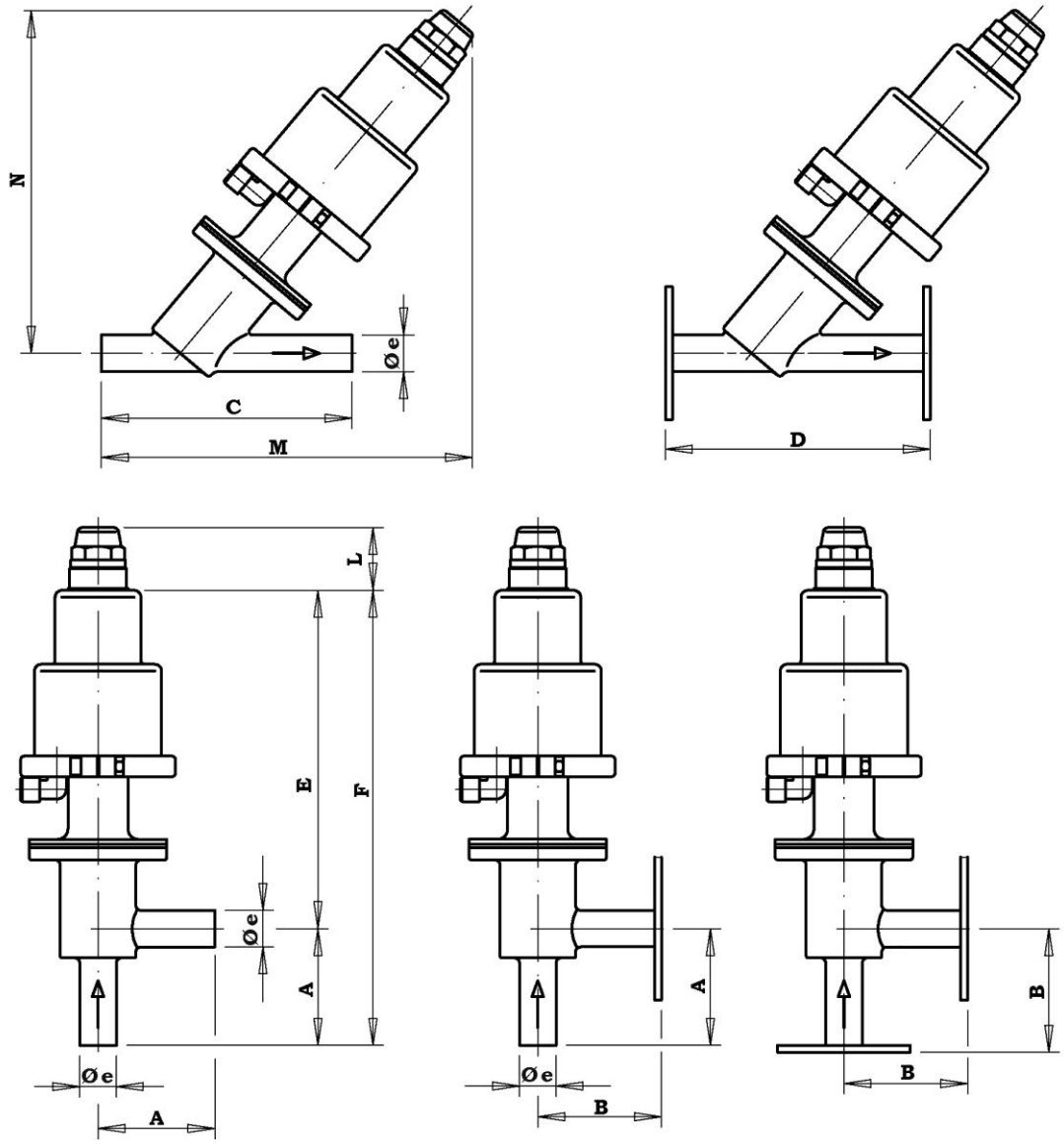
Dwg. nr. 960803 ReV:00

ND	15	20	25	32	40	50	65	80	100	125	150	200
∅e pipe	21.3	26.9	33.7	42.4	48.3	60.3	76.1	89	114.3	139.7	168.3	219
A	68	68	78	88	98	113	130	135	148	163	188	218
B	70	70	80	90	100	115	130	135	150	165	190	220
C	146	146	156	176	196	226	290	310	345	395	475	-
D	150	150	160	180	200	230	290	310	350	400	480	-
E	197	197	197	230	230	254	310	383	409	378	439	492
F	265	265	275	318	328	367	440	518	557	541	627	710
L	61	61	61	61	61	61	72	80	80	80	80	80
L_1	76	76	76	77	77	75	102	120	120	120	120	120
M	263.5	257.5	247	278	295	326.5	419	490	534	542	658	-
M_1	278	272	262	295	311	342	448	498	562	567	687	-
N	242	247	252	271.5	278	310	361	433	449	487	482	-
N_1	260	265	260	290	296	319	390	441	477	517	507	-

The values relevant to letters with subscript 1 refer to the handwheel position when the valve is completely open as for ND 15 to 65. As for the other NDs, it indicates the handwheel maximum allowed position.

Measure are expressed in millimetres

2.8.2 IVS-IVFL with visual indicator; groups: 8-9-10-12

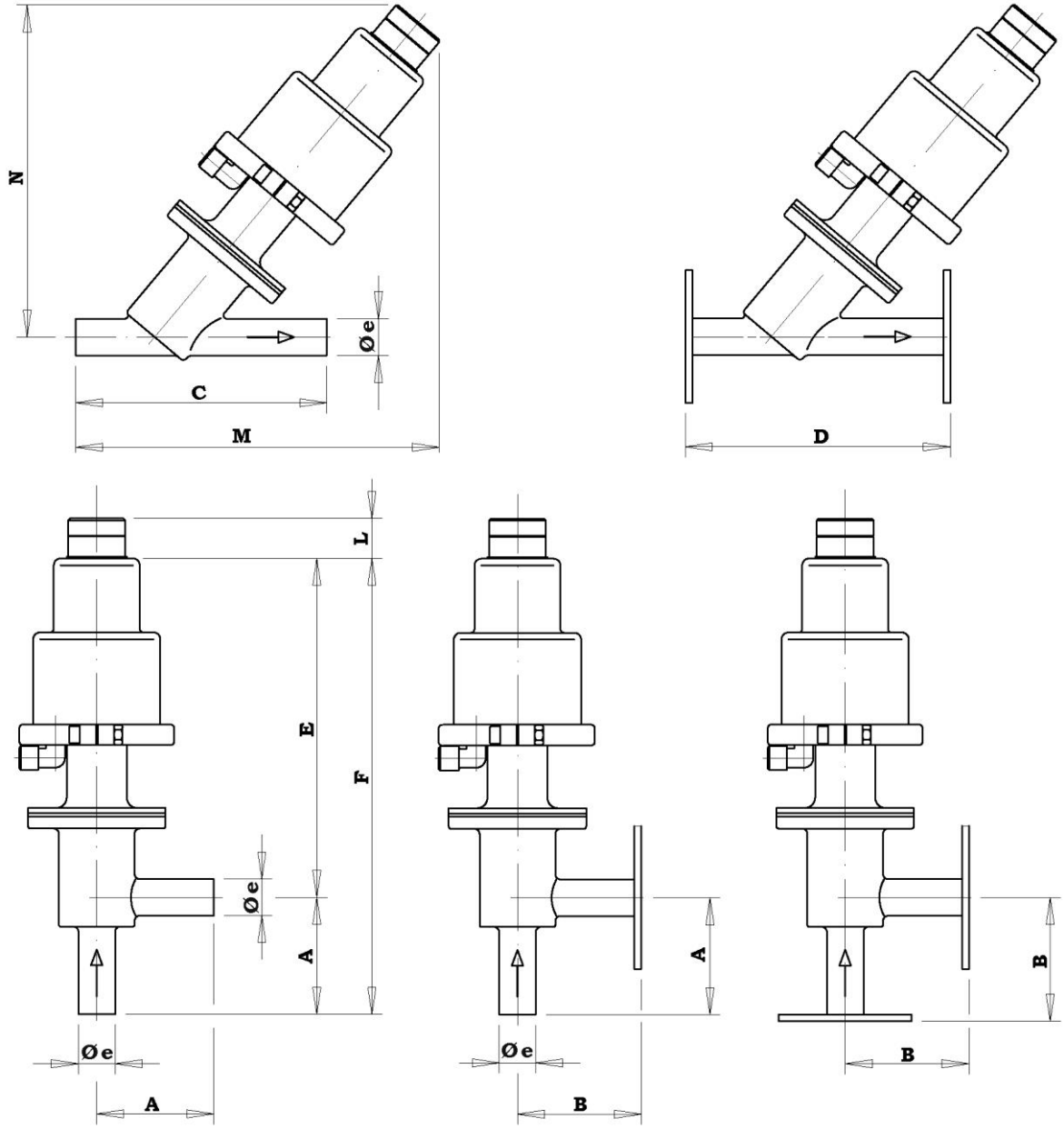


Dwg. nr. 960782 Rev.:00

ND	15	20	25	32	40	50	65	80	100	125	150	200
∅e pipe	21.3	26.9	33.7	42.4	48.3	60.3	76.1	89	114.3	139.7	168.3	219
A	68	68	78	88	98	113	130	135	148	163	188	218
B	70	70	80	90	100	115	130	135	150	165	190	220
C	146	146	156	176	196	226	290	310	345	395	475	-
D	150	150	160	180	200	230	290	310	350	400	480	-
E	197	197	197	230	230	254	310	383	409	378	439	492
F	265	265	275	318	328	367	440	518	557	541	627	710
L	36	36	36	36	36	36	65	84	84	84	84	84
M	216	209.5	200	232	248	279	367	449	494	496.5	622	-
N	200	205	200	228.5	235	256	309	394	408.5	451.5	437	-

Dimensions are in millimetres

2.8.3 IVS-IVFL normally open; groups: 8-9-10-12



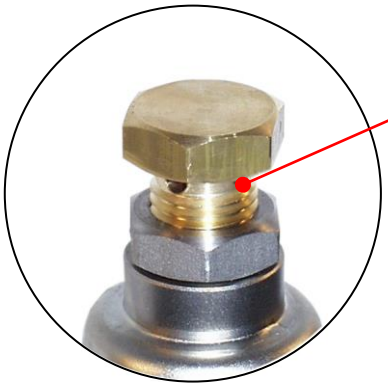
Dwg nr. XX0280 Rev.:00

ND	15	20	25	32	40	50	65	80
∅e pipe	21.3	26.9	33.7	42.4	48.3	60.3	76.1	89
A	68	68	78	88	98	113	130	135
B	70	70	80	90	100	115	130	135
C	146	146	156	176	196	226	290	310
D	150	150	160	180	200	230	290	310
E	197	197	197	230	230	254	361.5	441
F	265	265	275	318	328	367	491.5	576
L	23	23	23	23	23	23	28	36
M	211.5	206	195.5	228	243.5	274.5	387	478
N	193	198	193	222	228.5	251.5	329	407.5

Dimensions are in millimetres

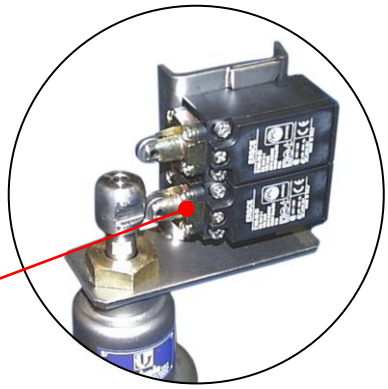
3 Fittings

Stainless steel valves may be fitted with various fittings so as to satisfy the customer various requirements.



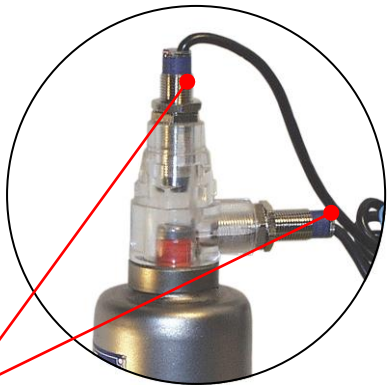
STROKE LIMITING DEVICE
The stroke limiting device permits to limit the valve stroke to the required value.

ELECTRIC LIMIT SWITCH (G 809)
It is operated from the movement of the shutter stem and detects the valve on/off condition.

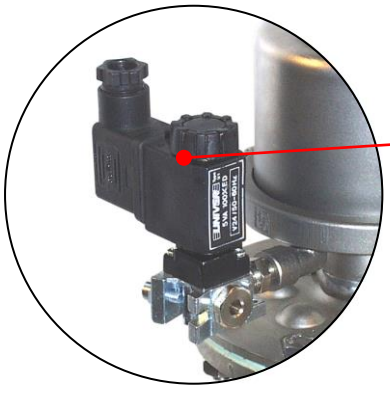


MAGNETIC SENSOR (G 809)
This sensors permits to detect the valve opening: it is activated by a magnet translating with the shutter.

INDUCTIVE SENSOR (G 809)
This sensor permits to detect the valve on/off condition.



SENSOR BOX (G 809)
The sensor box is fitted on the upper part of the servo control: inside it electric or pneumatic limit stops can be fitted.



SOLENOID VALVE (G 852)
The solenoid valve permits to control the opening and closing of the valve by means of an electric input.

4 Storage, assembly, check and maintenance

4.1 Transport, storage and handling

IVS-IVFL on-off valves shall be handled with the maximum care throughout the whole transport and assembly phase. Any crashes and anomalous stresses are to be avoided (do not grasp the VALVE by the transparent cap, in case of normally closed servocontrol).
VALVES shall be supplied provided with dust proof protections on all connections, which shall not be removed until the valve is assembled on the system.
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 be included between 0°C and + 50°C.

4.2 Assembly instructions

4.2.1 In general

The valve installation on the system shall be carried out by qualified personnel only, within the hydraulic 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 no case shall be the valve disassembled, nor modified – under penality of the warrenty loss.
NOTE A compression spring is included inside the valve.
Before the assembly, all protection devices shall be removed from the valve body. In case of servocontrol normally closed, remove the threaded cap located sideways. In case of servocontrol normally open, remove the threaded cap located on the upper side.
In case of normally closed servocontrol, the supply shall be carried out from the side connection.
In case of normally open servocontrol, the supply shall be carried out from the connection located on the cylinder head; the side threaded cap shall not be removed in order to prevent dust or foreign matters from entering the cylinder.
The compressed air shall be instrument air, with a pressure included between 6 bar and 7 bar, with $ø_{inner}$ = 4 mm. supply pipes.
The air connections on the VALVE shall be made of 1/8” Gas threaded coupling.
During the valve cleaning operations, do not blow compressed air or other fluids into the inspection holes.

4.2.2 Assembly of Flanged Valves

In case the body has flanged ends, a gasket shall be interposed between valve and pipe flanges, so as to guarantee a perfect seal; furthermore, flange fastening screws shall be torque tighten, in compliance with the plant characteristics and the mechanical requirements of the valve PS.

4.2.3 Assembly of Valves with Butt and Socket Welding Ends

In case of bodies having butt and socket welding ends, with servo control normally closed N.C., before starting welding, the whole servo control complete with its seal shall be removed, so as not to damage it during the welding. In order to properly bring to end the assembly and disassembly operations, the following steps shall be carried out:

for N.C. valves

1) Blow air inside the servo control (6 bar).

for all valves

2) Unscrew the screws fastening the servocontrol to the valve body.
3) Withdraw the servocontrol from the body.
4) Withdraw the gasket from the body.

The welding must be carried out considering the material of the valve body and the required thickness, as ruled by the provisions in force for the whole system.

4.2.4 Assembly of Valves with Female Screw Couplings

In case the body is provided with female screw couplings, the ends of connection pipes are to be sealed with PTFE tape, so as to guarantee a perfect seal; besides, it is necessary to torque tighten the couplings as indicated hereinafter, table 5.

Caution: the assembler shall verify that all the parts connected to the valve can support the required torque.

4.2.5 Assembly of valves with screw tap couplings

In case the body is provided with screw tap couplings, said areas are to be sealed with a PTFE tape so as to guarantee a perfect seal; besides, it is necessary to torque tighten the couplings as indicated hereinafter, table 5.

Caution: the assembler shall verify that all the parts connected to the valve can support the required torque.

In order to prevent foreign matters (slags, chips and others), present in the pipes, from damaging the valve seat, before setting the valve at work, open it completely and make the fluid go through at the maximum operating pressure, so as to clean the pipe.

4.3 Testing

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

On valves with normally closed N.C. servo control:

1) Send the fluid inside the valve under shutter at the operating pressure (check that it is always lower than the maximum allowable pressure).
2) Blow air inside the servo control and check the opening from the fluid passage.
3) Blow air out of the servo control.
4) Repeat up to 5 times.
5) Check, with air off, that no losses are present on the valve.
6) Check, with air on, that no air losses from the servo control are present.

On valves with normally open N.O. servo control:

1) Send the fluid inside the valve under shutter at the operating pressure (check that it is always lower than the maximum allowable pressure).
2) Blow air inside the servo control and check the opening from the fluid passage.
3) Blow air out of the servo control.
4) Repeat up to 5 times.
5) Check, with air off, that no losses are present on the valve.
6) Check, with air on, that no air losses from the servo control are present

4.4 Troubleshooting

Troubleshooting operations shall be always carried out by qualified personnel only, adequately equipped for the hydraulic and pneumatic operations and provided with the proper safety clothing, paying particular attention to the protection of face, eyes and hands.

4.4.1 N.C. VALVES

In case of anomalous operation or a loss through the valve, the operation shall be immediately interrupted and the following checks shall be carried out:
disconnect the air circuit; disconnect the air supplying pipe (with air off), to make sure that no air is present inside the piping.
Caution: during the troubleshooting the valve shall not be removed, nor placed elsewhere. No components of the valve shall be disassembled or unloosen.
Check with a pressure gauge that the fluid pressure at the valve inlet (upstream) is not higher than the maximum allowable pressure or, in case of $\Delta p < PS$, the Δp is not exceeded.
Should anomalies still be present after this check, valve inner parts are to be verified, disassembling the valve as indicated under the “Instructions for disassembly, gasket replacement and re-assembly of n.c. valves” included in the present manual.
For any doubt, or before operating in a way which has not been expressly indicated in this manual, contact directly our technical department.

4.4.2 N.O. VALVES

In case of anomalous operation or a loss through the valve, the operation shall be immediately interrupted and the following checks shall be carried out:

blow air (at a pressure value equal to the one indicated for a proper operation) into the servo control so as to make the valve close.
Caution: during the troubleshooting the valve shall not be removed, nor placed elsewhere. No components of the valve shall be disassembled or unloosen.
Check with a pressure gauge that the fluid pressure at the valve inlet (upstream) is not higher than the maximum allowable pressure or, in case of $\Delta p < PS$, the Δp is not exceeded.
Should anomalies still be present after this check, valve inner parts are to be verified, disassembling the valve as indicated under the "Instructions for disassembly, gasket replacement and reassembly of n.c. valves" included in the present manual.
For any doubt, or before operating in a way which has not been expressly indicated in this manual, contact directly our technical department.

4.5 Scheduled Maintenance

Scheduled maintenance operations shall be carried out apart from the ones due to possible failures, which always need an immediate intervention.
The time interval between one maintenance operation and the following one shall be included in the lower time interval between the one corresponding to 300.000 cycles and three years; it consists of a complete disassembly of the valve, replacement of all the gaskets and a complete cleaning of all other components. For disassembly and re-assembly operations, make reference to the relevant items of this manual.

4.6 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 15 to 50 with handwheel

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr 960340.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

4.6.1 Disassembly

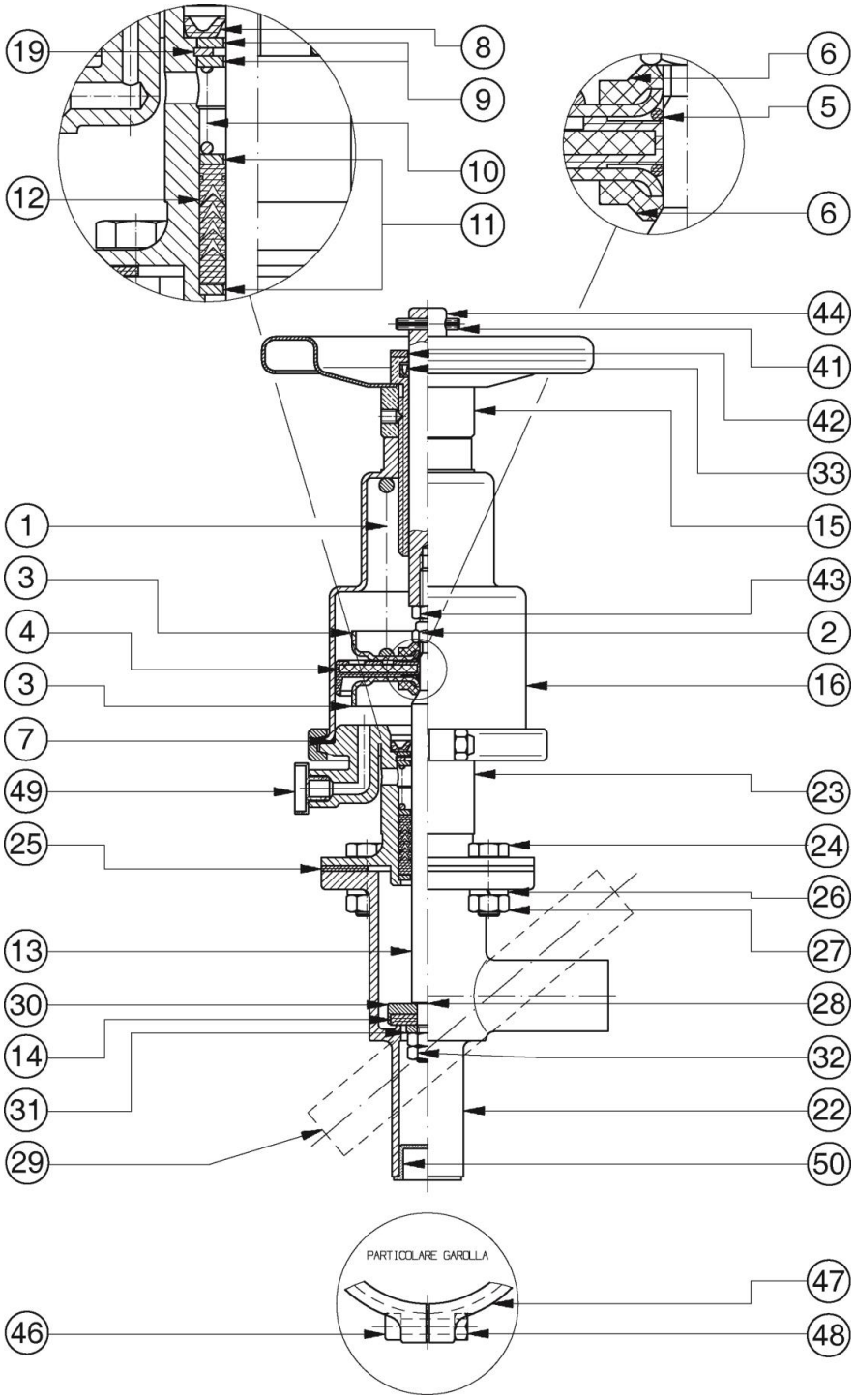
1) Blow air in the servo control (6 bar).
2) Unloosen nuts (27), withdraw washers (26) remove screws (24).
3) Remove the servo control from the valve body (22).
4) Remove the gasket from the body (25).
5) Withdraw the elastic pin (41), remove the plain washer (42)
6) Blow air out of the servo control. **Caution!** When air is blown out of the **servocontrol, the shutter shall have a movement equal to its stroke.**
7) Unloosen screws (46), remove nuts (48) then separate the two clamps (47). **Caution! A compressed spring is placed inside the cylinder.** Adequate fixture shall then be used preventing the spring housing cylinder (16) from leaving the intermediate body (23), once the two clamps are separated.
8) Remove the spring housing piston together with the handwheel (15). The spring as well (1) can then be withdrawn.
9) Remove the O-Ring (7).
10) Remove the DI gasket (33) from the handwheel hub.
11) Remove the spring (1).
12) Block the shutter stem between soft jaws (13). Unloosen the shaft (44), paying attention to leave the nut (43), unloosen then the nut (43) and the self-locking nut (2).
13) Withdraw the piston bearing first washer (6); withdraw the first piston support (3), placed on the upper side.
14) Remove the first O-ring (5), remove the piston with TDUOP gasket(4), withdraw the second O-ring (5).
15) Withdraw the piston second support (3), withdraw the piston second bearing washer (6).
16) Withdraw the shutter stem (13) out of the intermediate body (23).
17) Remove the BA gasket (8) and the first plain washer from the intermediate body (9).
18) Withdraw the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
19) Remove the second plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12) and the packing gland second washer (11).
20) Unloosen nuts (32).
21) Withdraw the cap stop washer (31), the cap (14).
22) Withdraw the cap holder (30) and the gasket (28) [Item 22 refers to ND ND 15 to 40 only].
23) Now the valve has been completely disassembled, so that the required components can be replaced.

4.6.2 Assembly

1) Insert the gasket (28) and the cap holder (30) into the shutter stem (13) [Item 1 refers to ND 15to 40 only].
2) Insert the cap (14), the cap stop washer (31) in the cap holder and torque tighten the nuts (32) as indicated under table 5.
3) Insert into the intermediate body (23) the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the first plain washer (9).
4) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
5) Insert the second plain washer (9) and the BA gasket (8) into the intermediate body.
6) Insert the shutter stem (13) previously assembled into the intermediate body.
7) Insert into the shutter stem the piston bearing first washer (6), the first piston support (3), the first OR (5).
8) Insert into the shutter stem the piston with TDUOP gasket (4), being careful to place it with lip down, the second OR (5), the second piston support (3) and the piston second bearing washer (6). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
9) Screw down the nut (43) up to 1 mm from the self-locking nut, screw down the shaft(44) up to 1 mm from the nut (43), torque tighten the nut (43) on the shaft (44), as indicated under table 5.
10) Insert the O-Ring (7) into the intermediate body.
11) Insert the spring (1) into the proper seat inside the piston support (3).
12) Insert the DI gasket (33) into the handwheel hub.
13) Insert the spring bearing piston (16) and the relevant handwheel (15) into the intermediate body.

14) Using proper instruments, approach the spring bearing piston to the intermediate body and lock it with the two clamps (47). **Caution! A compressed spring is placed inside the piston**.
15) Insert the nuts (48) into the clamps and torque tighten the screws (46) on them as indicated under table 5. Make sure that closing surfaces of clamps are parallel.
16) Insert the plain washer (42) and the elastic pin (41) into the shaft (44).
17) Blow air into the servocontrol (6 bar). **Caution! Once the air activates the servocontrol, the shutter shall have a movement equal to its stroke.**
18) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
19) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
20) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.
21) Blow air out of the servocontrol.

