SBS/86 VALVES in WCB-CF8M

FAMILY 04 GROUP 20-21-23-24-26-27

Master handbook description: Guide to selection, use and maintenance of SBS/86 valves in WCB and CF8M (English)

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DECLARATION OF CONFORMITY

Code: DPED01033 ***REV. 00*** ***Date: 01/03/2002***

Family no. 4 *CONTROL GLOBE VALVES, SERIES SBS*
WCB ASTM A216
CF8M ASTM A351

Groups**: 20, 21, 23, 24, 26, 27**

ITALVALVOLE s.a.s. of Spadon Oscar & C., via Amendola 125, 13836 Cossato (BI), declare that:
The control globe valves, series SBS with WCB ASTM A216 and CF8M ASTM A351 body in the following diameters, DN 15 PS 40 - DN 20 PS 40 - DN 25 PS 40 - DN 32 PS 40, is in compliance with the directive 97/23/EC (directive PED) with classification under Art. 3.3.

EC DECLARATION OF CONFORMITY

Code: DPED010C1 ***REV. 00*** ***Date: 01/03/2002***

Family no. 4 *CONTROL BALL VALVES, SERIES SBS*
WCB ASTM A216
CF8M ASTM A351

Groups**: 20, 21, 23, 24, 26, 27**

ITALVALVOLE s.a.s. of Spadon Oscar & C., via Amendola 125, 13836 Cossato (BI), declare that:
The control ball valves, series SBS with WCB ASTM A216 and CF8M ASTM A351 body in the following diameters, DN 40 PS 40 - DN 50 PS 40 - DN 65 PS 40 - DN 80 PS 40, is in compliance with the directive 97/23/EC (directive PED) with classification under category I.
The conformity evaluation procedure used as per Annex II consists of form A.

ITALVALVOLE S.A.S.

Legale rappresentante
Legal representative
Firmato digitalmente da
OSCAR SPADON
SerialNumber = IT:SPDSCR44M19L436J
C = IT

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1 Foreword

Valves with diaphragm have been conceived to check the flow of overheated water, liquids, gas and steam in pipes.
The valve is usually activated by an automatic pilot regulator which uses air for servo control fluid or by a manual pneumatic remote control panel.
Opening, closing and modulating action of valve are generated by the variation of pneumatic signal reaching the servomotor (valve pneumatic head).
Diaphragm, springs and shutters of valves are dimensioned to obtain fluid-dynamic properties required as well as the perfect compliance with operating conditions specified in customer order.
Diaphragm/spring combinations delivered on valve pneumatic head are usually provided for a control signal on diaphragm accounting for: 3/15 psi (0.2/1.0 bar), 6/18 psi (0.42/1.26 bar), 6/30 psi (0.42/2.1 bar), 9/32 psi (0.6/2.24 bar), 3/9 psi (0.2/0.6 bar), 9/15 psi (0.6/1.0 bar).

ITALVALVOLE® diaphragm valves supplied are normally closed (N.C.) (air opening) or normally open (N.O.) (air closing).
Anyway, since servomotor is reversible, it can transform a N.C. valve into N.O. valve or viceversa by simply replacing a few details.

2 Legend

- $\Delta p_{allowable}$ (allowable differential pressure): maximum allowable value, at a given temperature, of the static differential pressure of a valve in closed position (EN 7363 : 1997).
- **Allowable temperature:** maximum operating temperature, prescribed for safety reasons.
- **Allowable pressure:** maximum operating pressure, normally at the top of each compartment of the pressure equipment, prescribed for safety reasons (UNI EN 764 : 1997).
- **DN:** it is an alphanumeric designation of size for components of a pipework system, which is used for reference purposes.
  It comprises the letters DN followed by a dimensionless whole number which is indirectly related to the physical dimension, expressed in millimetres, of the hole or of the outer diameter of the ends of connection pipes (ISO 6708: 1995).
- **Kv:** flow rate, expressed in cubic meters/h, of water (10 to 25 °C with a volume equal to 1000 Kg/cubic meters), which goes through two ways of a valve, with a pressure drop Δp of 100 KPa (1 bar)

$$Kv = \frac{Q}{\sqrt{\Delta p}}$$

  where: Q is the flow rate in m^3/h (UNI 9753: 1990).

3 Inquiries

In case of specific needs or doubts, please contact our technical office after filling in the form below and the suitable type of valve to be used will be communicated to you.

DATA REQUIRED: DN_____ PN_____
Two-way☐ Three-way deviation valve ☐ mixer☐
Control signal_____ Type of flange _____
Shutter ☐ linear
☐ equal percentage
Body material ☐ carbon steel
☐ stainless steel
Valve action ☐ normally closed
☐ normally open
Operating fluid_____ Specific weight _____Kg/m^3
Maximum flow rate_____ Kg/h _____m^3/h
Pressure upstream the valve _____bars
Pressure downstream the valve _____bars
Fluid temperature in °C _____
Intermediate body ☐ standard
☐ with bellows
With handwheel☐ With pneumatic positioning device ☐

4 Technical features

BS 86 2-way PN 40 WCB

General notice: ⇒ all the pressure values indicated hereinafter are relative pressure values

⇒ **valve designed for fluids of group 2 (directive 97/23/EC).**

DN: ⇒ 15 ÷ 80

Connections: ⇒ flanged according to PN 40

Pmax all.(1): ⇒ 40 bars, 30 bars in version with bellows

Pmin all.: ⇒ 0 bar

Seal: ⇒ PEEK, metal and stellited

Shutter features: ⇒ equal percentage, linear

Tmax all.: ⇒ +200 °C with PEEK (standard)
+250 °C with PEEK (with safety bellows)
+300 °C with metallic or stellited seal (with safety bellows)

Tmin all.: ⇒ –10 °C (liquid phase)
-28 °C (with safety bellows and WCB body)
-40 °C (with safety bellows and CF8M body)

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

⇒ 3-way globe valve, with angle body, unidirectional.

Air connection: ⇒ 1/8" GAS (head Ø 200), 1/4" GAS (head Ø 275, Ø 360, Ø 430).

Supply fluid: ⇒ industrial air

Supply pipes: ⇒ pipe inner diameter = 4 mm, min. outdoor diameter = 6 mm, able to bear the supply Pmax under the environmental conditions of the plant where the valve is fitted.

Supply P (supply): ⇒ 3÷15 PSI, 6÷18 PSI, 6÷30 PSI, 9÷32 PSI, 3÷9 PSI, 9÷15 PSI

Versions: ⇒ normally closed, normally open, with or without bellows, with or without emergency handwheel

Manufacturing materials: ⇒ See drawings and relevant tables

Overall dimensions: ⇒ See overall dimensions drawings and relevant tables

(1)Pressure limit Pmax = see pressure/temperature diagram in paragraph 4.4

4.1 Table 1: Compatible Fluids

Type of fluid	Comp.	Type of fluid	Comp.
Linoleic acid	YES	Magnesium hydroxide	YES
Nitric acid HNO_3 anhydrous	YES	Animal oil	YES
Fresh water H_2O	YES	Lubricating oil	YES
Ammonia NH_3 aqueous	YES	Caustic soda NaOH 5%	YES
Ammonia NH_3 solution	YES	Caustic soda NaOH 20% E (1)	YES
Air	YES	Caustic soda NaOH 50% E (1)	YES
Nitrogen N liquid	YES	Caustic soda NaOH 75% E (1)	YES
Magnesium bisulphate	YES	Sodium carbonate Na_2CO_3 5%	YES
Ethylene glycol	YES	Heat transfer oil 300° (2)	YES
Propylene glycol	YES		

(1) "E" means "ebollizione", i.e. boiling

(2) In versions where temperature can reach such value

All data in table 1, if not otherwise specified, is relevant at a temperature of 21°C.
All data have a general meaning and are not valid for all possible working conditions. These data may considerably vary depending upon various conditions, such as: temperature, concentration, fluid speed.
For detailed information, please get in touch with the technical department.
Any use of the valve on explosive, easily inflammable, comburent and poison gases is strictly forbidden.
Any use of the valve on liquids based on: chlorine, fluorine, bromine, iodine and derivative elements is strictly forbidden.
Any deviation from such prohibitions may be issued for special applications, by our technical department, upon written request.

4.2 Table 2: Δp of SBS DN 15÷80 2-way valves without bellows

					Δp Valve						VALVE DEFINITION No.
Control signal in PSI (1)					3/15	6/18	6/30	9/32	3/9	9/15	
Control signal in BAR					0.2/1	0.42/1.26	0.4/2.1	0.6/2.24	0.2/0.6	0.6/1.0	
Max control pressure BAR					1.0	1.26	2.21	2.4	0.8	1.2	
DN	**Φ seat [mm]**	**Kvs**	**CV**	**Φe** servo control **[mm]**	Valve definition letters						
					A	B	C	D	R	S	
15	3	0.1	0.117	200	40	40	40	40	40	40	1
				275	40	40	40	40	40	40	2
	6	0.42	0.49	200	40	40	40	40	40	40	3
				275	40	40	40	40	40	40	4
	15	2.8	3.2	200	13	26	26	39	13	39	5
				275	32	40	40	40	32	40	6
20	8	1.1	1.28	200	40	40	40	40	40	40	7
				275	40	40	40	40	40	40	8
	15	2.5	2.9	200	13	26	26	39	13	39	9
				275	32	40	40	40	32	40	10
				360	40	40	40	40	40	40	11
				430	40	40	40	40	40	40	12
	20	7.8	9.1	200	7	14	14	21	7	21	13
				275	18	36	36	40	18	40	14
				360	36	40	40	40	36	40	15
				430	40	40	40	40	40	40	16
25	15	2.4	2.8	200	13	26	26	39	13	39	17
				275	32	40	40	40	32	40	18
				360	40	40	40	40	40	40	19
				430	40	40	40	40	40	40	20
	20	7	8.2	200	7	14	14	21	7	21	21
				275	18	36	36	40	18	40	22
				360	36	40	40	40	36	40	23
				430	40	40	40	40	40	40	24
	24	13.5	15.7	200	5	10	10	15	5	15	25
				275	12	24	24	34	12	34	26
				360	24	40	40	40	24	40	27
				430	28	40	40	40	28	40	28
32	20	6.6	7.7	200	7	14	14	21	7	21	29
				275	18	36	36	40	18	40	30
				360	36	40	40	40	36	40	31
				430	40	40	40	40	40	40	32
	24	12.2	14.2	200	5	10	10	15	5	15	33
				275	12	24	24	34	12	34	34
				360	24	40	40	40	24	40	35
				430	28	40	40	40	28	40	36
	31	15.2	17.7	200	4	8	8	12	4	12	37
				275	10	20	20	30	10	30	38
				360	20	40	40	40	20	40	39
				430	23	40	40	40	23	40	40

(1) ***In NO valves, to obtain the same*** Δp as NC valves, maximum control signal must consist of the addition of two signals; for example, in a NO valve with 3/15 PSI signal, the maximum control signal must be taken to 18 PSI (3+15) to obtain Δp of similar NC valve.
In 3-way valves, Δp refers to the way closing when air lacks; to obtain the same Δp on the other way follow the same procedure as applied to obtain Δp in NO valves.

Note: Δp Max symbol has been obtained with no air in head (***for NC valves only***).

					Δp Valve						VALVE DEFINITION No.
Control signal in PSI (1)					3/15	6/18	6/30	9/32	3/9	9/15	
Control signal in BAR					0.2/1	0.42/1.26	0.4/2.1	0.6/2.24	0.2/0.6	0.6/1.0	
Max control pressure BAR					1.0	1.26	2.21	2.4	0.8	1.2	
DN	**Φ seat [mm]**	**Kvs**	**CV**	**Φe** servo control **[mm]**	Valve definition letters						
					A	B	C	D	R	S	
40	24	11.5	13.4	200	5	10	10	15	5	15	41
				275	12	24	24	34	12	34	42
				360	24	40	40	40	24	40	43
				430	28	40	40	40	28	40	44
	31	13.7	16	200	4	8	8	12	4	12	45
				275	10	20	20	30	10	30	46
				360	20	40	40	40	20	40	47
				430	23	40	40	40	23	40	48
	38	25.8	30.1	200	2.8	5.5	5.5	8	2.8	8	49
				275	7	14	14	20	7	20	50
				360	14	28	28	40	14	40	51
				430	16	32	32	40	16	40	52
50	31	12.9	15	200	4	8	8	12	4	12	53
				275	10	20	20	30	10	30	54
				360	20	40	40	40	20	40	55
				430	23	40	40	40	23	40	56
	38	23.2	27.1	200	2.8	5.5	5.5	8	2.8	8	57
				275	7	14	14	20	7	20	58
				360	14	28	28	40	14	40	59
				430	16	32	32	40	16	40	60
	48	33	38.6	200	1.6	3.2	3.2	4.5	1.6	4.5	61
				275	4	8	8	12	4	12	62
				360	8	16	16	24	8	24	63
				430	9.3	18	18	27	9.3	27	64
65	38	21.9	25.6	200	2.8	5.5	5.5	8	2.8	8	65
				275	7	14	14	20	7	20	66
				360	14	28	28	40	14	40	67
				430	16	32	32	40	16	40	68
	48	29.7	34.7	200	1.6	3.2	3.2	4.5	1.6	4.5	70
				275	4	8	8	12	4	12	71
				360	8	16	16	24	8	24	72
				430	9.3	18	18	27	9.3	27	73
	63	62	72.5	200	1	2	2	3	1	3	75
				275	2.5	5	5	7.5	2.5	7.5	76
				360	5	10	10	15	5	15	77
				430	5.8	11	11	16	5.8	16	78
80	48	28	32.7	200	1.6	3.2	3.2	4.5	1.6	4.5	80
				275	4	8	8	12	4	12	81
				360	8	16	16	24	8	24	82
				430	9.3	18	18	27	9.3	27	83
	63	55.8	65.2	200	1	2	2	3	1	3	85
				275	2.5	5	5	7.5	2.5	7.5	86
				360	5	10	10	15	5	15	87
				430	5.8	11	11	16	5.8	16	88
	78	76	88.7	200	0.6	1.2	1.2	1.5	0.6	1.5	90
				275	1.5	3	3	4	1.5	4	91
				360	3	6	6	8.5	3	8.5	92
				430	3.5	7	7	10.5	3.5	10.5	93

(1) ***In NO valves, to obtain the same*** Δp as NC valves, maximum control signal must consist of the addition of two signals; for example, in a NO valve with 3/15 PSI signal, the maximum control signal must be taken to 18 PSI (3+15) to obtain Δp of similar NC valve.
In 3-way valves, Δp refers to the way closing when air lacks; to obtain the same Δp on the other way follow the same procedure as applied to obtain Δp in NO valves.

Note: Δp Max symbol has been obtained with no air in head (***for NC valves only***).

4.3 Table 3: Δp of SBS DN 15÷80 2-way valves with bellows

					Δp Valve						VALVE DEFINITION No.
Control signal in PSI (1)					3/15	6/18	6/30	9/32	3/9	9/15	
Control signal in BAR					0.2/1	0.42/1.26	0.4/2.1	0.6/2.24	0.2/0.6	0.6/1.0	
Max control pressure BAR					1.0	1.26	2.21	2.4	0.8	1.2	
DN	**Φ seat [mm]**	**Kvs**	**CV**	**Φe** servo control **[mm]**	Valve definition letters						
					A	B	C	D	R	S	
15	3	0.1	0.117	200							1
				275							2
	6	0.42	0.49	200							3
				275							4
	15	2.8	3.2	200	4.5	8.5	8.5	11	4.5	11	5
				275	10.5	20.5	20.5	24.5	10.5	24.5	6
20	8	1.1	1.28	200							7
				275							8
	15	2.5	2.9	200	4.5	8.5	8.5	11	4.5	11	9
				275	10.5	20.5	20.5	24.5	10.5	24.5	10
				360	21	40	40	40	21	40	11
				430							12
	20	7.8	9.1	200	4	8.5	8.5	11	4	11	13
				275	10	20	20	24.5	10	24.5	14
				360	20	40	40	40	20	40	15
				430	20.5	40	40	40	20.5	40	16
25	15	2.4	2.8	200	4.5	8.5	8.5	11	4.5	11	17
				275	10.5	20.5	20.5	24.5	10.5	24.5	18
				360	21	40	40	40	21	40	19
				430							20
	20	7	8.2	200	4	8.5	8.5	11	4	11	21
				275	10	20	20	24.5	10	24.5	22
				360	20	40	40	40	20	40	23
				430	20.5	40	40	40	20.5	40	24
	24	13.5	15.7	200	4	8	8	11	4	11	25
				275	10	20	20	24	10	24	26
				360	20	40	40	40	20	40	27
				430	20.2	40	40	40	20.2	40	28
32	20	6.6	7.7	200	4	8.5	8.5	11	4	11	29
				275	10	20	20	24.5	10	24.5	30
				360	20	40	40	40	20	40	31
				430	20.5	40	40	40	20.5	40	32
	24	12.2	14.2	200	4	8	8	11	4	11	33
				275	10	20	20	24	10	24	34
				360	20	40	40	40	20	40	35
				430	20.2	40	40	40	20.2	40	36
	31	15.2	17.7	200	3.5	7.5	7.5	10.5	3.5	10.5	37
				275	9.5	19	19	23	9.5	23	38
				360	19	38	38	40	19	38	39
				430	19.3	38.5	38.5	40	19.3	38.5	40

(1) ***In NO valves, to obtain the same*** Δp as NC valves, maximum control signal must consist of the addition of two signals; for example, in a NO valve with 3/15 PSI signal, the maximum control signal must be taken to 18 PSI (3+15) to obtain Δp of similar NC valve.
In 3-way valves, Δp refers to the way closing when air lacks; to obtain the same Δp on the other way follow the same procedure as applied to obtain Δp in NO valves.

Note: Δp Max symbol has been obtained with no air in head(***for NC valves only***).

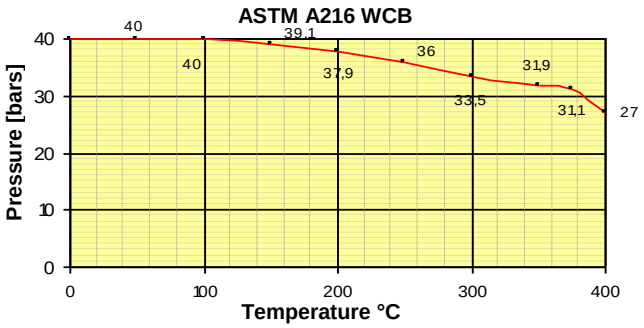
					Δp Valve						VALVE DEFINITION No.
Control signal in PSI (1)					3/15	6/18	6/30	9/32	3/9	9/15	
Control signal in BAR					0.2/1	0.42/1.26	0.4/2.1	0.6/2.24	0.2/0.6	0.6/1.0	
Max control pressure BAR					1.0	1.26	2.21	2.4	0.8	1.2	
DN	**Φ seat [mm]**	**Kvs**	**CV**	**Φe** servo control **[mm]**	Valve definition letters						
					A	B	C	D	R	S	
40	24	11.5	13.4	200	4	8	8	11	4	11	41
				275	10	20	20	24	10	24	42
				360	20	40	40	40	20	40	43
				430	20.2	40	40	40	20.2	40	44
	31	13.7	16	200	3.5	7.5	7.5	10.5	3.5	10.5	45
				275	9.5	19	19	23	9.5	23	46
				360	19	38	38	40	19	38	47
				430	19.3	38.5	38.5	40	19.3	38.5	48
	38	25.8	30.1	200	2.8	5.8	5.8	8	2.8	8	49
				275	7	14.8	14.8	18	7	18	50
				360	14.8	29.5	29.5	36	14.8	36	51
				430	15	30	30	40	15	40	52
50	31	12.9	15	200	3.5	7.5	7.5	10.5	3.5	10.5	53
				275	9.5	19	19	23	9.5	23	54
				360	19	38	38	40	19	38	55
				430	19.3	38.5	38.5	40	19.3	38.5	56
	38	23.2	27.1	200	2.8	5.8	5.8	8	2.8	8	57
				275	7	14.8	14.8	18	7	18	58
				360	14.8	29.5	29.5	36	14.8	36	59
				430	15	30	30	40	15	40	60
	48	33	38.6	200	1.8	3.5	3.5	5	1.8	5	61
				275	4.5	9	9	11	4.5	11	62
				360	9	18.5	18.5	22.5	9	22.5	63
				430	9.3	18.8	18.8	28	9.3	28	64
65	38	21.9	25.6	200	2.8	5.8	5.8	8	2.8	8	65
				275	7	14.8	14.8	18	7	18	66
				360	14.8	29.5	29.5	36	14.8	36	67
				430	15	30	30	40	15	40	68
	48	29.7	34.7	200	1.8	3.5	3.5	5	1.8	5	70
				275	4.5	9	9	11	4.5	11	71
				360	9	18.5	18.5	22.5	9	22.5	72
				430	9.3	18.8	18.8	28	9.3	28	73
	63	62	72.5	200	1	2	2	2.5	1	2.5	75
				275	2.5	5	5	6.5	2.5	6.5	76
				360	5	10	10	13	5	13	77
				430	5.5	10.5	10.5	16	5.5	16	78
80	48	28	32.7	200	1.8	3.5	3.5	5	1.8	5	80
				275	4.5	9	9	11	4.5	11	81
				360	9	18.5	18.5	22.5	9	22.5	82
				430	9.3	18.8	18.8	28	9.3	28	83
	63	55.8	65.2	200	1	2	2	2.5	1	2.5	85
				275	2.5	5	5	6.5	2.5	6.5	86
				360	5	10	10	13	5	13	87
				430	5.5	10.5	10.5	16	5.5	16	88
	78	76	88.7	200	0.6	1.2	1.2	1.5	0.6	1.5	90
				275	1.5	3	3	4	1.5	4	91
				360	3	6.5	6.5	8.5	3	8.5	92
				430	3.5	7	7	10.5	3.5	10.5	93

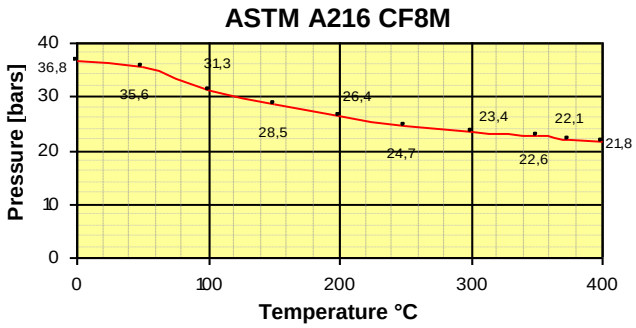
(1) ***In NO valves, to obtain the same*** Δp as NC valves, maximum control signal must consist of the addition of two signals; for example, in a NO valve with 3/15 PSI signal, the maximum control signal must be taken to 18 PSI (3+15) to obtain Δp of similar NC valve.

