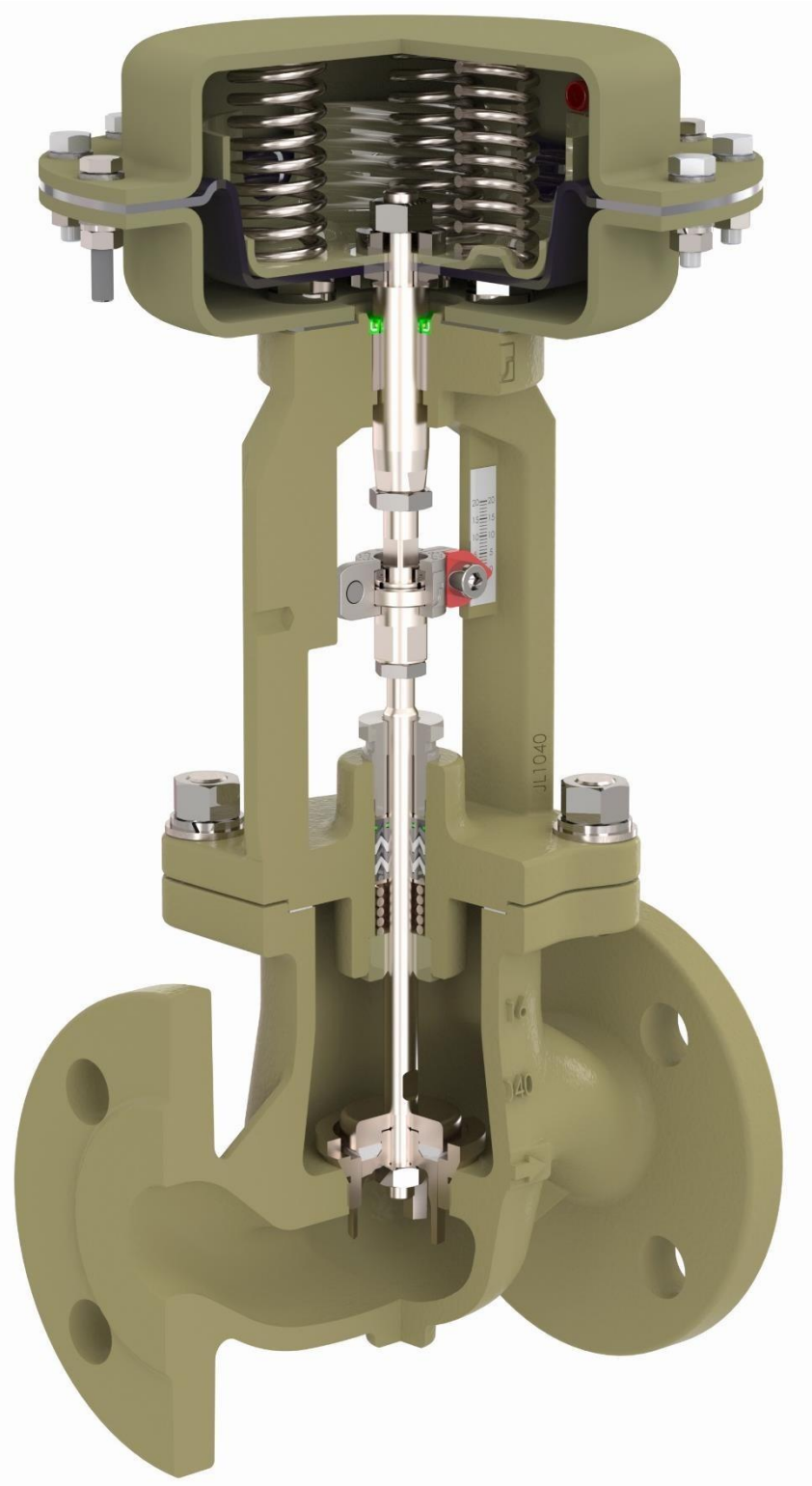
CONTROL VALVES SBS/16

FAMILY 04 GROUPS 120 # 129

Drawn up by: LN
Checked by: LR
Approved by: OS



IT AEOF 15 0974

Cert. PED N° 00008PED80001D D
Cert. PED N° PA01-97/23/CE-B

DIRETTIVA 2014/34/UE
ATTESTATO N° 0425 ATEX 2519
ATTESTATO N° 0425 ATEX 1318
ATTESTATO N° 0425 ATEX 2868

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EU DECLARATION OF CONFORMITY