4.6.3 Section Plane IVS-IVFL ND 15 to 50 with handwheel



Dwg. Nr. 960340 Rev.:02

4.7 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 65 with handwheel

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr 960340.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

4.7.1 Disassembly

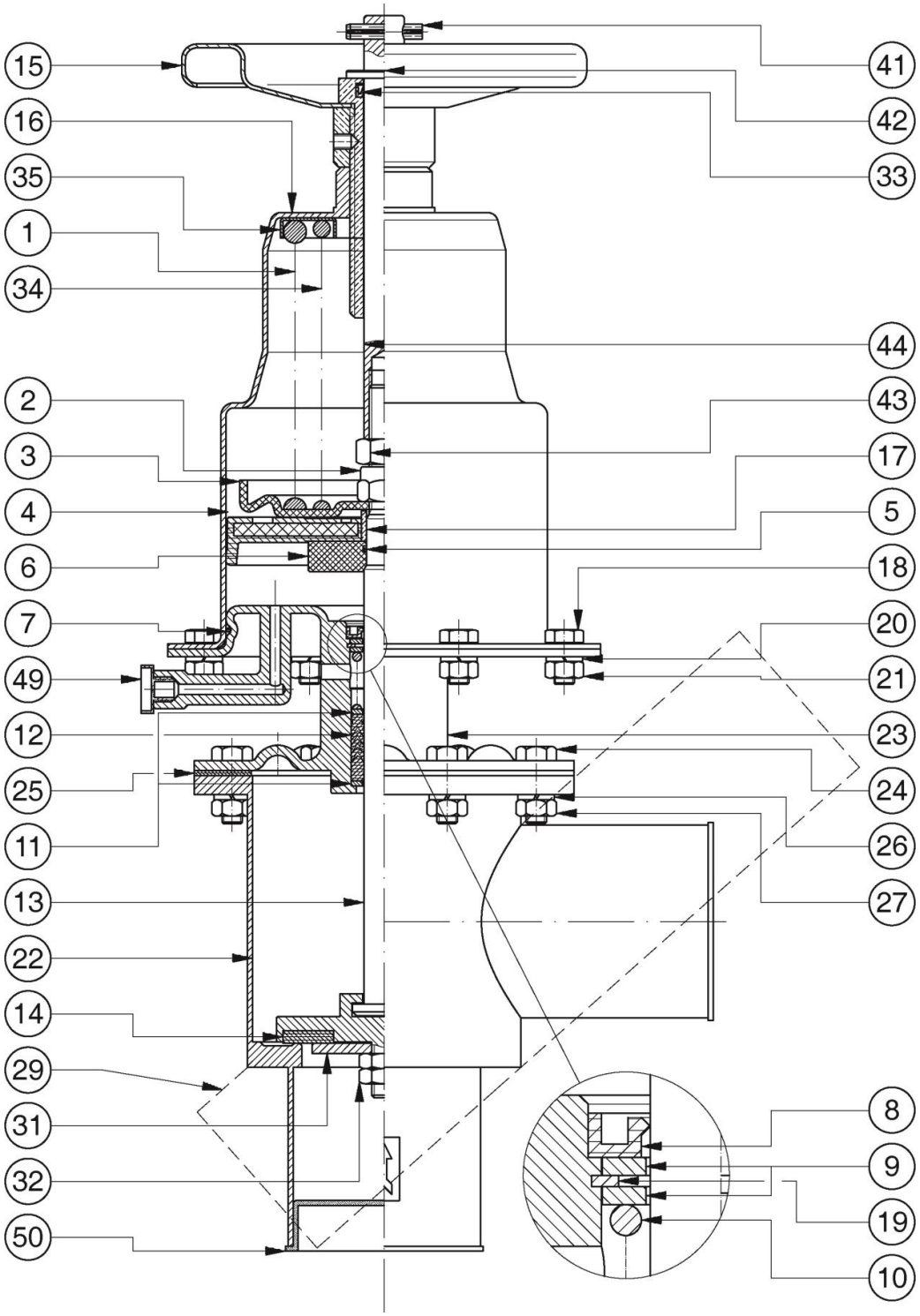
1) Blow air in the servo control (6 bar).
2) Unloosen nuts (27), withdraw washers (26) remove screws (24).
3) Remove the servo control from the valve body (22).
4) Remove the gasket from the body (25).
5) Withdraw the elastic pin (41), remove the plain washer (42)
6) Blow air out of the servo control. **Caution!** When air is blown out of the **servocontrol, the shutter shall have a movement equal to its stroke.**
7) Unloosen screws (18), then remove nuts (21) and washers (20). **Caution! Two compressed springs are placed inside the cylinder.** Adequate fixture shall then be used preventing the spring housing piston (16) from leaving the intermediate body (23), once screws (18) have been completely unloosen.
8) Remove the spring housing piston together with the handwheel (15). Springs (1) and (34) as well can then be withdrawn.
9) Remove the O-Ring (7).
10) Remove the DI gasket (33) from the handwheel hub.
11) Remove the spring guide (35), the spring (1) and the spring (34).
12) Block the shutter stem between soft jaws (13). Unloosen the shaft (44), paying attention to leave the nut (43), unloosen then the nut (43) and the self-locking nut (2).
13) Withdraw the piston support (3).
14) Remove the piston with TDUOP gasket (4) and withdraw the spacer ring out of it (17).
15) Withdraw the piston bearing washer (6) and withdraw the O-Ring (5) out of it.
16) Withdraw the shutter stem (13) out of the intermediate body (23).
17) Remove the BA gasket (8) and the first plain washer (9) from the intermediate body.
18) Withdraw the hole snap ring (19). Caution**! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
19) Remove the second plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12) and the packing gland second washer (11).
20) Unloosen nuts (32).
21) Withdraw the cap stop washer (31), the cap (14).
22) Now the valve has been completely disassembled, so that the required components can be replaced.

4.7.2 Assembly

1) Insert the cap (14), the cap stop washer (31) into the cap holder and torque tighten the nuts (32) as indicated under table 5.
2) Insert into the intermediate body (23) the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the first plain washer (9).
3) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
4) Insert the second plain washer (9) and the BA gasket (8) into the intermediate body.
5) Insert into the intermediate body the shutter stem (13) previously assembled.
6) Insert the O-Ring (5) into the piston bearing washer (6).
7) Insert into the shutter stem the piston bearing washer previously assembled, the spacer ring (17), the piston with TDUOP gasket (4), being careful to place it with lip down, the piston support (3). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
8) Screw down the nut (43) up to 1 mm from the self-locking nut, screw down the shaft(44) up to 1 mm from the nut (43), torque tighten the nut (43) on the shaft (44), as indicated under table 5.
9) Insert the O-Ring (7) into the intermediate body.
10) Insert spring (1) and spring (34) into their seats.
11) Insert the spring guides (35)
12) Insert the DI gasket (33) into the handwheel hub.
13) Insert the spring bearing piston (16) and the relevant handwheel (15) into the intermediate body.

14) Using proper instruments, approach the spring bearing piston to the intermediate body. **Caution! Two compressed springs are placed inside the cylinder.**
15) Insert the nuts (18) into the spring bearing piston near the intermediate body holes.
16) Insert the spring washers (20) into the screws (18) and torque tighten nuts (21) as indicated under table 5.
17) Insert the plain washer (42) and the elastic pin (41) into the shaft (44).
18) Blow air into the servocontrol (6 bar). **Caution! Once the air activates the servocontrol, the shutter shall have a movement equal to its stroke.**
19) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
20) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
21) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.
22) Blow air out of the servocontrol.

4.7.3 Section Plane IVS-IVFL ND 65 with handwheel



Dwg. nr 91479 Rev.:01

4.8 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 80 to 200 with handwheel

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr 940278.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

4.8.1 Disassembly

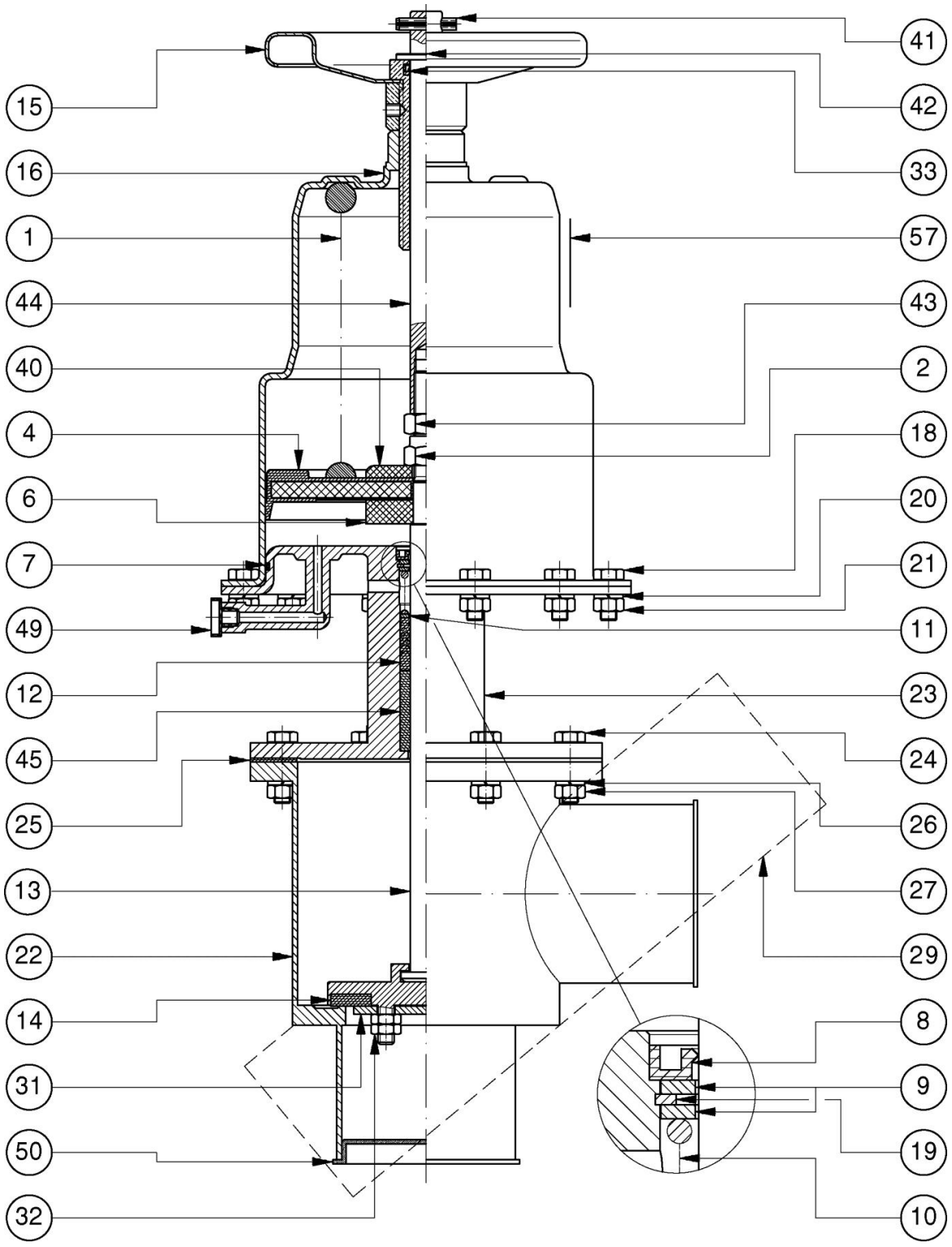
1) Blow air in the servo control (6 bar).
2) Unloosen nuts (27), withdraw washers (26) remove screws (24).
3) Remove the servo control from the valve body (22).
4) Remove the gasket from the body (25).
5) Withdraw the elastic pin (41), remove the plain washer (42)
6) Blow air out of the servo control. **Caution!** When air is blown out of the **servocontrol, the shutter shall have a movement equal to its stroke.**
7) Unloosen screws (18), then remove nuts (21) and washers (20). **Caution! A compressed spring is placed inside the cylinder.** Adequate fixture shall then be used preventing the spring housing piston (16) from leaving the intermediate body (23), once screws (18) have been completely unloosen.
8) Remove the spring housing piston together with the handwheel (15). Spring (1)l can then be withdrawn.
9) Remove the O-Ring (7).
10) Remove the DI gasket (33) from the handwheel hub.
11) Remove the spring (1).
12) Block the shutter stem between soft jaws (13). Unloosen the shaft (44), paying attention to leave the nut (43), unloosen then the nut (43) and the self-locking nut (2).
13) Withdraw the piston bearing washer (40).
14) Remove the piston with TDUOP gasket (4).
15) Withdraw the piston bearing washer (6).
16) Withdraw the shutter stem (13) out of the intermediate body (23).
17) Remove the BA gasket (8) and the first plain washer (9) from the intermediate body.
18) Withdraw the hole snap ring (19). Caution**! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
19) Remove the second plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12).
20) Remove the guide bush (45) [Item 20 refers to ND 80 to 100 only]
21) Unloosen nuts (32).
22) Withdraw the cap stop washer (31), the cap (14).
23) Now the valve has been completely disassembled, so that the required components can be replaced.

4.8.2 Assembly

1) Insert the cap (14), the cap stop washer (31) into the cap holder and torque tighten the nuts (32) as indicated under table 5.
2) Insert the bush (45) into the intermediate body (23) [Item 2 refers to ND 80 to 100 only].
3) Insert into the intermediate body (23) the packing gland (12), the packing gland washer (11), the spring (10) and the first plain washer (9).
4) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
5) Insert the second plain washer (9) and the BA gasket (8) into the intermediate body.
6) Insert into the intermediate body the shutter stem (13) previously assembled.
7) Insert into the shutter stem the piston bearing washer (6), the piston with TDUOP gasket (4), paying attention to assemble it in the original position, the piston support (40). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
8) Screw down the nut (43) up to 1 mm from the self-locking nut, screw down the shaft(44) up to 1 mm from the nut (43), torque tighten the nut (43) on the shaft (44), as indicated under table 5.
9) Insert the O-Ring (7) into the intermediate body.
10) Insert spring (1) into its seat.
11) Insert the DI gasket (33) into the handwheel hub.
12) Insert the spring bearing piston (16) and the relevant handwheel (15) into the intermediate body.
13) Using proper instruments, approach the spring bearing piston to the intermediate body. **Caution! A compressed spring is placed inside the cylinder.**

14) Insert the nuts (18) into the spring bearing piston near the intermediate body holes.
15) Insert the spring washers (20) into the screws (18) and torque tighten nuts (21) as indicated under table 5.
16) Insert the plain washer (42) and the elastic pin (41) into the shaft (44).
17) Blow air into the servocontrol (6 bar). **Caution! Once the air activates the servocontrol, the shutter shall have a movement equal to its stroke.**
18) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
19) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
20) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.
21) Blow air out of the servocontrol.

4.8.3 Section Plane IVS-IVFL ND 80 to 200 with handwheel



Dwg. nr 940278 Rev.:00

4.9 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 15 to 50 with visual indicator

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr 960339.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

4.9.1 Disassembly

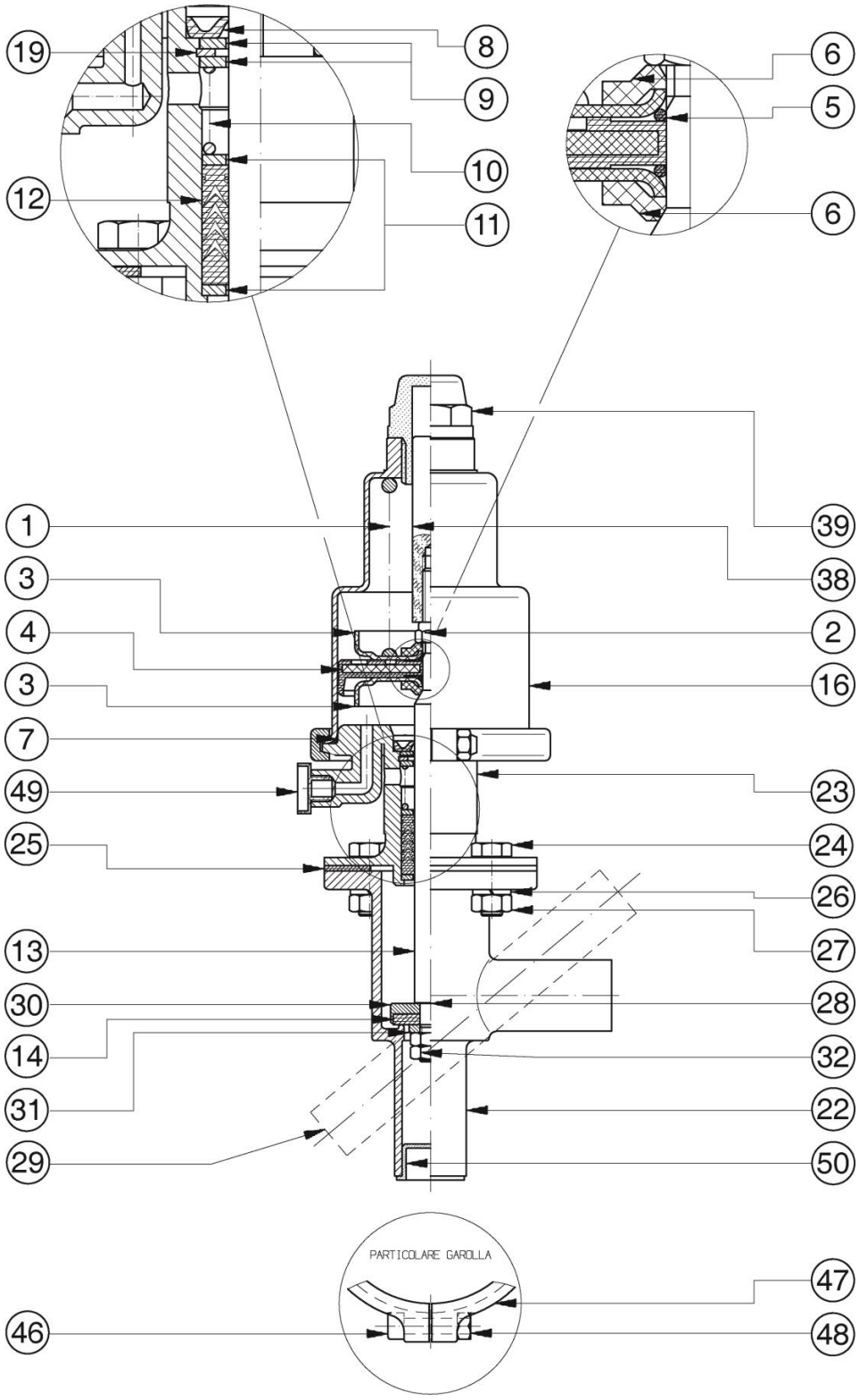
1) Blow air in the servo control (6 bar).
2) Unloosen nuts (27), withdraw washers (26) remove screws (24).
3) Remove the servo control from the valve body (22).
4) Remove the gasket from the body (25).
5) Blow air out of the servo control. **Caution!** When air is blown out of the **servocontrol, the shutter shall have a movement equal to its stroke.**
6) Unloosen screws (46), remove nuts (48) then separate the two clamps (47). **Caution! A compressed spring is placed inside the cylinder.** Adequate fixture shall then be used preventing the spring housing cylinder (16) from leaving the intermediate body (23), once the two clamps are separated.
7) Remove the spring housing piston. Then spring as well (1) can be withdrawn.
8) Remove the transparent cap (39).
9) Remove the O-Ring (7).
10) Remove the spring (1).
11) Block the shutter stem between soft jaws (13). Screw down the stroke indicator (38) and the self-locking nut (2).
12) Withdraw the piston bearing first washer (6); withdraw the first piston support (3), placed on the upper side.
13) Remove the first O-ring (5), remove the piston with TDUOP gasket(4), withdraw the second O-ring (5).
14) Withdraw the piston second support (3), withdraw the piston second bearing washer (6).
15) Withdraw the shutter stem (13) out of the intermediate body (23).
16) Remove the BA gasket (8) and the first plain washer from the intermediate body (9).
17) Withdraw the hole snap ring (19). Caution**! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
18) Remove the second plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12) and the packing gland second washer (11).
19) Unloosen nuts (32).
20) Withdraw the cap stop washer (31), the cap (14).
21) Withdraw the cap holder (30) and the gasket (28) [Item 21 refers to ND 15 to 40 only].
22) Now the valve has been completely disassembled, so that the required components can be replaced.

4.9.2 Assembly

1) Insert the gasket (28) and the cap holder (30) into the shutter stem (13) [Item 1 refers to ND 15to 40 only].
2) Insert the cap (14), the cap stop washer (31) in the cap holder and torque tighten the nuts (32) as indicated under table 5.
3) Insert into the intermediate body (23) the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the first plain washer (9).
4) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
5) Insert the second plain washer (9) and the BA gasket (8) into the intermediate body.
6) Insert the shutter stem (13) previously assembled into the intermediate body.
7) Insert into the shutter stem the piston bearing first washer (6), the first piston support (3), the first OR (5).
8) Insert into the shutter stem the piston with TDUOP gasket (4), being careful to place it with lip down, the second OR (5), the second piston support (3) and the piston second bearing washer (6). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
9) Screw down the stroke indicator (38).
10) Insert the O-Ring (7) into the intermediate body.
11) Insert the spring (1) into its seat.
12) Insert the spring bearing piston (16) into the intermediate body.
13) Using proper instruments, approach the spring bearing piston to the intermediate body and lock it with the two clamps (47). **Caution! A compressed spring is placed inside the piston.**
14) Insert the nuts (48) into the clamps and torque tighten the screws (46) on them as indicated under table 5. Make sure that closing surfaces of clamps are parallel.

15) Screw down the transparent cap (39) on the spring bearing piston, without forcing its seal.
16) Blow air into the servocontrol (6 bar). **Caution! Once the air activates the servocontrol, the shutter shall have a movement equal to its stroke.**
17) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
18) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
19) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.
20) Blow air out of the servocontrol.

4.9.3 Section Plane IVS-IVFL ND 15 to 50 with visual indicator



Dwg. nr 960339 Rev.:02

4.10 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 65 with visual indicator

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr 931078.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

4.10.1 Disassembly

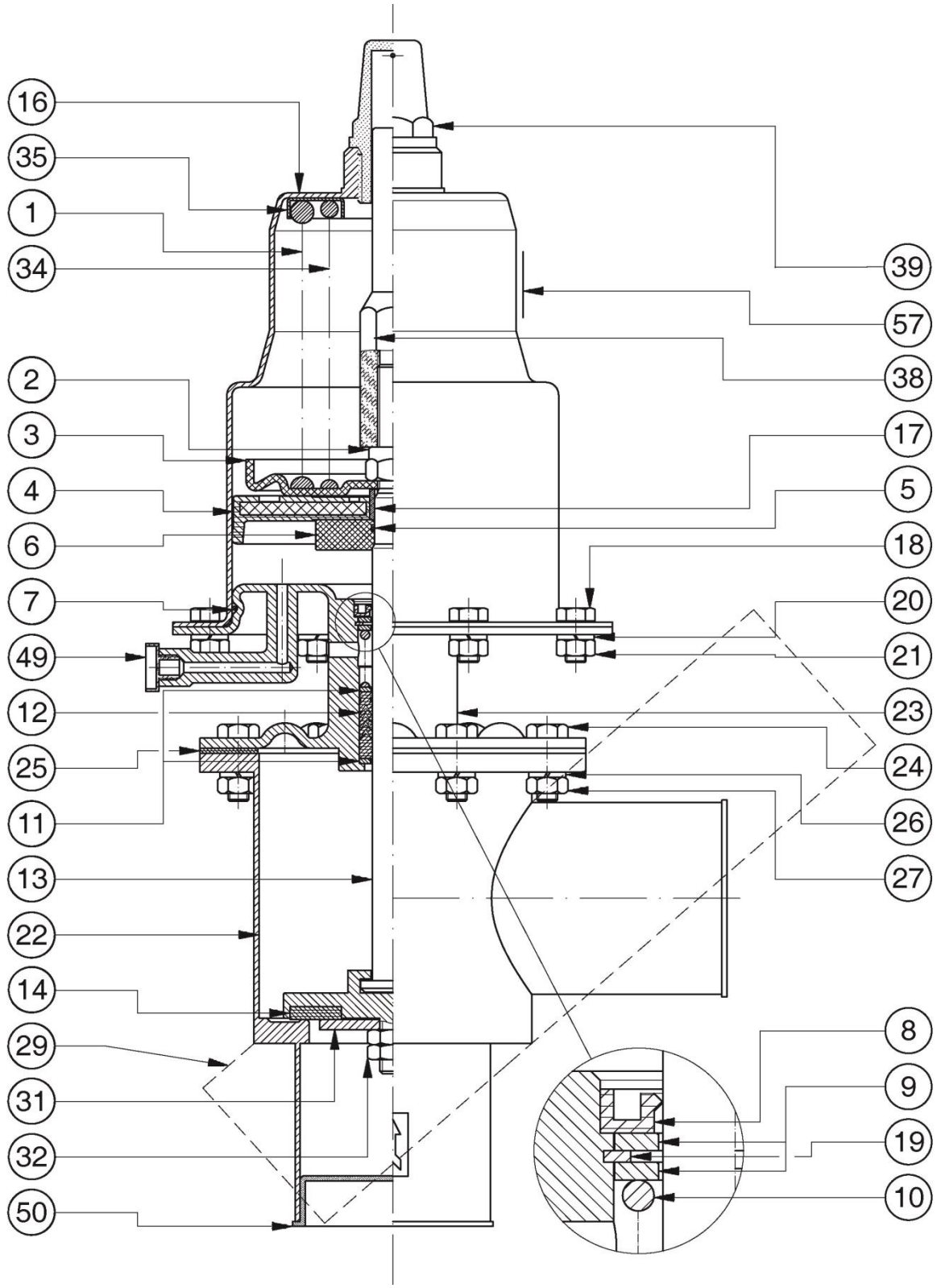
1) Blow air in the servo control (6 bar).
2) Unloosen nuts (27), withdraw washers (26) remove screws (24).
3) Remove the servo control from the valve body (22).
4) Remove the gasket from the body (25).
5) Blow air out of the servo control. **Caution!** When air is blown out of the **servocontrol, the shutter shall have a movement equal to its stroke.**
6) Unloosen screws (18), then remove nuts (21) and washers (20). **Caution! Two compressed springs are placed inside the cylinder.** Adequate fixture shall then be used preventing the spring housing piston (16) from leaving the intermediate body (23), once screws (18) have been completely unloosen.
7) Remove the spring housing piston. Springs (1) and (34) as well can then be withdrawn.
8) Screw down the transparent cap (39).
9) Remove the O-Ring (7).
10) Remove the spring guide (35), the spring (1) and the spring (34).
11) Block the shutter stem between soft jaws (13) . Screw down the stroke indicator (38) and the self-locking nut(2).
12) Withdraw the piston support (3).
13) Remove the piston with TDUOP gasket (4) and withdraw the spacer ring out of it (17).
14) Withdraw the piston bearing washer (6) and withdraw the O-Ring (5) out of it.
15) Withdraw the shutter stem (13) out of the intermediate body (23).
16) Remove the BA gasket (8) and the first plain washer (9) from the intermediate body.
17) Withdraw the hole snap ring (19). Caution**! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
18) Remove the second plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12) and the packing gland second washer (11).
19) Unloosen nuts (32).
20) Withdraw the cap stop washer (31), the cap (14).
21) Now the valve has been completely disassembled, so that the required components can be replaced.

4.10.2 Assembly

1) Insert the cap (14), the cap stop washer (31) into the cap holder and torque tighten the nuts (32) as indicated under table 5.
2) Insert the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the first plain washer (9) into the intermediate body (23).
3) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
4) Insert the second plain washer (9) and the BA gasket (8) into the intermediate body.
5) Insert into the intermediate body the shutter stem (13) previously assembled.
6) Insert the O-Ring (5) into the piston bearing washer (6).
7) Insert into the shutter stem the piston bearing washer previously assembled, the spacer ring (17), the piston with TDUOP gasket (4), being careful to place it with lip down, the piston support (3). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
8) Screw down the stroke indicator (38).
9) Insert the O-Ring (7) into the intermediate body.
10) Insert spring (1) and spring (34) into their seats.
11) Insert the spring guides (35).
12) Insert the spring bearing piston (16) into the intermediate body.
13) Using proper instruments, approach the spring bearing piston to the intermediate body. **Caution! Two compressed springs are placed inside the cylinder.**
14) Insert the nuts (18) into the spring bearing piston near the intermediate body holes.
15) Insert the spring washers (20) into the screws (18) and torque tighten nuts (21) as indicated under table 5.
16) Screw down the transparent cap (39) into the spring bearing washer (16), without forcing its seal.

17) Blow air into the servocontrol (6 bar). **Caution! Once the air activates the servocontrol, the shutter shall have a movement equal to its stroke.**
18) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
19) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
20) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.
21) Blow air out of the servocontrol.

4.10.3 Section Plane IVS-IVFL ND 65 with visual indicator



Dwg. nr 931087 Rev.:01

4.11 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 80 to 200 with visual indicator

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr 940276.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

4.11.1 Disassembly

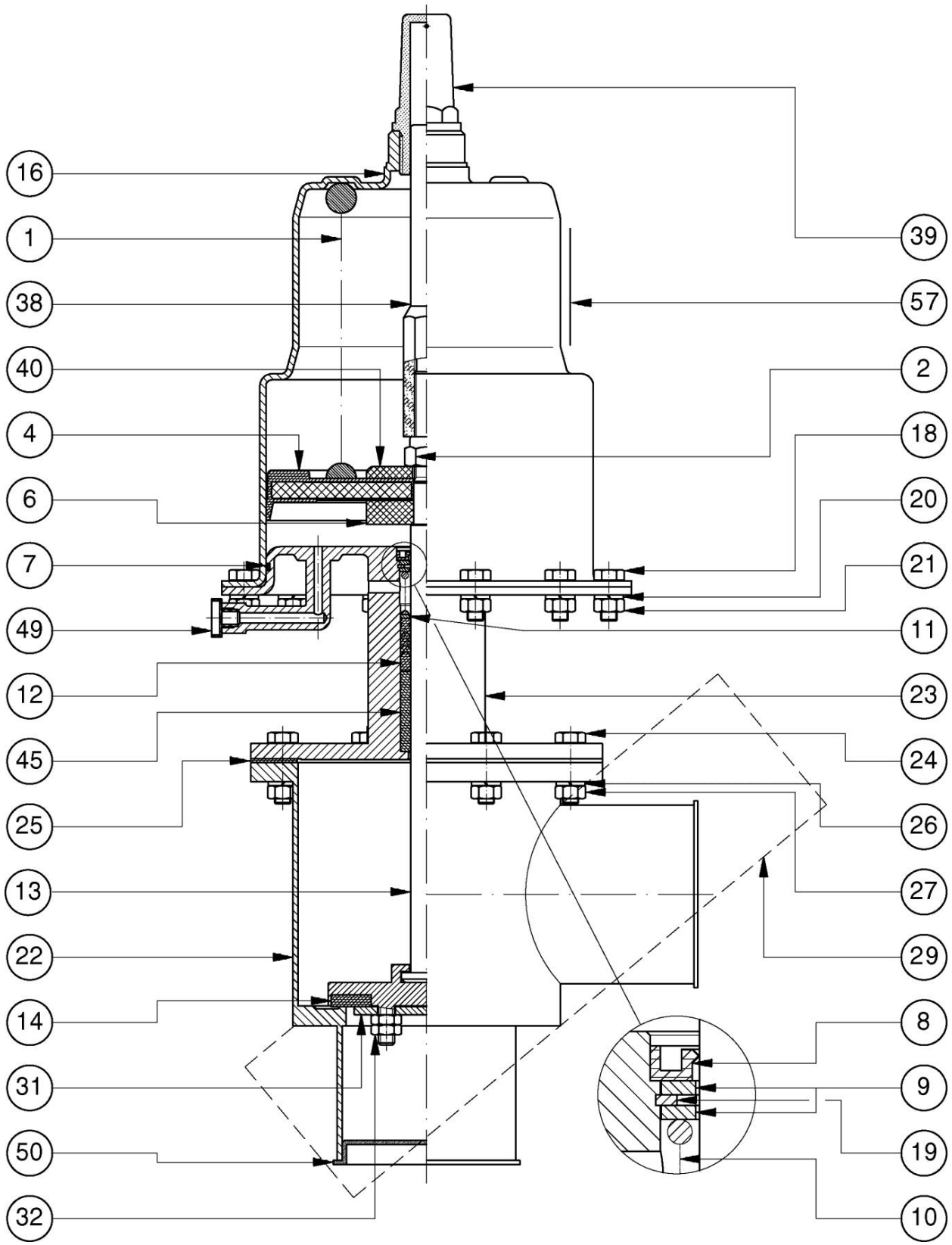
1) Blow air in the servo control (6 bar).
2) Unloosen nuts (27), withdraw washers (26) remove screws (24).
3) Remove the servo control from the valve body (22).
4) Remove the gasket from the body (25).
5) Blow air out of the servo control. **Caution!** When air is blown out of the **servocontrol, the shutter shall have a movement equal to its stroke.**
6) Unloosen screws (18), then remove nuts (21) and washers (20). **Caution! A compressed spring is placed inside the cylinder.** Adequate fixture shall then be used preventing the spring housing piston (16) from leaving the intermediate body (23), once screws (18) have been completely unloosen.
7) Remove the spring housing piston. Spring as well (1) can then be withdrawn.
8) Screw down the transparent cap (39).
9) Remove the O-Ring (7).
10) Remove the spring (1).
11) Block the shutter stem between soft jaws (13) . Screw down the stroke indicator (38) and the self-locking nut(2).
12) Withdraw the piston bearing washer (40).
13) Remove the piston with TDUOP gasket (4).
14) Withdraw the piston bearing washer (6).
15) Withdraw the shutter stem (13) out of the intermediate body (23).
16) Remove the BA gasket (8) and the first plain washer (9) from the intermediate body.
17) Withdraw the hole snap ring (19). Caution**! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
18) Remove the second plain washer (9), the spring (10), the packing gland washer (11), the packing gland (12).
19) Remove the guide bush (45) [Item 19 refers to ND 80 to100 only]
20) Unloosen nuts (32).
21) Withdraw the cap stop washer (31), the cap (14).
22) Now the valve has been completely disassembled, so that the required components can be replaced.