In 3-way valves, Δp refers to the way closing when air lacks; to obtain the same Δp on the other way follow the same procedure as applied to obtain Δp in NO valves.

Note: Δp Max symbol has been obtained with no air in head (***for NC valves only***).

4.4 Pressures/Temperatures diagram



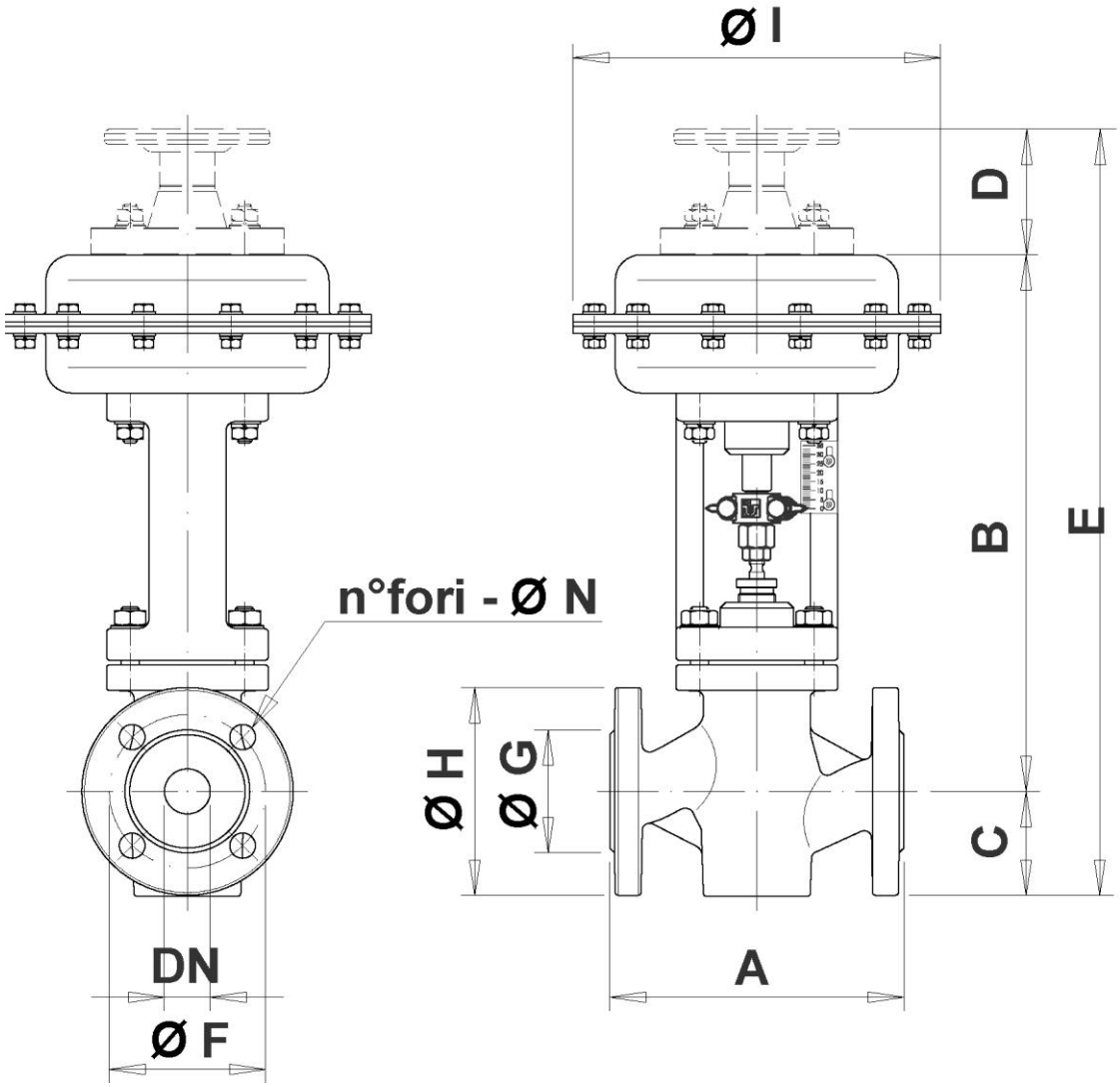


4.5 Safety Notes

- The valve body, under maximum operating temperature conditions, depending on the system, may reach a T=300°C. It is up to the engineer to provide the system with the necessary safety guards and/or warning signals with the purpose to remove/indicate the risk of possible burns to the user.
- During any operation on the valve, the fluid shall not be present inside the piping or the valve.

4.6 Overall dimensions of SBS valves

4.6.1 SBS 2-way WCB-CF8M DN 15 ÷ 50 group: 20-21

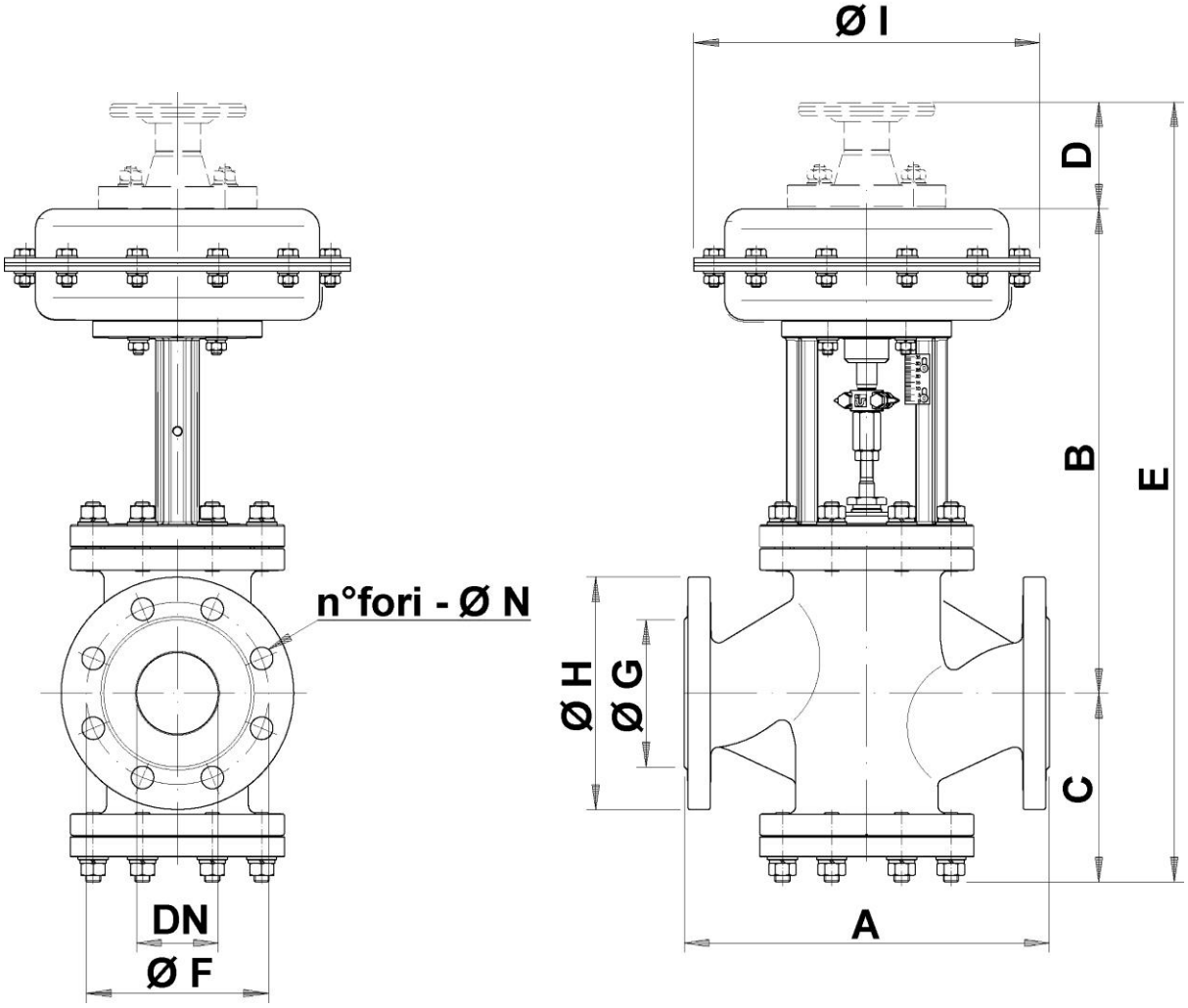


Drawing No. 020259 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
15	130	297.5	309	343.5	48	70	74	79	415.5	431	470.5	65	45	95	According to sealing Δp required (200-275-360-430)	14	4
20	150	297.5	309	343.5	53	70	74	79	420.5	436	475.5	75	58	105		14	4
25	160	297.5	309	343.5	58	70	74	79	425.5	441	480.5	85	68	115		14	4
32	180	316.5	328	362.5	70	70	74	79	456.5	472	511.5	100	78	140		18	4
40	200	316.5	328	362.5	75	70	74	79	461.5	477	516.5	110	88	150		18	4
50	230	316.5	328	362.5	82.5	70	74	79	469	484.5	524	125	102	165		18	4

Dimensions are in millimetres

4.6.2 SBS 2-way WCB-CF8M DN 65 ÷ 80 group: 20-21



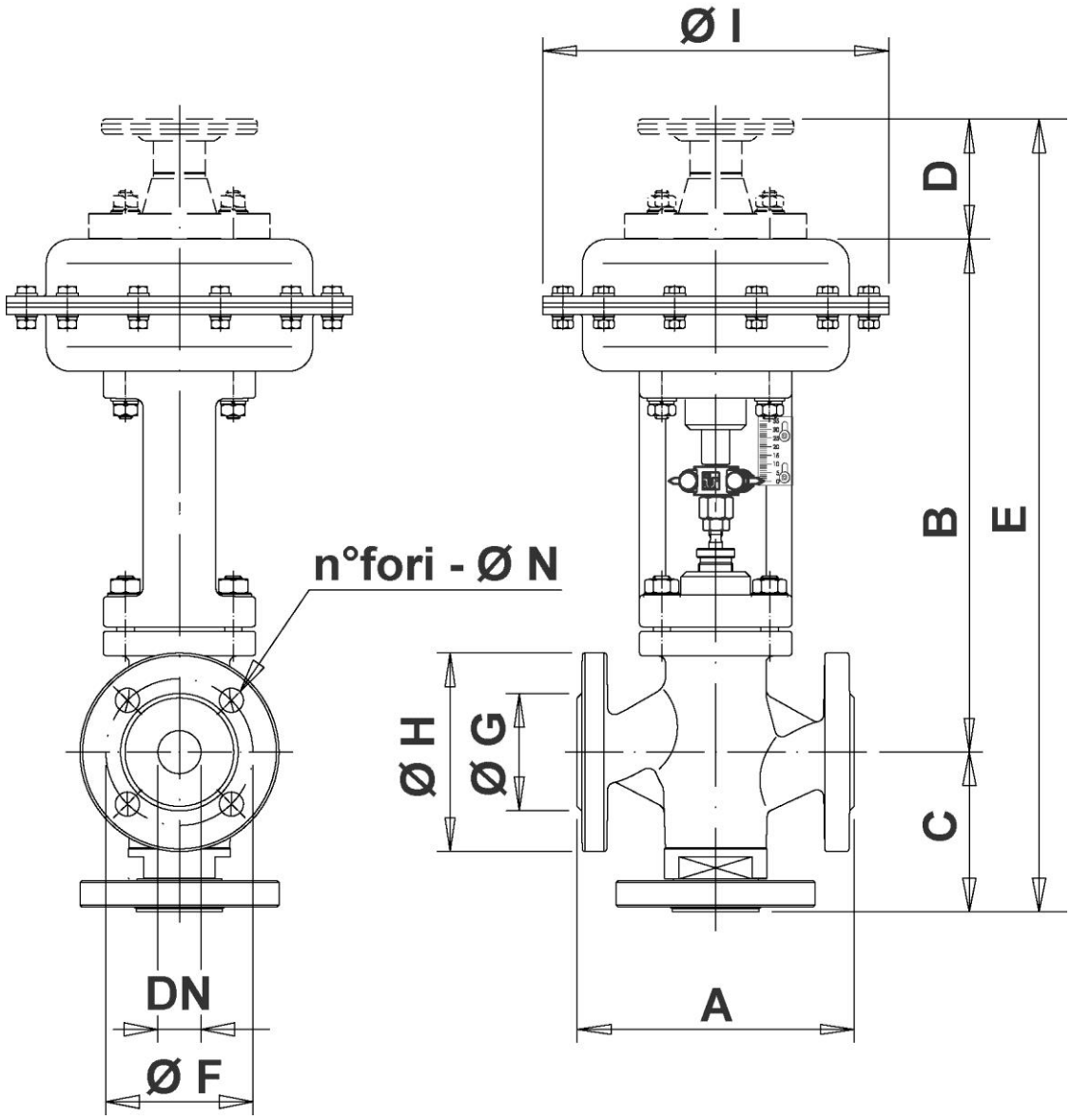
Drawing No. 100216 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
65	290	375	386.5	421	150	70	74	79	591	610.5	650	145	117	185	(1)	18	8
80	310	375	386.5	421	161	70	74	79	606	621.5	661	160	133	200		18	8

Dimensions are in millimetres

(1) According to sealing Δp required (200-275-360-430)

4.6.3 SBS 3 way WCB-CF8M DN 15 ÷ 50 group: 23, 24, 26, 27

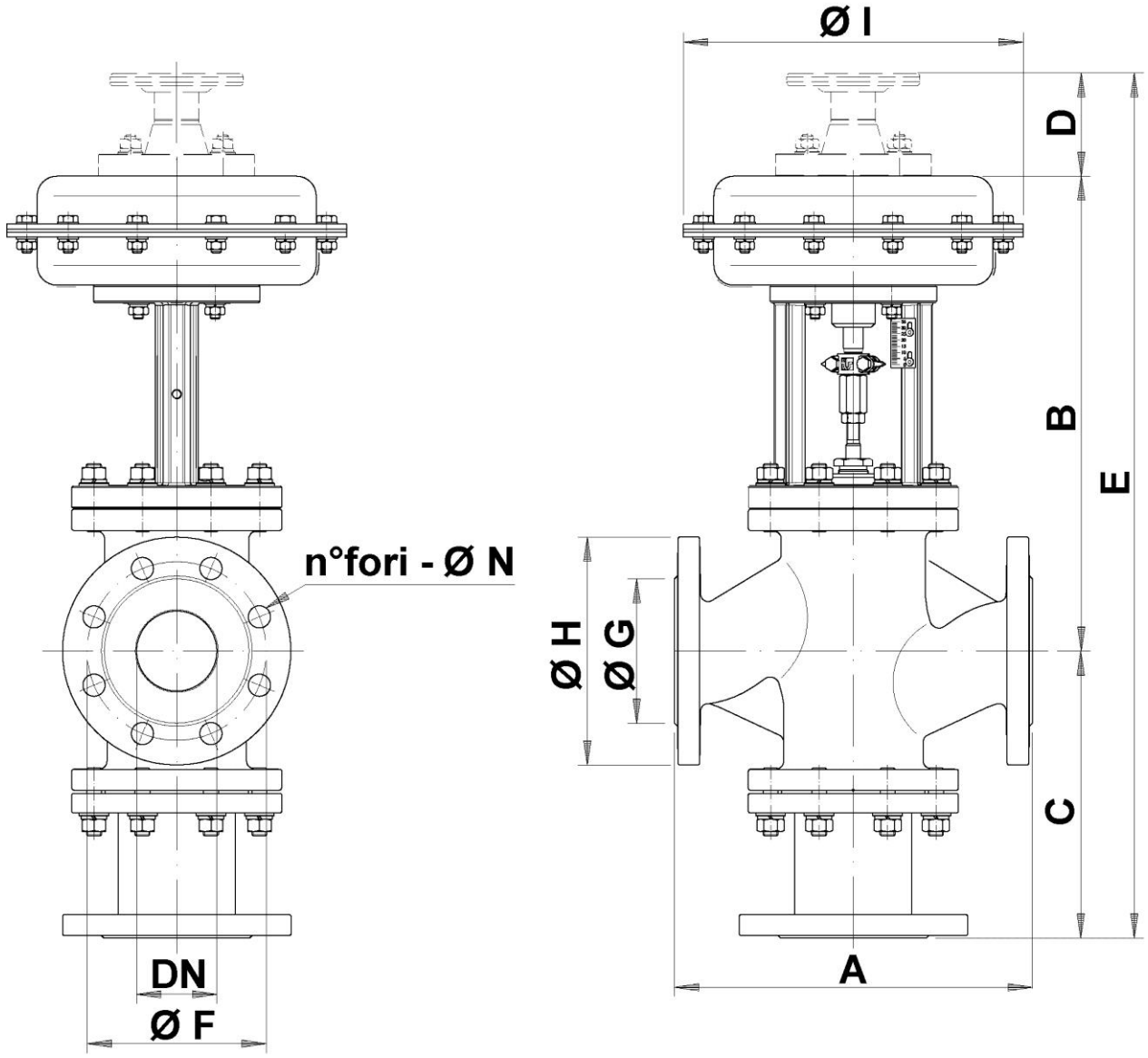


Drawing No. 020336 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
15	130	297.5	309	343.5	84	70	74	79	451.5	467	506.5	65	45	95	According to sealing Δp required (200-275-360-430)	14	4
20	150	297.5	309	343.5	87.5	70	74	79	455	470.5	510	75	58	105		14	4
25	160	297.5	309	343.5	92.5	70	74	79	460	475.5	515	85	68	115		14	4
32	180	316.5	328	362.5	100.5	70	74	79	487	502.5	542	100	78	140		18	4
40	200	316.5	328	362.5	110.5	70	74	79	497	512.5	552	110	88	150		18	4
50	230	316.5	328	362.5	116.5	70	74	79	503	518.5	558	125	102	165		18	4

Dimensions are in millimetres

4.6.4 SBS 3 way WCB-CF8M DN 65 ÷ 80 group: 23, 24, 26, 27



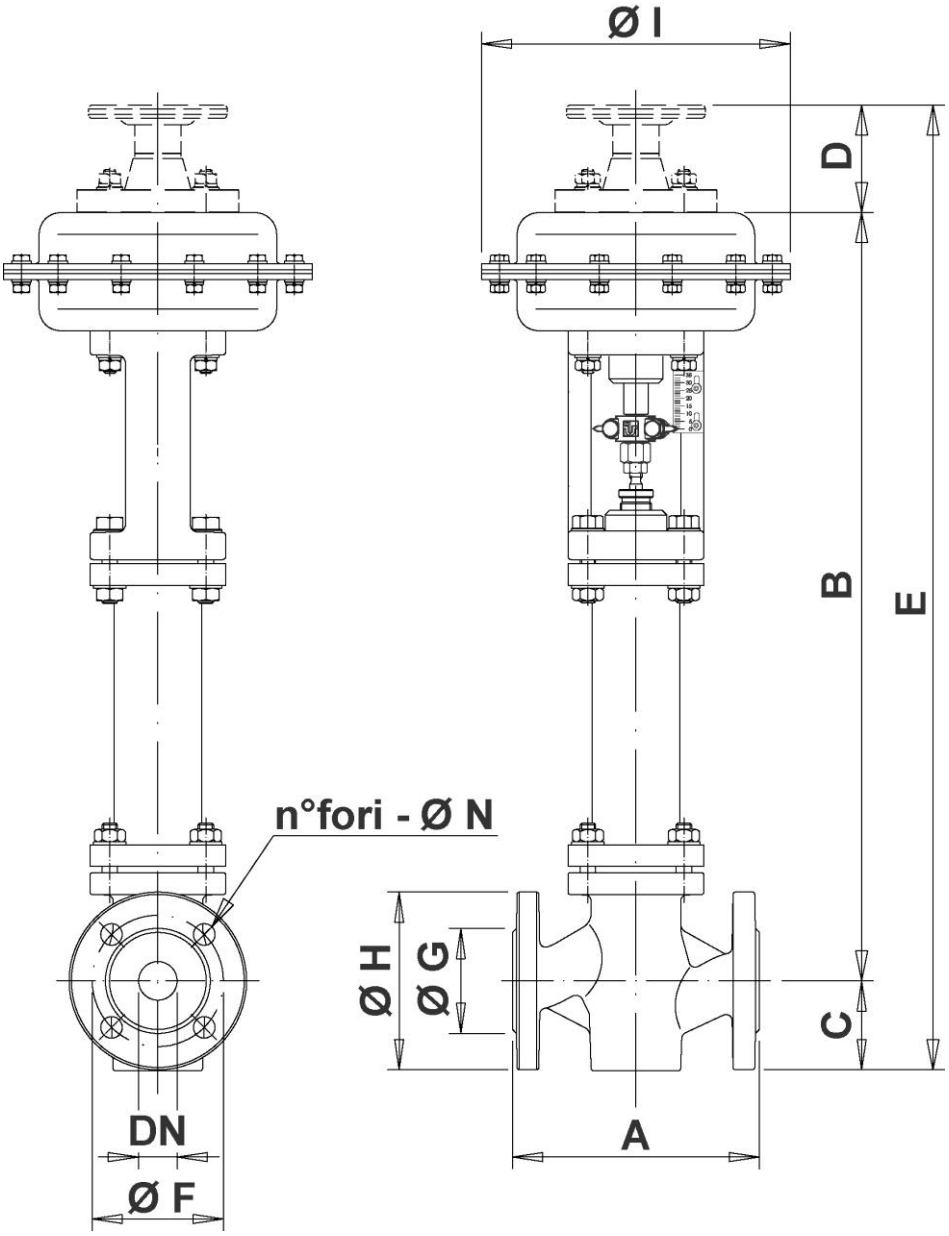
Drawing No. 100217 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
65	290	373	384.5	419	235	70	74	79	678	693.5	733	145	117	185	(1)	18	8
80	310	384	395.5	430	238.5	70	74	79	692.5	708	747.5	160	133	200		18	8