Mod: 701
Rev: 02
Date: 18/07/2017

EU DECLARATION OF CONFORMITY

VALVOLE A GLOBO DI REGOLAZIONE SERIE SBS

MODULATING GLOBE VALVES SERIES SBS

(in tutte le sue configurazioni / *in all their configurations*)

La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

ITALVALVOLE® s.a.s. di Spadon Oscar & C. dichiara che questa serie di prodotti è stata progettata e costruita in accordo a quanto indicato nell'ALLEGATO I della direttiva UE:

ITALVALVOLE® *s.a.s. of Spadon Oscar & C. declare that this series of products it was engineered and built in according as indicated on Annex 1 of the directive UE:*

2014/68/UE

CLASSIFICAZIONE DELLE VALVOLE / *CLASSIFICATION OF THE VALVES*

CATEGORIA I per fluidi del gruppo **II** - ***CATEGORY I*** *for fluids group* ***II***

Secondo valutazione di conformità descritte dall' allegato III (MODULO A)
With respect to the conformity described in annex III (MODULE A)

NORME TECHICHE ARMONIZZATE e SPECIFICHE UTILIZZATE:
HARMONISED TECHNICAL STANDARDS and SPECIFICATIONS USED:

UNI EN 1092-1-2 / UNI EN 12266-1-2 / UNI EN 1561 / UNI EN 1563 / UNI EN 10213

ALTRE DIRETTIVE EUROPEE APPLICATE:
OTHER EUROPEAN STANDARDS APPLIED:

2014/34/UE

Marcatura dell'apparecchiatura:
Marking of equipment:

CE Ex II 2GD Ex h IIC Tx Gb
CE Ex II 2GD Ex h IIC Tx Db

NORME TECHICHE ARMONIZZATE e SPECIFICHE UTILIZZATE:
HARMONISED TECHNICAL STANDARDS and SPECIFICATIONS USED:

UNI CEI EN ISO 80079-36 / UNI CEI EN ISO 80079-37

Attestato di archiviazione del fascicolo:
Certificate of the technical file storage:

0425 ATEX 1318-01

ENTE NOTIFICATO – *NOTIFIED BODY*

ICIM S.p.a

Via Don Enrico Mapelli, 75 – 20099 Sesto San Giovanni (MI)
Numero Identificativo dell'Organismo Notificato
Notified Body Identification Number:

0425

LUOGO e DATA - *Place and Date*
Cossato, 18/07/2017

Firmato da:
SPADON OSCAR
Motivo:
CF: SPDSCR44M19L436J

Luogo:
Cossato, 13836 (BI)
Data: 21/12/2018 16:09:30

Legale rappresentante
Legal representative

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Summary

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1 Introduction

SBS/16 series control valves are the result of the desire to further develop a product that was consolidated over the years in its previous versions.

Equipped with a diaphragm servomotor, they are designed to control the flow of process liquid in pipes; they are a fundamental element in controlling the flow rate (and consequently temperature or pressure) of a fluid, in a process in an automatic plant.

While the operating principle and main characteristics are the same as that of the valve, the range of servocontrols available has been increased, with more dimensions and control forces, improving response (ΔP).

ITALVALVOLE® also continues to focus on the quality of its materials and rational, simple assembly and maintenance.

- **A particularity of the new version is the integration of the intermediate body in the yoke for the whole series, in all materials, increasing the alignment performance between the seat and the shutter.**
- **The stroke indicator block, micro-cast in AISI 304stainless steel, with mobile washer, replaces the previous version, further improving the alignment between the shutter rod and the servocontrol rod.**
- **The heads without electro-welded tie-rods make the system stronger and more lasting**

The modulating action of the valve opening and closing is produced by the variation in the pneumatic signal which powers the valve servocontrol.

The membrane/spring combinations supplied inside the pneumatic head cover the following ranges of input signals on the membrane: 3÷15 psi [0.21÷1.05 bar], 6÷18 psi [0.42/1.26 bar], 6÷30 psi [0.42/2.1 bar], 9÷32 psi [0.63/2.24 bar], 3÷9 psi [0.21/0.63 bar], 9÷15 psi [0.63/1.05 bar], 20÷40 psi [1.40/2.8 bar].

ITALVALVOLE® SBS/16 series control valves are usually supplied normally closed ***N.C.*** (air opens), or normally open ***N.O.*** (air closes), in the ***2 way*** or ***3 way*** versions in the ***deviator*** (one inlet and two outlets) or ***mixer*** (two inlets and one outlet) configurations.

In any case, as the servo motor is reversible, an N.C. valve can be turned into a N.O. or vice versa simply by replacing the few parts.