4.11.2 Disassembly

1) Insert the cap (14), the cap stop washer (31) into the cap holder and torque tighten the nuts (32) as indicated under table 5.
2) Insert the bush (45) into the intermediate body (23) [Item 2 refers to ND 80 to 100 only].
3) Insert the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the first plain washer (9) into the intermediate body (23).
4) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
5) Insert the second plain washer (9) and the BA gasket (8) into the intermediate body.
6) Insert into the intermediate body the shutter stem (13) previously assembled.
7) Insert into the shutter stem the piston bearing washer (6), the piston with TDUOP gasket (4), paying attention to assemble it in the original position, the piston support (40). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
8) Screw down the stroke indicator (38).
9) Insert the O-Ring (7) into the intermediate body.
10) Insert spring (1) into its seat.
11) Insert the spring bearing piston (16) into the intermediate body.
12) Using proper instruments, approach the spring bearing piston to the intermediate body. **Caution! A compressed spring is placed inside the cylinder.**
13) Insert the nuts (18) into the spring bearing piston near the intermediate body holes.
14) Insert the spring washers (20) into the screws (18) and torque tighten nuts (21) as indicated under table 5.
15) Screw down the transparent cap (39) on the spring bearing washer (16) .

16) Blow air into the servocontrol (6 bar). **Caution! Once the air activates the servocontrol, the shutter shall have a movement equal to its stroke.**
17) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
18) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
19) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.
20) Blow air out of the servocontrol.

4.11.3 Section Plane IVS-IVFL ND 80 to 200 with visual indicator



Dwg. nr 940276 Rev.:00

4.12 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 15 to 50 normally open

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr XX0279.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

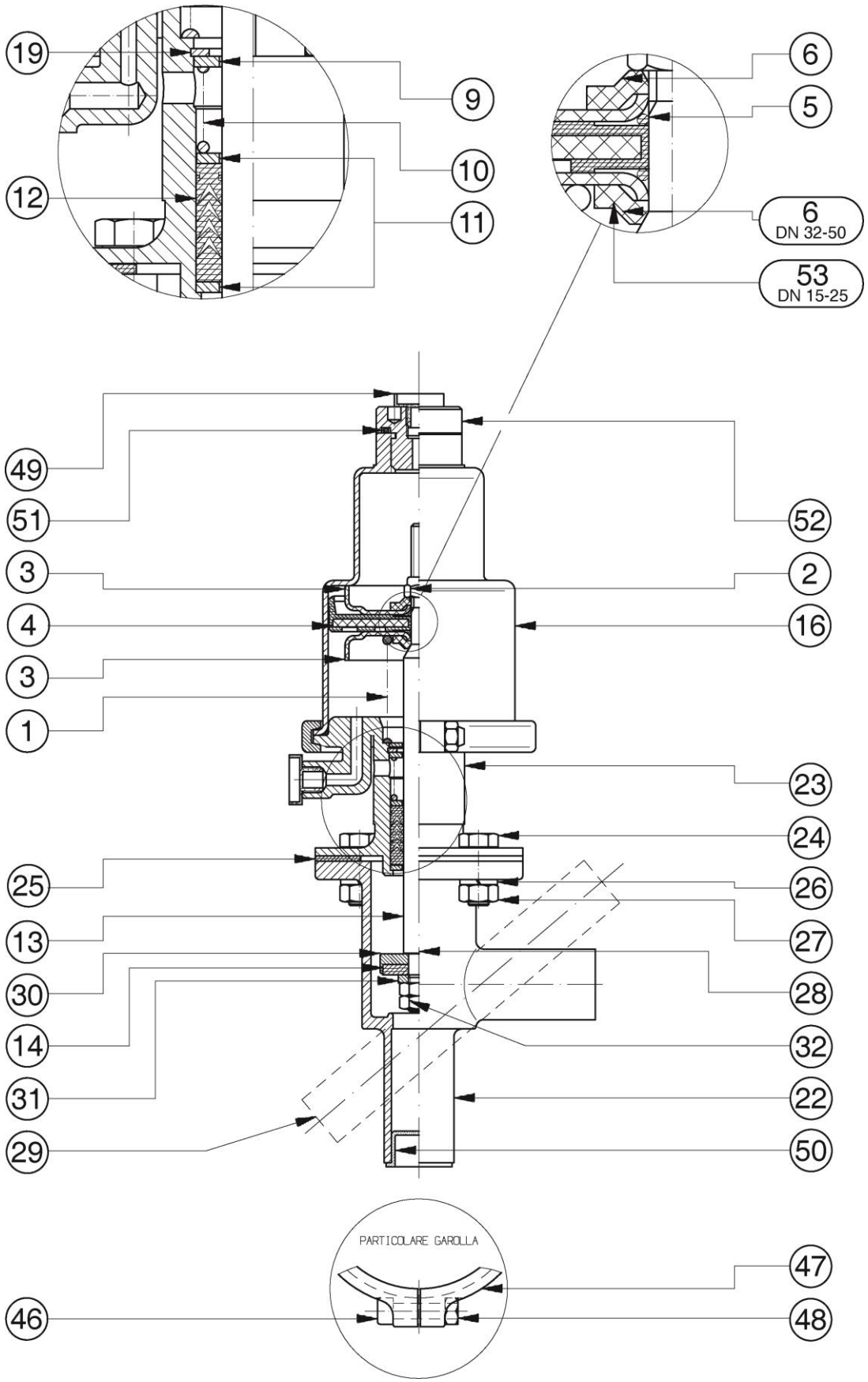
4.12.1 Disassembly

1) Unloosen nuts (27), withdraw washers (26) remove screws (24).
2) Remove the servo control from the valve body (22).
3) Remove the gasket from the body (25).
4) Unloosen screws (46), remove nuts (48) then separate the two clamps (47). **Caution! A compressed spring is placed inside the cylinder. Adequate fixture shall then be used preventing the spring housing cylinder** (16) from leaving the intermediate body (23), once the two clamps are separated.
5) Withdraw the spring housing piston.
6) Screw down the air inlet coupling (52) and withdraw the O-Ring from it (51).
7) Block the shutter stem between soft jaws (13). Unloosen the self-locking nut (2).
8) Withdraw the piston bearing first washer (6); withdraw the piston first support (3), placed on the upper side.
9) Remove the first O-ring (5), remove the piston with TDUOP gasket (4), withdraw the second O-ring (5).
10) Withdraw the piston second support (3), withdraw the piston bearing second washer (6) [for ND 32 to 40] and (53) [from ND 15 to 25].
11) Withdraw the shutter stem (13) from the intermediate body (23).
12) Withdraw the spring (1) from the intermediate body.
13) Withdraw the snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
14) Remove the second plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12) and the packing gland second washer (11).
15) Unloosen nuts (32).
16) Withdraw the cap stop washer (31), the cap (14).
17) Withdraw the cap holder (30) and the gasket (28) [Item 22 refers to ND 15 to 40 only].
18) Now the valve has been completely disassembled, so that the required components can be replaced.

4.12.2 Assembly

1) Insert the gasket (28) and the cap holder (30) into the shutter stem (13) [Item 1 refers to ND 15to 40 only].
2) Insert the cap (14), the cap stop washer (31) in the cap holder and torque tighten the nuts (32) as indicated under table 5.
3) Insert into the intermediate body (23) the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the plain washer (9).
4) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
5) Insert the spring (1) into the intermediate body (23).
6) Insert into the intermediate body the shutter stem (13) previously assembled.
7) Insert into the shutter stem the piston bearing first washer (6), the first piston support (3), the first OR (5).
8) Insert into the shutter stem the piston with TDUOP gasket (4), being careful to place it with lip up, the second OR (5), the second piston support (3) and the piston second bearing washer (6). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
9) Insert the spring bearing piston (16) into the intermediate body.
10) Using proper instruments, approach the spring bearing piston to the intermediate body and lock it with the two clamps (47). **Caution! A compressed spring is placed inside the piston**.
11) Insert the nuts (48) into the clamps and torque tighten the screws (46) on them as indicated under table 5. Make sure that closing surfaces of clamps are parallel.
12) Insert the O-Ring (51) into the air inlet coupling (52).
13) Torque tighten the air inlet coupling (52) on the spring bearing piston (16) as indicated under table 5.
14) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
15) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
16) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.

4.12.3 Section Plane IVS-IVFL ND 15 to 50 normally open



Dwg. nr XX0279 Rev.:02

4.13 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 65 normally open

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr XX0281.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

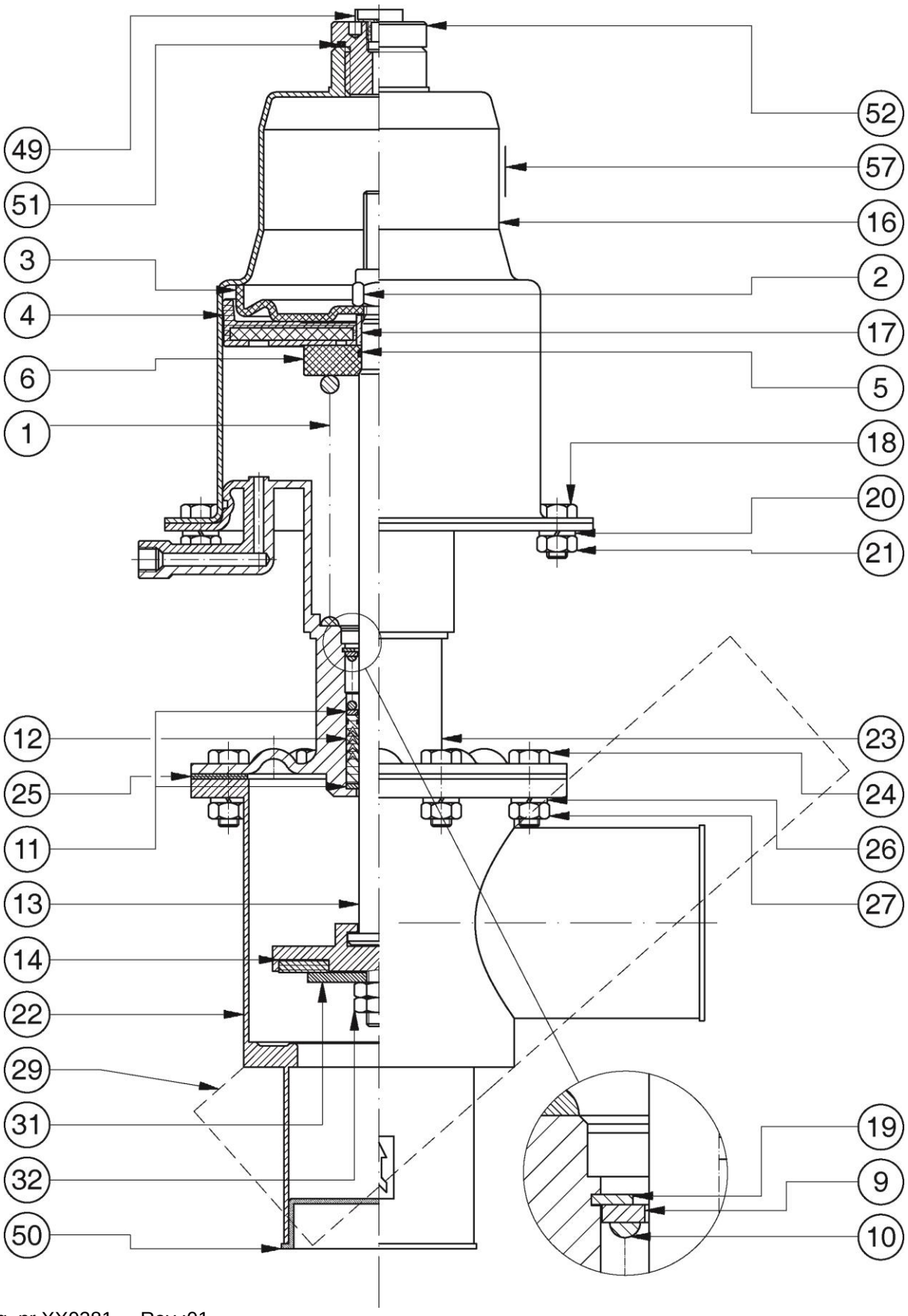
4.13.1 Disassembly

1) Unloosen nuts (27), withdraw washers (26) remove screws (24).
2) Remove the servo control from the valve body (22).
3) Remove the gasket from the body (25).
4) Unloosen screws (18) then remove nuts (21) and washers (20). **Caution! Two compressed spring are placed inside the cylinder. Adequate fixture shall then be used preventing the spring housing cylinder** (16) from leaving the intermediate body (23), once the two clamps are separated.
5) Remove the spring housing piston.
6) Screw down the air inlet coupling (52).
7) Withdraw the O-Ring from it (51).
8) Block the shutter stem between soft jaws (13). Unloosen the self-locking nut (2).
9) Withdraw the spring housing piston (3).
10) Remove the piston with TDUOP gasket (4) and withdraw the spacer ring from it (17).
11) Withdraw the piston bearing washer (6) and withdraw the O-ring out of it (5).
12) Withdraw the shutter stem (13) from the intermediate body (23).
13) Withdraw the spring (1) from the intermediate body (23).
14) Withdraw the snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
15) Remove the plain washer (9), the spring (10), the first packing gland washer (11), the packing gland (12) and the packing gland second washer (11).
16) Unloosen nuts (32).
17) Withdraw the cap stop washer (31), the cap (14).
18) Now the valve has been completely disassembled, so that the required components can be replaced.

4.13.2 Assembly

1) Insert the cap (14), the cap stop washer (31) in the cap holder and torque tighten the nuts (32) as indicated under table 5.
2) Insert into the intermediate body (23) the first packing gland washer (11), the packing gland (12), the second packing washer (11), the spring (10) and the plain washer (9).
3) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
4) Insert the spring (1) into the intermediate body.
5) Insert into the intermediate body the shutter stem (13) previously assembled.
6) Insert the O-Ring (5) into the piston bearing washer (6).
7) Insert into the shutter stem the piston bearing washer previously assembled, the spacer ring (17), the piston with TDUOP gasket (4), being careful to place it with lip up, the piston support (3). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
8) Insert the spring bearing piston (16) into the intermediate body.
9) Using proper instruments, approach the spring bearing piston to the intermediate body and lock it with the two clamps (47). **Caution! A compressed spring is placed inside the piston.**
10) Insert the nuts (18) into the spring bearing piston near the intermediate body holes.
11) Insert the spring washers (20) into the screws (18) and torque tighten nuts (21) as indicated under table 5.
12) Insert the O-Ring (51) into the air inlet coupling (52).
13) Torque tighten the air inlet coupling (52) on the spring bearing piston (16) as indicated under table 5.
14) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
15) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
16) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.

4.13.3 Section Plane IVS-IVFL ND 65 normally open



Dwg. nr XX0281 Rev.:01

4.14 Instructions for Disassembly, Gasket Replacement and Re-assembly of IVS-IVFL Valves, ND 65 normally open

For the disassembly and assembly operations of the N.C. valve, refer to annexed Dwg. nr XX0282.
All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic field and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.
Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.
NOTE: Read the procedures thoroughly before starting any operation.

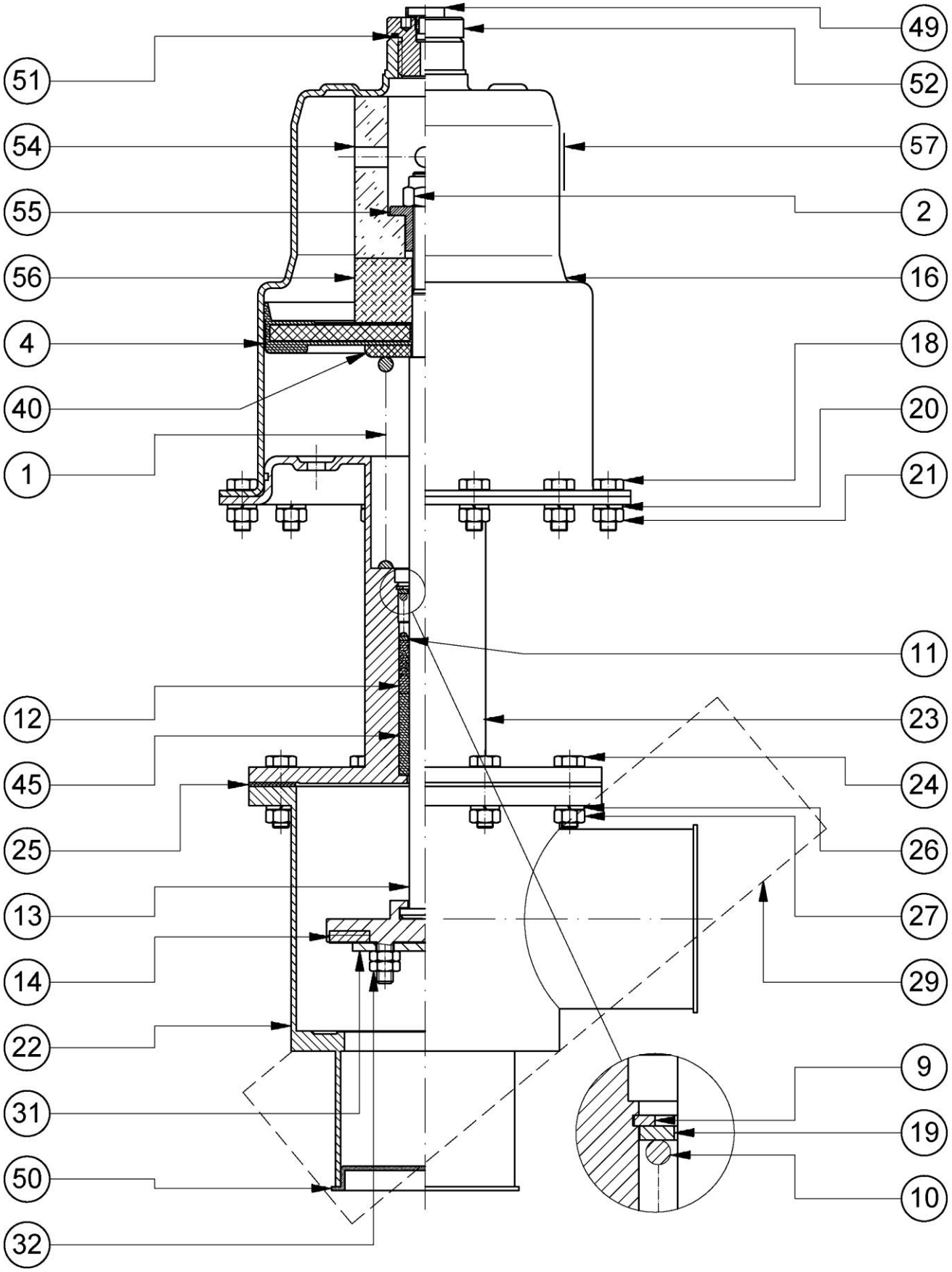
4.14.1 Disassembly

1) Unloosen nuts (27), withdraw washers (26) remove screws (24).
2) Remove the servo control from the valve body (22).
3) Remove the gasket from the body (25).
4) Unloosen screws (18) then remove nuts (21) and washers (20). **Caution! A compressed spring is placed inside the cylinder. Adequate fixture shall then be used preventing the spring housing cylinder** (16) from leaving the intermediate body (23), once the screws (18) are completely loosen down.
5) Remove the spring housing piston.
6) Screw down the air inlet coupling (52) and withdraw the O-Ring (51).
7) Block the shutter stem between soft jaws (13).Unloosen the self-locking nut (2).
8) Withdraw the bumper stop washer (55).
9) Withdraw the bumper gasket (54).
10) Withdraw the spacer ring (56).
11) Remove the piston with TDUOP gasket (4).
12) Withdraw the piston bearing washer (40).
13) Withdraw the spring (1).
14) Withdraw the shutter stem (13) from the intermediate body (23).
15) Withdraw the snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring (10) compressed**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
16) Remove the plain washer (9), the spring (10), the packing gland washer (11), the packing gland (12).
17) Remove the guide bush (45) [Item 17 refers to ND 80 to100 only]
18) Unloosen nuts (32).
19) Withdraw the cap stop washer (31), the cap (14).
20) Now the valve has been completely disassembled, so that the required components can be replaced.

4.14.2 Assembly

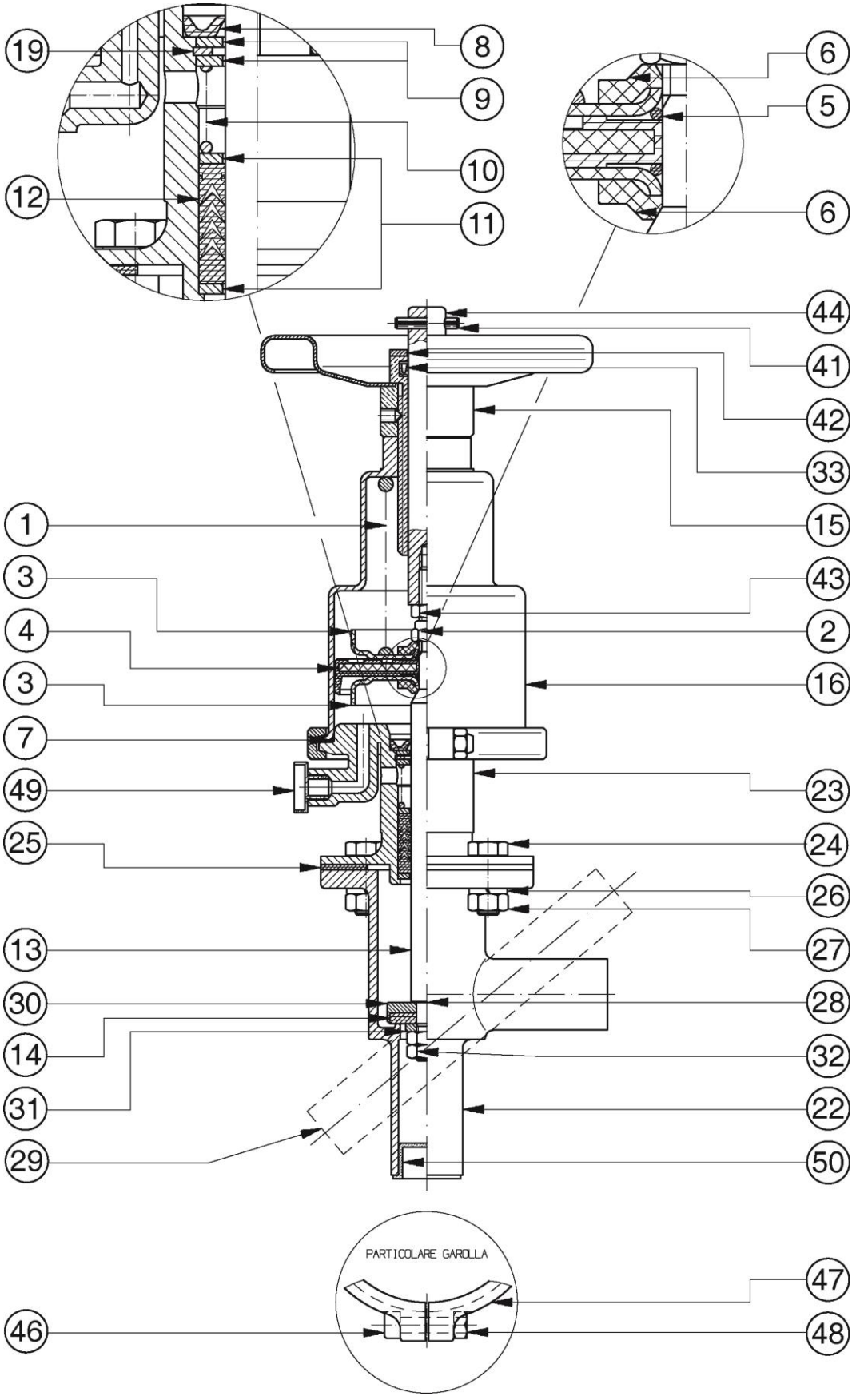
1) Insert the cap (14), the cap stop washer (31) in the cap holder and torque tighten the nuts (32) as indicated under table 5.
2) Insert into the intermediate body (23) the bush (45) [Item 2 refers to ND 80 to100 only].
3) Insert the packing gland (12), the packing gland washer (11), the spring (10) and the plain washer (9) into the intermediate body (23)
4) Compress all components and lock the hole snap ring (19). **Caution! The snap ring (19) keeps the packing gland spring compressed (10)**; the maximum care shall then be taken to prevent the spring from coming out suddenly during the disassembly operations.
5) Insert into the intermediate body the shutter stem (13) previously assembled.
6) Insert into the shutter stem the piston bearing washer (40), the piston with TDUOP gasket (4) paying attention to assemble it in the original position, the spacer ring (56), the bumper gasket (54) and the bumper stop washer (55). Screw down all the components with the self-locking nut (2) closing the component packing without torque tighten.
7) Insert the spring bearing piston (16) into the intermediate body (16).
8) Using proper instruments, approach the spring bearing piston to the intermediate body. **Caution! A compressed spring is placed inside the cylinder.**
9) Insert the nuts (18) into the spring bearing piston near the intermediate body holes.
10) Insert the spring washers (20) into the screws (18) and torque tighten nuts (21) as indicated under table 5.
11) Insert the O-Ring (51) into the air inlet coupling (52).
12) Torque tighten the air inlet coupling (52) on the spring bearing piston (16) as indicated under table 5.
13) Place the body gasket (25) on the valve body (22). Insert the servocontrol into the valve body.
14) Insert screws (24) into the servocontrol intermediate body near the valve body holes.
15) Insert the spring washers (26) into the screws and torque tighten the nuts (27) as indicated under table 5.