Dimensions are in millimetres

(1) According to sealing Δp required (200-275-360-430)

4.6.5 SBS 2-way WCB-CF8M DN 15 ÷ 50 with safety bellows group: 20, 21

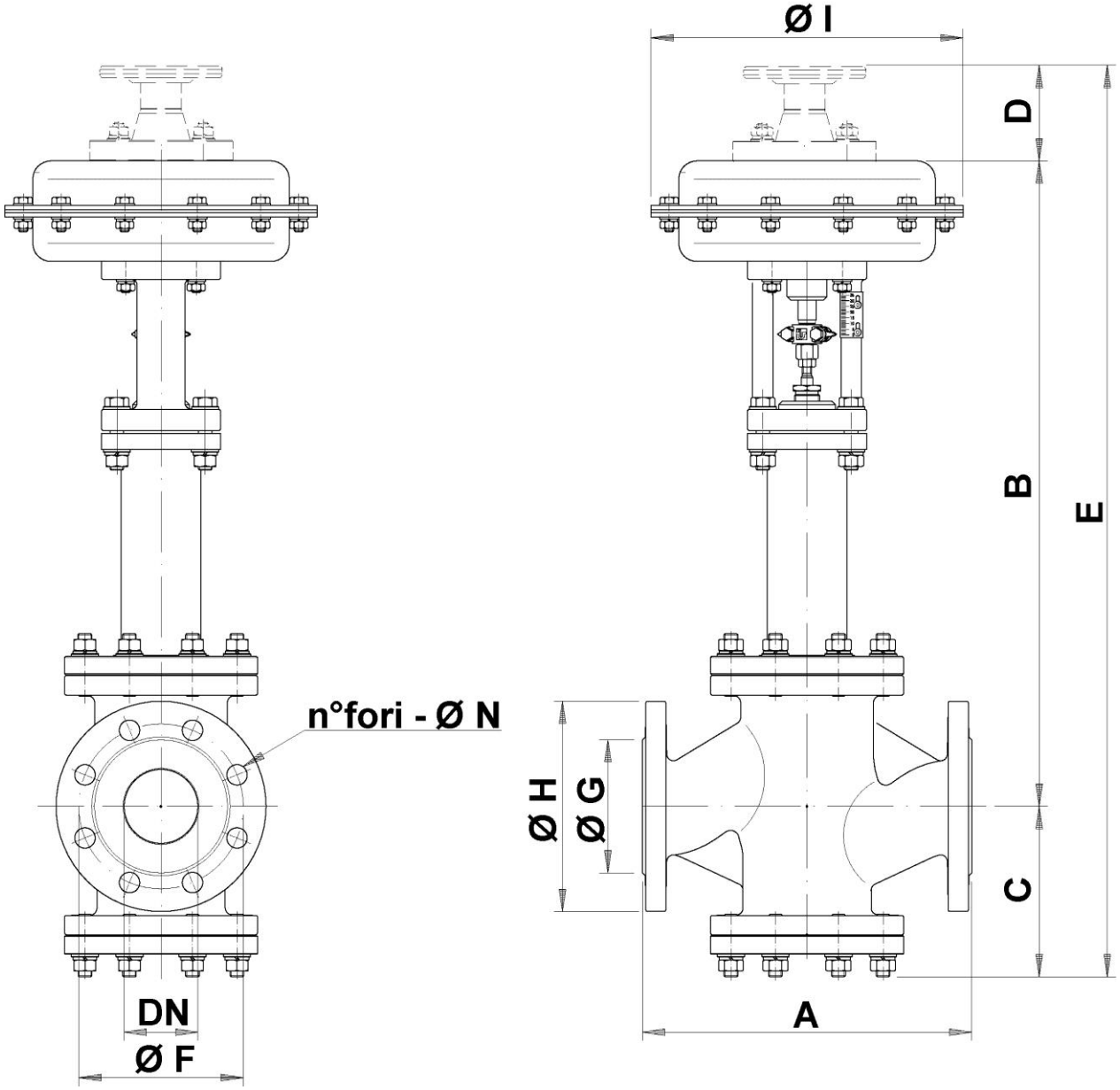


Drawing No. 020338 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
15	130	497.5	509	543.5	48	70	74	79	615.5	631	670.5	65	45	95	According to sealing Δp required (200-275-360-430)	14	4
20	150	497.5	509	543.5	53	70	74	79	620.5	636	675.5	75	58	105		14	4
25	160	497.5	509	543.5	58	70	74	79	625.5	641	680.5	85	68	115		14	4
32	180	530.5	542	576.5	70	70	74	79	670.5	686	725.5	100	78	140		18	4
40	200	530.5	542	576.5	75	70	74	79	675.5	691	730.5	110	88	150		18	4
50	230	529	540.5	575	82.5	70	74	79	681.5	697	736.5	125	102	165		18	4

Dimensions are in millimetres

4.6.6 SBS 2-way WCB-CF8M DN 65 ÷ 80 with safety bellows group: 20, 21



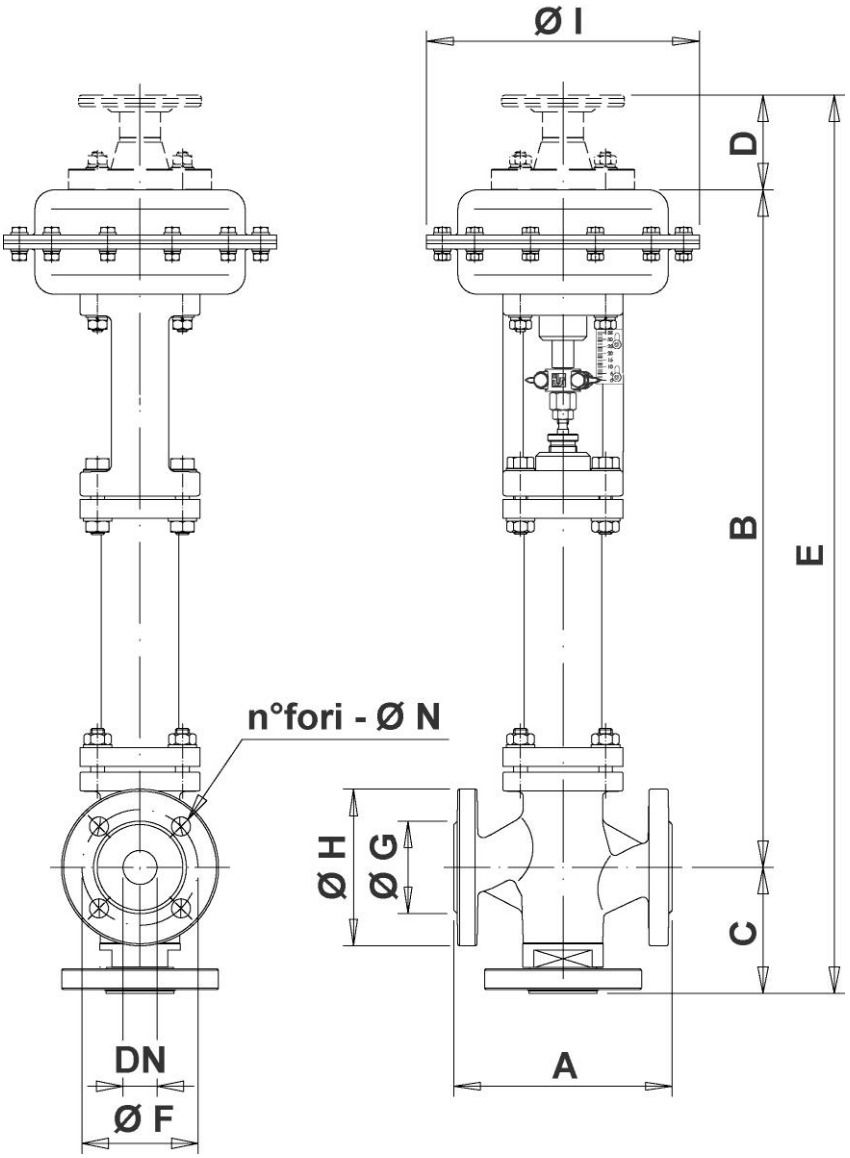
Drawing No. 100218 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
65	290	557	568.5	603	150	70	74	79	777	792.5	832	145	117	185	(1)	18	8
80	310	557	568.5	603	161	70	74	79	788	803.5	843	160	133	200		18	8

Dimensions are in millimetres

(1) According to sealing Δp required (200-275-360-430)

4.6.7 SBS 3 way cast iron DN 15 ÷ 50 with safety bellows group: 23, 24, 26, 27



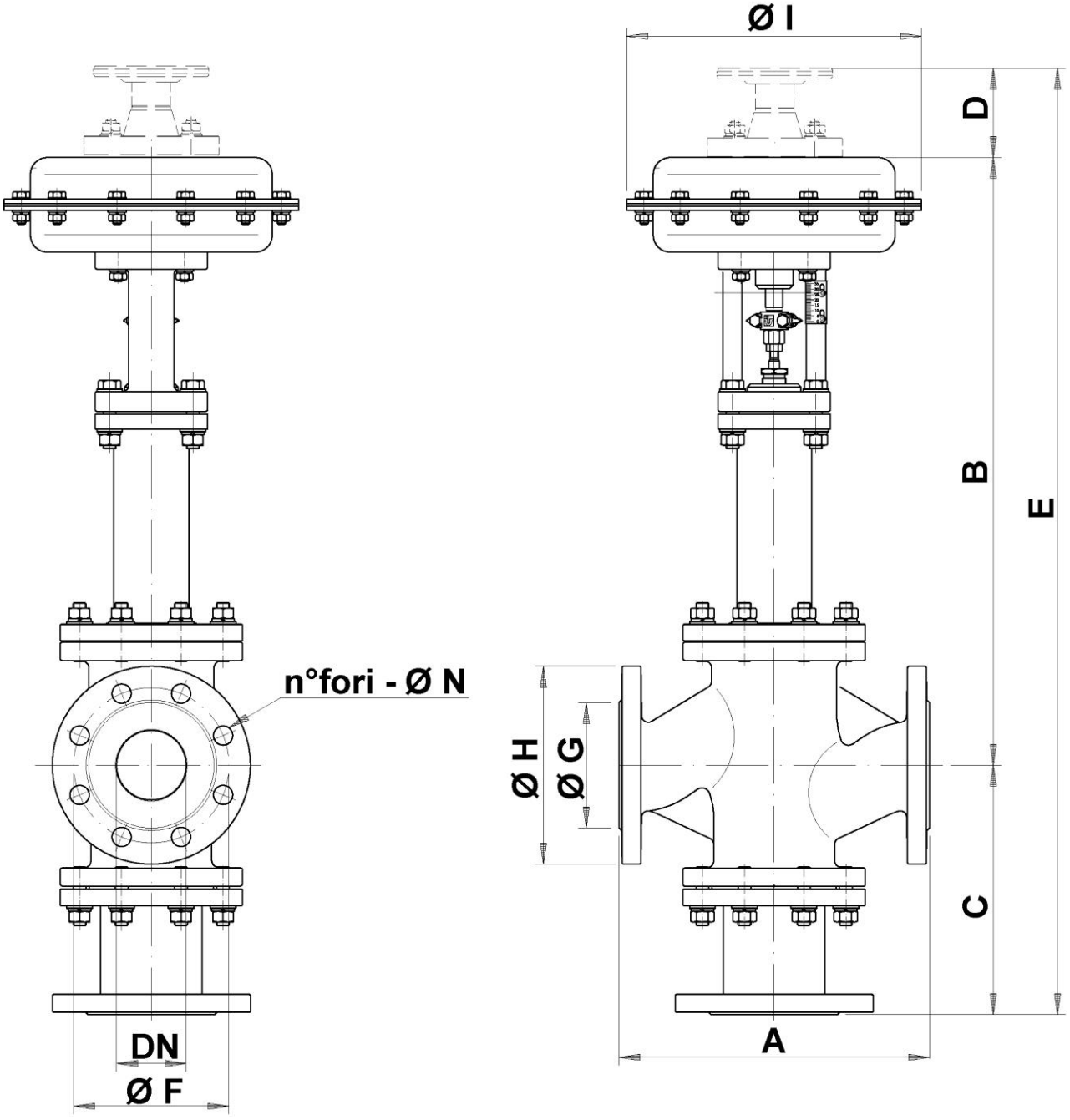
Drawing No. 020340 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
15	130	497.5	509	543.5	84	70	74	79	651.5	667	706.5	65	45	95	According to sealing Δp required (200-275-360-430)	14	4
20	150	497.5	509	543.5	87.5	70	74	79	655	670.5	710	75	58	105		14	4
25	160	497.5	509	543.5	92.5	70	74	79	660	675.5	715	85	68	115		14	4
32	180	530.5	542	576.5	100.5	70	74	79	701	716.5	756	100	78	140		18	4
40	200	530.5	542	576.5	110.5	70	74	79	711	726.5	766	110	88	150		18	4
50	230	529	540.5	575	116.5	70	74	79	715.5	731	770.5	125	102	165		18	4

Dimensions are in millimetres

4.6.8 SBS 3 way WCB-CF8M DN 65 ÷ 80 with safety bellows

group: 23, 24, 26, 27



Drawing No. 100219 Rev.:00

DN	A	B			C	D			E			Ø F	Ø G	Ø H	Ø I	Ø N	No. of holes
		Ø servo control				Ø servo control			Ø servo control								
		200	275 360	430		200	275 360	430	200	275 360	430						
65	290	555	566.5	601	235	70	74	79	860	875.5	915	145	117	185	(1)	18	8
80	310	566	577.5	612	238.5	70	74	79	874.5	890	929.5	160	133	200		18	8

Dimensions are in millimetres

(1) According to sealing Δp required (200-275-360-430)

5 Storage, Assembly, Check And Maintenance

5.1 Transport, Storage And Handling

SBS valves, during transport and assembly, must be handled very carefully. Shocks as well as anomalous stresses must be avoided (do not handle the valve by the servo control).

Avoid shocks and tampering to any accessories the valve may be equipped with (positioning devices, transducers, FRLM units, etc.).

Valves are delivered with dust-proof protections on all connections and these protections must not be removed until they are installed.

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

Storage temperature shall be between 0°C and + 50°C.

Avoid any shock to servo control as they could provoke misalignments and affect valve proper operation.

Comply with specifications on labels.

5.2 Assembly Instructions

5.2.1 General information

Valve installation on the system shall be carried out only by personnel qualified in hydraulics and pneumatics, 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 protect face, eyes and hands.

The valve must never be disassembled or modified. Otherwise, warranty is voided.

Please note. Attention: compressed springs are included inside the servo control..

Before assembly, dust-proof protections shall be removed from the valve body.

In case of normally closed servo control, the supply shall be carried out from the servo control lower head; in case of normally open servo control, the supply shall be carried in servo control upper head; in both cases, do not remove the threaded cap of the unused air connection to prevent dust or foreign bodies from penetrating the servo control.

Compressed air shall be industrial air, with a pressure between servo control useful values and anyway never exceeding 2.5 bars, with supply pipes made of nylon or copper and $Ø_{int.}$ (inner Ø) = 4 mm. Air connections on valve consist of be 1/8” GAS (head Ø 200) or 1/4" (head Ø 275, Ø 360, Ø 430, Ø 530) male threaded couplings.

5.2.2 Installation of valve on the plant

Comply with specifications on labels.

Before assembly, ensure that no dirt has penetrated the valve body; in case of doubt, strongly blow with compressed air.

It is recommended to install a protection filter on pipe upstream the valve.

The commonest recommended installation provides for vertical assembly of the valve, with head (servo control) on top. Tilted or horizontal assemblies are only accepted for dimensional reasons only, when assembly in oblique position is really mandatory.

To ensure a continuous operation of the plant also during valve maintenance, it is recommended to provide for a proper bypass with relevant on-off and manual control valves.

WARNINGS: when installing a valve, provide for a minimum space necessary to disassemble the pneumatic head and internal organs during maintenance operations.

Please note. Attention: compressed springs are included inside the servo control..

Be very careful when assembling the pipe valve, ensure it is installed in compliance with specifications on body fusion, in the same direction as pipe flow. Perform a uniform and crossed tightening of flange bolts to evenly press seals and prevent any harmful tensions from arising on the valve body.

It is recommended to use joints between plant pipes and valve connections, suitable to discharge any tensions possibly damaging the valve itself.

After installation, with pneumatic valve in opening position, carefully clean the line with suitably blowing fluid to remove any foreign bodies, welding slags and debris possibly damaging valve sealing surfaces.

Connect the pneumatic signal out of the pilot regulator or remote control panel to the relevant threaded coupling on the head.

5.3 Operation Test

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

On valves with normally closed NC 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 of the valve as shown on specifications plate).
2) Insert into servo control the minimum value of control signal shown on specifications plate (the valve should start opening, datum available on stroke plate).
3) Insert into servo control the maximum value of control signal shown on specifications plate (the valve should be fully open, datum available on stroke plate).
4) Switch off air from the servo control.
5) Repeat this operation 5 times.
6) Check, with air off, that there is no leak from the valve.
7) Check, with air on, that there is no air leak from the servo control.

On valves with normally open NO 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 of the valve).
2) Insert into servo control the minimum value of control signal shown on specifications plate (the valve should start closing, datum available on stroke plate).
3) Insert into servo control a pressure value equal to the addition between maximum and minimum control signals shown on specifications plate (the valve should close, datum available on stroke plate).
4) Repeat this operation 5 times.
5) Check, with air on, that there is no leak from the valve (with pressure value equal to the addition of two signals 3/15 =18 PSI).
6) Check, with air on, that there is no air leak from the servo control.

5.4 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.

Note:: to properly operate the valve, the stem must freely move with no friction when air pressure on diaphragm changes.

Valve serial number is printed on the label located on servo control. Please refer to the serial number for spare part request and correspondence.

Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.

5.4.1 Fluid passage with valve closed

If the valve is in closed position, ensure that no foreign body exists between shutter and seat and the surface contact is not damaged.

For effective damages affecting the seat, the shutter seat must be replaced (for valve disassembly see instructions below).

5.4.2 Diaphragm (membrane)

If the rubber membrane inside the servo control breaks, the valve cannot perform a complete stroke.

Replace the membrane when it is broken or has lost elasticity (see proper procedure below).

In all cases of irregular operation during adjustment, immediately ensure that pneumatic connections between pilot regulator and valve and the relevant fittings show no signs of air leaks.

Also ensure that regulator is properly calibrated (activity direction, proportionate band, automatic restoration.

5.5 Scheduled Maintenance

Scheduled maintenance operations shall be carried out independently of the ones due to possible failures, which always require an immediate intervention.

The time interval between one maintenance operation and the following shall be included in the lower time interval between the one corresponding to 500,000 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 paragraphs of this manual.

After first operating period, it is recommended to check the packing gland, as it requires special care. During the first operating hours, check no leaks have occurred, otherwise act very carefully on the relevant tightening nut to eliminate them, by rotating once of 1/4 revolution maximum on each packing gland make of teflon-graphite.

It is also recommended not to excessively tighten the nut, to prevent excessive increase of frictions on the stem which could block the valve or generate bad operation. Should further lacks persist in spite of tightening, fully replace the packing gland.

5.6 Disassembly and assembly instructions for SBS servo control from valve body.

For the disassembly and assembly operations of the servo control for all SBS DN 15÷80 refer to Drw. no. 020279 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

5.6.1 Removal of the normally closed servo control from the valve

1) Unscrew the screws (30), remove the nuts (33), extract the spring washers (32) and the junction clamps (31).
2) Enter air into the servo control equal to the maximum value provided for by this signal: **Attention! Servo control shaft shall move upwards.**
3) Unscrew the nuts (36), extract the spring washers (37) and the plain washers (38).
4) Separate the servo control from the valve body frame (39).
5) Remove air from servo control, unscrew the nuts (29), extract the spring washers (28) and the plain washers (27).
6) Separate the frame (34) from servo control.