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2 General rules for working in safety

- ***Maintenance, manoeuvring and installation on the line must be performed by qualified staff, before proceeding to work they must strictly follow and read the instructions given and detailed in this manual, also complying with the laws in force relating to hygiene and safety at work, thus avoiding all types of exposure to hazards, guaranteeing the safety of staff and any other persons present.***
- *The handling and installation on the line of valves with cast iron components must be performed with particular care due to the fragility of the material compared to steel.*
- *A cast iron valve that has been accidentally dropped can no longer be used; the systems engineer must take special precautions to avoid hammering and tensions on the pipe coupling flanges.*

- *At the maximum working temperature (dependent on the plant) the valve body can reach T=200°C (GJL-250) up to T=300°C (GJL-500), T=350°C (WCB, CF8M). The plant engineer is responsible for ensuring the installation of guards and/or signs to eliminate/warn of the risk of burns to users, and generally the temperature risks.*
- *Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions. The valves must be at room temperature to be worked on.*
- ***The valve must not be subjected to pressures, temperatures, or load capacities higher than those stated in the technical specifications on the plate or those established at the time of order**.*

- ***During any type of operation, there must be no fluid in the pipes or inside the valve***
- ***The valve must be emptied to avoid dead zones, particularly for valves with bellows.***

- To avoid hazards due to moving parts, before working on the valve, check that the power to the servomotor has been disabled.
- ***Stop the valve immediately in the event of irregular operation or malfunction.***

The (EX) symbol on the side identifies special instructions to follow to protect from explosion.

(Directive **2014/34/EU or ATEX**).

The valves recognised by this directive are intended to block the passage of process fluids, and are installed inside a potentially explosive atmosphere.

The maximum surface temperature of the valve should correspond to the maximum temperature of the fluid contained in the valve, suitably increased by a given degree of safety and it is very important that the maximum permissible temperature indicated on the machine data plate is not exceeded.

(All data refer to room temperatures of between 20°C and 40°C)

The suitability of the additional accessories for **ATEX** certification is required in order to ensure the correct operation of the plant.

WARNING!

THE VALVE MUST NOT BE SUBJECTED TO PRESSURES, TEMPERATURES OR FLOW RATES HIGHER THAN THOSE INDICATED IN THE TECHNICAL CHARACTERISTICS ON THE PLATE OR THOSE ESTABLISHED AT THE TIME OF ORDER. ITALVALVOLE® SHALL NOT BE LIABLE FOR DAMAGE CAUSED TO THE EQUIPMENT BY EXTERNAL SOURCES. ITALVALVOLE® SHALL ONLY BE LIABLE FOR THE MATERIALS OR THE EQUIPMENT SUPPLIED, SELECTED ACCORDING TO THE DATA PROVIDED BY THE CUSTOMER AND INDICATED IN THE ORDER CONFIRMATION.

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3 Key

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

- **Permissible temperature:** limit to working temperature (maximum and minimum), required for safety reasons.

- **Permissible pressure:** limits to working pressure, normally at the top of each chamber in the pressurised equipment, prescribed for safety reasons (UNI EN 764: 1997).
- **DN:** an alphanumeric description of the dimension common to all components in a piping system, used to provide a point of reference. It includes the letters DN followed by a whole non-dimensional number indirectly correlated to the physical dimension, expressed in millimetres, of the hole or the external diameter of the end part of the connections (ISO 6708: 1995)
- **Kv**: flow rate, expressed in m_3/h, of water (from 10 to 25 °C with volume mass equal to 1000 Kg/m_3) crossing two ways of a valve with a drop in pressure 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).

4 Requests

For any special needs or doubts, having completed the form below, contact our technical office to obtain updated information on the related valve type.

DATA TO KNOW:

DN_____ PN 16 ☐ PN 40 ☐

2 VIE ☐ 3 WAY DEVIATOR ☐ 3 WAY MIXER ☐

CONTROL SIGNAL: _____

SHUTTER: ☐ LINEAR
☐ EQUAL PERCENTAGE
☐ WITH SILENCER

BODY MATERIAL: ☐GREY CAST ☐NODULAR CAST ☐WCB ☐CF8M

VALVE ACTION: ☐ NORMALLY CLOSED
☐ NORMALLY OPEN

OPERATING FLUID_____ SPECIFIC WEIGHT _____KG/M^3

MAXIMUM FLOW RATE _____ KG/H _____M^3/H

PRESSURE UPSTREAM OF THE VALVE _____BAR

PRESSURE DOWNSTREAM OF THE VALVE _____BAR

TEMPERATUR OF THE FLUID _____°C

INTERMEDIATE BODY: ☐ STANDARD ☐ WITH BELLOWS

ACCESSORIES:

☐ HANDWHEEL ☐ TRANSDUCER

☐ PNEUMATIC POSITIONER ☐ ELECTRIC POSITIONER

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5 Accessories

Pneumatic positioner

Electro-pneumatic positioner

Reducer filter

Transducer

Handwhell

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6 Technical features of the VALVE

Connections	flanged PN 16 and PN 40 (WCB, CF8M) according to EN 1092-2:1999			
Flow direction	2 WAY unidirectional, 3 WAY mixer and 3 WAY deviator			
Body material	EN GJL 250	EN GJS 500	WCB/1.0619	CF8M/1.4408
DN	15 ÷ 80	15 ÷ 80	15 ÷ 80	15 ÷ 80
PN	16		40	40
Pmax perm.	16 [bar]		40 [bar] (20 [bar] with safety bellows)	
Pmin perm.	0 [bar]			
Tmax perm.	-10÷200	-10÷200	-10÷200	-10÷200
Tmax. (safety bellows)	-	-10÷300	-28÷350	-40÷350
Shutter characteristics	equal percentage or linear			
Stroke	15 mm – 20 mm– 30 mm (serv. T.530)			
Seal	PEAK – metallic – hard-faced*			
Seal grade	Grade A for PEAK Seal, Grade B for metallic and hard-faced seals			
Control pressure	3÷15 PSI –6÷18 PSI - 6÷30 PSI – 9÷32 PSI - 3÷9 PSI – 9÷15 PSI– 20÷40** PSI			
Intake fluid	instrument air			
Servocontrol sizes	Ø 200, Ø 275, Ø 360, Ø 430, Ø 530			
Air coupling	1/8” GAS (head Ø 200) – 1/4” GAS (head Ø 275, Ø 360, Ø 430, Ø 530)			
Version	*** normally closed, normally open			
Accessories	emergency handwheel, silencer, pneumatic/electropneumatic positioner, transducer			
ATEX classification	Group 2 Category II (directive 2014/34/EU)			

(*) the hard-faced seal is recommended for Δp>10 bar
(**) available only for servocontrol Ø530
(***) 3 way refers to L-shaped way

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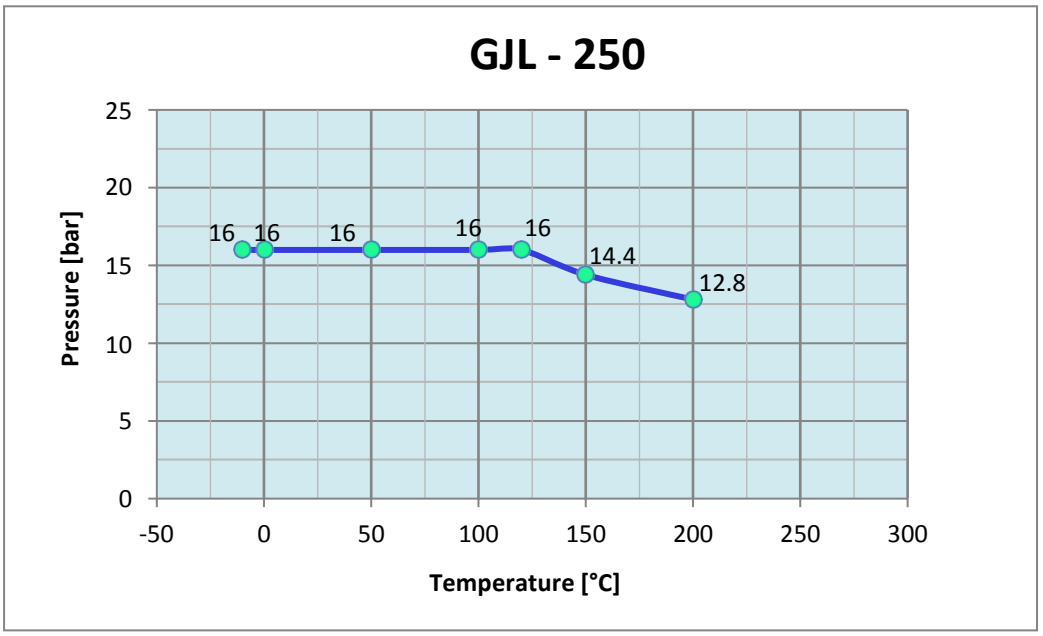
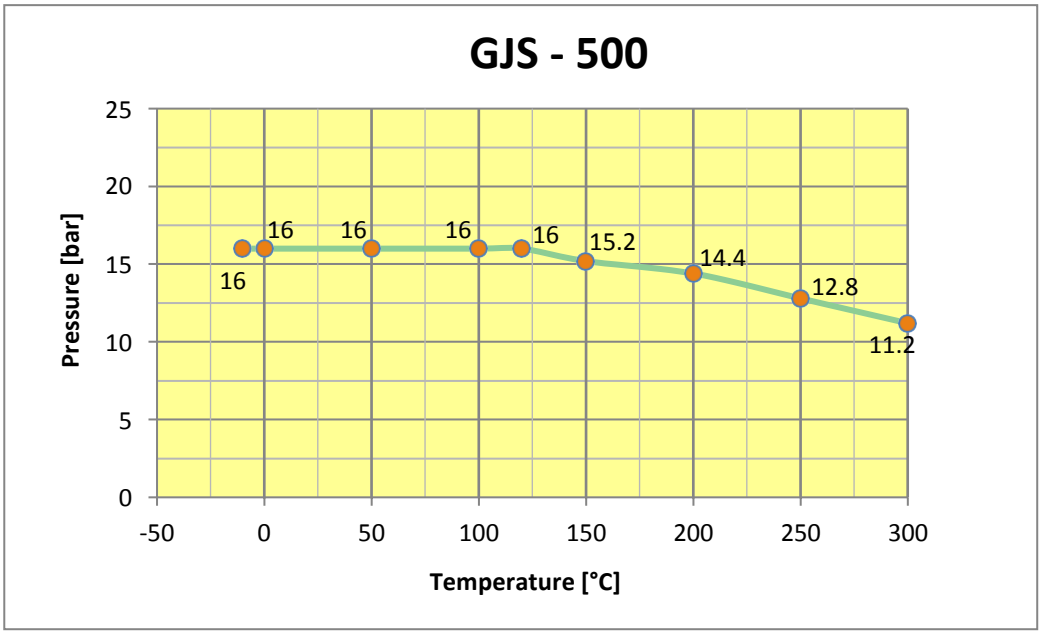
6.1 Pressure/Temperature graph VALVE BODY