4.14.3 Section Plane IVS-IVFL ND 80 to 200 normally open



Dwg. nr XX0282 Rev.:00

Section plane IVS-IVFL ND 15 to 50 with handwheel



Dwg. nr 960340 Rev.:02

DETAIL NR.	Q.ty	DESCRIPTION	MATERIAL	GROUP	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	Servocontrol spring	STEEL	552	557			MTD087091		
2	1	Self-braking nut	Fe 360	576	D06AUTOFE			DO8AUTOFE		
3	2	Piston support	Fe 360	545	AFD087239			AFD087240		
4	1	TDUOP gasket	NBR/ACC.	566	TDUOP7065			TDUOP8073		
5	2	O-Ring gasket	GACO	548	OR02025GA			OR02031GA		
6	2	Piston bearing washer	Fe 360	671	RAD087233			RAD087234		
7	1	O-Ring gasket	GACO	548	OR03256GA			OR002300GA		
8	1	BA gasket	FPM	567	BA0V12284					
9	2	Plain washer	AISI 316	703	RDD088148					
10	1	Packing gland spring	AISI 316	552	MTD088149					
11	2	Packing gland washer	AISI 316	703	RDD086297					
12	1	Packing gland	PTFE/GRAF.	587	PT01222TG					
13	1	Shutter stem	AISI 316	**(2)**	AINF950782	AINF950783		AINF950784	AINF950785	ACPT950787
14	1	Cap	EPDM	511	2613		537	538	539	540
			EPDM RIV. PTFE	818	TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
			PTFE/CAR.	839	TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
15	1	Handwheel	Fe 360/OTT. AISI 304	507	VPD000025					
16	1	Spring bearing piston	AISI 304	651	PAMC941010			PAMC950781		
19	1	Snap ring	AISI 304	695	SEEF23304					
22	1	Square body	AISI 316	841/819	M316950238	M316950244	M316093104	M316940103	M316950400	M316950402
23	1	Intermediate body	AISI 304 AISI 316	632	CINT950776			CINT950777	CINT950778	CINT950780
24	**(1)**	Hexagonal head screw	AISI 316	774	VTE082206					VTE082506
25	1	Body gasket	TESNIT-BAU	511	GUAR950928			GUAR950929	GUAR950930	550
26	**(1)**	Spring washer	AISI 304	503	RE0800304					
27	**(1)**	Hexagonal nut	AISI 304	501	D08055884					
28	1	Shaft gasket	PTFE	511	GD0001465					-
29	1	Flow body	AISI 316	841/819	M316950241	M316950245	M316093943	M316940102	M316950399	M316950401
30	1	Cap holder	AISI 316	527	TTD001229		TTD001251	TTD001255	TTD001257	-
31	1	Cap holder spring	AISI 316	526	RFD090441	RFD000127	RFD000116	RFD000117	RFD000118	RFD000119
32	2	Hexagonal nut	AISI 316	501	D06055896	D08055896				D10055896
33	1	DI gasekt	GACO	511	GD0000056					
41	1	Elastic pin	AISI 304	504	SP0424304					
42	1	Plain washer	AISI 304	502	RP1400304					
43	1	Hexagonal nut	AISI 304	501	D06055884			D08055884		
44	1	Manual shaft	AISI 304	652	NAMD89007			NAMD88147		
46	2	tcce screw	AISI 304	551	TCCE06254					
47	2	Clamp	AISI 304	819	M304940071			M304940072		
48	2	Hexagonal nut	AISI 304	501	D06055884					
49	1	Threaded cap	POLIETIL.	505	TEP400G018					
50	2	Cylindric cap	POLIETIL.	505	T01ST00160	T01ST00230	T01ST00285	T01ST00350	T01ST00440	T00000535

(1) N° 4 FROM ND 15 TO ND 32 – N° 8 FROM ND 40 TO ND 50

(2) GROUP 657 FROM ND 15 TO ND 40 – GROUP 788 ND 50

4.15 Details and spare parts IVS-IVFL ND 15 to 50 with handwheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 2003, FROM ND 15 TO ND 50 POSITION 17 - 20

SPARE PARTS COMPLETE SERIES - PISTON/96 WITHOUT SPRING

SPARE PART CODE		**2837**			**7895**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	OR03256GA			OR002300GA		
33	1	GD0000056					

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE			**2820**		**2821**	**2822**	**2823**	**2824**
		R.T.	**4190**		**4191**	**4192**	**4193**	**4194**
		T.C.	**5351**		**5352**	**5353**	**5354**	**5355**
DETAIL NR.		Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
8		1	BA0V12284					
10		1	MTD088149					
12		1	PT01222TG					
14	EPDM	1	2613		537	538	539	540
	R.T.		TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.		TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25		1	GUAR950928			GUAR950929	GUAR950930	550
28		1	GD0001465					-

DETAIL NR.	QUANTITY	DESCRIPTION	MATERIAL	GROUP	ND 65
1	1	Servocontrol spring	STEEL FOR SPRINGS	552	MTD089226
2	1	Self-braking nut	Fe 360	576	D12AUTOFE
3	1	Piston bearing	Fe 360	545	AFD089222
4	1	TDUOP gasket	NBR STEEL	566	TDUOP1254
5	1	O-Ring gasket	VITON	548	OR02056VI
6	1	Piston bearing washer	ASTM-A105	671	RAD089220
7	1	O-Ring gasket	GACO	548	OR03475GA
8	1	BA gasket	VITON	567	BA0V16305
9	2	Plain washer	AISI 316	703	RDD088158
10	1	Packing gland spring	AISI 316	552	MTD088172
11	2	Packing gland washer	AISI 316	703	RDD088157
12	1	Packing gland	TEF./GRAF.	587	PT01626TG
13	1	Shutter stem	AISI 316	788	NACD90293
14	1	Cap	EPDM	511	541
			EPDM RIV. PTFE	818	TDRD90337
			PTFE/CAR.	839	TTEF040427
15	1	Handwheel	Fe 360/OTT. AISI 304	507	VPD000026
16	1	Spring bearing piston	AISI 304	651	NPMD89224
17	1	Piston spacer ring	BRASS	522	DDD089279
18	8	tcce screw	AISI 304	500	VTE081604
19	1	Snap ring	AISI 304	695	SEEF27304
20	8	Spring washer	AISI 304	503	RE0800304
21	8	Hexagon nut	AISI 304	501	D08055884
22	1	Square body	AISI 316	841	M31601501
23	1	Intermediate body	AISI 304 AISI 316	632	NCID89296
24	8	Hexagon head screw	AISI 316	774	VTE082506
25	1	Body gasket	EPDM RINF. NYLON	511	GUAR030117
26	8	Spring washer	AISI 304	503	RE0800304
27	8	Hexagon nut	AISI 304	501	D08055884
29	1	Flow body	AISI 316	841	M316010502
31	1	Cap stop washer	AISI 316	526	RFD000120
32	2	Hexagon nut	AISI 316	501	D10055896
33	1	DI gasket	GACO	511	GD0000062
34	1	Servocontrol spring	AISI 302	552	MTD089227
35	1	Spring guide	AISI 304	812	NGMD90295
41	1	Elastic pin	AISI 304	504	SP0630304
42	1	Plain washer	AISI 304	502	RP1600304
43	1	Hexagon nut	AISI 304	501	D12055884
44	1	Hand-operated shaft	AISI 304	652	NAMD89293
49	1	Threaded cap	POLYETHYLENE	505	TEP400G018
50	2	Cylindrical cap	POLYETHYLENE	505	T01ST00730
57	1	Manufacturer's label		506	EAITA4324

4.16 Details and spare parts IVS-IVFL ND 65 with handwheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 2002, FROM ND 65 POSITION 15

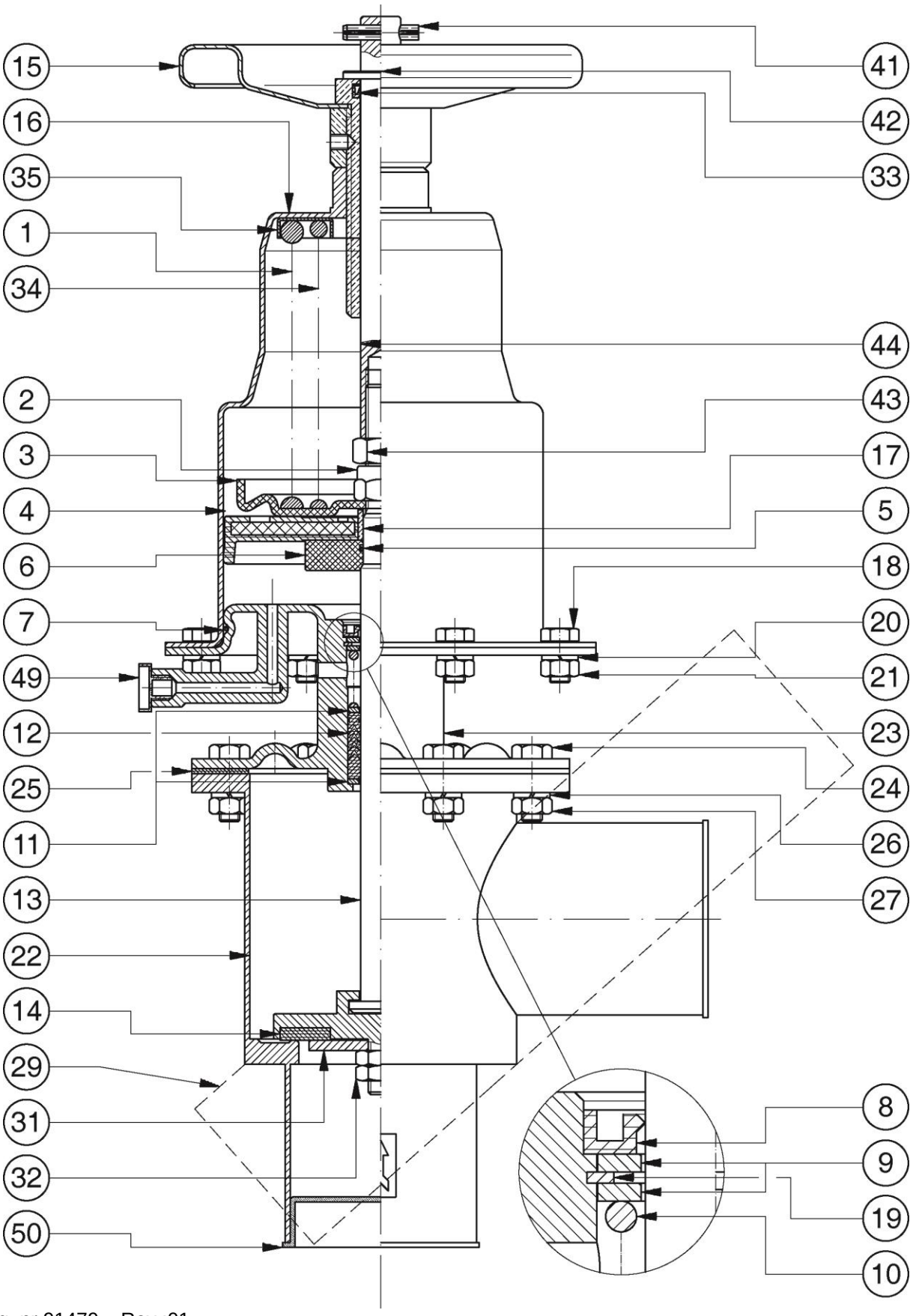
SPARE PARTS COMPLETE SERIES - PISTON/89 WITHOUT SPRING

SPARE PART CODE		**2839**
∅ PISTON		125
DETAIL NR.	Q.ty	ND 65
4	1	TDUOP1254
5	1	OR02056VI
6	1	RAD089220
7	1	OR03475GA
33	1	GD0000062

SPARE PARTS COMPLETE SERIES - BODY

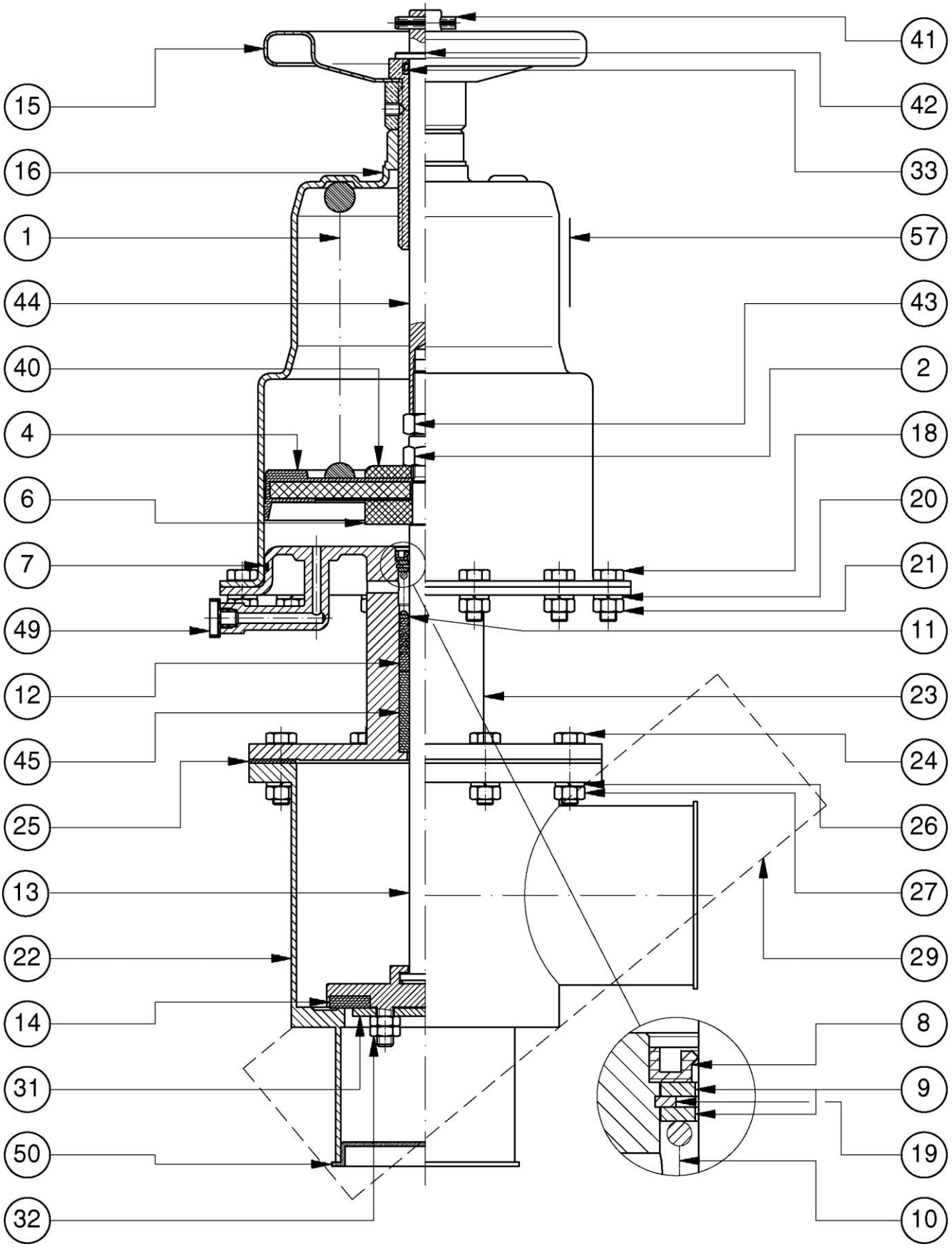
SPARE PART CODE	EPDM	**7585**
	R.T.	**7586**
	T.C.	8305
DETAIL NR.	Q.ty	ND 65
8	1	BA0V16305
10	1	MTD088172
12	1	PT01626TG
14 EPDM	1	541
14 R.T	1	TDRD90337
14 T.C.	1	TTEF040427
25	1	GUAR030117

Section Plane IVS-IVFL ND 65 with handwheel



Dwg. nr 91479 Rev.:01

Section plane IVS-IVFL ND 80 to 200 with handwheel



Dwg. nr 940278 Rev.:00

DETAIL NR.	Q.ty	DESCRIPTION		MATERIAL	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	Servo-control spring	flow	SPRING STEEL	552	562		562		-
			square					MTD089226		
2	1	Self-braking nut		Fe 360	576	D12AUTOFE				
4	1	TDUOP gasket		NBR STEEL	566	TDUOP1602				
6	1	Piston bearing washer		ASTM-A105	671	RAD090362				
7	1	O-Ring		GACO	548	OR03600GA				
8	1	BA gasket		VITON	567	BA0V16305		BA0V22405		
9	2	Plain washer		AISI 316	703	RDD088158		RDD092181		
10	1	Packing gland spring		AISI 316	552	MTD088172		MTD088163		
11	1	Packing gland washer		AISI 316	703	RDD088157		RDD092180		
12	1	Packing gland		TEF./GRAF.	587	PT01626TG		PT02236TG		
13	1	Shutter stem.	flow	AISI 316	788	NACD90383	NACD92199	NACD92201	NACD93938	-
			square					NACD92200	NACD93072	NACD93073
14	1	Cap		EPDM	511	542	543	544	545	546
				EPDM RIV. PTFE	818	TDRD90338	TDRD90339	TDRD90340	TDRD90341	TDRD90395
15	1	Handwheel		Fe 360/OTT. AISI 304	507	VPD000026				
16	1	Spring bearing piston		AISI 304	651	NPMD90061				
18	12	Hexagonal head screw		AISI 304	500	VTE082004				
19	1	Snap ring		AISI 304	695	SEEF27304		SEEF37304		
20	12	Spring washer		AISI 304	503	RE0800304				
21	12	Hexagon nut		AISI 304	501	D08055884				
22	1	Square body		**(5)**	**(7)**	M316010503	M316020649	SUD000496	SUD001210	SUD001263
23	1	Intermediate body		AISI 304 AISI 316	632	NCID90386	NCID92213	NCID92214	NCID93078	NCID93079
24	**(1)**	Tcce screw		**(3)**	**(4)**	VTE083006	VTE103504			
25	1	Body gasket		**(6)**	511	GUAR030116	GUAR040146	554	555	556
26	**(1)**	Spring washer		AISI 304	503	RE0800304	RE1000304			
27	**(1)**	Hexagon nut		AISI 304	501	D08055884	D10055884			
29	1	Flow body		**(5)**	**(8)**	M316010504	M316020650	FLD001147	FLD001100	-
31	1	Cap stop washer		AISI 316	526	RFD000121	RFD000122	RFD000123	RFD000242	RFD000335
32	**(2)**	Hexagon nut		AISI 316	501	D08055896				
33	1	DI gasket		GACO	511	GD0000062				
40	1	Piston bearing washer		Fe 360	671	RAD090362				
41	1	TIL.tic pin		AISI 304	504	SP0630304				
42	1	Plain washer		AISI 304	502	RP1600304				
43	1	Hexagon nut		AISI 304	501	D12055884				
44	1	Hand-operated shaft		AISI 304	652	NAMD90361				
45	1	Guide bush		PTFE	581	BGD091127		-		
49	1	Threaded cap		POLYETH.	505	TEP400G018				
50	2	Cylindrical cap		POLYETH.	505	T01ST00850	T01ST01110	T013PT0125	T013PT0150	T013PT0200
57	1	Manufacturer's label			506	EAITA4324				

(1) N° 8 FROM ND 80 TO ND 125 – N° 12 ND 150 – N° 16 ND 200

(2) N° 6 ND 80 – N° 8 FROM ND 100 TO ND 200

(3) AISI 316 ND 80 – AISI 304 FROM ND 100 TO ND 200

(4) GROUP 774 ND 80 – GROUP 500 FROM ND 100 TO ND 200

(5) AISI 316 FROM ND 80 TO ND 100 – AISI 316+AISI 304 FROM ND 125 TO ND 200

(6) EPDM RINF. NYLON FROM ND 80 TO ND 100– TESNIT-BAU FROM ND 125 TO ND 200

(7) GROUP 841 FROM ND 80 TO ND 100 – GROUP 519 FROM ND 125 TO ND 200

(8) GROUP 841 FROM ND 80 TO ND 100– GROUP 515 FROM ND 125 TO ND 150

4.17 Details and spare parts IVS-IVFL ND 80 to 200 with hand-wheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 1993 FROM ND 100 TO ND 200 POSITION 4 , MANUFACTURED SINCE END 2003 ND 80 POSITION 15, MANUFACTURED SINCE HALF 2004 ND 100 POSITION 15

SPARE PARTS COMPLETE SERIES - PISTON/89 WITHOUT SPRING

SPARE PART CODE		**2840**				
∅ PISTON		160				
DETAIL NR.	Q.ty	ND 80	ND 100	ND 125	ND 150	ND 200
4	1	TDUOP1602				
7	1	OR03600GA				
33	1	GD0000062				

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE	EPDM	**2826**	**2827**	**2828**	**2829**	**2830**
	R.T.	**4196**	**4197**	**4198**	**4199**	**4200**
DETAIL NR.	Q.ty	ND 80	ND 100	ND 125	ND 150	ND 200
8	1	BA0V16305		BA0V22405		
10	1	MTD088172		MTD088163		
12	1	PT01626TG		PT02236TG		
14	EPDM	GUAR030116	GUAR040146	544	545	546
	R.T.	TDRD90338	TDRD90339	TDRD90340	TDRD90341	TDRD90395
25	1	552	553	554	555	556
45	1	BGD091127		-		

4.18 Details and spare parts IVS-IVFL ND 15 to 50 with visual indicator

DETAIL NR.	Q.ty	DESCRIPTION	MATERIAL	GROUP	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	Servocontrol spring	STEEL	552	557			MTD087091		
2	1	Self-braking nut	Fe 360	576	D06AUTOFE			DO8AUTOFE		
3	2	Piston support	Fe 360	545	AFD087239			AFD087240		
4	1	TDUOP gasket	NBR/ACC.	566	TDUOP7065			TDUOP8073		
5	2	O-Ring gasket	GACO	548	OR02025GA			OR02031GA		
6	2	Piston bearing washer	Fe 360	671	RAD087233			RAD087234		
7	1	OR gasket	GACO	548	OR03256GA			OR002300GA		
8	1	BA gasket	VITON	567	BA0V12284					
9	2	Plain washer	AISI 316	703	RDD088148					
10	1	Packing gland spring	AISI 316	552	MTD088149					
11	2	Packing gland washer	AISI 316	703	RDD086297					
12	1	Packing gland	PTFE/GRAF.	587	PT01222TG					
13	1	Shutter stem	AISI 316	**(2)**	AINF950782	AINF950783		AINF950784	AINF950785	ACPT950787
14	1	Cap	EPDM	511	2613		537	538	539	540
			EPDM RIV. PTFE	818	TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
			PTFE/CAR.	839	TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
16	1	Spring bearing piston	AISI 304	651	PAMC941010			PAMC950781		
19	1	Snap ring	AISI 304	695	SEEF23304					
22	1	Square body	AISI 316	841/819	M316950238	M316950244	M316093104	M316940103	M316950400	M316950402
23	1	Intermediate body	AISI 304 AISI 316	632	CINT950776			CINT950777	CINT950778	CINT950780
24	**(1)**	Hexagonal head screw	AISI 316	774	VTE082206					VTE082506
25	1	Body gasket	TESNIT-BAU	511	GUAR950928			GUAR950929	GUAR950930	550
26	**(1)**	Spring washer	AISI 304	503	RE0800304					
27	**(1)**	Hexagonal nut	AISI 304	501	D08055884					
28	1	Shaft gasket	PTFE	511	GD0001465					-
29	1	Flow body	AISI 316	841/819	M316950241	M316950245	M316093943	M316940102	M316950399	M316950401
30	1	Cap holder	AISI 316	527	TTD001229		TTD001251	TTD001255	TTD001257	-
31	1	Cap holder spring	AISI 316	526	RFD090441	RFD000127	RFD000116	RFD000117	RFD000118	RFD000119
32	2	Hexagon nut	AISI 316	501	D06055896	D08055896				D10055896
38	1	Stroke indicator	PVC RED	840	ICD091255			ICD091256		
39	1	Transparent cap	PLASTIC	840	ICD091467					
46	2	tcce screw	AISI 304	551	TCCE06254					
47	2	Clamp	AISI 304	841	M304940071			M304940072		
48	2	Hexagon nut	AISI 304	501	D06055884					
49	1	Threaded cap	POLYETH.	505	TEP400G018					
50	2	Cylindrical cap	POLYETH.	505	T01ST00160	T01ST00220	T01ST00285	T01ST00375	T01ST00410	T00000535

(1) N° 4 FROM ND 15 TO ND 32 – N° 8 FROM ND 40 TO ND 50

(2) GROUP 657 FROM ND 15 TO ND 40 – GROUP 788 ND 50

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 2003 FROM ND 15 TO ND 50 POSITION 18 - 21

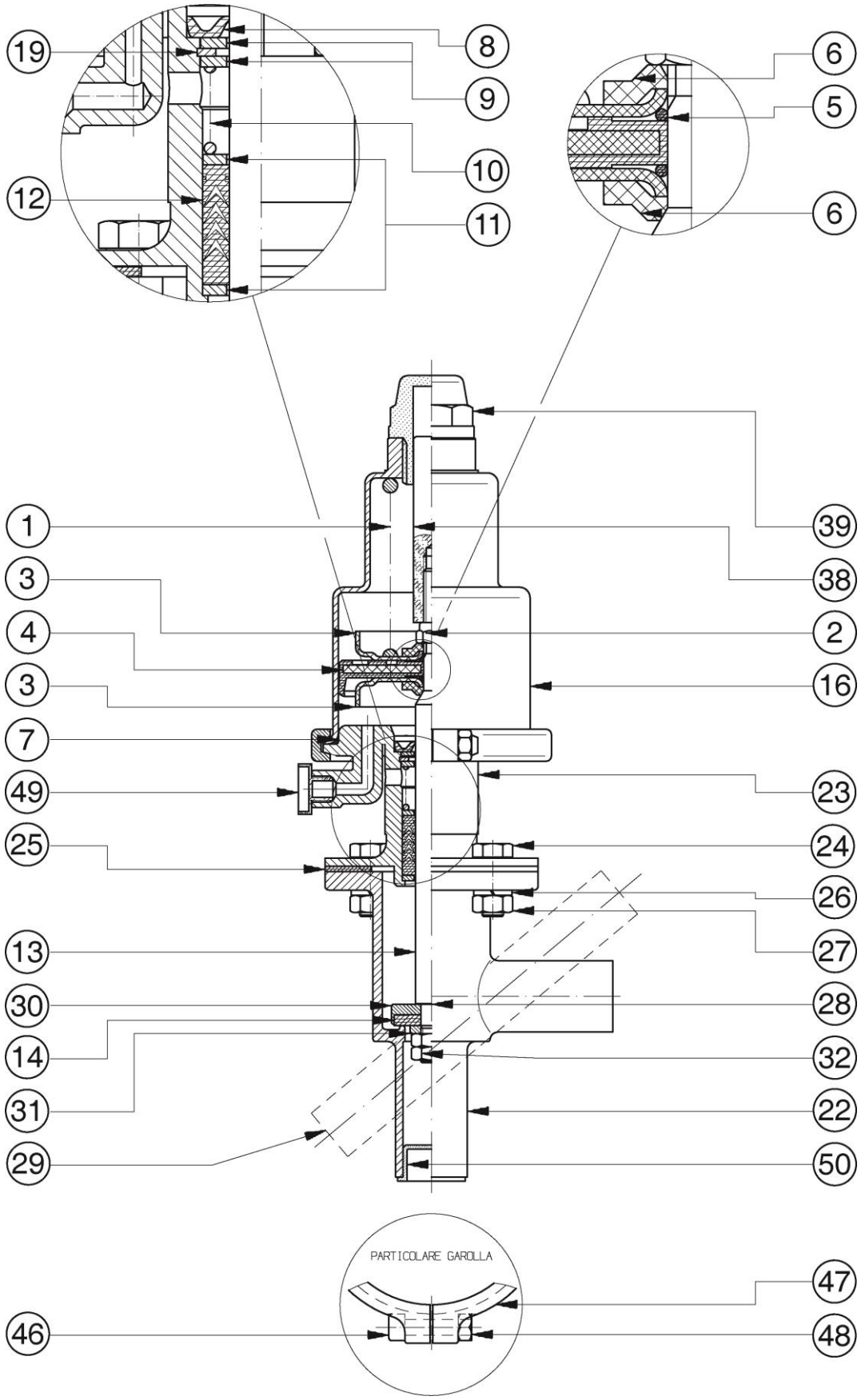
SPARE PARTS COMPLETE SERIES PISTON/96 WITHOUT SPRING

SPARE PART CODE		**3945**			**7896**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	OR03256GA			OR002300GA		

SPARE PARTS COMPLETE SERIES - BODY

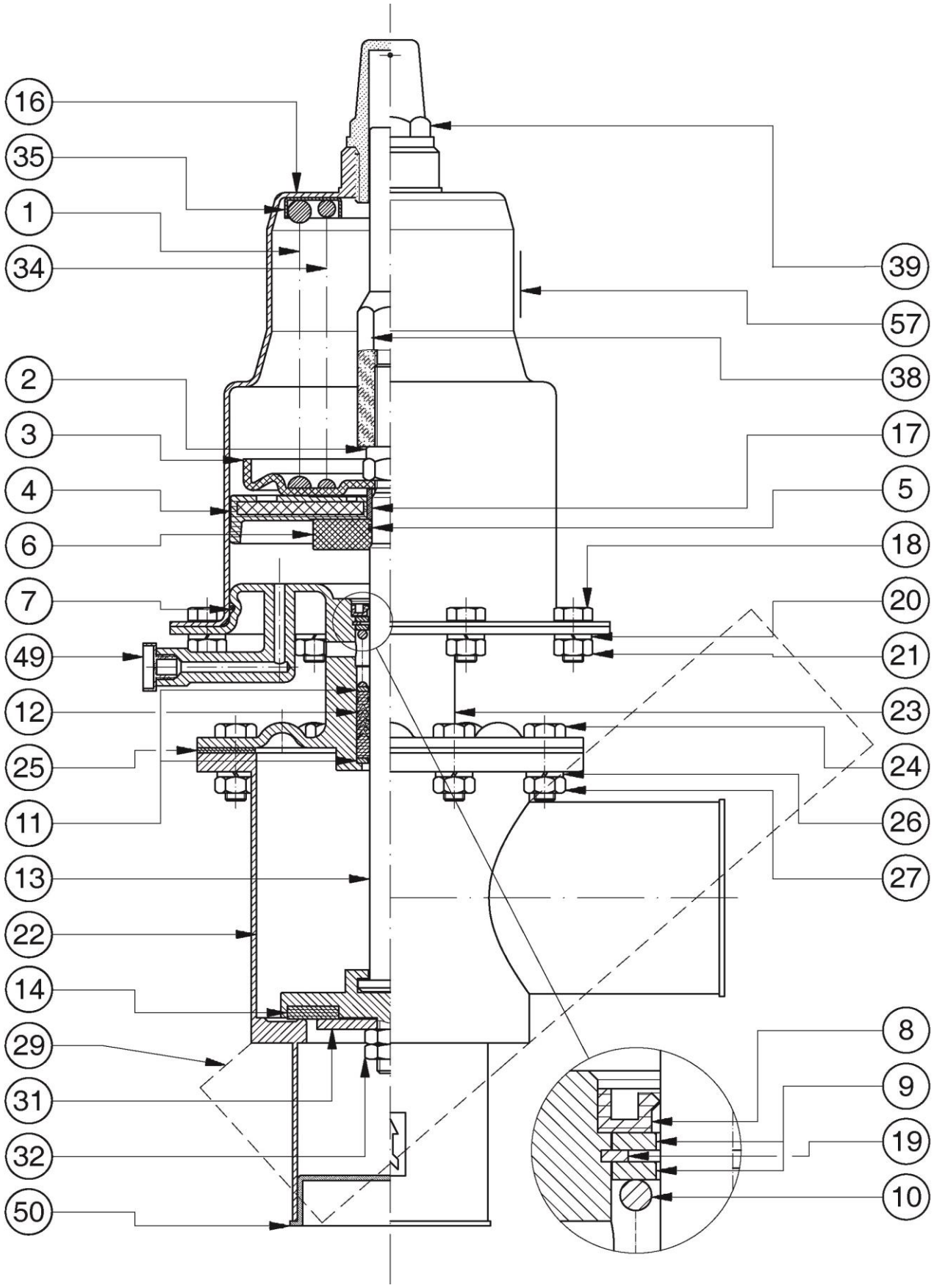
SPARE PART CODE		EPDM	**2820**	**2821**	**2822**	**2823**	**2824**
		R.T.	**4190**	**4191**	**4192**	**4193**	**4194**
		T.C.	**5351**	**5352**	**5353**	**5354**	**5355**
DETAIL NR.		Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
8		1	BA0V12284					
10		1	MTD088149					
12		1	PT01222TG					
14	EPDM	1	2613		537	538	539	540
	R.T.		TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.		TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25		1	GUAR950928			GUAR950929	GUAR950930	550
28		1	GD0001465					-