5.6.2 Removal of the normally open servo control from the valve

1) Unscrew the screws (30), remove the nuts (33), extract the spring washers (32) and the junction clamps (31).
2) Take care when removing the clamps (31); the shutter (19) can move downward, colliding with the seat (20). We recommend to guide the shutter until it touches the seat, to avoid damages to the seal.
3) Unscrew the nuts (36), extract the spring washers (37) and the plain washers (38).
4) Separate the servo control from the valve body frame (39).
5) Unscrew the nuts (29), extract the spring washers (28) and the plain washers (27).
6) Separate the frame (34) from servo control.

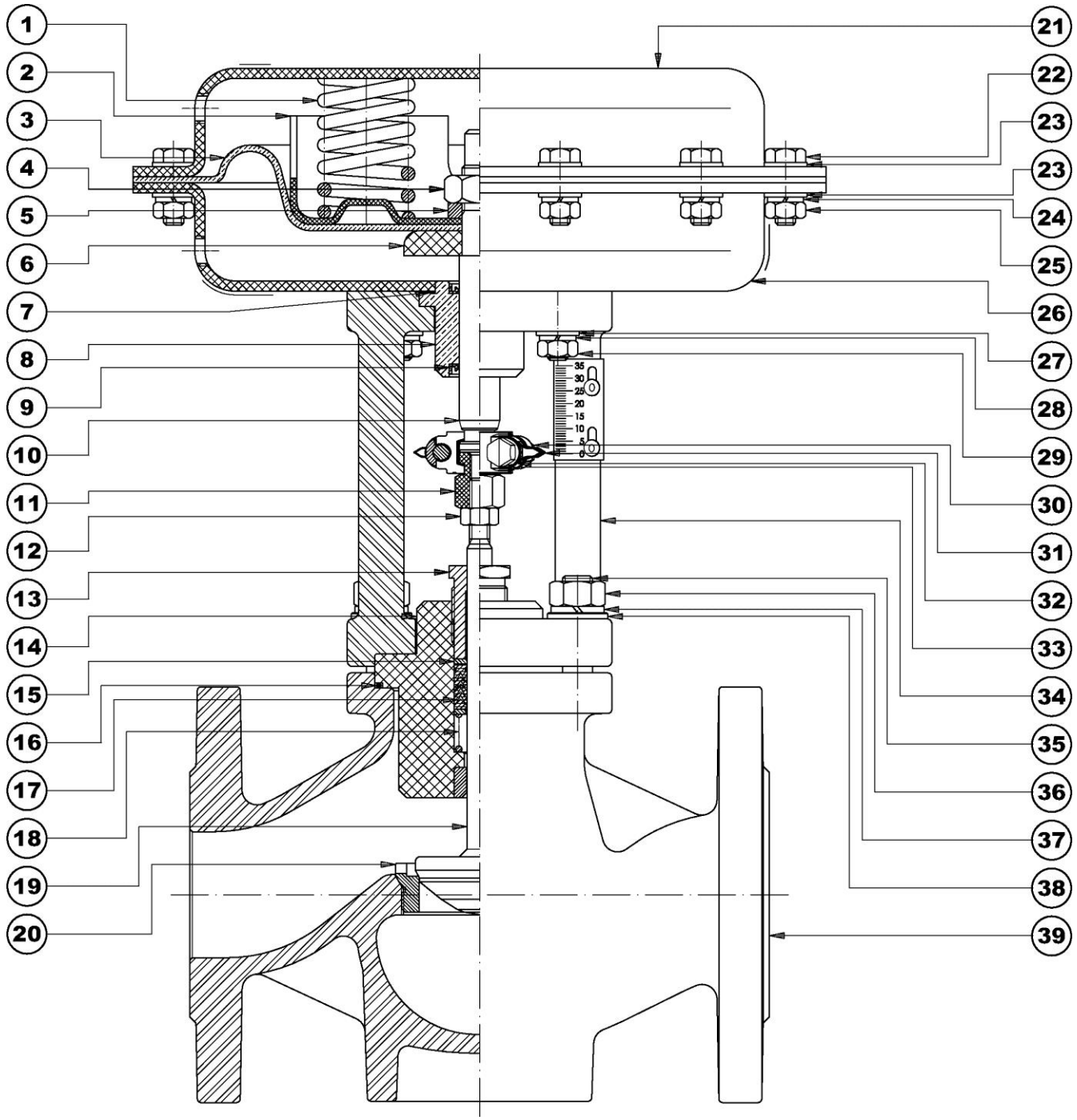
5.6.3 Positioning the normally closed servo control on the valve

1) Place the servo control on the valve frame (34).
2) Insert plain washers (27) and spring washers (28) on the lower head stud-bolts (26).
3) Torque tighten the nuts (29) according to table 6.
4) Blow air in the servo control. **Attention! The servo control shaft will move by its stroke.**
5) Insert the frame (34) with servocontrol onto the valve body stud-bolts (35) and onto the shutter stem so that the air couplings are on the valve output.
6) Insert the plain washers (38) and the spring washers (37) on the stud-bolts and tighten nuts (36) to torque as specified in Table 6.
7) Push shutter in contact with seat, then extract air from servo control: **Attention! Servo control stem shall move downwards until in contact with adjustment nut (11).**
8) Join precharge adjustment nut (11) and servo control shaft (10) with junction clamps (31), insert screws (30) and insert washers (32) on them.
9) Torque tighten the nuts (33) according to table 6.

5.6.4 Positioning the normally open servo control on the valve

1) Place the servo control on the valve frame (34).
2) Insert plain washers (27) and spring washers (28) on the lower head stud-bolts (26).
3) Torque tighten the nuts (29) according to table 6.
4) Insert the frame (34) with servocontrol onto the valve body stud-bolts (35) and onto the shutter stem so that the air couplings are on the valve output.
5) Insert the plain washers (38) and the spring washers (37) on the stud-bolts and tighten nuts (36) to torque as specified in Table 6.
6) Lock the shutter (19) until the preload adjustment nut (11) is in contact with servo control shaft (10).
7) Join precharge adjustment nut (11) and servo control shaft (10) with junction clamps (31), insert screws (30) and insert washers (32) on them.
8) Torque tighten the nuts (33) according to table 6.

Exploded view of SBS 2-way DN 15 ÷ 50 NC valve



Drawing No. 020279 Rev.:01

5.7 Instructions for disassembly, gasket replacement, reassembly of NC SINGLE HEAD servo controls for SBS

For disassembly and assembly instructions for N.C. SINGLE HEAD servo control for SBS refer to to Drw. No. 020279 attached hereby.

Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.

Whenever operations are to be carried out on valves, remove the fluid completely.

NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

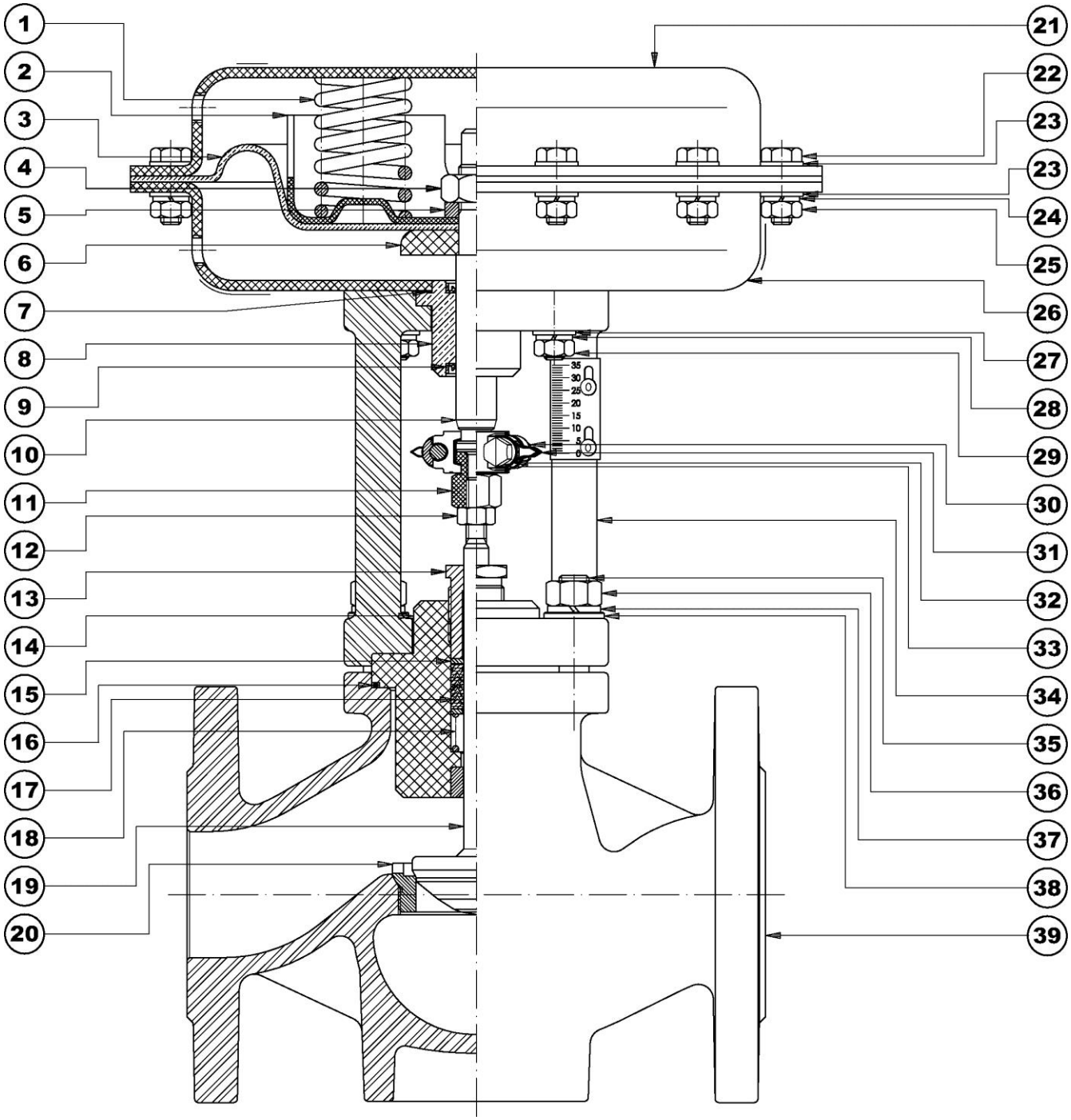
5.7.1 Disassemble of NC SINGLE HEAD servo control

1) Extract jig bushing (8). Remove BA (9) and OR gasket (7) from it.
2) Untighten screws (22) and separate from nuts (25), from washers (23) and from spring washers (24).
3) **Attention! Compressed springs are included inside the servo control**: use a suitable equipment to prevent sudden separation of two servo control heads when all screws are untightened (22).
4) Remove the upper head (21).
5) Extract servo control springs (1).
6) Extract servo control shaft (10) from the lower head (26).
7) Lock the servo control shaft between soft cheeks (10), then unscrew the nut (4).
8) Extract from servo control shaft (10) the spacer ring washer (5), spring-holding plate (2), membrane (3) and diaphragm counter-disc (6).
9) Now the servo control has been completely disassembled, so that the required components can be replaced.

5.7.2 Reassemble of NC SINGLE HEAD servo control

1) Fasten the servo control shaft (10) between soft jaws, insert on it diaphragm counter-disc (6), membrane (3), spring-holding plate (2) and spacer ring washer (5).
2) Tighten and punch hexagonal nut (4) to torque, according to Table 6.
3) Insert servo control shaft assembled into the lower head (26).
4) Insert springs (1) into spring-holding plate (2), by placing them on bosses located on plate.
5) Place membrane (3) so that its screw holes correspond with lower head screw holes.
6) Place upper head (21) so that air holes of both heads are on the same vertical line and screw holes correspond with membrane and lower head screw holes.
7) Using proper instruments, press the springs go get the two heads closer. **Attention! Ensure that two heads cannot suddenly separate before being fastened with proper screws.**
8) Insert the washers (23) in the screws (22), insert screws (22) into upper head holes (21), insert washers (23) and spring washers (24) into screws (22) and torque tighten the hexagonal nuts (25) according to table 6,
9) Insert BA (9) and OR gasket (7) into jig bushing (8).
10) Insert jig bushing assembled (8) on servo control shaft (10) and lower head (26).
11) Now, servo control is completely assembled and can be re-located on frame.

5.7.3 Exploded view of SBS valve with NC SINGLE HEAD servo control



Drawing No. 020279 Rev.:01

5.8 Instructions for disassembly, gasket replacement, reassembly of N.O. SINGLE HEAD servo controls for SBS

For disassembly and assembly instructions for N.O. SINGLE HEAD servo control for SBS refer to to Drw. No. 020361 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

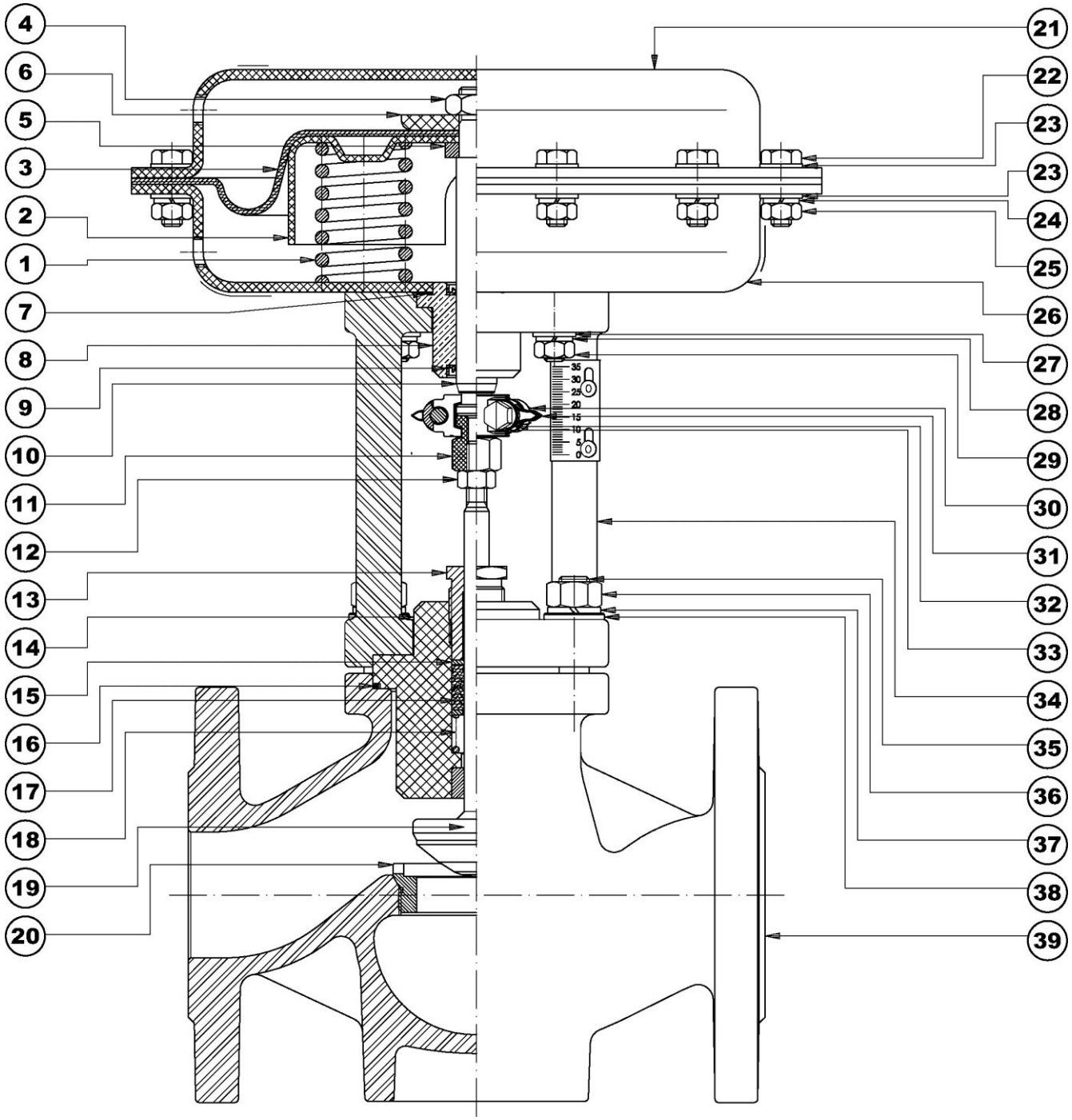
5.8.1 Disassemble of N.O. SINGLE HEAD servo control

1) Extract jig bushing (8). Remove BA (9) and OR gasket (7) from it.
2) Untighten screws (22) and separate from nuts (25), from washers (23) and from washers (24).
3) **Attention! Compressed springs are included inside the servo control**: use a suitable equipment to prevent sudden separation of two servo control heads when all screws are untightened (22).
4) Remove the upper head (21).
5) Extract servo control shaft (10) from the lower head (26).
6) Extract the springs (1) from lower head (26).
7) Lock the servo control shaft between soft jaws and unscrew the nut (4), extract diaphragm counterdisc (6). Note: 200 diameter servo control has no nut (4), but the same diaphragm counterdisc works like a closing nut.
8) Extract membrane (3), spring-holding plate (2) and spacer (5) from servo control shaft (10).
9) Now the servo control has been completely disassembled, so that the required components can be replaced.

5.8.2 Reassemble of N.O. SINGLE HEAD servo control

1) Fasten the servo control shaft (10) between soft jaws, insert on it spacer (5), spring-holding plate (2), membrane (3) and diaphragm counter-disc (6).
2) Tighten and punch hexagonal nut (4) to torque, according to Table 6. 200-diameter servo control has no nut (4), but the same diaphragm counterdisc (6) works like a closing nut.
3) Insert servo control shaft assembled into the upper head (21).
4) Insert springs (1) into spring-holding plate (2), by placing them on bosses located on plate.
5) Place membrane so that its screw holes correspond with upper head screw holes.
6) Place lower head (21) so that air holes of both heads are on the same vertical line and screw holes correspond with membrane and upper head screw holes.
7) Using proper instruments, press the springs go get the two heads closer. **Attention! Ensure that two heads cannot suddenly separate before being fastened with proper screws.**
8) Insert the washers (23) in the screws (22), insert screws (22) into upper head holes (21), insert washers (23) and spring washers (24) into screws (22) and torque tighten the hexagonal nuts (25) according to table 6.
9) Insert BA (9) and OR gasket (7) into jig bushing (8).
10) Insert jig bushing assembled (8) on servo control shaft (10) and lower head (26).
11) Now, servo control is completely assembled and can be re-located on frame.

5.8.3 Exploded view of SBS valve with N.O. SINGLE HEAD servo control



Drawing No. 020361 Rev.:00

5.9 Instructions for disassembly, gasket replacement, reassembly of NC DOUBLE HEAD servo controls for SBS

For disassembly and assembly instructions for N.C.DOUBLE HEAD for SBS refer to Dwg. No. 100212 attached hereby.

Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.

Whenever operations are to be carried out on valves, remove the fluid completely.

NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

5.9.1 Disassemble of NC DOUBLE HEAD servo control

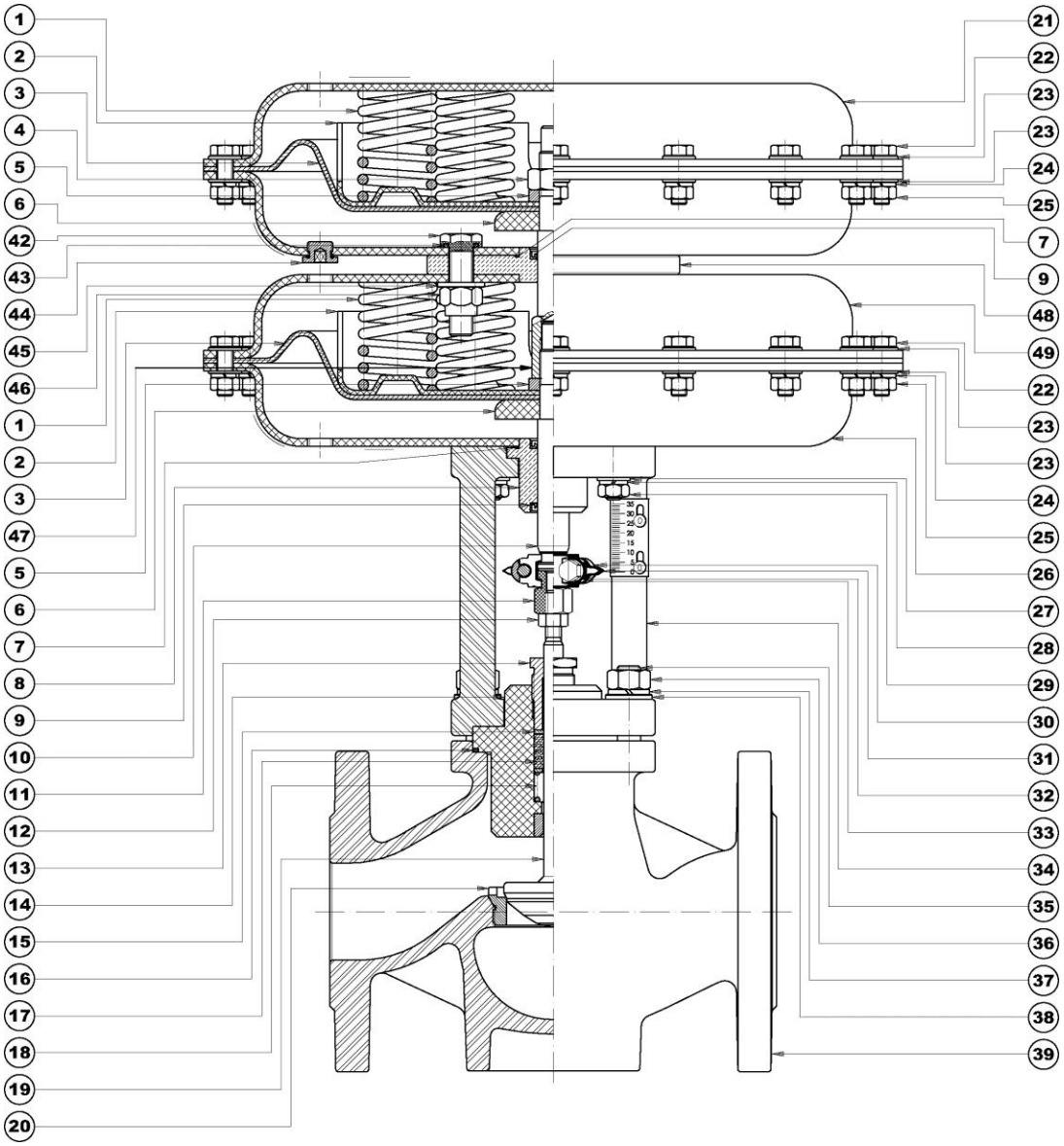
1) Extract jig bushing (8). Remove BA (9) and OR gasket (7) from it.
2) Untighten screws (22) of upper servo control and separate from nuts (25), washers (23) and spring washers (24).
3) **Attention! Compressed springs are included inside the upper servo control**: use a suitable equipment to prevent sudden separation of two servo control heads when all screws are untightened (22).
4) Remove the upper head (21).
5) Extract the first set of servo control springs (1).
6) Extract the nut (4).
7) Extract the servo control shaft (47) from the first spacer ring washer (5), first spring-holding plate (2), first membrane (3) and first diaphragm counter-disc (6).
8) Untighten screws (22) and separate from nuts (25), from washers (23) and from spring washers (24) of lower servo control.
9) Attention! Compressed springs are included inside the lower servo control: use a suitable equipment to prevent sudden separation of two servo control heads when all screws are untightened (22).
10) Extract two central heads from servo control as still joined by screws (42).
11) Extract the second set of servo control springs (1).
12) Remove from lower head (26) two servo control shafts as still joined.
13) Fasten shaft (10) to untighten the stem (47), them remove the second spacer ring washer (5), second spring-holding plate (2), second membrane (3) and second diaphragm counter-disc (6).
14) Untighten screws (42) and remove ORs (43), then separate two remove control intermediate heads.
15) Remove spacer (48) and extract BA (9) and OR gasket (7) from it.
16) Now the servo control has been completely disassembled, so that the required components can be replaced.

5.9.2 Reassemble of NC DOUBLE HEAD servo control

1) Insert onto stem (10) diaphragm counterdisc (6), membrane (3), spring-holding plate (2) and spacer ring washer (5).
2) Torque tighten, as specified in Table 6, shaft (47) on stem (10) and place the newly-assembled unit onto lower head (26) so that membrane holes coincide with lower head holes.
3) Place the first set of springs (1) on bosses of the first spring-holding plate.
4) Place BA (9) and OR gasket (7) into spacer (48).
5) Insert previously-assembled spacer (48) between two heads (49).
6) Inserts screws (42) with ORs (43) in their relevant seat, into intermediate heads, insert washers (45) and tighten nuts (46) to have the assembly compacted.
7) Place the spacer and intermediate head assembly onto shaft (47) so that head screw holes correspond with lower head screw holes.
8) Using proper instruments, press the springs go get the heads closer. **Attention! Ensure that heads cannot suddenly separate before being fastened with proper screws.**
9) Insert the washers (23) in the screws (22), insert screws (22) into head holes and insert washers (23) and spring washers (24) into screws (22) and torque tighten the hexagonal nuts (25) according to table 6.
10) Insert onto stem (47) the second diaphragm counterdisc (6), second membrane (3), second spring-holding plate (2) and the remaining spacer ring washer (5).
11) Tighten and punch nut (4).
12) Place the remaining servo control springs.

13) Place upper head (21) so that air holes of heads are on the same vertical line and screw holes correspond with membrane and lower head screw holes.
14) Using proper instruments, press the springs go get the two heads closer. Attention! Ensure that two heads cannot suddenly separate before being fastened with proper screws.
15) Insert the washers (23) in the screws (22), insert screws (22) into head holes (21) and insert washers (23) and spring washers (24) into screws (22) and torque tighten the hexagonal nuts (25) according to table 6.
16) Insert BA (9) and OR gasket (7) into jig bushing (8).
17) Insert jig bushing assembled (8) on servo control shaft (10) and lower head (26).
18) Now, servo control is completely assembled and can be re-located on frame.

5.9.3 Exploded view of SBS valve with NC DOUBLE HEAD servo control



Drawing No. 100212 Rev.:00

5.10 Instructions for disassembly, gasket replacement, reassembly of N.O. DOUBLE HEAD servo controls for SBS

For disassembly and assembly instructions for N.O.DOUBLE HEAD for SBS refer to Dwg. No. 100213 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

5.10.1 Disassemble of N.O. DOUBLE HEAD servo control

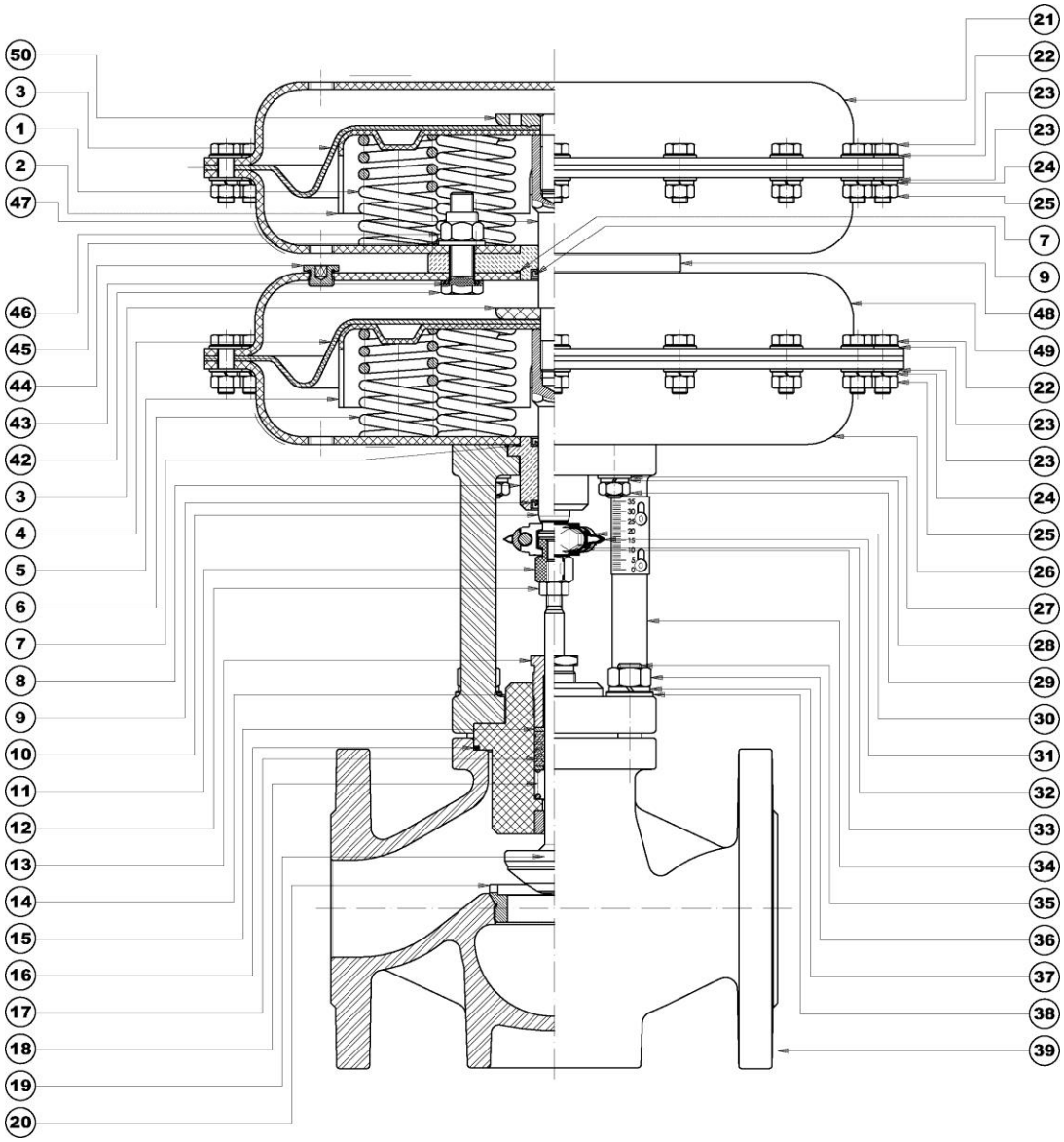
1) Extract jig bushing (8). Remove BA (9) and OR gasket (7) from it.
2) Untighten screws (22) of two servo controls and separate from nuts (25), washers (23) and spring washers (24).
3) **Attention! Compressed springs are included inside the servo controls**: use a suitable equipment to prevent sudden separation of servo control heads when all screws are untightened (22).
4) Remove the upper head (21).
5) Untighten threaded diaphragm counter-disc (50).
6) Extract the first membrane (3) and first spring-holding plate (2) from servo control shaft (47) and extract the first set of servo control springs (1).
7) Extracts two stems (47 and 10) still connected to intermediate heads assembly and second set of membrane and spring-holding plate.
8) Extract the second set of springs (1) from lower servo control.
9) Fasten shaft (10) to untighten stem (47).
10) Remove the intermediate heads assembly.
11) Then, extract diaphragm counter-disc (3), second membrane (4) and second spring-holding plate (5).
12) Untighten screws (42) and remove ORs (43), then separate two remove control intermediate heads.
13) Remove spacer (48) and extract BA (9) and OR gasket (7) from it.
14) Remove from lower head (26) two servo control shafts as still joined.
15) Now the servo control has been completely disassembled, so that the required components can be replaced.

5.10.2 Reassemble of N.O. DOUBLE HEAD servo control

1) Place BA (9) and OR gasket (7) into spacer (48).
2) Place spacer (48) between two intermediate heads (49) with air coupling holes on the same vertical line.
3) Fasten head assembly with screws (42) equipped with ORs (43), by placing the washers (45) and tightening nuts (46).
4) Insert the servo control shaft (10) into the spacer and diaphragm counter-disc (3), membrane (4) and spring-holding plate (5) into servo control shaft, then torque tighten the servo control shaft (47) as specified in Table 6.
5) Place springs (6) onto lower head (26), then insert servo control stem (18) into head and centre springs (6) on bosses of the spring-holding plate (5).
6) Place springs (1) onto upper servo control intermediate head, place spring-holding plate (2) and act to place springs on bosses of the spring-holding plate.
7) Then insert membrane (3) and place it so that screw-passing holes correspond with lower head holes.
8) Tighten diaphragm counter-disc (50) to torque, according to Table 6.
9) Place upper head (21) so that air coupling holes are on the same vertical line.
10) Using proper instruments, press the springs go get the heads closer. **Attention! Ensure that heads cannot suddenly separate before being fastened with proper screws.**
11) Insert the washers (23) in the screws (22), insert screws (22) into head holes and insert washers (23) and spring washers (24) into screws (22) and torque tighten the hexagonal nuts (25) according to table 6; perform this operation on both head assemblies.
12) Insert BA (9) and OR gasket (7) into jig bushing (8).
13) Insert jig bushing assembled (8) on servo control shaft (10) and lower head (26).

14) Now, servo control is completely assembled and can be re-located on frame.

5.10.3 Exploded view of SBS valve with N.O. DOUBLE HEAD servo control



Drawing No. 100213 Rev.:00

5.11 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 2-WAY DN 15÷ 50

For the disassembly and assembly operations of the body SBS 2-way DN 15÷50 refer to Drw. no. 020279 attached hereby.

Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.

Whenever operations are to be carried out on valves, remove the fluid completely.

NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

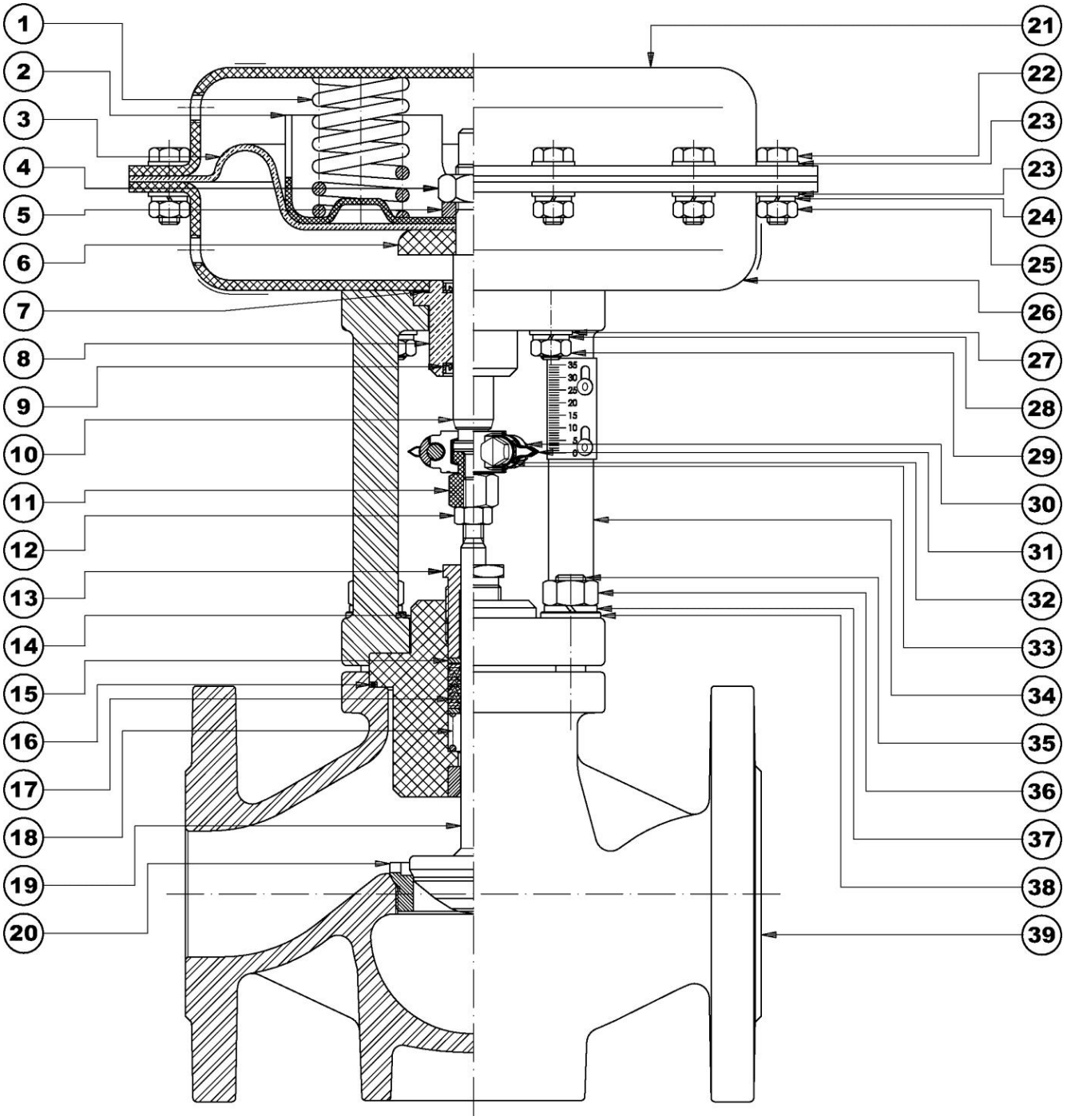
5.11.1 Disassembly of 2-way DN 15 ÷ 50 valve body.

1) Untighten adjustment nut (11) from shutter stem (19) carefully marking their position.
2) Extract the nut (12).
3) Remove the intermediate body (14) with shutter (19) inserted.
4) Extract the shutter (19) from the intermediate body (14).
5) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the inner components of intermediate body from coming out suddenly when the packing gland screw (13) is no more kept.**
6) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
7) Extract the body gasket (16) into the valve body (39).
8) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.11.2 Reassembly of 2-way DN 15 - 50 valve body.

1) Grease intermediate body internal side (14) with silicone grease.
2) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
3) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
4) Grease with silicone grease the stem of the servo control (19) and insert it into the previously-assembled intermediate body (14).
5) Lean the body gasket (16) onto the valve body seat (39).
6) Then, place the intermediate body (14) into valve body (39) with shutter (19) already inserted.
7) Tighten on the shutter stem the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
8) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.11.3 Exploded view of SBS 2-way DN 15 ÷ 50 NC valve



Drawing No. 020279 Rev.:01

5.12 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 2-WAY DN 65÷ 80

For the disassembly and assembly operations of the body SBS 2-way DN 65÷80 refer to Drw. no. 100208 attached hereby.

Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.

Whenever operations are to be carried out on valves, remove the fluid completely.

NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

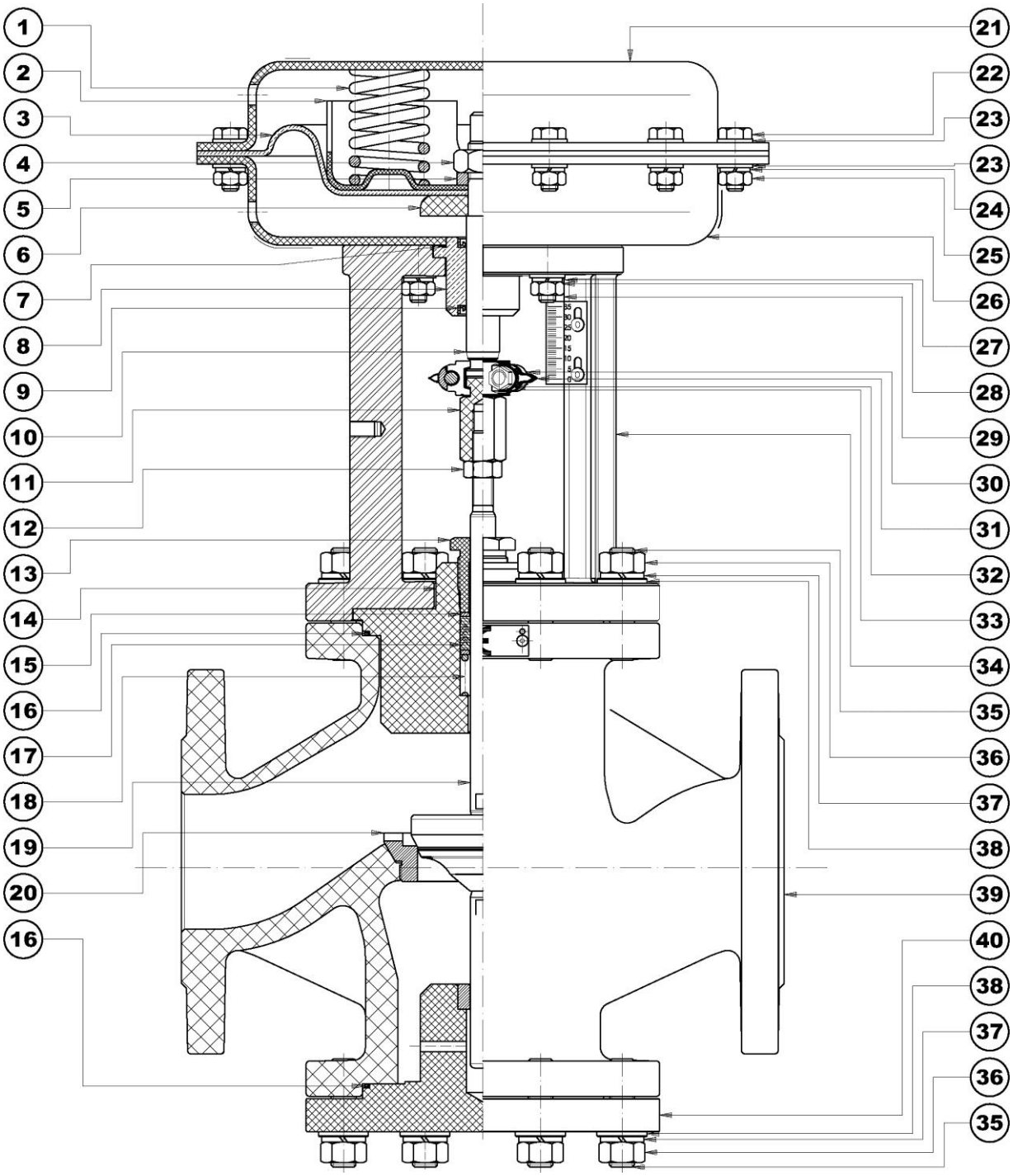
5.12.1 Disassembly of 2-way DN 65 ÷ 80 valve body.