Section plane IVS-IVFL ND 15 to 50 with visual indicator



Dwg. nr 940339 Rev.:02

Section plane IVS-IVFL ND 65 with visual indicator



Dwg. nr 931087 Rev.:01

DETAIL NR.	DESCRIPTION	DESCRIPTION	MATERIAL	GROUP	ND 65
1	1	Servocontrol spring	SPRING STEEL	552	MTD089226
2	1	Self-braking nut	Fe 360	576	D12AUTOFE
3	1	Piston bearing	Fe 360	545	AFD089222
4	1	TDUOP gasket	NBR STEEL	566	TDUOP1254
5	1	OR gasket	VITON	548	OR02056VI
6	1	Piston bearing washer	ASTM-A105	671	RAD089220
7	1	O-Ring gasket	GACO	548	OR03475GA
8	1	BA gasket	VITON	567	BA0V16305
9	2	Plain washer	AISI 316	703	RDD088158
10	1	Packing gland spring	AISI 316	552	MTD088172
11	2	Packing gland washer	AISI 316	703	RDD088157
12	1	Packing gland	TEF./GRAF.	587	PT01626TG
13	1	Shutter stem	AISI 316	788	NACD90293
14	1	Cap	EPDM	511	541
			EPDM RIV. PTFE	818	TDRD90337
			PTFE/CAR.	839	TTEF040427
16	1	Spring bearing washer	AISI 304	651	NPMD89224
17	1	Piston spacer ring	BRASS	522	DDD089279
18	8	Hexagon head screws	AISI 304	500	VTE081604
19	1	Snap ring	AISI 304	695	SEEF27304
20	8	Spring washer	AISI 304	503	RE0800304
21	8	Hexagon nut	AISI 304	501	D08055884
22	1	Square body	AISI 316	841	M316010501
23	1	Intermediate body	AISI 304 AISI 316	632	NCID89296
24	8	Hexagon head screw	AISI 316	774	VTE082506
25	1	Body gasket	EPDM RINF. NYLON	511	GUAR030117
26	8	Spring washer	AISI 304	503	RE0800304
27	8	Hexagon nut	AISI 304	501	D08055884
29	1	Flow body	AISI 316	841	M316010502
31	1	Cap stop washer	AISI 316	526	RFD000120
32	2	Hexagon nut	AISI 316	501	D10055896
34	1	Servocontrol spring	AISI 302	552	MTD089227
35	1	Spring guide	AISI 304	812	NGMD90295
38	1	Stroke indicator	PVC RED	840	ICD091257
39	1	Transparent cap	PLASTIC	840	ICD092917
49	1	Threaded cap	POLYETH.	505	TEP400G018
50	2	Cylindrical cap	POLYETH.	505	T01ST00730
57	1	Manufacturer's label		506	EAITA4324

4.19 Details and spare parts IVS-IVFL ND 65 with visual indicator

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 2002 FROM ND 65 POSITION 16

SPARE PARTS COMPLETE SERIES – SPRINGLESS PISTON

SPARE PART CODE		**3947**
∅ PISTON		125
DETAIL NR.	Q.ty	ND 65
4	1	TDUOP1254
5	1	OR02056VI
6	1	RAD089220
7	1	OR03475GA

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE		EPDM	**7585**
		R.T.	**7586**
		T.C.	**8305**
DETAIL NR.		Q.ty	ND 65
8		1	BA0V16305
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	541
	R.T.		TDRD90337
	T.C.		TTEF040427
25		1	GUAR030117

DETAIL NR.	Q.ty	DESCRIPTION		MATERIAL	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	Servo-control spring	flow	STEEL FOR SPRINGS	552	562		562		-
			square					MTD089226		
2	1	Self-braking nut		Fe 360	576	D12AUTOFE				
4	1	TDUOP gasket		NBR STEEL	566	TDUOP1602				
6	1	Piston bearing washer		ASTM-A105	671	RAD090362				
7	1	O-Ring gasket		GACO	548	OR03600GA				
8	1	BA gasket		VITON	567	BA0V16305		BA0V22405		
9	2	Plain washer		AISI 316	703	RDD088158		RDD092181		
10	1	Packing gland spring		AISI 316	552	MTD088172		MTD088163		
11	1	Packing gland washer		AISI 316	703	RDD088157		RDD092180		
12	1	Packing gland		TEF./GRAF.	587	PT01626TG		PT02236TG		
13	1	Shutter stem.	flow	AISI 316	788	NACD90383	NACD92199	NACD92201	NACD93938	-
			square					NACD92200	NACD93072	NACD93073
14	1	Cap		EPDM	511	542	543	544	545	546
				EPDM RIV. PTFE	818	TDRD90338	TDRD90339	TDRD90340	TDRD90341	TDRD90395
16	1	Spring bearing piston		AISI 304	651	NPMD90061				
18	12	Hexagon head screw		AISI 304	500	VTE082004				
19	1	Snap ring		AISI 304	695	SEEF27304		SEEF37304		
20	12	Spring washer		AISI 304	503	RE0800304				
21	12	Hexagon nut		AISI 304	501	D08055884				
22	1	Square body		**(5)**	**(7)**	M316010503	M316020649	SUD000496	SUD001210	SUD001263
23	1	Intermediate body		AISI 304 AISI 316	632	NCID90386	NCID92213	NCID92214	NCID93078	NCID93079
24	**(1)**	Hexagon head screw		**(3)**	**(4)**	VTE083006	VTE103504			
25	1	Body gasket		**(6)**	511	GUAR030116	GUAR040146	554	555	556
26	**(1)**	Spring washer		AISI 304	503	RE0800304	RE1000304			
27	**(1)**	Hexagon nut		AISI 304	501	D08055884	D10055884			
29	1	Flow body		**(5)**	**(8)**	M316010504	M316020650	FLD001147	FLD001100	-
31	1	Cap stop washer		AISI 316	526	RFD000121	RFD000122	RFD000123	RFD000242	RFD000335
32	**(2)**	Hexagon nut		AISI 316	501	D08055896				
38	1	Stroke indicator		PVC RED	840	ICD091258				
38	1	Transparent cap		PLASTIC	840	ICD092916				
40	1	Piston bearing washer		Fe 360	671	RAD090362				
45	1	Guide bush		PTFE	581	BGD091127		-		
49	1	Threaded cap		POLYIETH.	505	TEP400G018				
50	2	Cylindrical cap		POLYETH.	505	T01ST00850	T01ST01110	T013PT0125	T013PT0150	T013PT0200
57	1	Manufacturer's label			506	EAITA4324				

(1) N° 8 FROM ND 80 TO ND 125 – N° 12 ND 150 – N° 16 ND 200

(2) N° 6 ND 80 – N° 8 FROM ND 100 TO ND 200

(3) AISI 316 ND 80 – AISI 304 FROM ND 100 TO ND 200

(4) GROUP 774 ND 80 – GROUP 500 FROM ND 100 TO ND 200

(5) AISI 316 FROM ND 80 TO ND 100 – AISI 316+AISI 304 FROM ND 125 TO ND 200

(6) EPDM RINF. NYLON FROM ND 80 TO ND 100– TESNIT-BAU FROM ND 125 TO ND 200

(7) GROUP 841 FROM ND 80 TO ND 100 – GROUP 519 FROM ND 125 TO ND 200

(8) GROUP 841 FROM ND 80 TO ND 100– GROUP 515 FROM ND 125 TO ND 150

4.20 Details and spare parts IVS-IVFL ND 80 to 200 with visual indicator

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 1993 FROM ND 100 TO ND 200 POSITION 7, MANUFACTURED SINCE END 2003 ND 80 POSITION 16, MANUFACTURED SINCE HALF 2004 ND 100 POSITION 16

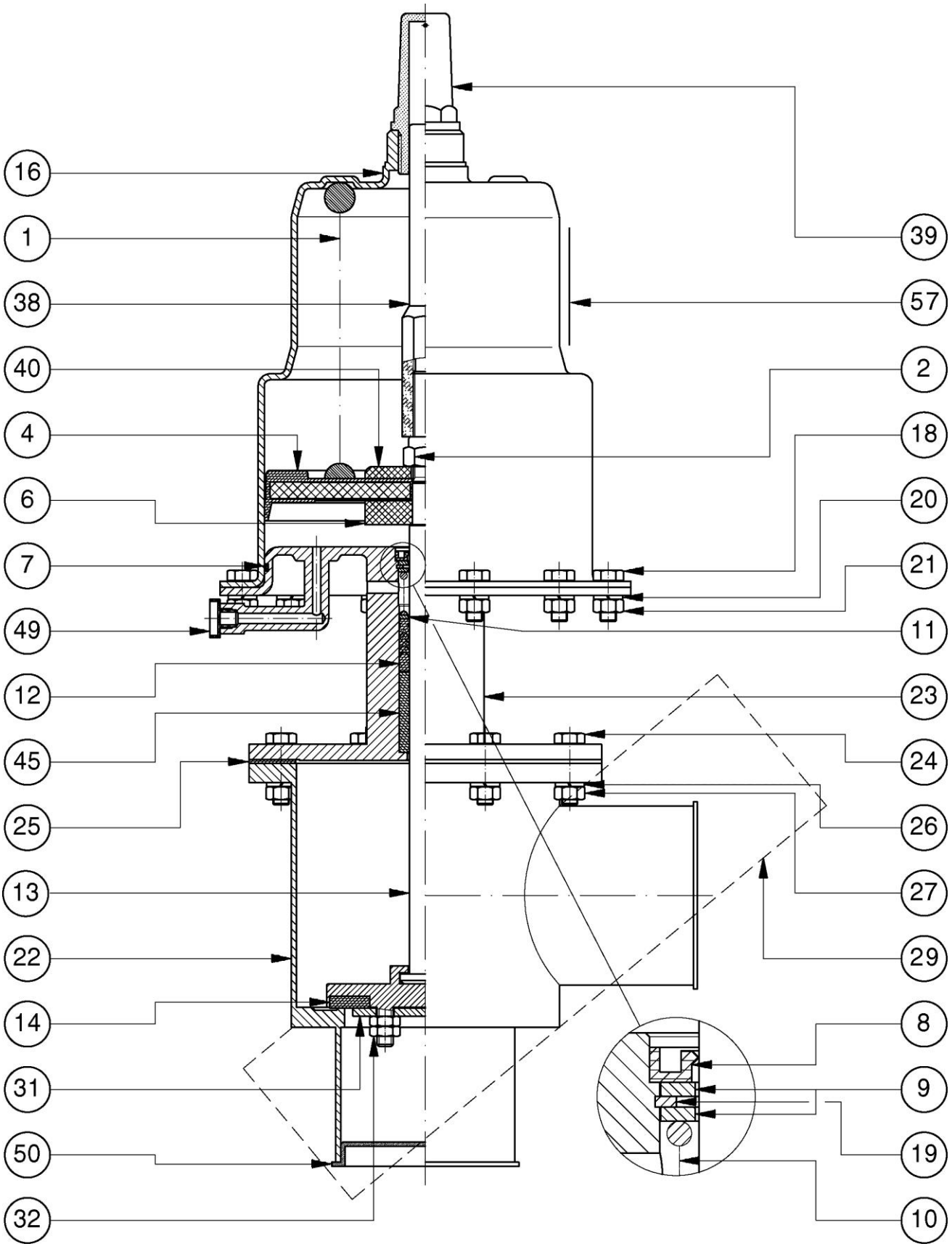
SPARE PARTS COMPLETE SERIES – SPRINGLESS PISTON

SPARE PART CODE		**3948**				
∅ PISTON		160				
DETAIL NR.	Q.ty	ND 80	ND 100	ND 125	ND 150	ND 200
4	1	TDUOP1602				
7	1	OR03600GA				

SPARE PARTS COMPLETE SERIES - BODY

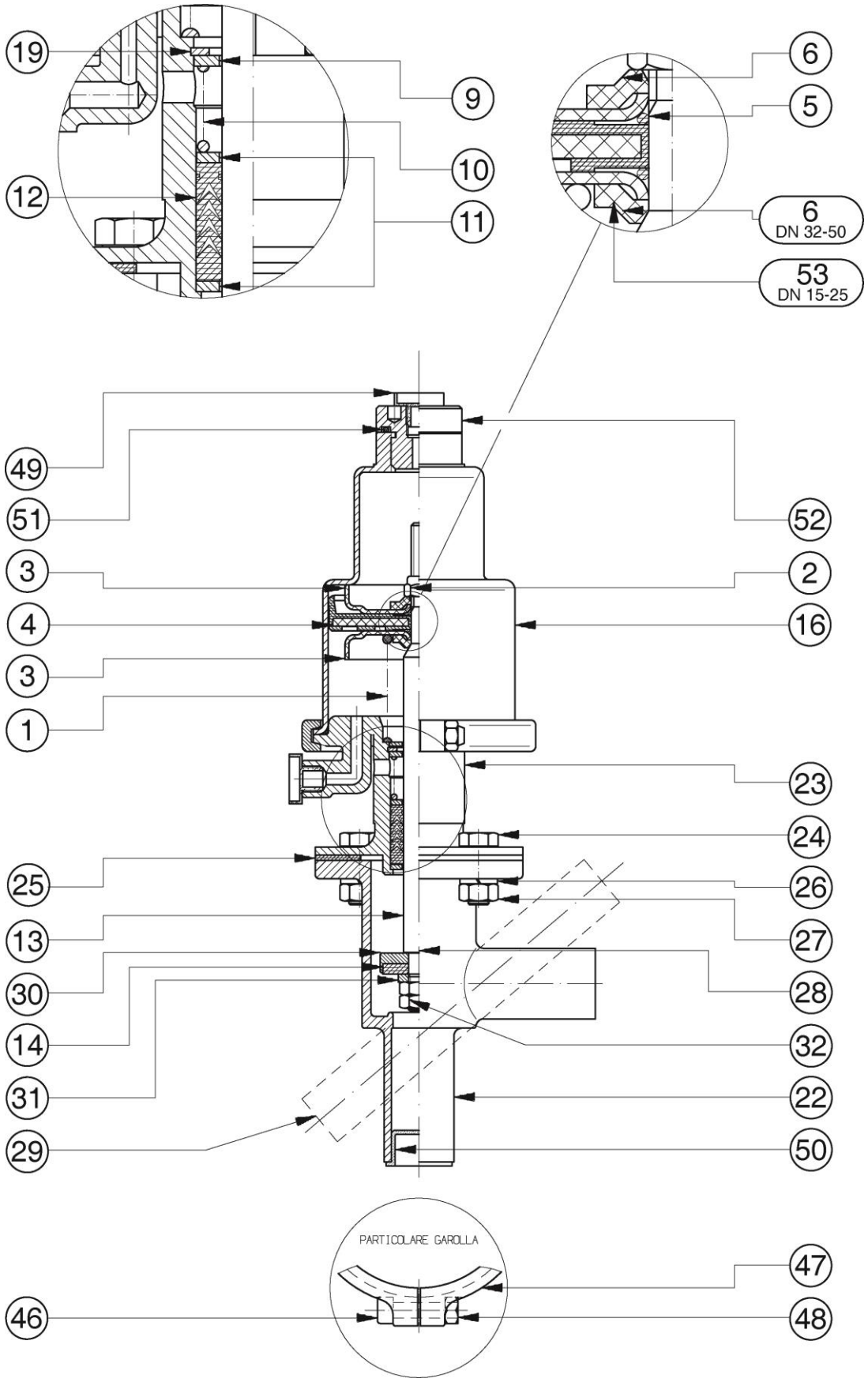
SPARE PART CODE		EPDM	**2826**	**2827**	**2828**	**2829**	**2830**
		R.T.	**4196**	**4197**	**4198**	**4199**	**4200**
DETAIL NR.		Q.ty	ND 80	ND 100	ND 125	ND 150	ND 200
8		1	BA0V16305		BA0V22405		
10		1	MTD088172		MTD088163		
12		1	PT01626TG		PT02236TG		
14	EPDM	1	542	543	544	545	546
	R.T.		TDRD90338	TDRD90339	TDRD90340	TDRD90341	TDRD90395
25		1	GUAR030116	GUAR040146	554	555	556
45		1	BGD091127		-		

Section plane IVS-IVFL ND 80 to 200 with visual indicator



Dwg. nr 940276 Rev.:00

Section plane IVS-IVFL ND 15 to 50 normally open



Dwg. nr XX0279 Rev.:02

DETAIL NR.	Q.ty	DESCRIPTION	MATERIAL	GROUP	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	Servocontrol spring	STEEL	552	MTD092510					
2	1	Self-braking nut	Fe 360	576	D06AUTOFE			DO8AUTOFE		
3	2	Piston support	Fe 360	545	AFD087239			AFD087240		
4	1	TDUOP gasket	NBR/STEEL	566	TDUOP7065			TDUOP8073		
5	2	O-Ring gasket	GACO	548	OR02025GA			OR02031GA		
6	**(1)**	Piston bearing washer	Fe 360	671	RAD087233			RAD087234		
9	1	Plain washer	AISI 316	703	RDD088148					
10	1	Packing gland spring	AISI 316	552	MTD088149					
11	2	Packing gland washer	AISI 316	703	RDD086297					
12	1	Packing gland	PTFE/GRAF.	587	PT01222TG					
13	1	Shutter stem	AISI 316	**(3)**	AINF950782	AINF950783		AINF950784	AINF950785	ACPT950787
14	1	Cap	EPDM	511	2613		537	538	539	540
			EPDM RIV. PTFE	818	TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
			PTFE/CAR.	839	TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
16	1	Spring bearing piston	AISI 304	651	PAMC941010			PAMC950781		
19	1	Snap ring	AISI 304	695	SEEF23304					
22	1	Square body	AISI 316	841/819	M316950238	M316950244	M316093104	M316940103	M316950400	M316950402
23	1	Intermediate body	AISI 304 AISI 316	632	CINT950776			CINT950777	CINT950778	CINT950780
24	**(2)**	Hexagonal head screw	AISI 316	774	VTE082206					VTE082506
25	1	Body gasket	TESNIT-BAU	511	GUAR950928			GUAR950929	GUAR950930	550
26	**(2)**	Spring washer	AISI 304	503	RE0800304					
27	**(2)**	Hexagonal nut	AISI 304	501	D08055884					
28	1	Shaft gasket	PTFE	511	GD0001465					-
29	1	Flow body	AISI 316	841/819	M316950241	M316950245	M316093943	M316940102	M316950399	M316950401
30	1	Cap holder	AISI 316	527	TTD001229		TTD001251	TTD001255	TTD001257	-
31	1	Cap holder spring	AISI 316	526	RFD090441	RFD000127	RFD000116	RFD000117	RFD000118	RFD000119
32	2	Hexagon nut	AISI 316	501	D06055896	D08055896				D10055896
46	2	tcce screw	AISI 304	551	TCCE06254					
47	2	Clamp	AISI 304	841	M304940071			M304940072		
48	2	Hexagon nut	AISI 304	501	D06055884					
49	1	Threaded cap	POLYETH.	505	TEP400G018					
50	2	Cylindrical cap	POLYETH.	505	T01ST00160	T01ST00220	T01ST00285	T01ST00375	T01ST00410	T00000535
51	1	O-Ring gasket	GACO	548	533					
52	1	Air inlet coupling	AISI 304	811	RRDD93955					
53	1	Piston bearing washer	Fe 360	671	RAD092502			-		

(1) N° 1 FROM ND 15 TO ND 25 – N° 2 FROM ND 32 TO ND 50
(2) N° 4 FROM ND 15 TO ND 32 – N° 8 FROM ND 40 TO ND 50
(3) GROUP 657 FROM ND 15 TO ND 40 – GROUP 788 ND 50

4.21 Details and spare parts IVS-IVFL ND 15 to 50 Normally Open

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 1996 FROM ND 15 TO ND 50 POSITION 10 – 19 – 22

SPARE PARTS COMPLETE SERIES PISTON/96 WITHOUT SPRING

SPARE PART CODE		**6380**			**6381**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	533					

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE	EPDM	**6384**		**6385**	**6386**	**6387**	**6388**
	R.T.	**6391**		**6392**	**6393**	**6394**	**6395**
	T.C.	**6398**		**6399**	**6400**	**6401**	**6402**
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
10	1	MTD088149					
12	1	PT01222TG					
14	EPDM	2613		537	538	539	540
	R.T.	TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.	TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25	1	GUAR950928			GUAR950929	GUAR950930	550
28	1	GD0001465					-

DETAIL NR.	QUANTITY	DESCRIPTION		MATERIAL	GROUP	ND 65
1	1	Servocontrol spring		STEEL FOR SPRINGS	552	MTD088172
2	1	Self-braking nut		Fe 360	576	D12AUTOFE
3	1	Piston bearing		Fe 360	545	AFD089222
4	1	TDUOP gasket		NBR STEEL	566	TDUOP1254
5	1	O-Ring gasket		VITON	548	OR02056VI
6	1	Piston bearing washer		ASTM-A105	671	RAD089220
9	1	Plain washer		AISI 316	703	RDD088158
10	1	Packing gland spring		AISI 316	552	MTD088172
11	2	Packing gland washer		AISI 316	703	RDD088157
12	1	Packing gland		TEF./GRAF.	587	PT01626TG
13	1	Shutter stem	Flow	AISI 316	788	ACPT960931
			Square			ACPT960347
14	1	Cap		EPDM	511	541
				EPDM RIV. PTFE	818	TDRD90337
16	1	Spring bearing piston		AISI 304	651	NPMD89224
17	1	Piston spacer ring		BRASS	522	DDD089279
18	8	Hexagon head screws		AISI 304	500	VTE081604
19	1	Snap ring		AISI 304	695	SEEF27304
20	8	Spring washer		AISI 304	503	RE0800304
21	8	Hexagon nut		AISI 304	501	D08055884
22	1	Square body		AISI 304 AISI 316	519	SUD001125
23	1	Intermediate body		AISI 304 AISI 316	632	CINT960343
24	8	Hexagon head screw		AISI 316	774	VTE082506
25	1	Body gasket		TESNIT-BAU	511	551
26	8	Spring washer		AISI 304	503	RE0800304
27	8	Hexagon nut		AISI 304	501	D08055884
29	1	Flow body		AISI 304 AISI 316	515	FLD001042
31	1	Cap stop washer		AISI 316	526	RFD000120
32	2	Hexagon nut		AISI 316	501	D10055896
35	1	Spring guide		AISI 304	812	NGMD90295
49	1	Threaded cap		POLYETHYLENE	505	TEP400G018
50	2	Cylindrical cap		POLYETHYLENE	505	T01ST00730
51	1	O-Ring gasket		VITON	548	OR03112VI
52	1	Air inlet coupling		AISI 304	811	RRDD91609
57	1	Manufacturer's label			506	EAITA4324

4.22 Details and spare parts IVS-IVFL ND 65 normally open

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 1996 FROM TO 2002 ND 65 POSITION 10

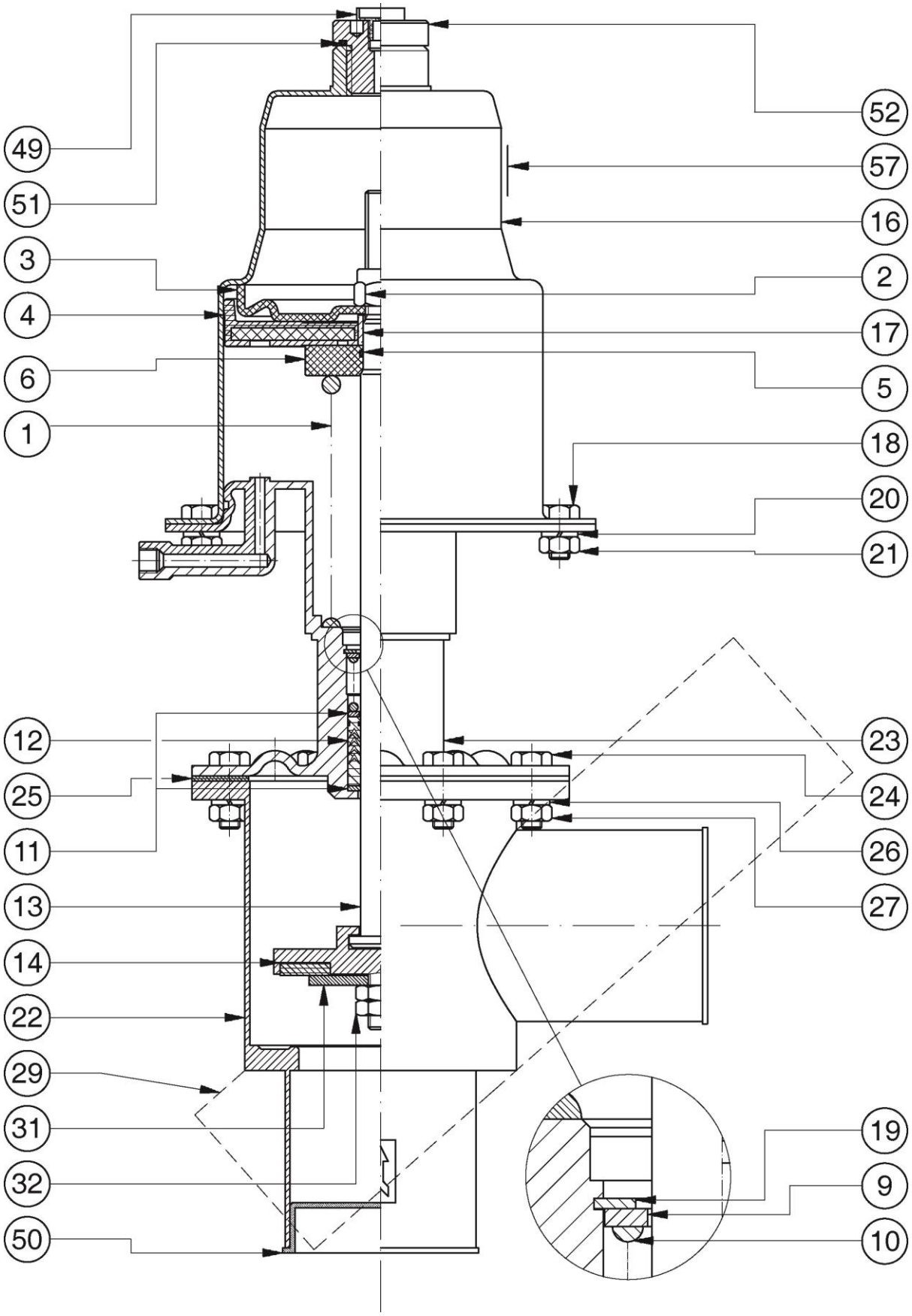
SPARE PARTS COMPLETE SERIES SPRINGLESS PISTON

SPARE PART CODE		**6382**
∅ PISTON		125
DETAIL	Q.ty	ND 65
4	1	TDUOP1254
5	1	OR02056VI
51	1	OR03112VI

SPARE PARTS COMPLETE SERIES - BODY

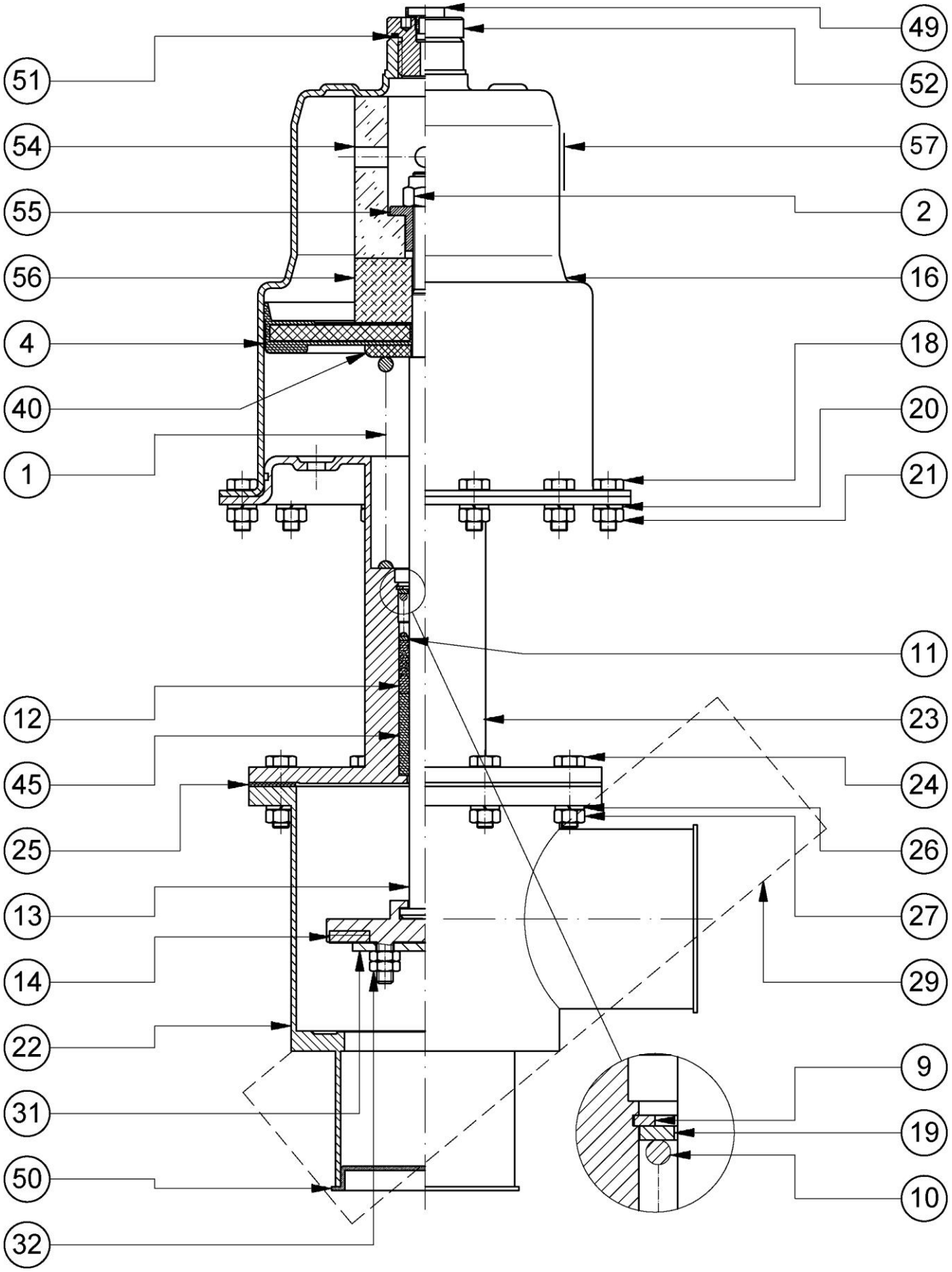
SPARE PART CODE		EPDM	**6389**
		R.T.	**6396**
DETAIL NR.		Q.ty	ND 65
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	541
	R.T.		TDRD90337
25		1	551

Section plane IVS-IVFL ND 65 normally open



Dwg. nr XX0281 Rev.:01

Section plane IVS-IVFL ND 80 to 200 normally open



Dwg. nr XX0282 Rev.:00

DETAIL NR.	Q.ty	DESCRIPTION	MATERIAL	GROUP	ND 80
1	1	Servocontrol spring	STEEL FOR SPRINGS	552	MTD087091
2	1	Self-braking nut	Fe 360	576	D12AUTOFE
4	1	TDUOP gasket	NBR STEEL	566	TDUOP1602
9	1	Plain washer	AISI 316	703	RDD088158
10	1	Packing gland spring	AISI 316	552	MTD088172
11	1	Packing gland washer	AISI 316	703	RDD088157
12	1	Packing gland	TEF./GRAF.	587	PT01626TG
13	1	Shutter stem.	AISI 316	788	ACPT990629
14	1	Cap	EPDM	511	542
			EPDM RIV. PTFE	818	TDRD90338
16	1	Spring bearing piston	AISI 304	651	NPMD90061
18	12	Hexagon head screw	AISI 304	500	VTE082004
19	1	Snap ring	AISI 304	695	SEEF27304
20	12	Spring washer	AISI 304	503	RE0800304
21	12	Hexagon nut	AISI 304	501	D08055884
22	1	Square body	AISI 316	841	M316010503
23	1	Intermediate body NO	AISI 304 AISI 316	632	CINT990623
24	8	Hexagon head screw	AISI 316	774	VTE083006
25	1	Body gasket	EPDM RINF. NYLON	511	GUAR030116
26	8	Spring washer	AISI 304	503	RE0800304
27	8	Hexagon nut	AISI 304	501	D08055884
29	1	Flow body	AISI 316	841	M316010504
31	1	Cap stop washer	AISI 316	526	RFD000121
32	6	Hexagon nut	AISI 316	501	D08055896
40	1	Piston bearing washer	Fe 360	671	RAD090362
45	1	Guide bush	PTFE	581	BGD091127
49	1	Threaded cap	POLYETH.	505	TEP400G018
50	2	Cylindrical cap	POLYETH.	505	T01ST00850
51	1	O-Ring gasket	VITON	548	OR03112VI
52	1	Air inlet coupling	AISI 304	811	RRDD91609
54	1	Bumper gasket	RUBBER	511	GUAR990678
55	1	Bumper stop washer	AISI 304	847	VLDE990228
56	1	Piston spacer ring NO	ALUMINIUM	522	DIST990679
57	1	Manufacturer's label		506	EAITA4324

4.23 Details and spare parts IVS-IVFL ND 80 to 200 normally open

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES MANUFACTURED SINCE 1999 FROM ND 80

POSITION 10

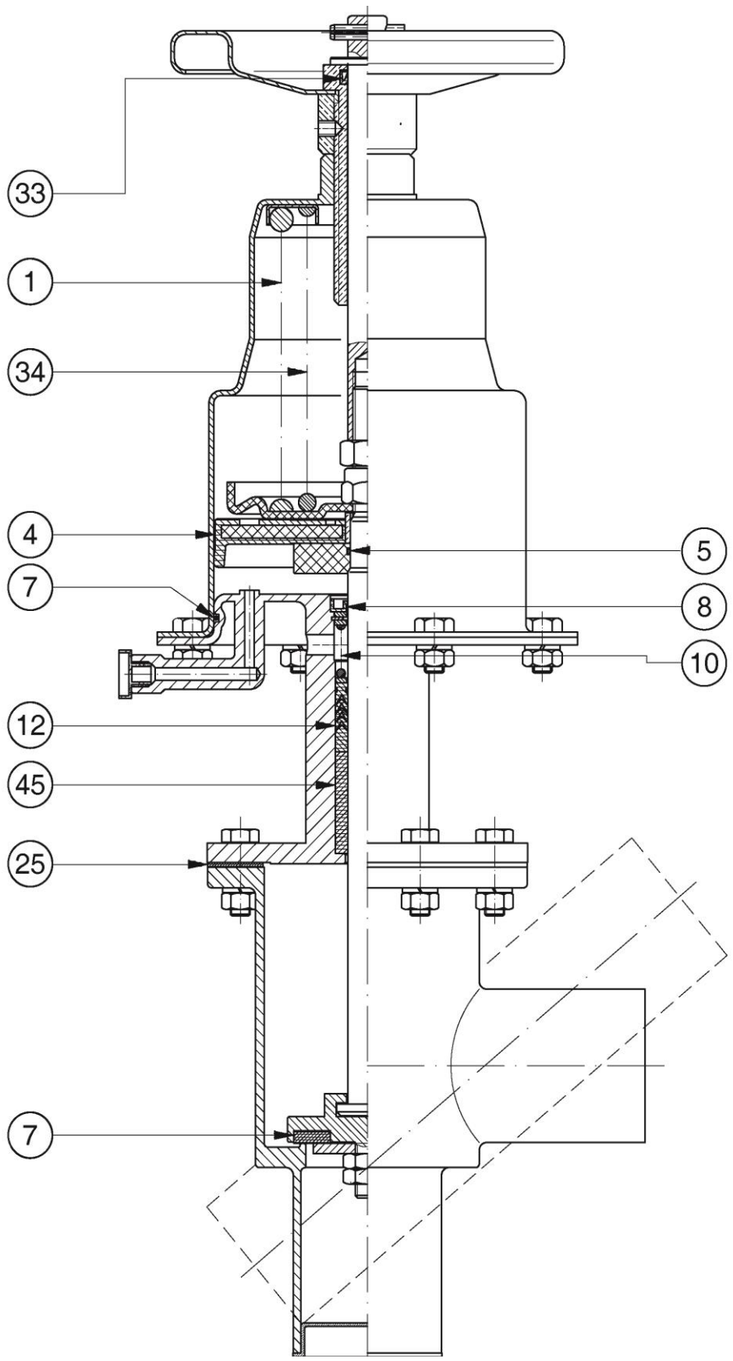
SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**6383**
∅ PISTON		160
DETAIL NR.	Q.ty	ND 80
4	1	TDUOP1602
51	1	OR03112VI
54	1	GUAR990678

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE		EPDM	**6390**
		R.T.	**6397**
DETAIL NR.		Q.ty	ND 80
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	542
	R.T.		TDRD90338
25		1	GUAR030116
45		1	BGD091127

Section plane IVS-IVFL ND 50 with uprated ΔP handwheel



4.24 Spare parts IVS-IVFL ND 50 with uprated ΔP handwheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES WITH UPRATED ΔP HANDWHEEL
MANUFACTURED SINCE 1996 – ND 50
POSITION 11

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3947**
∅ PISTON		125
DETAIL NR.	Q.ty	ND 50
4	1	TDUOP1254
5	1	OR02056VI
7	1	OR03475GA
33	1	GD0000062

SPARE PARTS COMPLETE SERIES - BODY

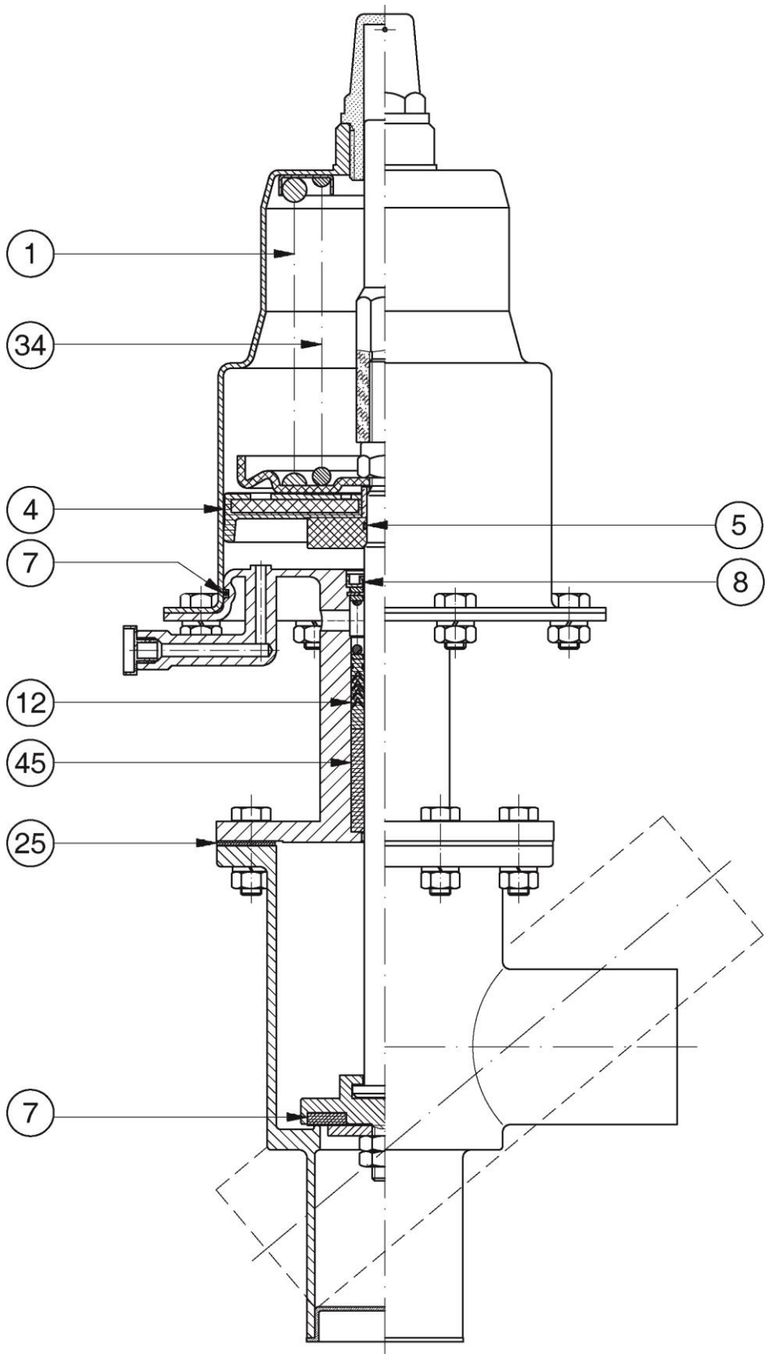
SPARE PART CODE		EPDM	**6403**
		R.T.	**6407**
		T.C.	**6411**
DETAIL NR.		Q.ty	ND 65
8		1	BA0V16305
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	540
	R.T.		TDRD90336
	T.C.		TTEF960057
25		1	550
45		1	BGD091127

SERVOCONTROL SPRINGS

DETAIL NR	Q.ty	MATER.	GROUP	ND 50
1	1	STEEL SPRINGS	552	MTD089226
34	1	STEEL SPRINGS	552	MTD089227

Dwg. nr XX0288 Rev.:01

Section plane IVS-IVFL ND 50 with ΔP uprated visual indicator



Dwg. nr XX0287 Rev.:01

4.25 Spare parts IVS-IVFL ND 50 with uprated ΔP visual indicator

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES WITH UPRATED ΔP VISUAL INDICATOR MANUFACTURED SINCE 1996 – ND 50
POSITION 12

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3947**
∅ PISTON		125
DETAIL NR.	Q.ty	ND 50
4	1	TDUOP1254
5	1	OR02056VI
7	1	OR03475GA

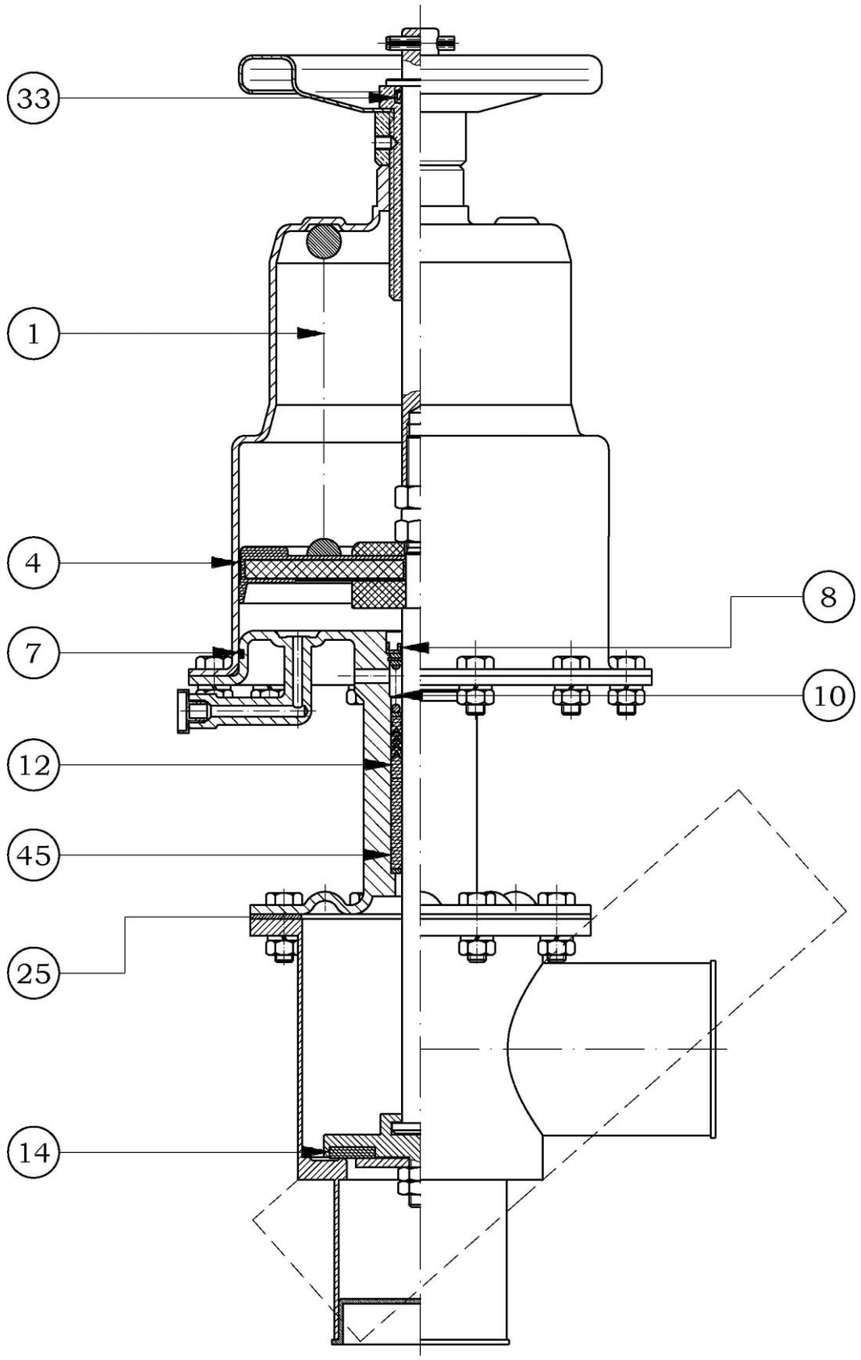
SPARE PARTS COMPLETE SERIES -BODY

SPARE PART CODE		EPDM	**6403**
		R.T.	**6407**
		T.C.	**6411**
DETAIL NR.		Q.ty	ND 50
8		1	BA0V16305
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	540
	R.T.		TDRD90336
	T.C.		TTEF960057
25		1	550
45		1	BGD091127

SERVOCONTROL SPRINGS

DETAIL NR	Q.ty	MATER.	GROUP	ND 50
1	1	STEEL SPRINGS	552	MTD089226
34	1	STEEL SPRINGS	552	MTD089227

Section plane IVS-IVFL ND 65 with uprated ΔP handwheel



4.26 Spare parts IVS-IVFL ND 65 with uprated ΔP handwheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES WITH UPRATED ΔP HANDWHEEL MANUFACTURED SINCE 1996 TO 2002– ND 65
POSITION 11

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**2840**
∅ PISTON		160
DETAIL NR.	Q.ty	ND 65
4	1	TDUOP1602
7	1	OR03600GA
33	1	GD0000062

SPARE PARTS COMPLETE SERIES - BODY

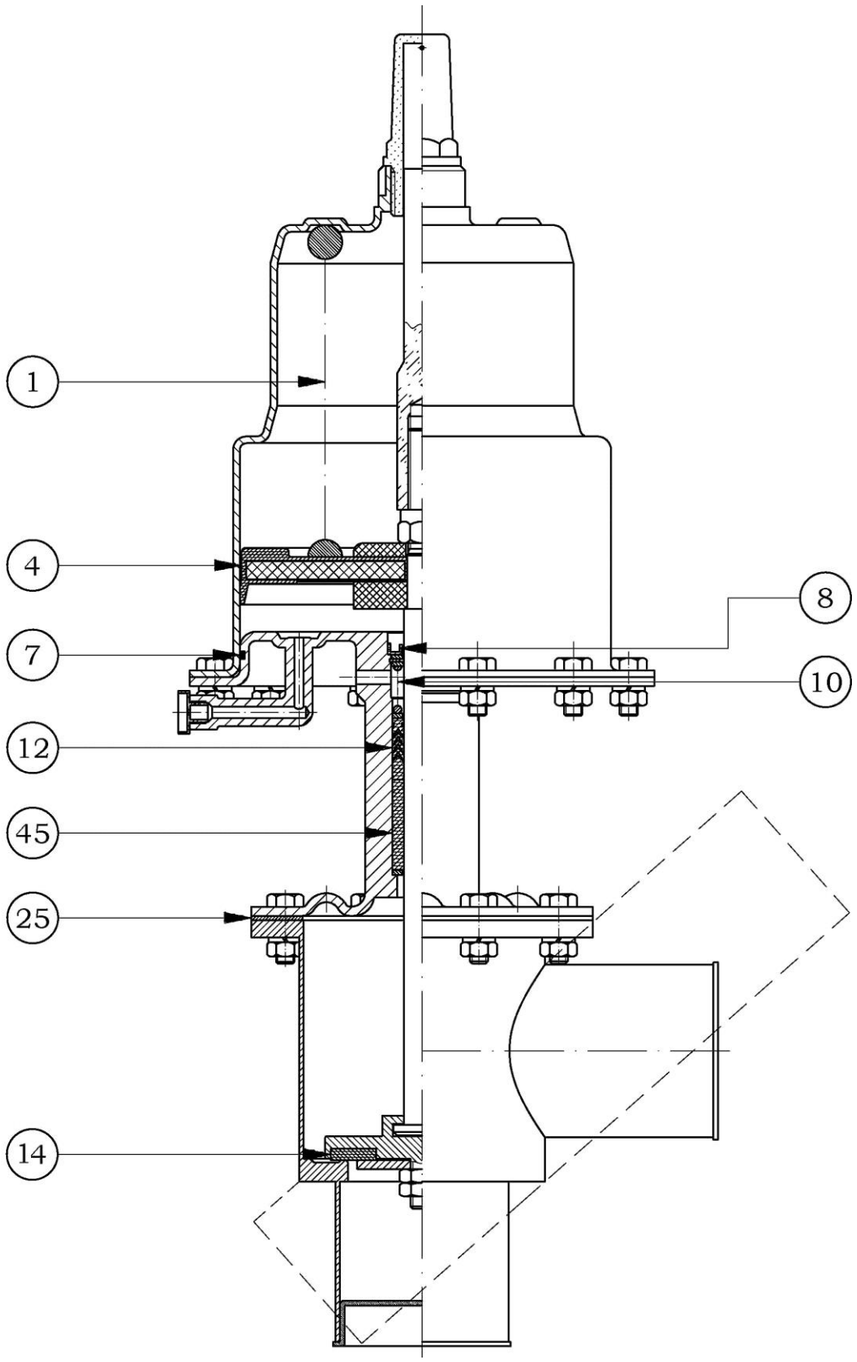
SPARE PART CODE	EPDM	**6404**
	R.T.	**6408**
DETAIL NR.	Q.ty	ND 65
8	1	BA0V16305
10	1	MTD088172
12	1	PT01626TG
14 EPDM	1	541
14 R.T.	1	TDRD90337
25	1	551
45	1	BGD091127

SERVOCONTROL SPRINGS

DETAIL NR	Q.ty	MATER.	GROUP	ND 65
1	1	STEEL FOR	552	562

Dwg. nr XX0290 Rev.:00

Section plane IVS-IVFL ND 65 with uprated ΔP handwheel



4.27 Spare parts IVS-IVFL ND 65 with uprated ΔP handwheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES WITH UPRATED ΔP VISUAL INDICATOR MANUFACTURED SINCE 1996 TO 2002 – ND 65
POSITION 12

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3948**
∅ PISTON		160
DETAIL NR.	Q.ty	ND 65
4	1	TDUOP1602
7	1	OR03600GA

SPARE PARTS COMPLETE SERIES - BODY

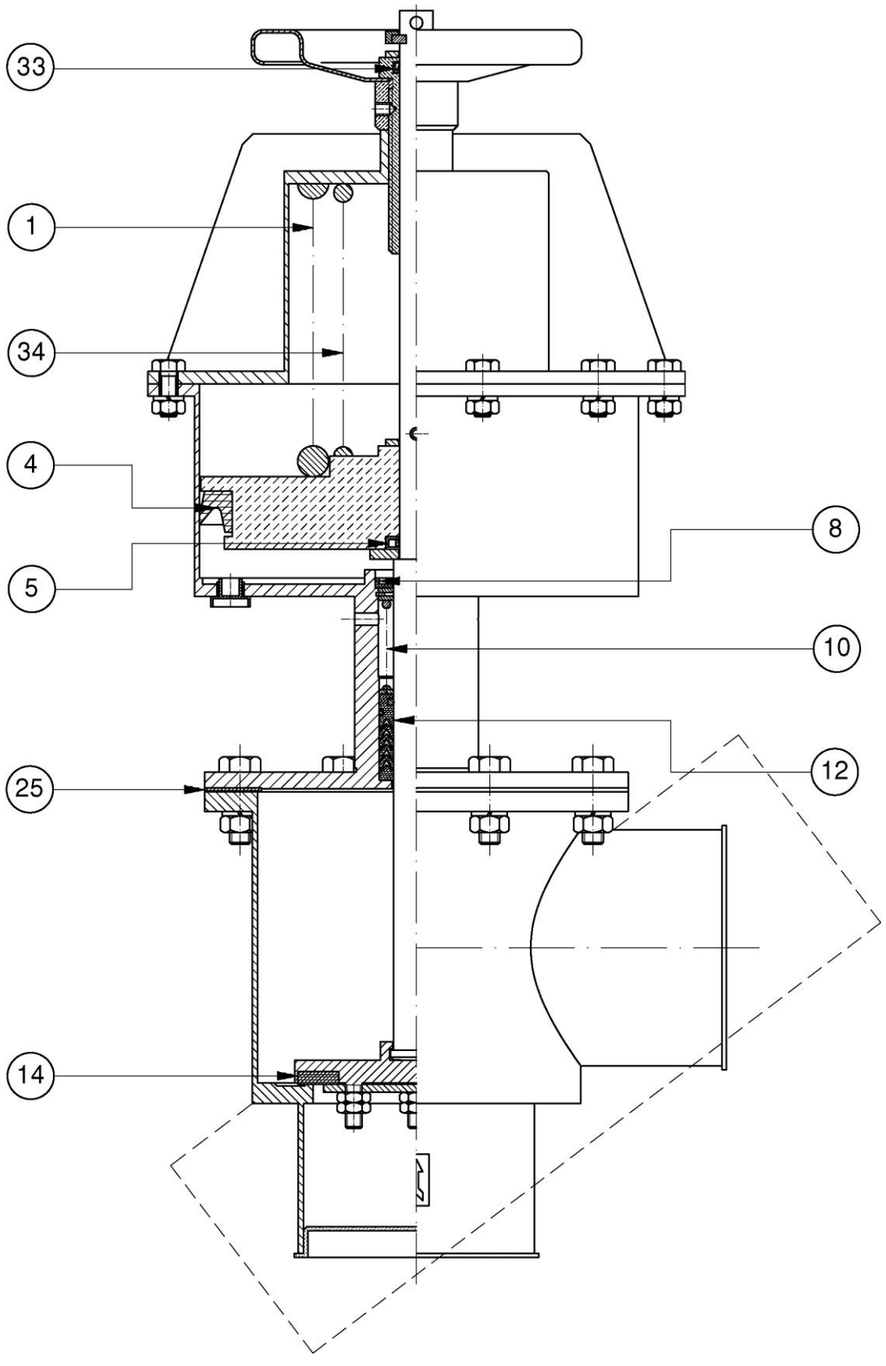
SPARE PART CODE		EPDM	**6404**
		R.T.	**6408**
PART. N°		Q.ty	ND 65
8		1	BA0V16305
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	541
	R.T.		TDRD90337
25		1	551
45		1	BGD091127

SERVOCONTROL SPRINGS

DETAIL NR	Q.ty	MATER.	GROUP	ND 50
1	1	STEEL FOR SPRINGS	552	562

Dwg. nr XX0289 Rev.:00

Section plane IVS-IVFL ND 80 to 200 with uprated ΔP handwheel



4.28 Spare parts IVS-IVFL ND 80 to 200 with uprated ΔP handwheel

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES WITH UPRATED ΔP HANDWHEEL MANUFACTURED SINCE 1996 – FROM ND 80 TO ND 200

POSITION 13

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE				**2841**				
∅ PISTON				210				
PART. N°	Q.ty	MATER.	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
4	1	GACO	511	530				
5	1	VITON	567	BA0V16305				
33	1	GACO	511	GD0000062				

SPARE PARTS COMPLETE SERIES -BODY

SPARE PART CODE			EPDM	**6405**	**6406**	**2828**	**2829**	**2830**
			R.T.	**6409**	**6410**	**4198**	**4199**	**4200**
DETAIL NR.	Q.ty	MATER.	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
8	1	VITON	567	BA0V22405				
10	1	AISI 316	552	MTD088163				
12	1	TEF/GRAF	587	PT02236TG				
14	1	EPDM	511	542	543	544	545	546
		EPDM PTFE	818	TDRD90338	TDRD90339	TDRD90340	TDRD90341	TDRD90395
25	1	**(1)**	511	GUAR030116	GUAR040146	554	555	556