1) Untighten adjustment nut (11) from shutter stem (19) carefully marking their position.
2) Extract the nut (12).
3) Remove the intermediate body (14) with shutter (19) inserted.
4) Extract the shutter (19) from the intermediate body (14).
5) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the inner components of intermediate body from coming out suddenly when the packing gland screw (13) is no more kept.**
6) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
7) Extract the body gasket (16) into the valve body (39).
8) Untighten the bottom base (40) from the valve body (39) and extract the bottom base gasket (16).
9) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.12.2 Reassembly of 2-way DN 65 - 80 valve body

1) Place the bottom base gasket (16) on the bottom base (40) and torque tighten onto valve body (39), as specified in Table 6.
2) Grease intermediate body internal side (14) with silicone grease.
3) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (25).
4) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
5) Grease with silicone grease the stem of the servo control (19) and insert it into the previously-assembled intermediate body (14).
6) Lean the body gasket (16) onto the valve body seat (39).
7) Then, place the intermediate body (14) into valve body (39) with shutter (19) already inserted.
8) Tighten the nut (12) and the adjustment nut (11) on the shutter stem (19), carefully restoring the original position marked before the disassembly.
9) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.12.3 Exploded view of SBS 2-way DN 65 ÷ 80 NC valve



Disegno N° 100208 Rev.:00

5.13 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 3-WAY DN 15÷ 50

For the disassembly and assembly operations of the body SBS 3-way DN 15÷50 refer to Drw. no. 020363 attached hereby.

Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.

Whenever operations are to be carried out on valves, remove the fluid completely.

NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

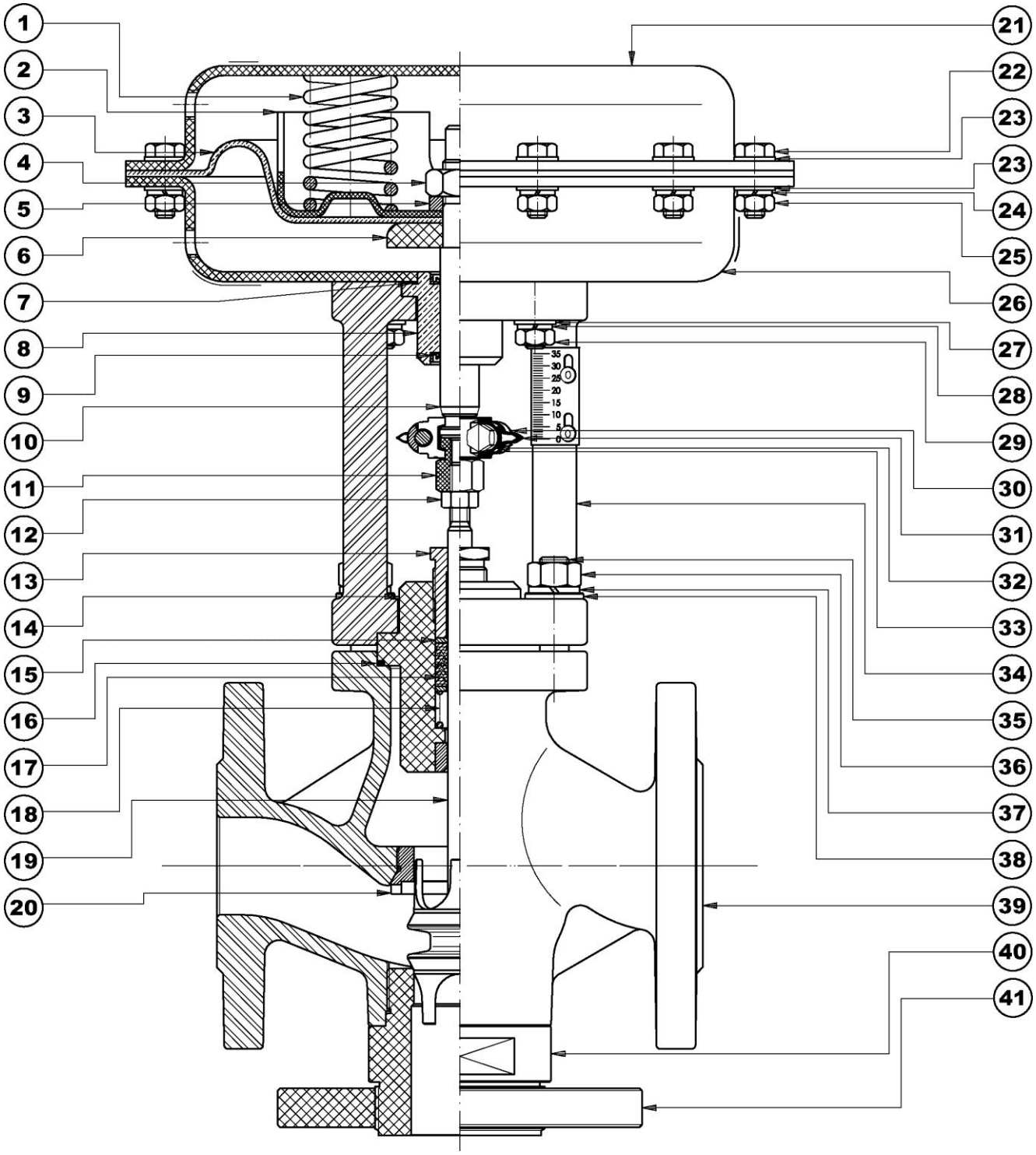
5.13.1 Disassembly of 3-way DN 15 ÷ 50 valve body

1) Untighten adjustment nut (11) from shutter stem (19) carefully marking their position.
2) Extract the nut (12).
3) Unscrew the third way flange (41) and third way bottom base (40)
4) Extract the shutter (19) from the body valve bottom (39).
5) Extract the intermediate body (14).
6) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the inner components of intermediate body from coming out suddenly when the packing gland screw (13) is no more kept.**
7) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
8) Extract the body gasket (16) into the valve body (39).
9) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.13.2 Disassembly of 3-way DN 15 ÷ 50 valve body

1) Grease intermediate body internal side (14) with silicone grease.
2) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
3) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
4) Lean the body gasket (16) onto the valve body seat (39).
5) Then, insert the intermediate body (14) into the valve body (39).
6) Grease with silicone grease the stem of the shutter (19) and insert it into the previously-assembled intermediate body (14) from the valve body bottom (39).
7) Torque tighten the third way bottom base (40) onto the valve body (39), as specified in Table 6.
8) Tighten the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
9) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.13.3 Exploded view of SBS 3-way DN 15 ÷ 50 NC valve



Drawing No. 020363 Rev.:00

5.14 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 3-WAY DN 65÷ 80

For the disassembly and assembly operations of the body SBS 3-way DN 65÷80 refer to Drw. no. 100209 attached hereby.

Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.

Whenever operations are to be carried out on valves, remove the fluid completely.

NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

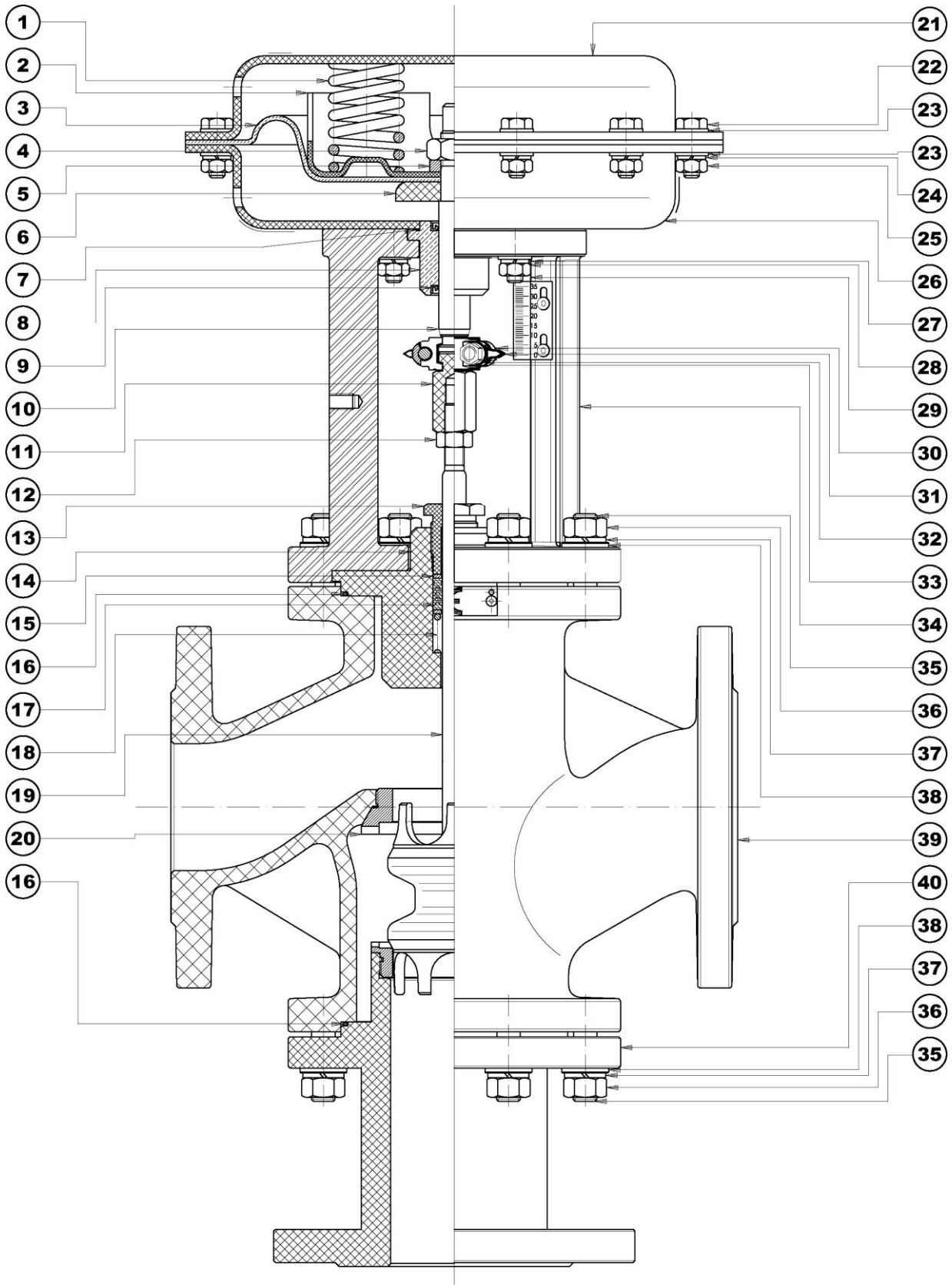
5.14.1 Disassembly of 3-way DN 65 ÷ 80 valve body

1) Untighten adjustment nut (11) from shutter stem (19) carefully marking their position.
2) Extract the nut (12).
3) Unscrew the lower nuts (36), extract the spring washers (37) and the plain washers (38).
4) Remove the third way bottom base (40) and the bottom base gasket (16) from the bottom base.
5) Extract the shutter (19) from the body valve bottom (39).
6) Extract the intermediate body (14).
7) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the inner components of intermediate body from coming out suddenly when the packing gland screw (13) is no more kept.**
8) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
9) Extract the body gasket (16) into the valve body (39).
10) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.14.2 Disassembly of 3-way DN 65 ÷ 80 valve body

10) Grease intermediate body internal side (14) with silicone grease.
11) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
12) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
13) Lean the body gasket (16) onto the valve body seat (39).
14) Then, insert the intermediate body (14) into the valve body (39).
15) Grease with silicone grease the stem of the shutter (19) and insert it into the previously-assembled intermediate body (14) from the valve body bottom (39).
16) Place the bottom base gasket (16) on third way bottom base (40) and place it on the valve body (39): insert the plain washers (38) and the spring washers (37) on the stud-bolts (35) and tighten nuts (36) to torque as specified in Table 6.
17) Tighten the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
18) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.14.3 Exploded view of SBS 3-way DN 65 ÷ 80 NC valve



Drawing No. 100209 Rev.:00

5.15 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 2-WAY DN 15÷ 50 with bellows

For the disassembly and assembly operations of the body SBS 2-way DN 15÷50 refer to Drw. no. 020372 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

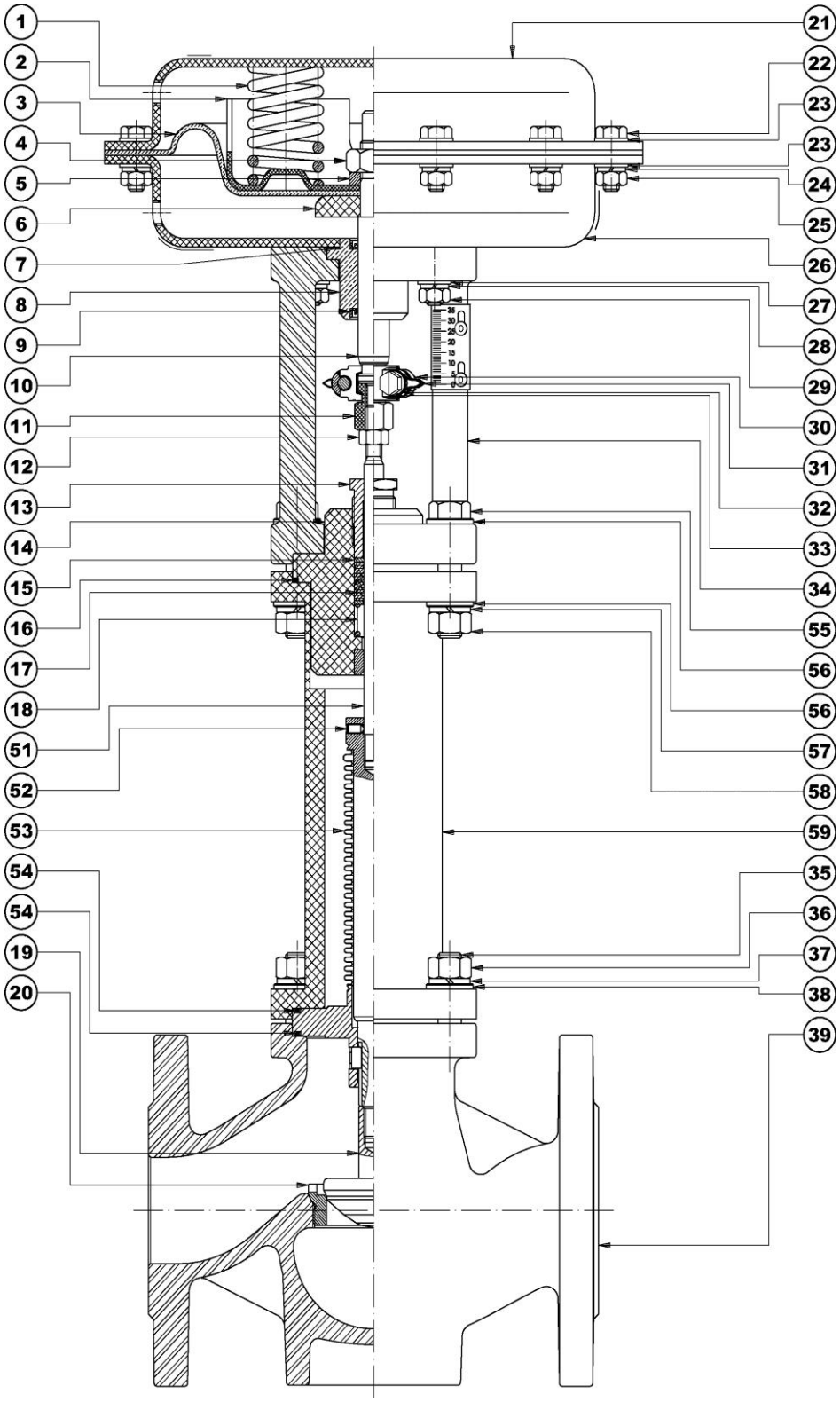
5.15.1 Disassembly of 2-way DN 15 - 50 valve body with bellows.

1) Untighten adjustment nut (11) from upper stem (51) carefully marking their position.
2) Extract the nut (12).
3) Extract the intermediate body (14) from frame extension (59), remove the gasket (16) from it.
4) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the intermediate body components from coming out suddenly when the packing gland screw (13) is no longer in position.**
5) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
6) Unscrew the nuts (36), extract the spring washers (37) and the plain washers (38).
7) Remove the frame extension (59): now, extract the intermediate body with bellows (53), then gaskets (54). Handle bellows with care, since it is a very fragile component.
8) Untighten the headless screw (52) and the upper stem (51).
9) Untighten the shutter (19) from the intermediate body (53) with bellows. Please note: this operation is very delicate and must be performed with maximum care. It is not strictly necessary for gasket replacement.
10) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.15.2 Reassembly of 2-way DN 15 - 50 valve body with bellows.

1) Grease intermediate body internal side (14) with silicone grease.
2) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
3) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
4) Tighten the shutter (19) on the stem of intermediate body (53) with bellows until it touches.
5) Tighten the upper stem (51) into the intermediate body with bellows (53) and tighten headless screw (52).
6) Insert body gaskets (54) into intermediate body with bellows (53).
7) Insert the previously assembled intermediate with bellows into the valve body.
8) Insert the frame extension (59) onto valve body stud bolts (35).
9) Insert the plain washers (38), the spring washers (39), the nuts (36) on the stud-bolts (35) and torque tighten as specified in Table 6.
10) Place the gasket (16) into the frame extension.
11) Insert the previously-assembled intermediate body (14) into the frame extension (59) and onto the upper stem (51).
12) Tighten the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
13) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.15.3 Exploded view of SBS 2-way DN 15 ÷ 50 NC valve with bellows



Drawing No. 020372 Rev.:00

5.16 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 2-WAY DN 65÷ 80 with bellows

For the disassembly and assembly operations of the body SBS 2-way DN 65÷80 refer to Drw. no. 100214 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

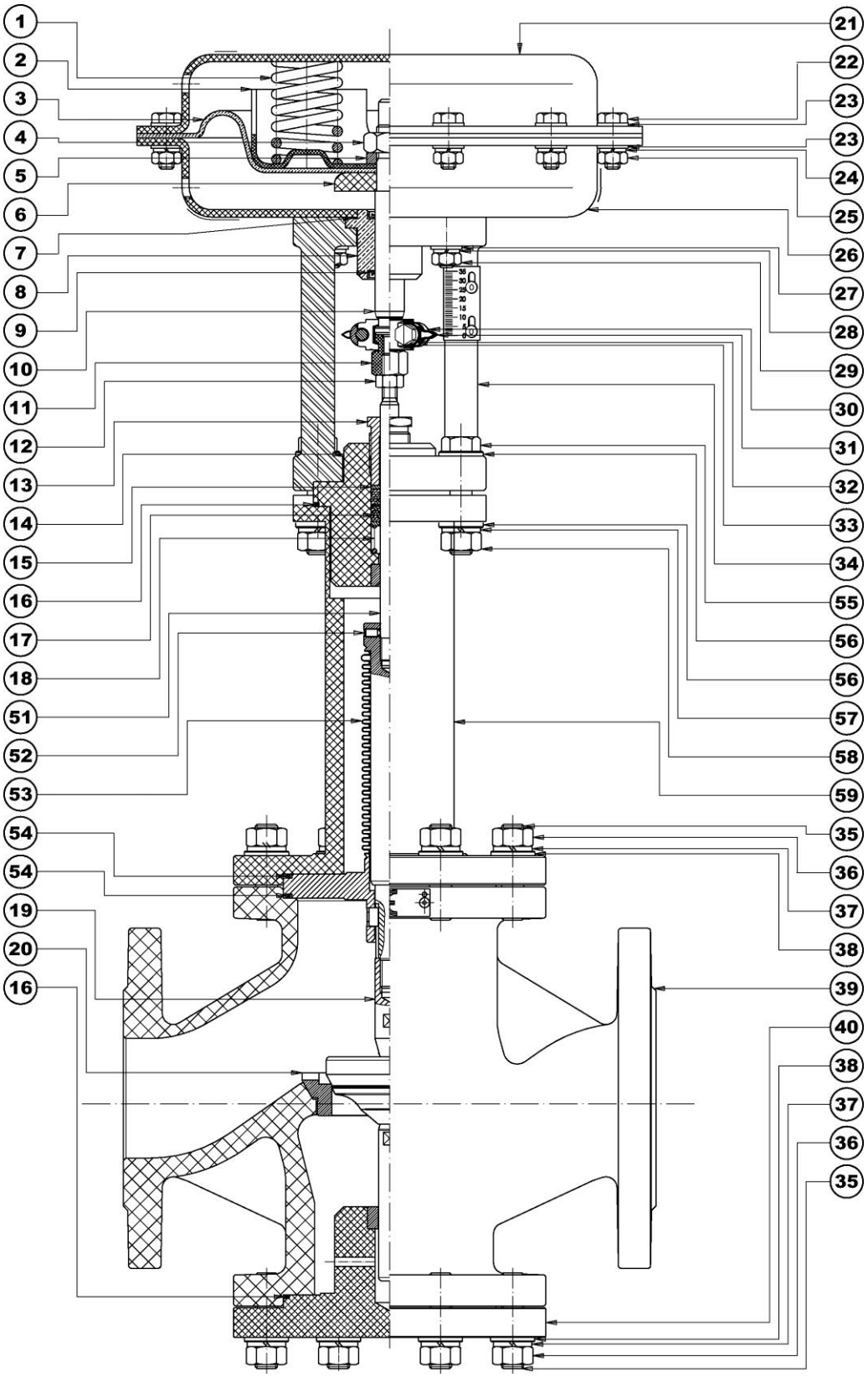
5.16.1 Disassembly of 2-way DN 65 - 80 valve body with bellows.