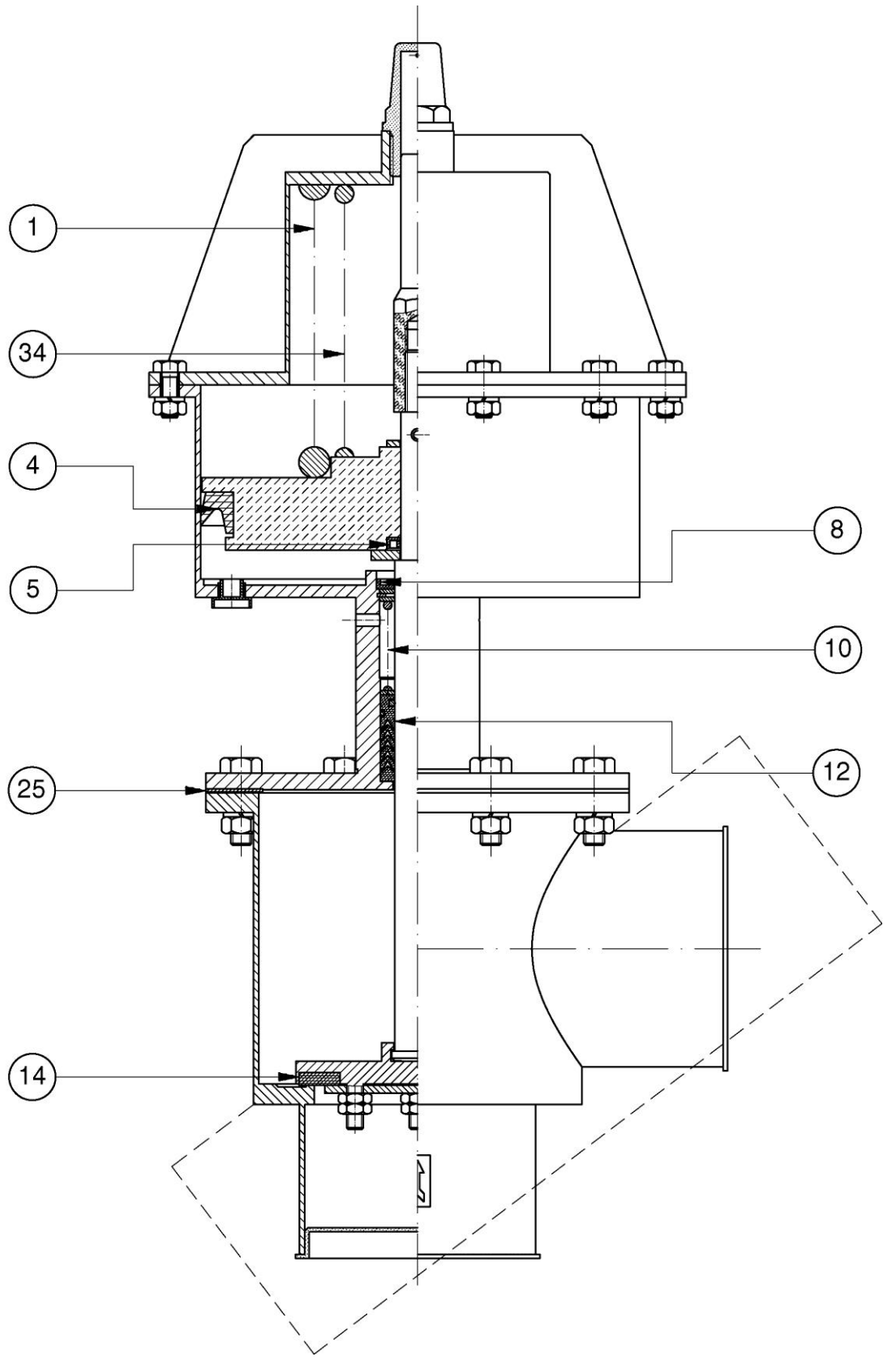
(1) EPDM RINF. NYLON FROM ND 80 TO ND 100– TESNIT-BAU FROM ND 125 TO ND 200

SERVOCONTROL SPRINGS

DETAIL NR	Q.ty	MATER.	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	STEEL FOR SPRINGS	552	562				
34	1	STEEL FOR SPRINGS	552	MTD089226				

Dwg. nr XX0285 Rev.:00

Section plane IVS-IVFL ND 80 to 200 with uprated ΔP visual indicator



Dwg. nr XX0284 Rev.:00

4.29 Spare parts IVS-IVFL ND 80 to 200 with uprated ΔP visual indicator

GROUP 94

STAINLESS STEEL VALVE SPARE PARTS COMPLETE SERIES WITH UPRATED ΔP VISUAL INDICATOR MANUFACTURED SINCE 1996 – FROM ND 80 TO ND 200

POSITION 14

COMPLETE SERIES SPARE PARTS SPRINGLESS PISTON

SPARE PART CODE				**3949**				
∅ PISTON				210				
PART. N°	Q.ty	MATER.	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
4	1	GACO	511	530				
5	1	VITON	567	BA0V16305				

SPARE PARTS COMPLETE SERIES - BODY

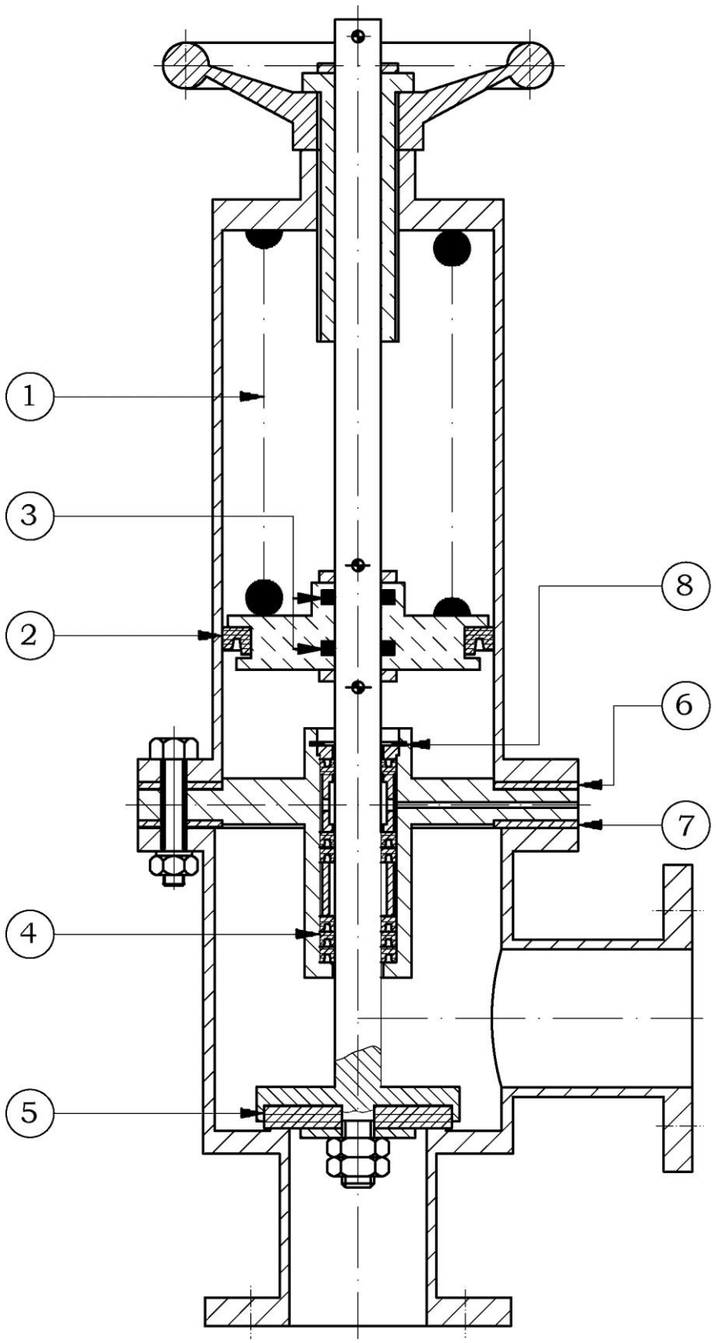
SPARE PART CODE			EPDM	**6405**	**6406**	**2828**	**2829**	**2830**
			R.T.	**6409**	**6410**	**4198**	**4199**	**4200**
PART. N°	Q.ty	MATER.	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
8	1	VITON	567	BA0V22405				
10	1	AISI 316	552	MTD088163				
12	1	TEF/GRAF	587	PT02236TG				
14	1	EPDM	511	542	543	544	545	546
		EPDM PTFE	818	TDRD90338	TDRD90339	TDRD90340	TDRD90341	TDRD90395
25	1	**(1)**	511	GUAR030116	GUAR040146	554	555	556

(1) EPDM RINF. NYLON FROM ND 80 TO ND 100– TESNIT-BAU FROM ND 125 TO ND 200

SERVOCONTROL SPRINGS

DETAIL NR	Q.ty	MATER.	GROUP	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	STEEL FOR SPRINGS	552	562				
34	1	STEEL FOR SPRINGS	552	MTD089226				

Section plane IVS-IVFL Position 1



Dwg. nr 980083 Rev.:00

4.30 Spare parts IVS-IVFL Position 1

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1973 TO 1974 FROM ND 15 TO ND 200

POSITION 1

SPARE PARTS COMPLETE SERIES - SPRINGLESS

SPARE PART CODE				2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754
DET. NR	Q.ty	MATERIAL	GROUP	ND 15-20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
2	1	GACO	511	GDE0000162		GDE0000212	525	526	527	528				530
3	2	GACO	548	531				532						
4	6	VITON	803	GU0093056V				GUV0100062V						
5	1	EPDM	511	2613	GUAR980215	GUAR980216	GUAR980217	GUAR970834	GUAR970835	GUAR970836	GUAR980084	GUAR980085	GUAR980086	GUAR980087
6	**(1)**	TESNIT BAU	511	GUAR980100		GUAR980101	GUAR980102	GUAR980096	GUAR980097	552	553		552	GUAR980099
7	1	TESNIT BAU	511	GUAR980100		GUAR980101	GUAR980102	GUAR980096	GUAR980097	552	553		GUAR980098	GUAR980099
8	1	AISI 304	693	-				SEEF031316						

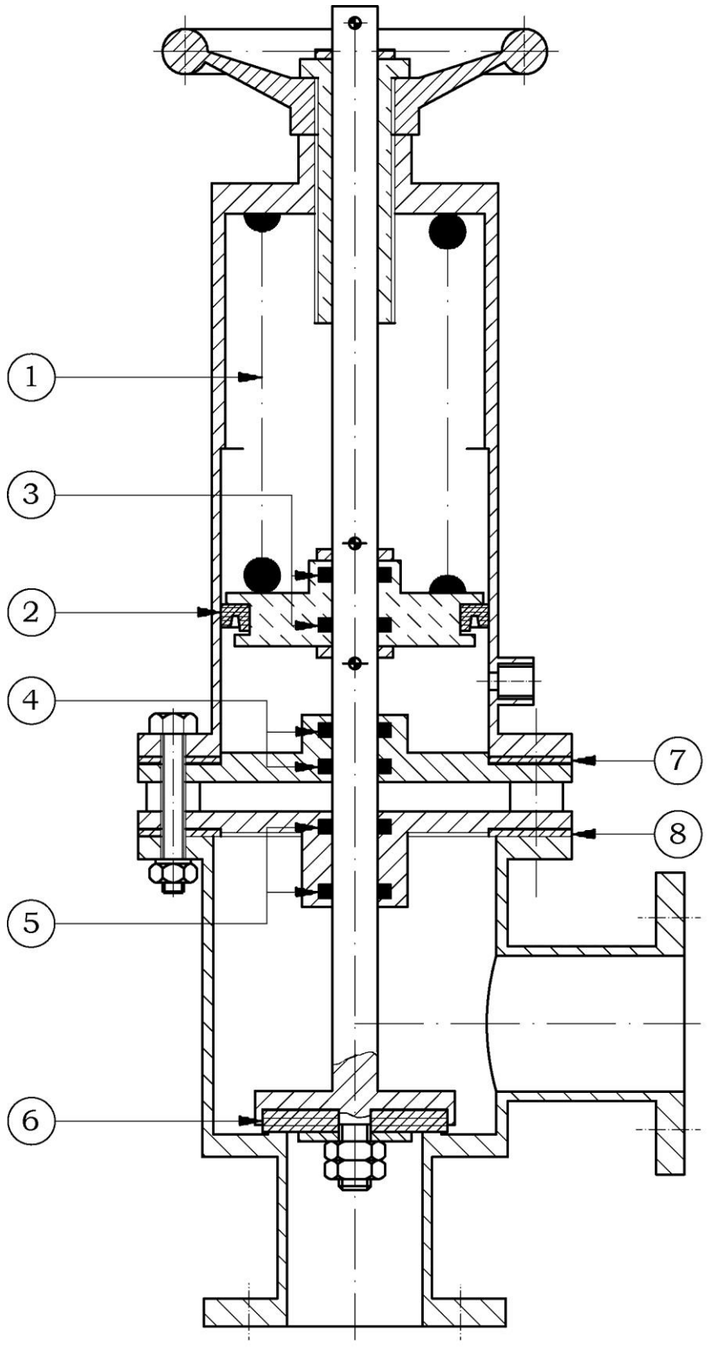
(1) N° 2 FROM ND 15 TO ND 40 - N° 1 FROM ND 50 TO ND 200

SERVOCONTROL SPRING

PART. N°	Q.ty	MATER.	ND 15-20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	STEEL FRO SPRINGS	MZ 15	MZ 16	MZ 17	MZ 18	MTD087091 **(2)**	MZ 20	MZ 21				MZ 310

(2) THE SPRING CODE MTD089091 SHALL BE SUPPLIED TOGETHER WITH SPACER RING CODE DIST980398

Section plane IVS-IVFL Position 1



4.31 Spare parts IVS-IVFL Position 2

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1975 TO 1979 FROM ND TO AL ND 200

POSITION 2

SPARE PARTS COMPLETE SERIES - SPRINGLESS

SPARE PART CODE				**5194**	**5195**	**5196**	**5197**	**5198**	**5199**	**5200**	**5201**	**5202**	**5203**	**5204**
DET. NR	Q.ty	MATERIAL	GROUP	ND 15-20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
2	1	GACO	511	GDE0000162		GDE0000212	525	526	527	528				530
3	2	GACO	548	531				532						
4	2	**(2)**	548	531				532				533		OR04118VI
5	2	VITON	548	OR03056VI				535				536		OR04118VI
6	**(1)**	EPDM	511	2613	GUAR980215	GUAR980216	GUAR980217	GUAR970834	GUAR970835	GUAR970836	GUAR980084	GUAR980085	GUAR980086	GUAR980087
7	1	TESNIT BAU	511	GUAR980100		GUAR980101	GUAR980102	GUAR980096	GUAR980097	552	553	552		GUAR980099
8	1	TESNIT BAU	511	GUAR980100		GUAR980101	GUAR980102	GUAR980096	GUAR980097	552	553	554	GUAR980098	GUAR980099

(1) N° 2 FROM ND 15 TO ND 40 - N° 1 FROM ND 50 TO ND 200

(2) IN GACO FROM ND 15 TO ND 150 – IN VITON ND 200

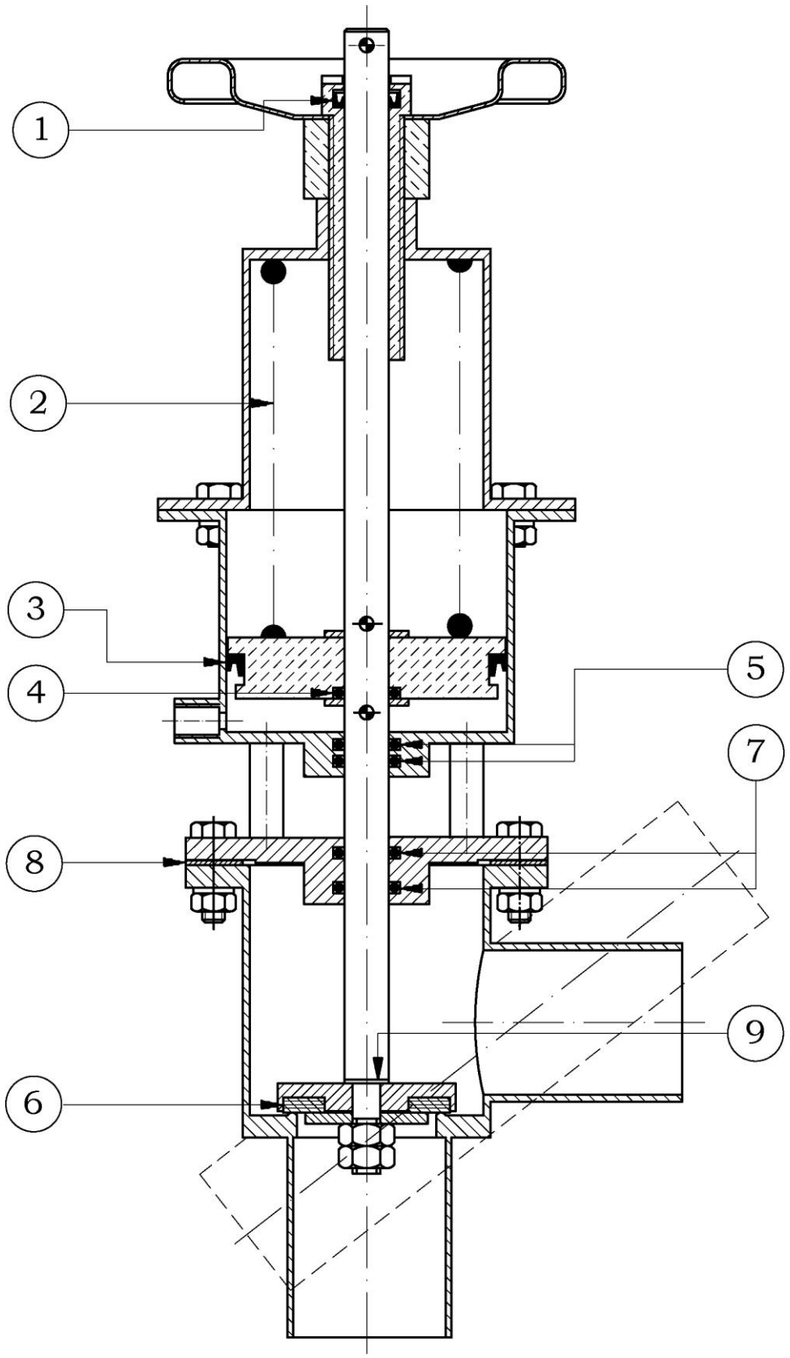
SERVOCONTROL SPRING

DETAIL NR	Q.ty	MATER.	ND 15-20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	STEEL FRO SPRINGS	MZ 16		MZ 17	MZ 18	MTD087091 **(3)**	MZ 20	MZ 21				MZ 310

(3) THE SPRING CODE MTD089091 SHALL BE SUPPLIED TOGETHER WITH SPACER RING CODE DIST980398

Dwg. nr 980137 Rev.:00

Section plane IVS-IVFL Positions 3 - 5



4.32 Spare parts IVS-IVFL Position 3 - 5

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES : FROM 1980 TO 1988 FROM ND 15 TO ND 50 – DAL 1980 AL 1990 ND 65 – FROM 1980 TO 1992 FROM ND 80 TO ND 200

POSITIONS 3 – 5

SPARE PARTS COMPLETE SERIES - SPRINGLESS

SPARE PART CODE				**2615**	**1243**	**1244**	**1245**	**1246**	**1247**	**1248**	**1249**	**1408**	**1422**	**1423**
DET. NR	Q.ty	MATERIAL	GROUP	ND 15-20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	GACO	511	GD0000056				GD0000062						
3	1	GACO	511	525			526	527	528	529		530		
4	**(1)**	GACO	511	531				532						
5	2	GACO	548	531				532				533		
6	1	EPDM	511	2613	537	538	539	540	541	542	543	544	545	546
7	2	VITON	548	OR03056VI				535				536		
8	1	TESNIT BAU	511	547		548	549	550	551	552	553	554	555	556
9	1	TEFLON	511	GD0001465				-						

(1) N° 2 FROM ND 15 TO ND 125 - N° 1 FROM ND 150 TO ND 200

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 15-20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
1	1	STEEL FOR SPRINGS	557 **(3)**		558 **(4)**	MTD087091 **(2)**		561	562				

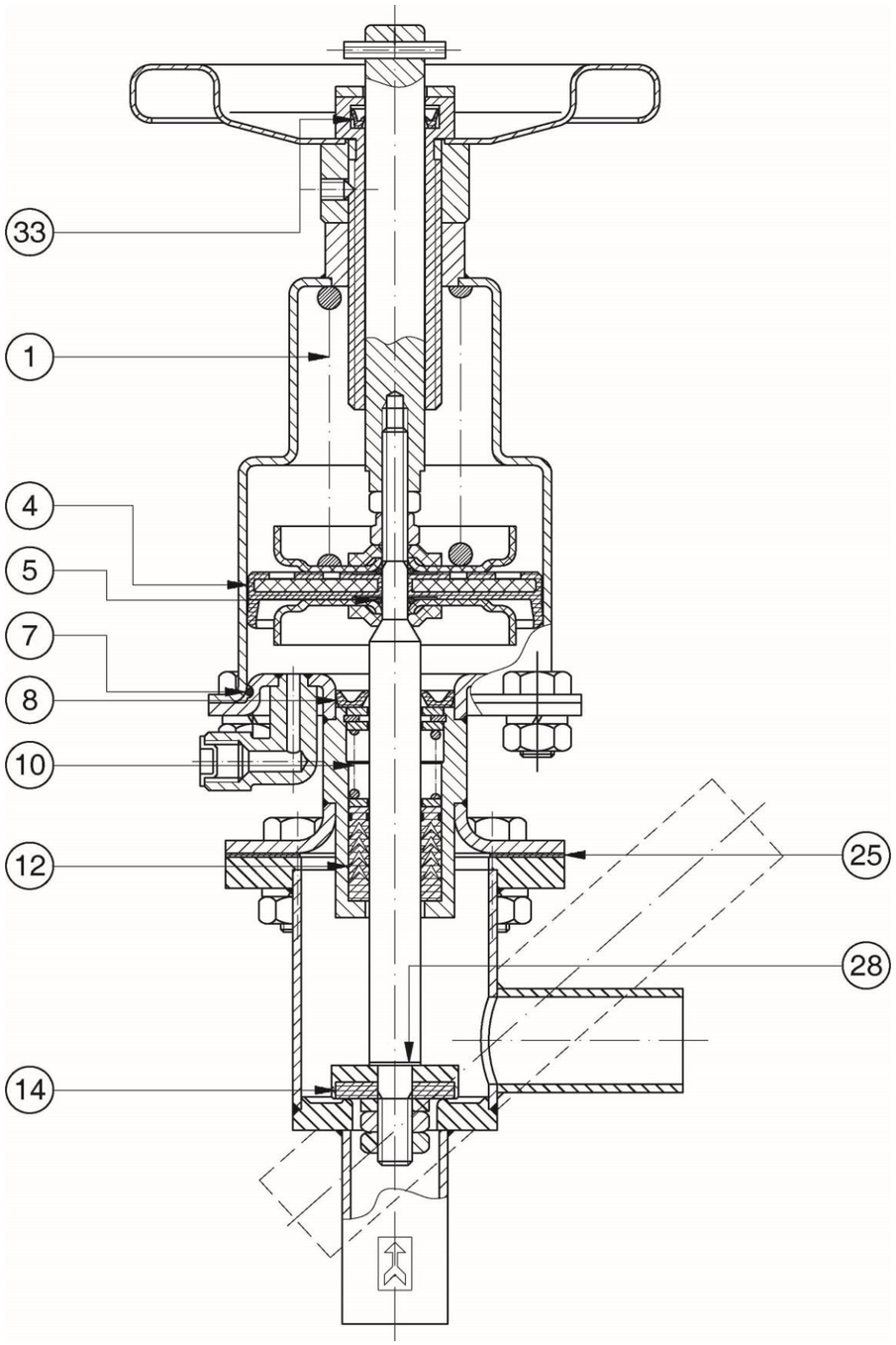
(2) SPACER RING CODE DISTXX0132 FOR ND 40 AND SPACER RING CODE DIST980095 FOR ND 50 SHALL BE SUPPLIED TOGETHER WITH SPRING CODE MTD087091

(3) THIS PARTICULAR IS NO LONGER AVAILABLE AS SPARE PART

(4) SOSTITUTED BY CODE MTD088167

Dwg. nr 89267 Rev.:00

Section plane IVS-IVFL ND 15-50 Positions 4 – 6



4.33 Spare parts IVS-IVFL ND 15-50 Positions 4 - 6

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1989 TO 1996 FROM ND 15 TO ND 50
POSITIONS 4 – 6

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**2837**			**2838**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	OR03256GA			OR03300GA		
33	1	GD0000056					

SPARE PARTS COMPLETE SERIES - BODY

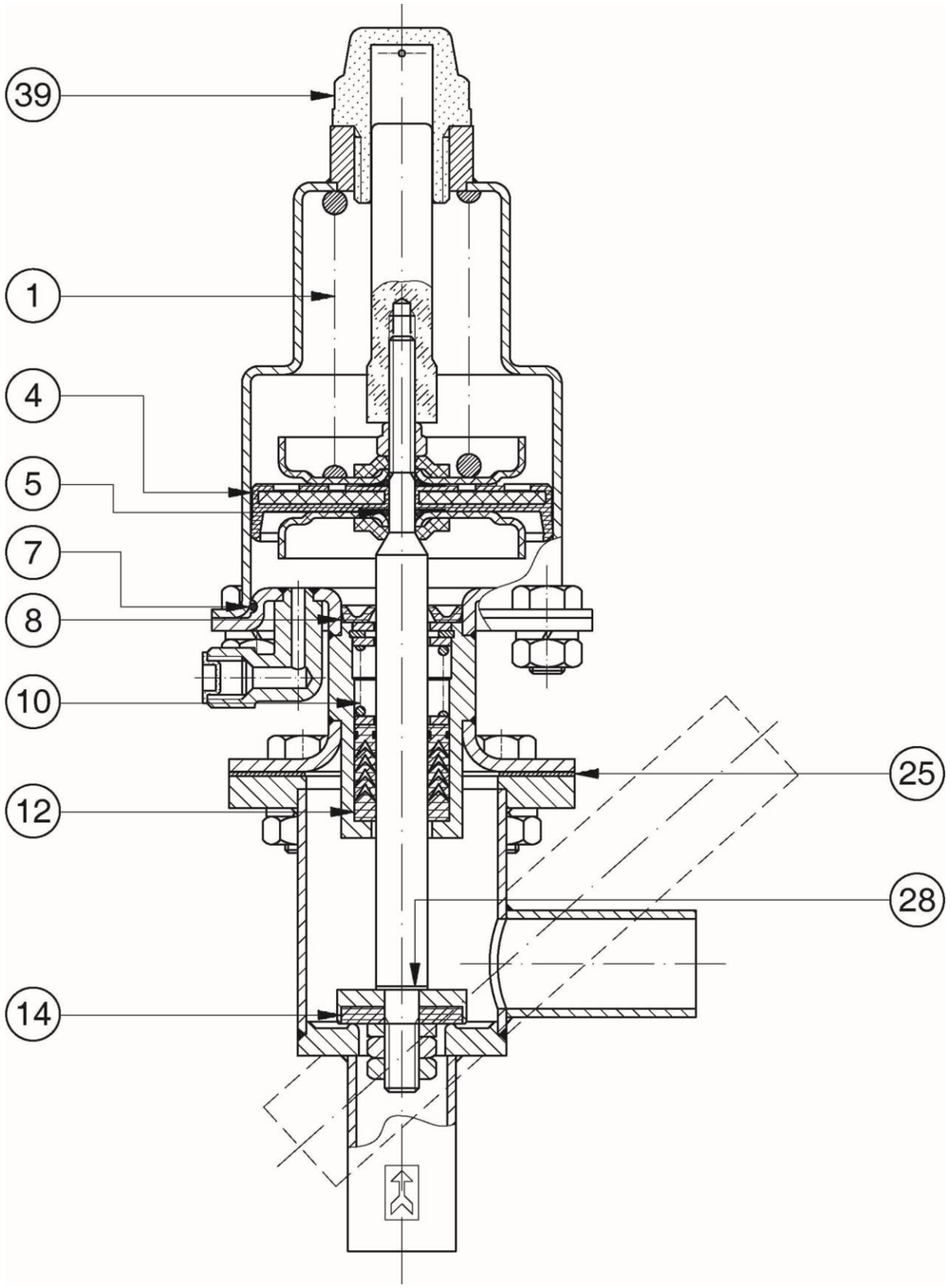
SPARE PART CODE		EPDM	**2820**		**2821**	**2822**	**2823**	**2824**
		R.T.	**4190**		**4191**	**4192**	**4193**	**4194**
		T.C.	**5351**		**5352**	**5353**	**5354**	**5355**
DETAIL NR.		Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
8		1	BA0V12284					
10		1	MTD088149					
12		1	PT01222TG					
14	EPDM	1	2613		537	538	539	540
	R.T.		TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.		TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25		1	GUAR950928			GUAR950929	GUAR950930	550
28		1	GD0001465					

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	STEEL FOR	557			MTD087091		

Dwg. nr 93128 Rev.:00

Section plane IVS-IVFL ND 15-50 Position 7



Dwg. nr 93581 Rev.:00

4.34 Spare parts IVS-IVFL ND 15- 50 Position 7

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1993 TO 1996 – FROM ND 15 TO ND 50
POSITION 7

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3945**			**3946**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	OR03256GA			OR03300GA		