1) Untighten adjustment nut (11) from upper stem (51) carefully marking their position.
2) Extract the nut (12).
3) Extract the intermediate body (14) from frame extension (59), remove the gasket (16) from it.
4) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the intermediate body components from coming out suddenly when the packing gland screw (13) is no longer in position.**
5) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
6) Unscrew the nuts (36), extract the spring washers (37) and the plain washers (38).
7) Remove the frame extension (59): now, extract the intermediate body with bellows (53), then gaskets (54). Handle bellows with care, since it is a very fragile component.
8) Untighten the headless screw (52) and the upper stem (51).
9) Now, untighten the shutter (19) from the intermediate body (53) with bellows. Please note: this operation is very delicate and must be performed with maximum care. It is not strictly necessary for gasket replacement.
10) Untighten the bottom base (40) from the valve body (39) and extract the bottom base gasket (16).
11) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.16.2 Reassembly of 2-way DN 65 - 80 valve body with bellows.

1) Place the bottom base gasket (16) on the bottom base (40) and torque tighten it onto valve body (39), as specified in Table 6.
2) Grease intermediate body internal side (14) with silicone grease.
3) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
4) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
5) Tighten the shutter (19) on the stem of intermediate body (53) with bellows until it touches.
6) Tighten the upper stem (51) into the intermediate body with bellows (53) and tighten headless screw (52).
7) Insert gaskets (54) and into intermediate body with bellows (53).
8) Insert the previously assembled intermediate with bellows into the valve body.
9) Insert the frame extension (59) onto valve body stud bolts.
10) Insert the plain washers (38), the spring washers (37), the nuts (36) on the stud-bolts (35) and torque tighten as specified in Table 6.
11) Place the gasket (16) into the frame extension.
12) Insert the previously-assembled intermediate body (14) into the frame extension (59) and onto the upper stem (51).
13) Tighten the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
14) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.16.3 Exploded view of SBS 2-way DN 65 ÷ 80 NC valve with bellows



Drawing No. 100214 Rev.:00

5.17 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 3-WAY DN 15÷ 50 with bellows

For the disassembly and assembly operations of the body SBS 3-way DN 15÷50 refer to Drw. no. 020386 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

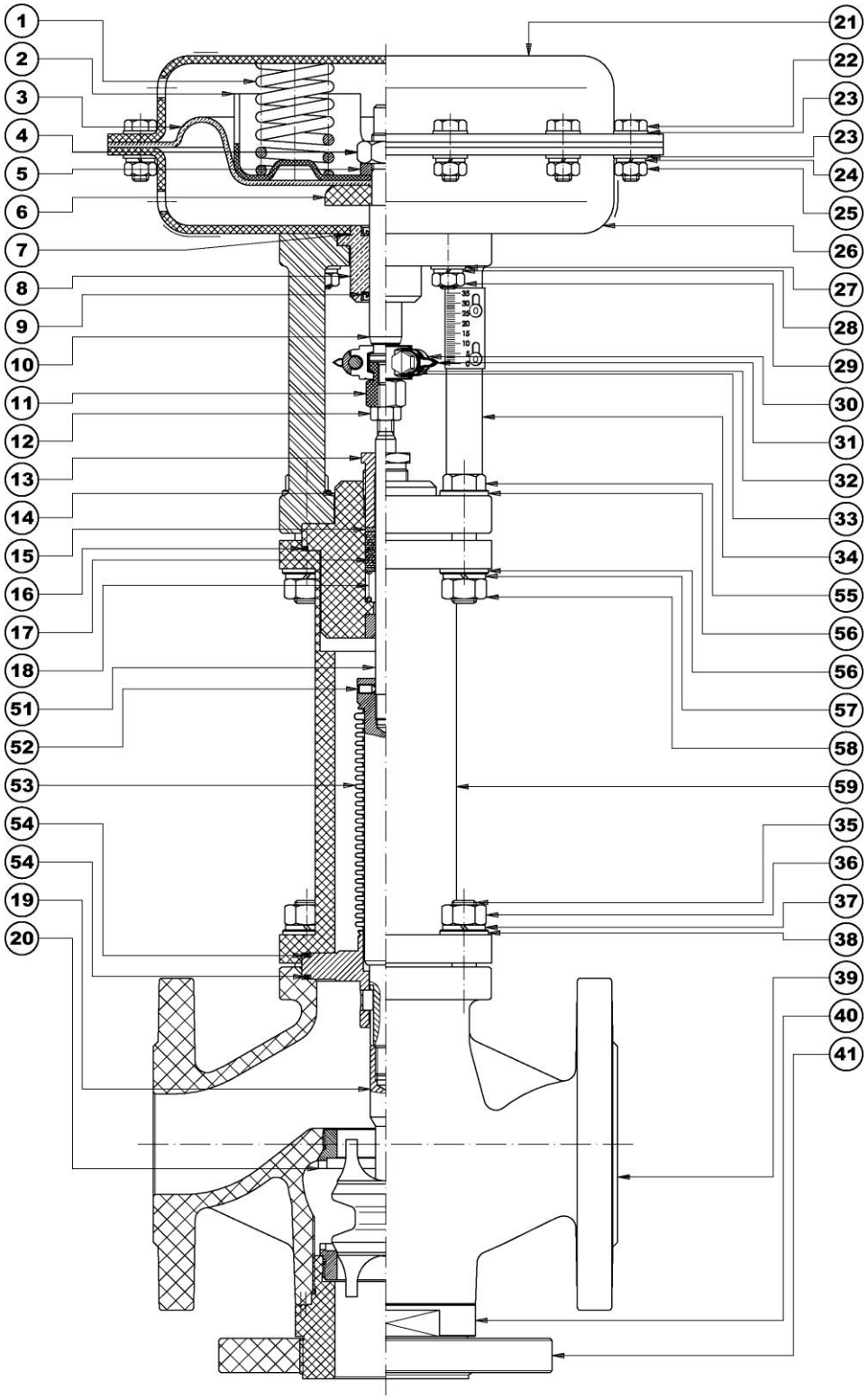
5.17.1 Disassembly of 3-way DN 15 - 50 valve body with bellows.

1) Untighten adjustment nut (11) from upper shutter (51) carefully marking their position.
2) Extract the nut (12).
3) Extract the intermediate body (14) from frame extension (59), remove the gasket (16) from it.
4) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the intermediate body components from coming out suddenly when the packing gland screw (13) is no longer in position.**
5) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
6) Unscrew the nuts (36), extract the spring washers (37) and the plain washers (38).
7) Remove the frame extension (59), then extract the first gasket (54).
8) Untighten the headless screw (52) and the upper stem (51).
9) Unscrew the third way bottom base (40).
10) Untighten the shutter (19) from the intermediate body (53) with bellows and extract the shutter from valve bottom.
11) Extract the intermediate body with bellows (53) from valve body (39), then remove the second gasket (54).
12) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.17.2 Reassembly of 3-way DN 15 - 50 valve body with bellows.

1) Place the first gasket (54) into valve body (39) and lean the intermediate body with bellows (53). Handle bellows with care, since it is a very fragile component.
2) Insert the shutter (19) from valve body bottom and tighten to intermediate body with bellows until it touches.
3) Tighten the third way bottom base (39), as specified in Table 6.
4) Tighten the upper stem (51) into the intermediate body with bellows (53) and tighten headless screw (52).
5) Place the second gasket (54) and insert the frame extension (59) onto valve body stud bolts (35).
6) Insert the plain washers (38), the spring washers (37), the nuts (36) on the stud-bolts (35) and torque tighten as specified in Table 6.
7) Grease intermediate body internal side (14) with silicone grease.
8) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
9) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
10) Place the gasket (16) into the frame extension.
11) Insert the previously-assembled intermediate body (14) into the frame extension (59) and onto the upper stem (51).
12) Tighten the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
13) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

5.17.3 Exploded view of SBS 3-way DN 15 ÷ 50 NC valve with bellows



Drawing No. 020386 Rev.:00

5.18 Instructions for disassembly, gasket replacement, reassembly of bodies for SBS 3-WAY DN 65÷ 80 with bellows

For the disassembly and assembly operations of the body SBS 3-way DN 65÷80 refer to Drw. no. 100215 attached hereby.
Assembly and disassembly operations shall be carried out only by personnel qualified in hydraulics and pneumatics, provided with all the necessary work and safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions, and take the relevant safety measures.
Whenever operations are to be carried out on valves, remove the fluid completely.
NOTE: Read the procedures thoroughly before starting any operation.

Instructions to separate and reassemble the servo control from the valve body are described in paragraph 5.6

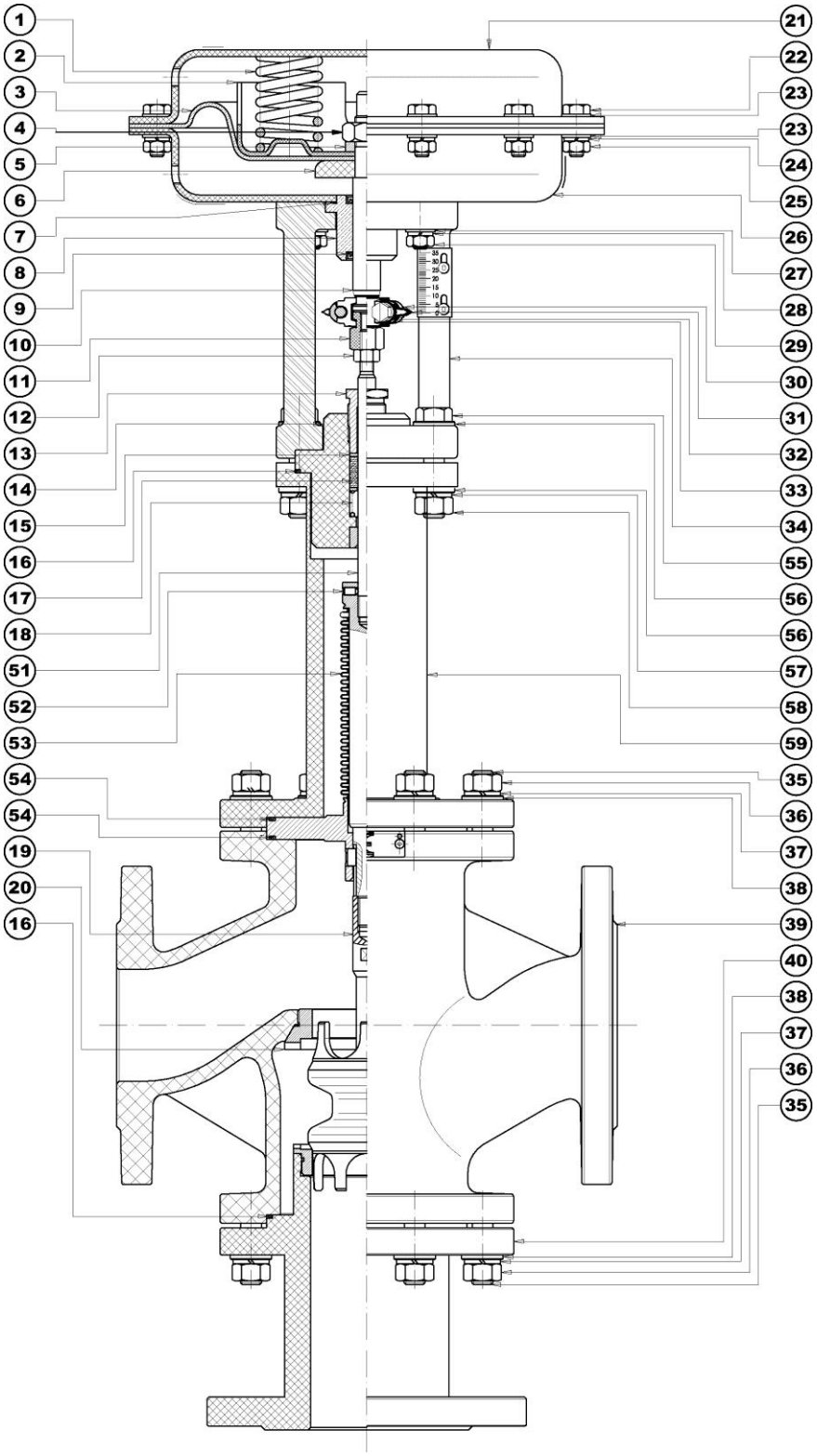
5.18.1 Disassembly of 3-way DN 65 - 80 valve body with bellows.

1) Untighten adjustment nut (11) from upper stem (51) carefully marking their position.
2) Extract the nut (12).
3) Extract the intermediate body (14) from frame extension (59), remove the gasket (16) from it.
4) Untighten the packing gland screw (13). **Attention! The packing gland screw (13) keeps the packing gland spring (18) compressed; maximum care shall then be taken to prevent the intermediate body components from coming out suddenly when the packing gland screw (13) is no longer in position.**
5) Remove from the intermediate body (14) the first packing gland washer (15), the packing gland (17), the second packing gland washer (15) and the packing gland spring (18).
6) Unscrew the upper nuts (36), extract the spring washers (37) and the plain washers (38).
7) Remove the frame extension (59), then extract the first gasket (54). Handle bellows with care, since it is a very fragile component.
8) Untighten the headless screw (52) and the upper stem (51).
9) Unscrew the lower nuts (36), extract the spring washers (37) and the plain washers (38); extract the third way bottom base (40) and take the bottom base gasket (16) out of it.
10) Untighten the shutter (19) from the intermediate body (53) with bellows and extract the shutter from valve bottom.
11) Extract the intermediate body with bellows (53) from valve body (39), then remove the second gasket (54).
12) Now the valve body has been completely disassembled, so that the required components can be replaced.

5.18.2 Reassembly of 3-way DN 65 - 80 valve body with bellows.

1) Place the first gasket (54) into valve body (39) and lean the intermediate body with bellows (53). Handle bellows with care, since it is a very fragile component.
2) Insert the shutter (19) from valve body bottom and tighten to intermediate body with bellows until it touches.
3) Place the bottom base gasket (16) on third way bottom base (40), insert the bottom base on stud-bolts (35); insert the plain washers (38), the spring washers (37) and the nuts (36): tighten to torque as specified in Table 6.
4) Tighten the upper stem (51) into the intermediate body with bellows (53) and tighten headless screw (52).
5) Place the second gasket (54) and insert the frame extension (59) onto valve body stud bolts (35).
6) Insert the plain washers (38), the spring washers (37), the nuts (38) on the stud-bolts (35) and torque tighten as specified in Table 6.
7) Grease intermediate body internal side (14) with silicone grease.
8) Insert in the intermediate body (14) the packing gland spring (18), the packing gland washer (15), the packing gland (17), the second packing gland washer (15).
9) Tighten packing gland screw (13) until it is projected by ≈ 13 mm from the upper level of intermediate body. **Attention! The packing gland screw keeps the packing gland spring compressed; maximum care shall then be taken to prevent the parts located on the spring from coming out suddenly during the assembly operations.**
10) Place the gasket (59) into the frame extension.
11) Insert the previously-assembled intermediate body (14) into the frame extension (59) and onto the upper stem (51).
12) Tighten the nut (12) and the adjustment nut (11), carefully restoring the original position marked before the disassembly.
13) Now the valve body is fully assembled and can be reconnected to the servo control with frame.

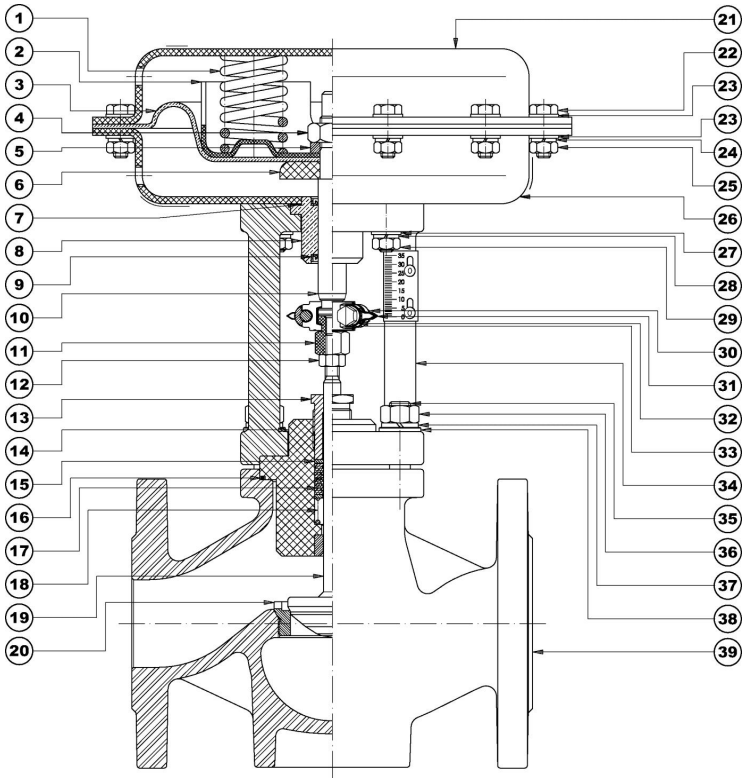
5.18.3 Exploded view of SBS 3-way DN 65 ÷ 80 NC valve with bellows



Drawing No. 100215 Rev.:00

5.19 Parts and spare parts SBS/86 2-WAY DN15÷50 N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M



Body side spare parts

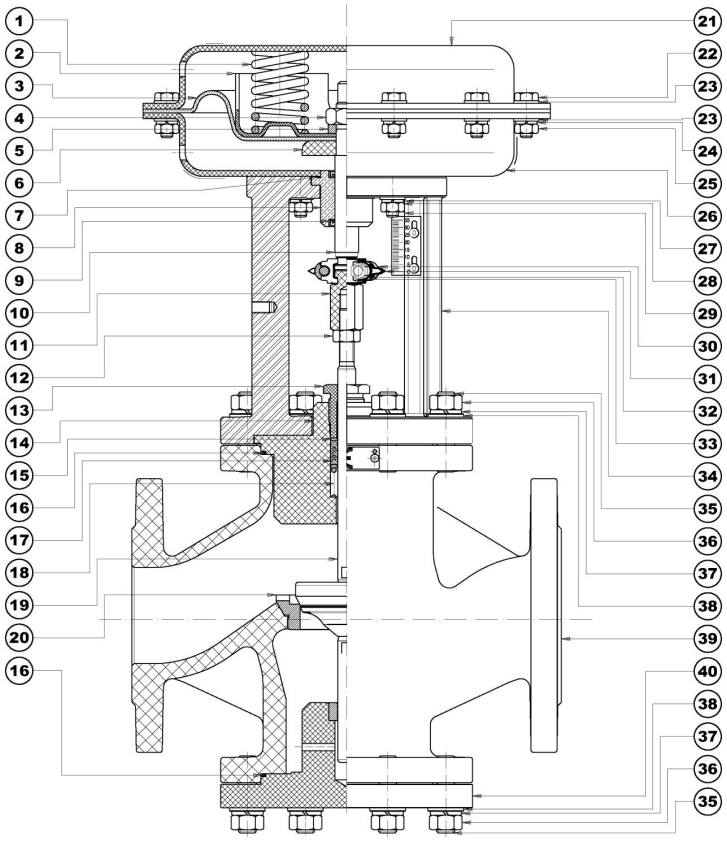
DN	SPARE PART CODE (Part No. 16/17/18)	
	with flat gasket	with OR
15#25	2651	8290
32#40	2652	7814
50	2653	11436

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No. 3/7/9)	DH (Part No. 3/7/9)
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

5.20 Parts and spare parts SBS/86 2-WAY DN65÷80 N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
40	Third way bottom base		Fe 430/ASTM A105 +S42000	S31600

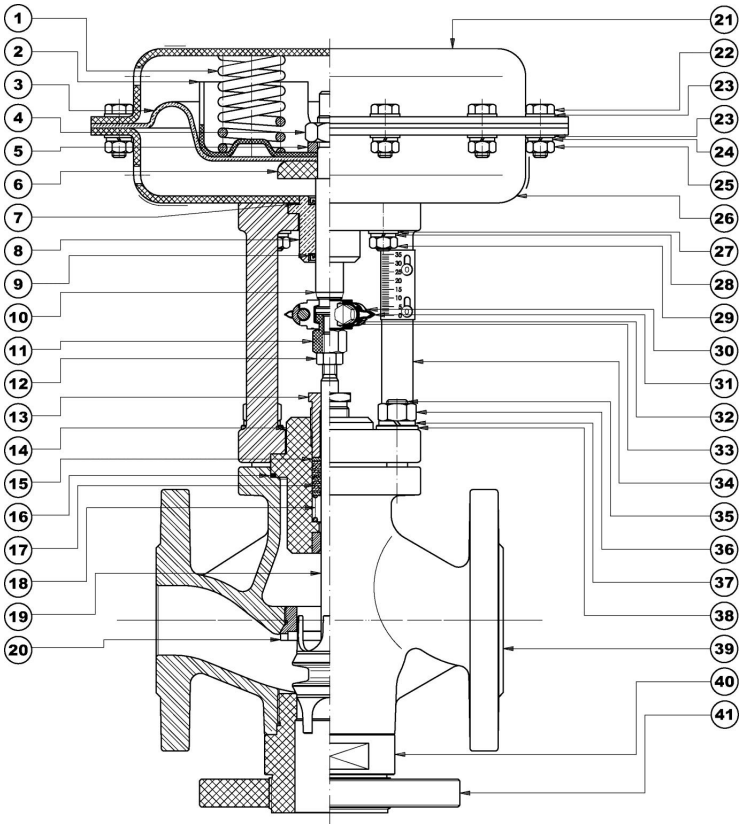


Body side spare parts

DN	SPARE PART CODE (Part No. 16/17/18)	
	with flat gasket	with OR
65#80	5425	11373

5.21 Parts and spare parts SBS/86 3-WAY DN15÷50 N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
40	Third way bottom base		Fe 430/ASTM A105 +S30400	S31600
41	Third way flange		Fe 360/ASTM A105	S30400



Body side spare parts

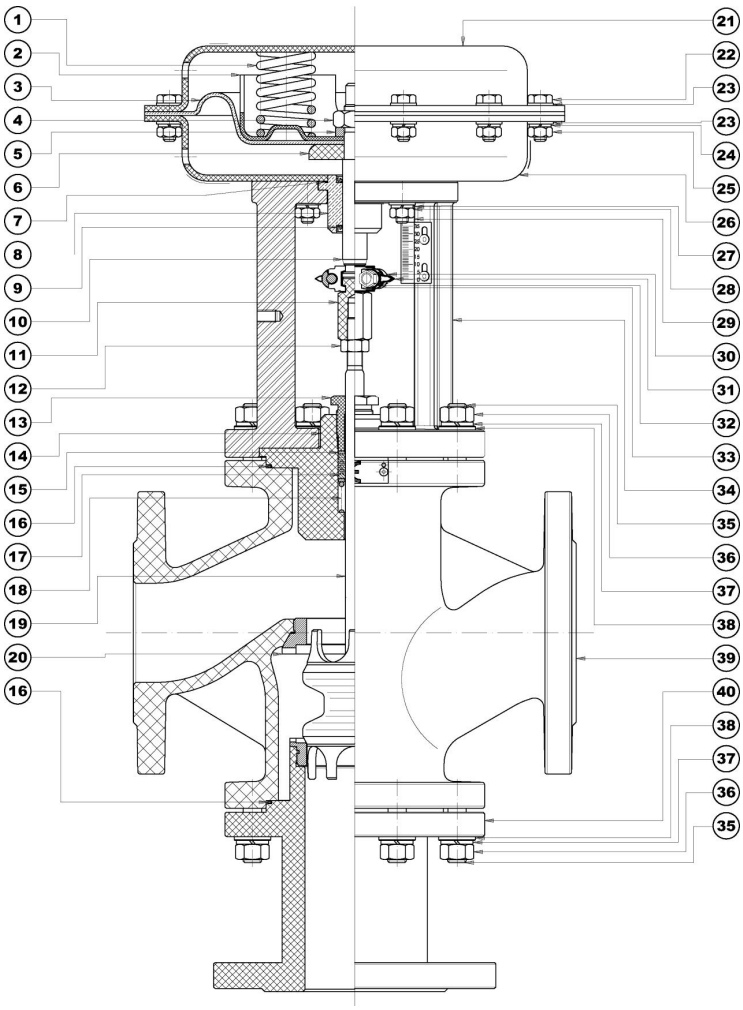
DN	SPARE PART CODE (Part No. 16/17/18)	
	with flat gasket	with OR
15	5419	8291
20	5420	8292
25	5421	8293
32	5422	7815
40	5423	7816
50	5424	11437

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No. 3/7/9)	DH (Part No. 3/7/9)
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

5.22 Parts and spare parts SBS/86 3-WAY DN65÷80 N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
40	Third way bottom base		Fe 430/ASTM A105 +S30400	S31600



Body side spare parts

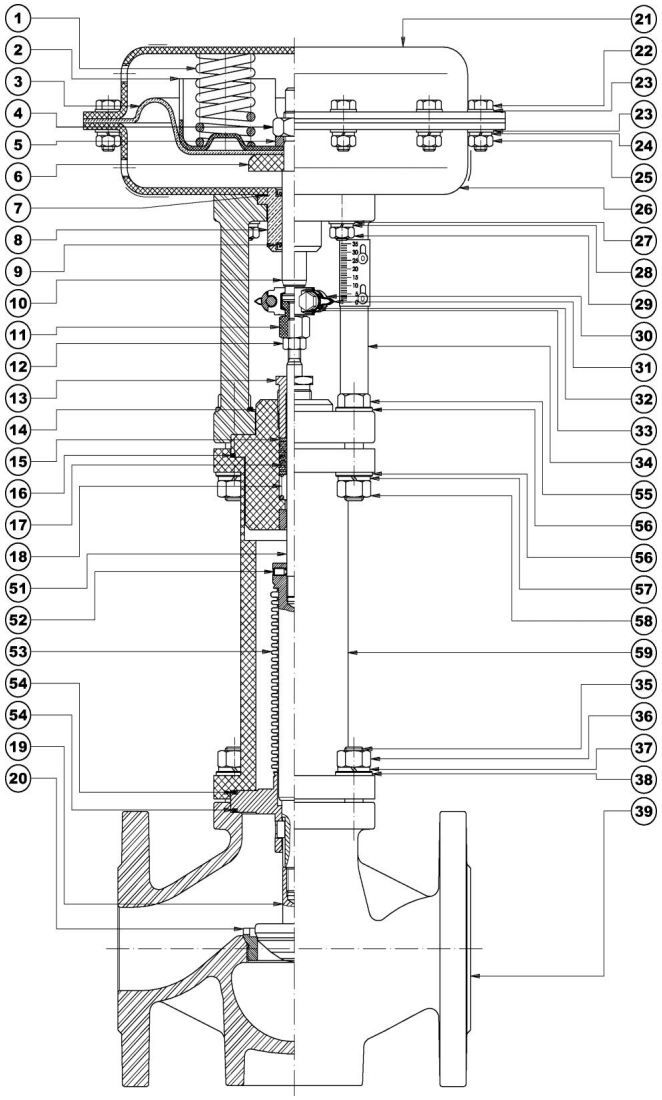
DN	SPARE PART CODE (Part No.)	
	with flat gasket	with OR
65#80	5425	11373

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No. 3/7/9)	DH
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

5.23 Parts and spare parts SBS/86 2-WAY DN15÷50 mixer with bellows N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
51	Upper stem		S30400	
52	Headless screw		S30400	
53	Intermediate body with bellows		S30400+S31600	S31600
54	Body gasket		Plain:FASIT 400/OR: FPM	
55	Hexagonal head screw		Galvanized CL.8.8 STEEL	
56	Flat washer		Galvanized STEEL	
57	Spring washer		Galvanized STEEL	
58	Hexagon nut		Galvanized CL.8 STEEL	
59	Bellows extension		Fe 430	



Body side spare parts

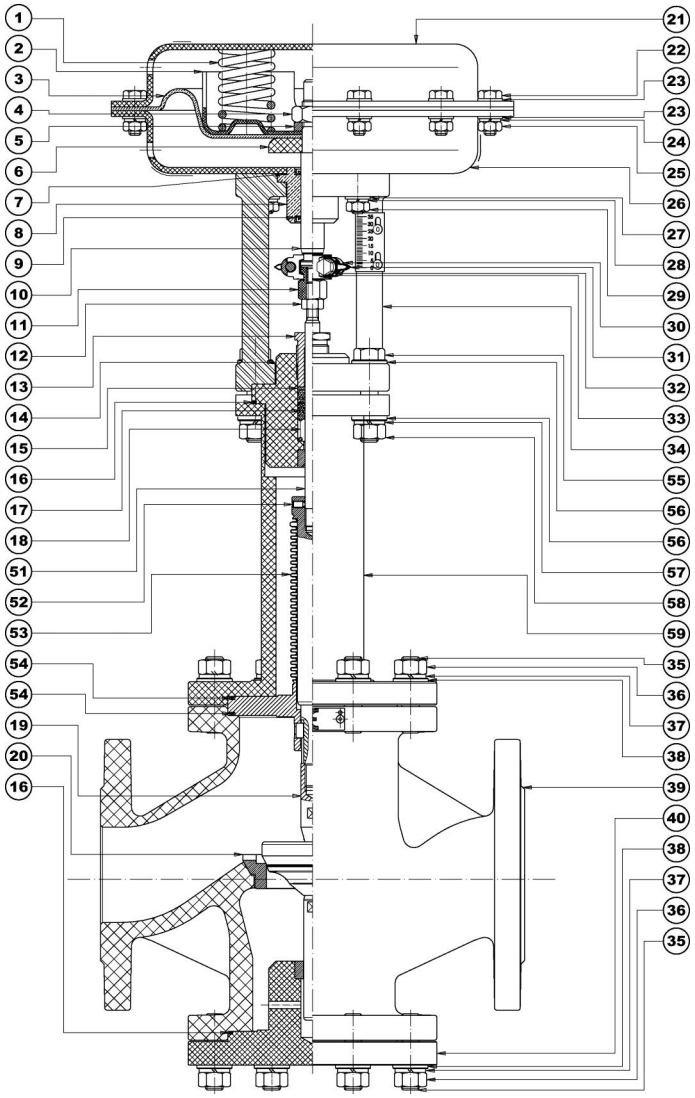
DN	SPARE PART CODE (Part No.)	
	With flat gasket (up to 2008)	With OR (from 2009)
15#25	5426	11374
32#40	8659	-
50	5428	11380

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No. 3/7/9)	DH
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

5.24 Parts and spare parts SBS/86 2-WAY DN65÷80 mixer with bellows N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
40	Third way bottom base		Fe 430/ASTM A105 +S42000	S31600
51	Upper stem		S30400	
52	Headless screw		S30400	
53	Intermediate body with bellows		S30400+S31600	S31600
54	Body gasket		Plain:FASIT 400/OR: FPM	
55	Hexagonal head screw		Galvanized CL.8.8 STEEL	
56	Flat washer		Galvanized STEEL	
57	Spring washer		Galvanized STEEL	
58	Hexagon nut		Galvanized CL.8 STEEL	
59	Bellows extension		Fe 430	



Body side spare parts

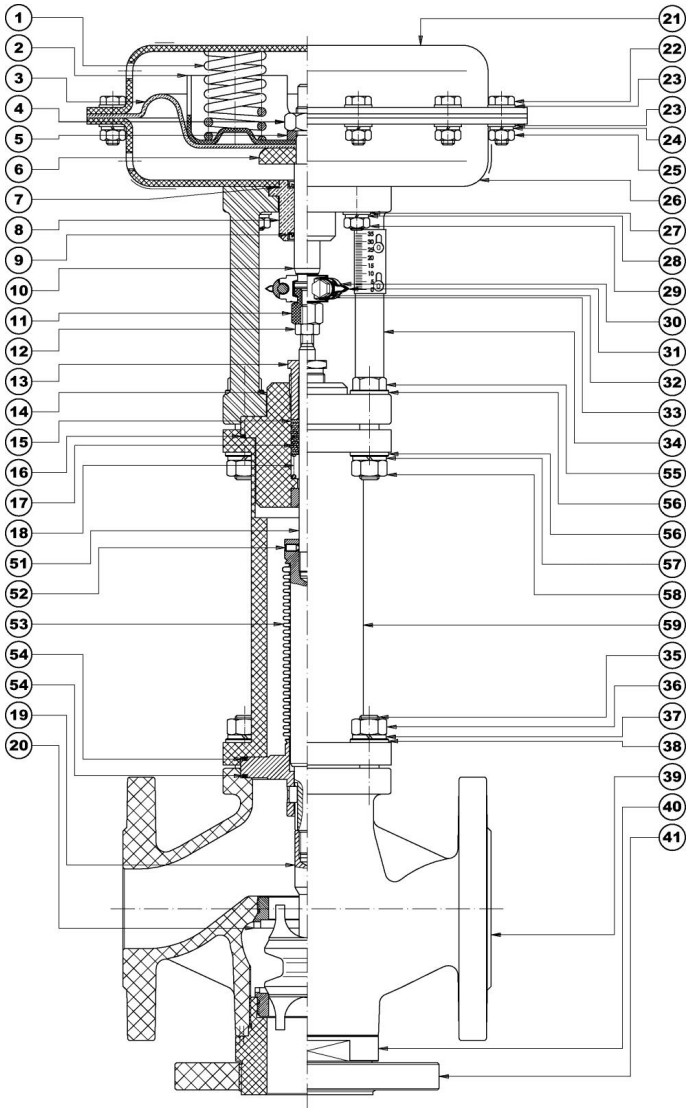
DN	SPARE PART CODE (Part No.)	
	With flat gasket (up to 2008)	With OR (from 2009)
65#80	5437	11383

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No. 3/7/9)	DH
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

5.25 Parts and spare parts SBS/86 3-WAY DN15÷50 mixer with bellows N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
40	Third way bottom base		Fe 430/ASTM A105 +S42000	S31600
41	Third way flange		Fe 360/ASTM A105	S30400
51	Upper stem		S30400	
52	Headless screw		S30400	
53	Intermediate body with bellows		S30400+S31600	S31600
54	Body gasket		Plain:FASIT 400/OR: FPM	
55	Hexagonal head screw		Galvanized CL.8.8 STEEL	
56	Flat washer		Galvanized STEEL	
57	Spring washer		Galvanized STEEL	
58	Hexagon nut		Galvanized CL.8 STEEL	
59	Bellows extension		Fe 430	



Body side spare parts

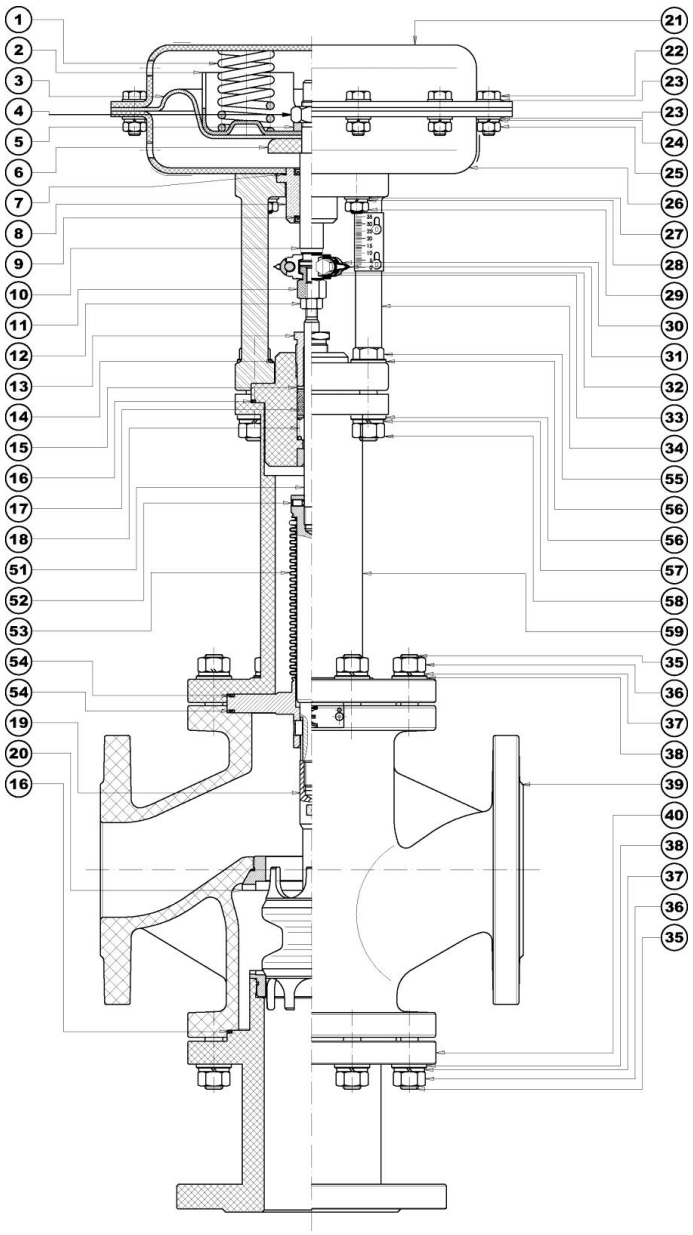
DN	SPARE PART CODE (Part No.)	
	with flat gasket	with OR
15	5429	11374
20	5430	11374
25	5431	11374
32	5432	11374
40	5433	11374
50	5434	11374

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No.	DH
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

5.26 Parts and spare parts SBS/86 3-WAY DN65÷80 mixer with bellows N.C./N.O.

No.	DESCRIPTION		MATERIAL	
			version WCB	version CF8M
1	Servo control spring		SPRING STEEL	
2	Spring-holding plate		Galvanized Fe – P04	
3	Membrane		NBR rubber fabric	
4	Hexagon nut		Galvanized CL.8 STEEL	
5	Distance ring washer		S30400	
6	Diaphragm counterdisc		Galvanized ASTM A105	
7	O-Ring gasket		NBR	
8	Jig bushing		CuZn40Pb2 BRASS	
9	BA gasket		NBR	
10	Servo control shaft		S30400	
11	Adjustment nut		Galvanized Fe 430 B	
12	Hexagon nut		Galvanized CL.8 STEEL	
13	Packing gland screw		Galvanized CF9SMnPb36 STEEL	
14	Intermediate body		ASTM A105 zinc	S31600
15	Distance ring washer		S30400	
16	Body gasket		Plain:FASIT 400/OR: FPM	
17	Packing gland		PTFE + PTFE/GRAPHITE + FPM	
18	Packing gland spring		S31600	
19	Shutter	T.P.	S30400+PTFE/GR	S31600+PTFE/GR
		T.M.	S30400	S31600
20	Seat		S30400	S31600
21	Upper head		Fe – P04	
22	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
23	Flat washer		Galvanized STEEL	
24	Spring washer		Galvanized STEEL	
25	Hexagon nut		Galvanized CL.8 STEEL	
26	Lower head		Fe – P04 + copper STEEL	
27	Flat washer		Galvanized STEEL	
28	Spring washer		Galvanized STEEL	
29	Hexagon nut		Galvanized CL.8 STEEL	
30	Hexagonal-head screw		Galvanized CL.8.8 STEEL	
31	Clamp with indicator		CF8	
32	Spring washer		Galvanized STEEL	
33	Hexagon nut		Galvanized CL.8 STEEL	
34	Frame		GJL-250	
35	Stud-bolt		Galvanized CL.8.8 STEEL	S30400
36	Hexagon nut		Galvanized CL.8 STEEL	S30400
37	Spring washer		Galvanized STEEL	S30400
38	Flat washer		Galvanized STEEL	S30400
39	Valve body		WCB	CF8M
40	Third way bottom base		Fe 430/ASTM A105 +S42000	S31600
51	Upper stem		S30400	
52	Headless screw		S30400	
53	Intermediate body with bellows		S30400+S31600	S31600
54	Body gasket		Plain:FASIT 400/OR: FPM	
55	Hexagonal head screw		Galvanized CL.8.8 STEEL	
56	Flat washer		Galvanized STEEL	
57	Spring washer		Galvanized STEEL	
58	Hexagon nut		Galvanized CL.8 STEEL	
59	Bellows extension		Fe 430	



Body side spare parts

DN	SPARE PART CODE (Part No.)	
	With flat gasket (up to 2008)	With OR (from 2009)
65#80	5437	11383

Air side spare parts

Ø servo control	SPARE PART CODE	
	SH (Part No. 3/7/9)	DH
Ø 200	2655	-
Ø 275	5401	-
Ø 360	5402	5410
Ø 430	5403	5411

6 Table 5: Servo control springs

Øe SERV	STROKE (mm)	SIGNAL											
		3 ÷ 15		6 ÷ 18		6 ÷ 30		9 ÷ 32		3 ÷ 9		9 ÷ 15	
		No.	CODE	No.	CODE	No.	CODE	No.	CODE	No.	CODE	No.	CODE
200	15	3	MTD086100	3	MTD086101	6	MTD086100	6	MTD086102	3	MOLL092037	3	MOLL940412
275	15	3	MTD086106	6	MTD086107	6	MTD086106	6	MTD086108	3	MTD086107	3	MOLL092038
360	15	6	MTD086106	12	MTD086107	12	MTD086106	12	MTD086108	6	MTD086107		
430	15	4	MTD086103	8	MTD086104	8	MTD086103	8	MTD086105	4	MTD086104		
	30	4	MOLL950278	8	MOLL950279	8	MOLL950278						

7 Table 6: Tightening Torques

Part couplings	Tightening torque for SBS/86 valve threaded couplings [N·m]											
	Servo Control Couplings Øe Servo				Body couplings DN							
	200	275	360	430	15	20	25	32	40	50	65	80
Part 4 – Part 10	12	17										
Part 22 – Part 25	17											
Part 10 – Part 47	93											
Part 50 – Part 47	93											
Part 35 – Part 36					17			32			32	
Part 55 – Part 58					17			32			32	
Part 45 – Part 48					17			32			32	
Part 20 – Part 39					170	170	210	370	500	630	800	800
Part 40 – Part 39					200	200	250	400	530	660	-	-

8 Valve life

SBS-series valve has been designed and manufactured to ensure proper operation under conditions and limits provided for by technical characteristics.
All fastened metal parts not involved in sealing have an expected life of 10 years. Sealing and moving parts must be subject to complete overhaul within a time interval shorter than 500000 manoeuvres and three years. This overhaul operation can be carried out by specialized personnel only.
Scheduled maintenance operations shall be carried out independently of the ones due to possible failures, which always require an immediate intervention.

9 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.
Assembly and disassembly operations shall be carried out by qualified personnel only, equipped with all the work and safety tools. **ATTENTION! Compressed springs are included inside the servo control.**. Thus, during valve disassembly, components are disposed of by using all safety equipment necessary to prevent sudden separation of upper head from lower head when all servo control upper head fastening screws have been removed.

WARNINGS:

- The safety conditions shall not be guaranteed and malfunctions shall not be subjected to valves in case:
  - disassembly, re-assembly, maintenance operations are not carried out in compliance with the use and maintenance manual.
  - original spare parts are not used.
- It is forbidden to remove pages from this document or to make any correction.
- In case of doubt, make reference to Italian version of the manual.
- ITALVALVOLE® S.A.S. reserves the right to change its products and the relevant documentation without prior notice.
- The use of the handbook does not exempt from the observance of the laws in force.