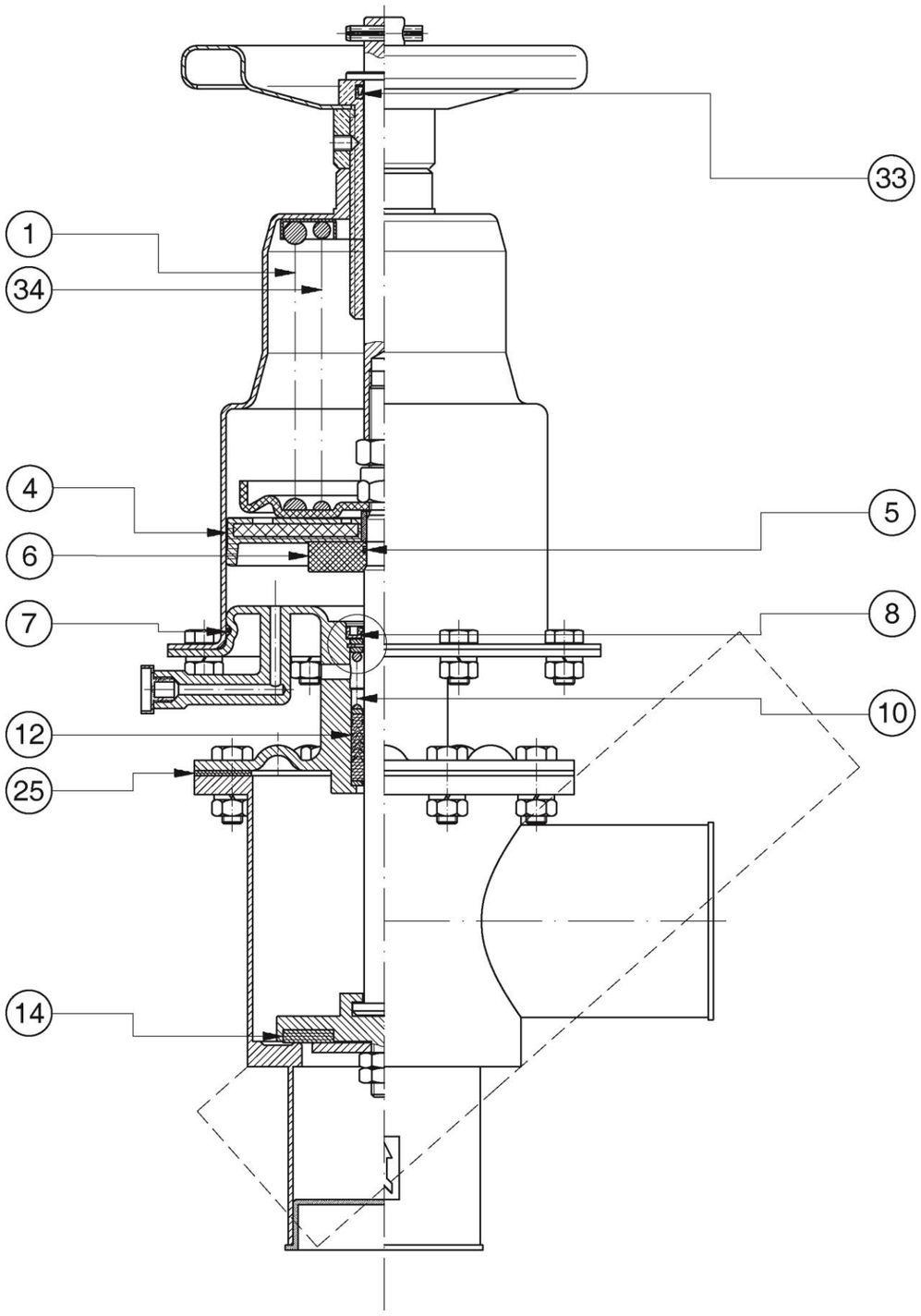
SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE			**2820**		**2821**	**2822**	**2823**	**2824**
		R.T.	**4190**		**4191**	**4192**	**4193**	**4194**
		T.C.	**5351**		**5352**	**5353**	**5354**	**5355**
DETAIL NR.		Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
8		1	BA0V12284					
10		1	MTD088149					
12		1	PT01222TG					
14	EPDM	1	2613		537	538	539	540
	R.T.		TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.		TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25		1	GUAR950928			GUAR950929	GUAR950930	550
28		1	GD0001465					

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	STEEL FOR SPRINGS	557			MTD087091		

Section plane IVS-IVFL ND 65 Positions 4 – 6



4.35 Spare parts IVS-IVFL ND 65 Positions 4 - 6

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1991 TO 2002 ND 65
POSITIONS 4 – 6

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**2839**
∅ PISTON		125
DETAIL NR.	Q.ty	ND 65
4	1	TDUOP1254
5	1	OR02056VI
6	1	RAD089220
7	1	OR03475GA
33	1	GD0000062

SPARE PARTS COMPLETE SERIES - BODY

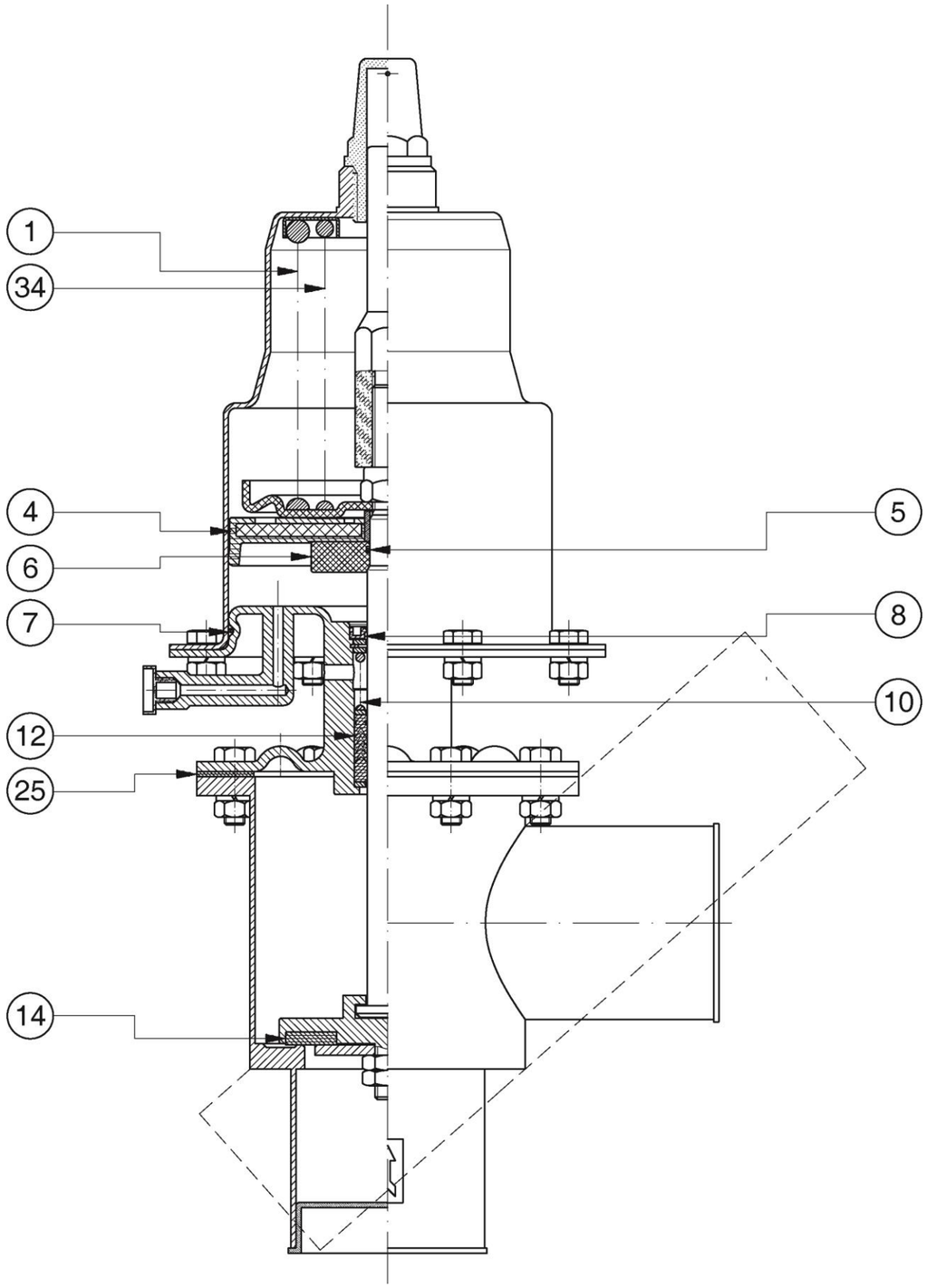
SPARE PART CODE	EPDM	**2825**
	R.T.	**4195**
DETAIL NR.	Q.ty	ND 65
8	1	BA0V16305
10	1	MTD088172
12	1	PT01626TG
14 EPDM	1	541
14 R.T.	1	TDRD90337
25	1	551

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 65
1	1	STEEL FOR SPRINGS	MTD089226
34	1	STEEL FOR SPRINGS	MTD089227

Dwg. nr 030789 Rev.:00

Section plane IVS-IVFL ND 65 Position 7



Dwg. nr 030790 Rev.:00

4.36 Spare parts IVS-IVFL ND 65 Position 7

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1993 TO 2002 ND 65 POSITION 7

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3947**
∅ PISTON		125
DETAIL NR.	Q.ty	ND 65
4	1	TDUOP1254
5	2	OR02056VI
6	1	RAD089220
7	1	OR03475GA

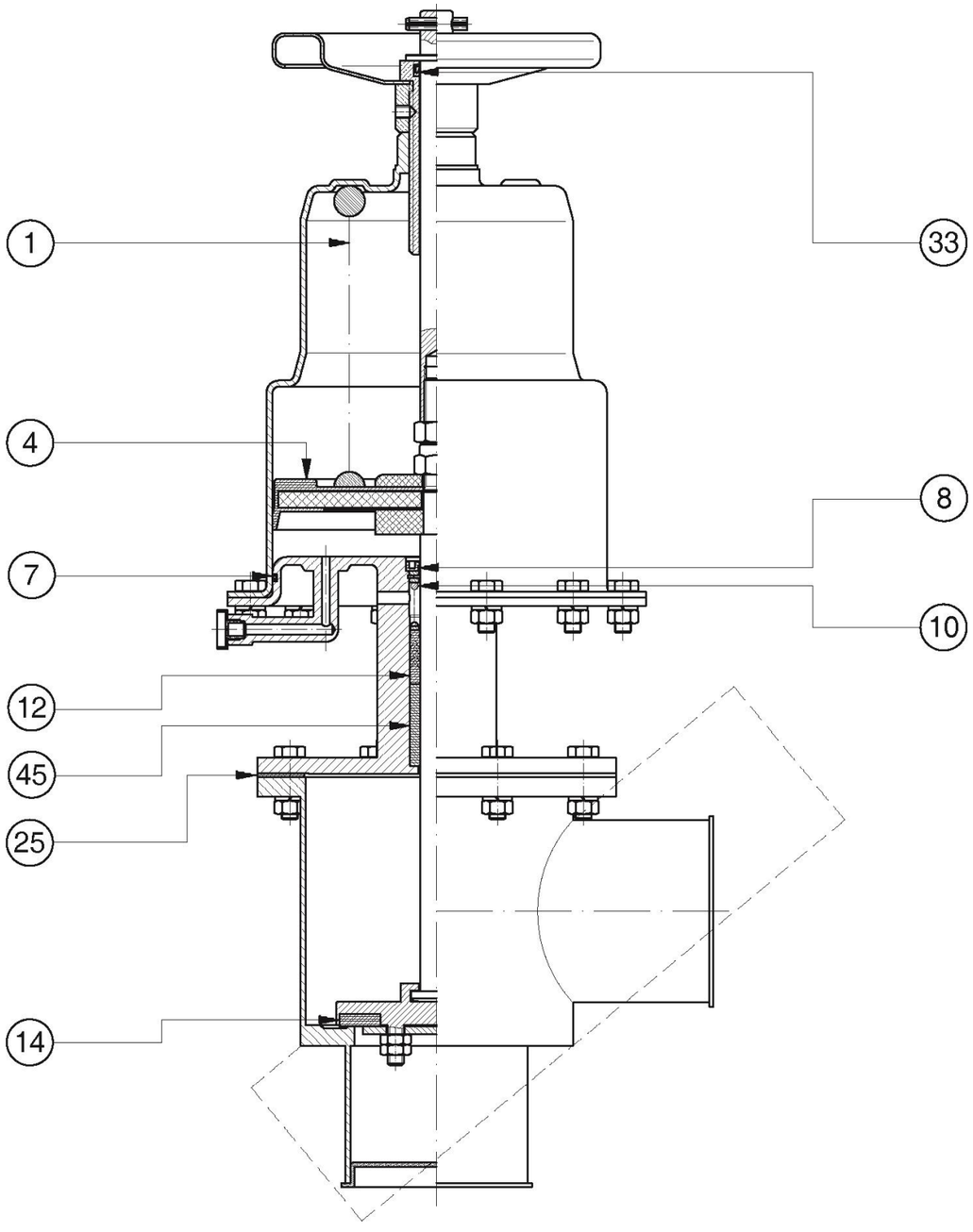
SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE		EPDM	**2825**
		R.T.	**4195**
		T.C.	
DETAIL NR.		Q.ty	ND 65
8		1	BA0V16305
10		1	MTD088172
12		1	PT01626TG
14	EPDM	1	541
	R.T.		TDRD90337
25		1	551

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 65
1	1	STEEL FOR SPRINGS	MTD089226
34	1	STEEL FOR SPRINGS	MTD089227

Section plane IVS-IVFL ND 80 Positions 4



4.37 Spare parts IVS-IVFL ND 80 Positions 4

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1993 TO END 2003 ND 80 POSITIONS 4

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**2840**	
∅ PISTON		160	
DETAIL NR.	Q.ty	ND 80	ND 100
4	1	TDUOP1602	
7	1	OR03600GA	
33	1	GD0000062	

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE	EPDM	**2826**	**2827**
	R.T.	**4196**	**4197**
DETAIL NR.	Q.ty	ND 80	ND 100
8	1	BA0V16305	
10	1	MTD088172	
12	1	PT01626TG	
14 EPDM	1	542	543
14 R.T.	1	TDRD90338	TDRD90339
25	1	GUAR030116	GUAR040146
45	1	BGD091127	

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 80	ND 100
1	1	STEEL FOR SPRINGS	562	

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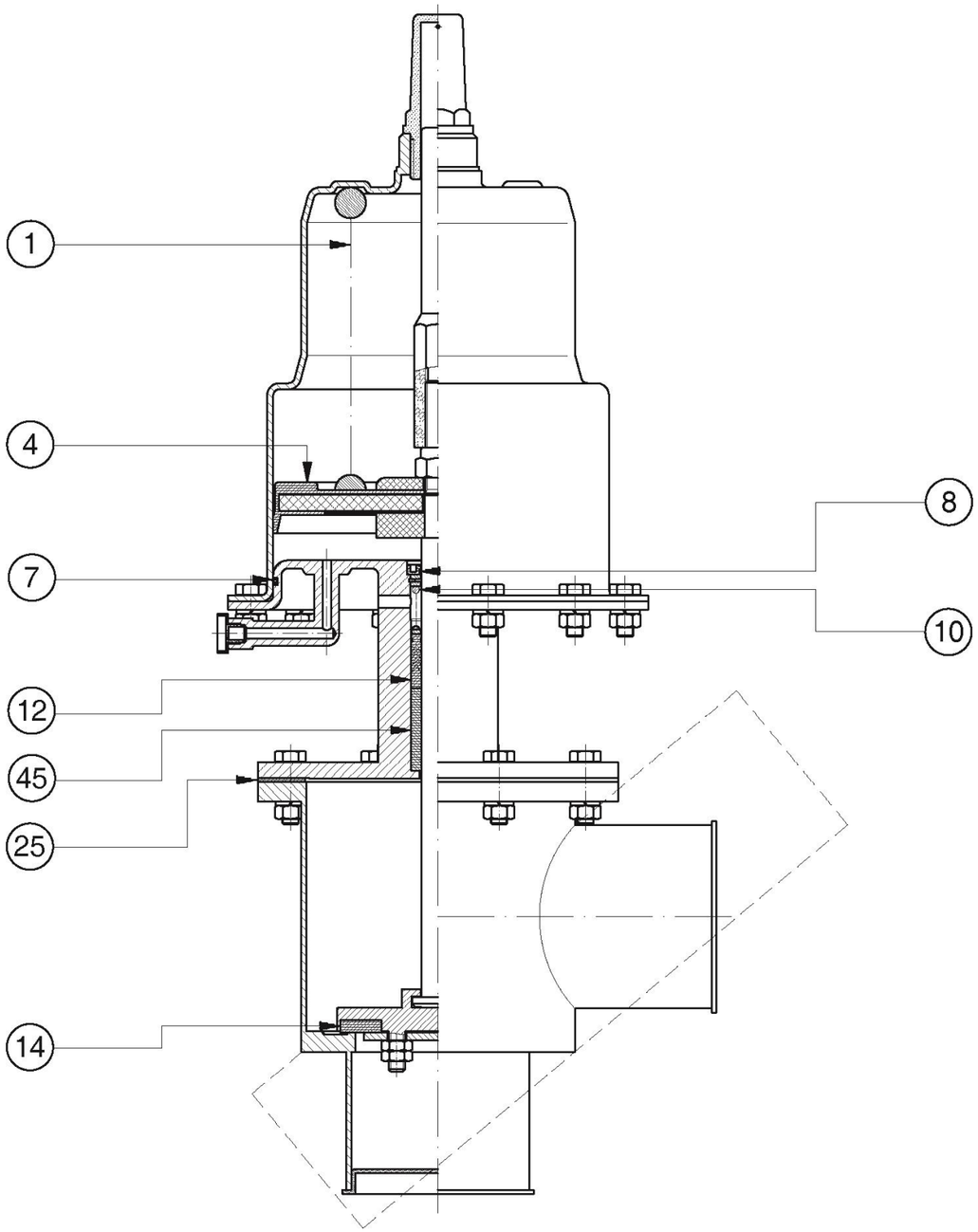
Section plane IVS-IVFL ND 80 Positions 7



4.38 Spare parts IVS-IVFL ND 80 Positions 7

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1993 TO END 2003 ND 80 POSITIONS 7

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3948**	
∅ PISTON		160	
DETAIL NR.	Q.ty	ND 80	ND 100
4	1	TDUOP1602	
7	1	OR03600GA	

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE	EPDM	**2826**	**2827**
	R.T.	**4196**	**4197**
DETAIL NR.	Q.ty	ND 80	ND 100
8	1	BA0V16305	
10	1	MTD088172	
12	1	PT01626TG	
14	EPDM	1	542	543
	R.T.		TDRD90338	TDRD90338
25	1	GUAR030116	GUAR040146
45	1	BGD091127	

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 80	ND 100
1	1	STEEL FOR SPRINGS	562	

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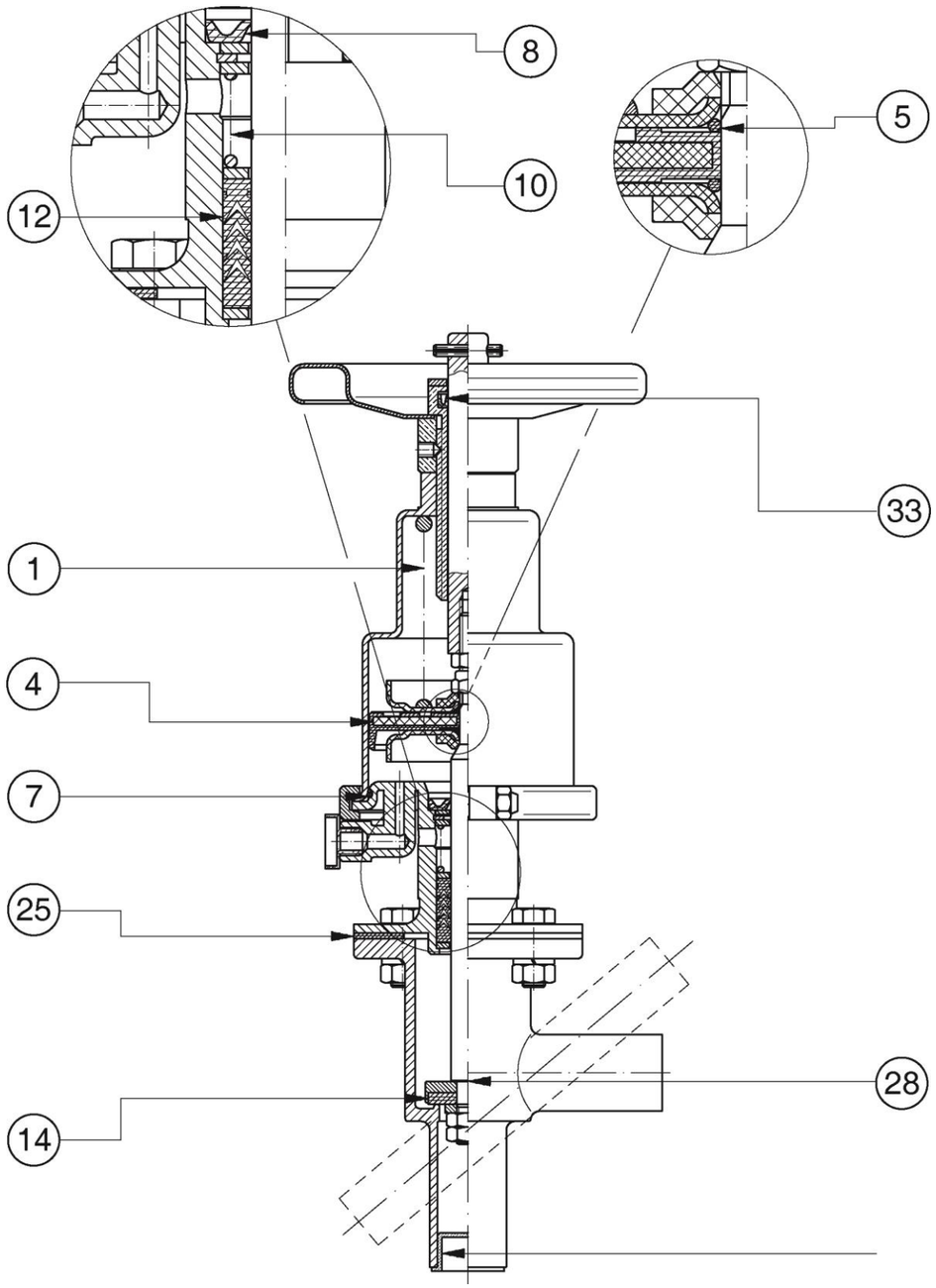
Section plane IVS-IVFL DN 15-50 Positions 8



4.39 Spare parts IVS-IVFL DN 15-50 Positions 8

GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1996 TO 2002 FROM ND 15 TO ND 50
POSITIONS 8

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**2837**			**2838**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	OR03256GA			OR03300GA		
33	1	GD0000056					

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE		EPDM	**2820**		**2821**	**2822**	**2823**	**2824**
		R.T.	**4190**		**4191**	**4192**	**4193**	**4194**
		T.C.	**5351**		**5352**	**5353**	**5354**	**5355**
DETAIL NR.		Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
8		1	BA0V12284					
10		1	MTD088149					
12		1	PT01222TG					
14	EPDM	1	2613		537	538	539	540
	R.T.		TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.		TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25		1	GUAR950928			GUAR950929	GUAR950930	550
28		1	GD0001465					

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	STEEL FOR	557			MTD087091		

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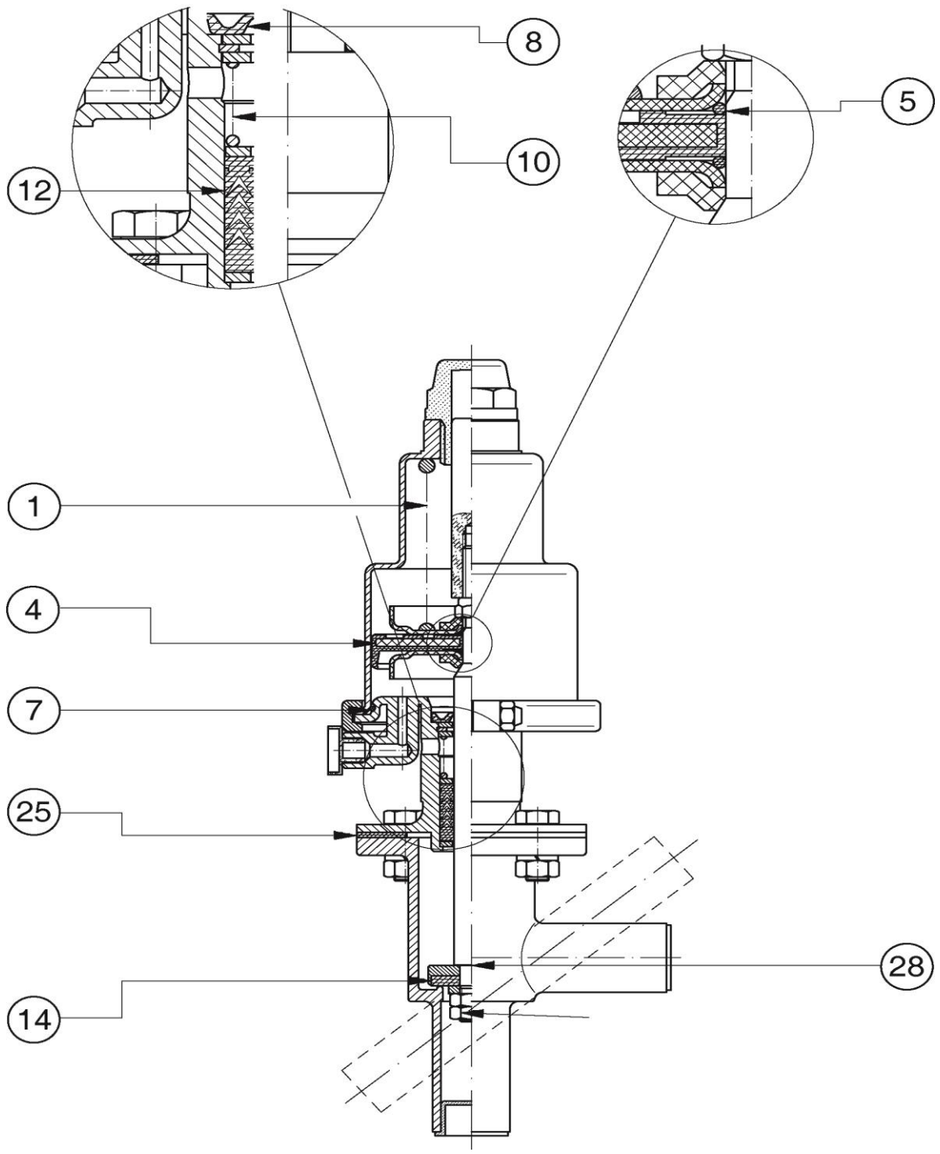
Section plane IVS-IVFL DN 15-50 Positions 9

4.40 Spare parts IVS-IVFL DN 15-50 Positions 9



GROUP 94

SPARE PARTS COMPLETE SERIES OF STAINLESS STEEL VALVES FROM 1996 TO 2002 FROM ND 15 TO ND 50
POSITIONS 9

SPARE PARTS COMPLETE SERIES - SPRINGLESS PISTON

SPARE PART CODE		**3945**			**3946**		
∅ PISTON		70			80		
DETAIL NR.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
4	1	TDUOP7065			TDUOP8073		
5	2	OR02025GA			OR02031GA		
7	1	OR03256GA			OR03300GA		

SPARE PARTS COMPLETE SERIES - BODY

SPARE PART CODE								
	EPDM		**2820**		**2821**	**2822**	**2823**	**2824**
	R.T.		**4190**		**4191**	**4192**	**4193**	**4194**
	T.C.		**5351**		**5352**	**5353**	**5354**	**5355**
DETAIL NR.		Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
8		1	BA0V12284					
10		1	MTD088149					
12		1	PT01222TG					
14	EPDM	1	2613		537	538	539	540
	R.T.		TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336
	T.C.		TTEF960053		TTEF960054	TTEF960055	TTEF960056	TTEF960057
25		1	GUAR950928			GUAR950929	GUAR950930	550
28		1	GD0001465					

SERVOCONTROL SPRING

DETAIL NR.	Q.ty	MATER.	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50
1	1	STEEL FOR	557			MTD087091		

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5 Table 6: tightening torques

Detail coupling	Tightening torque for threaded couplings in stainless steel valves [$Kg_f \cdot m$]											
	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	ND 150	ND 200
P. 32	0,65	1,5				3		1,5				
P. 43 P. 44	0,65			1,5			5,3					
P. 46 P. 48	0,65											
P. 24 P. 27	2,5								4,5			
P. 18 P. 21							1,5					
P. 16 P. 52	7,0						19,6					

6 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.

NOTES:

- Safety conditions ca not be warranted and wrong workings can not be attributed to our valves if:
  - Disassembly, assembly and maintenance operations are not carried out following the instructions described in this manual.
  - Original spare parts are not used.
- It is forbidden to remove pages from this document or to make any correction.
- ITALVALVOLE® S.A.S. reserves the right to make modification and/or amendment to its products and relevant documentation without giving notice.
- The use of the handbook does not exempt from the observance of the laws in force.