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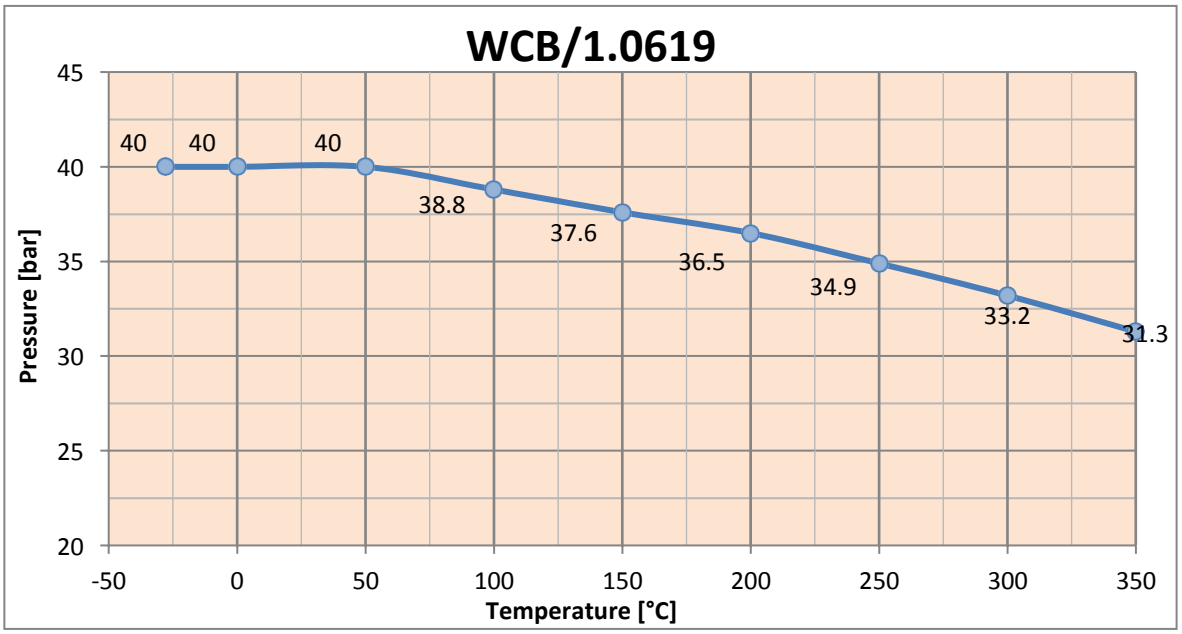

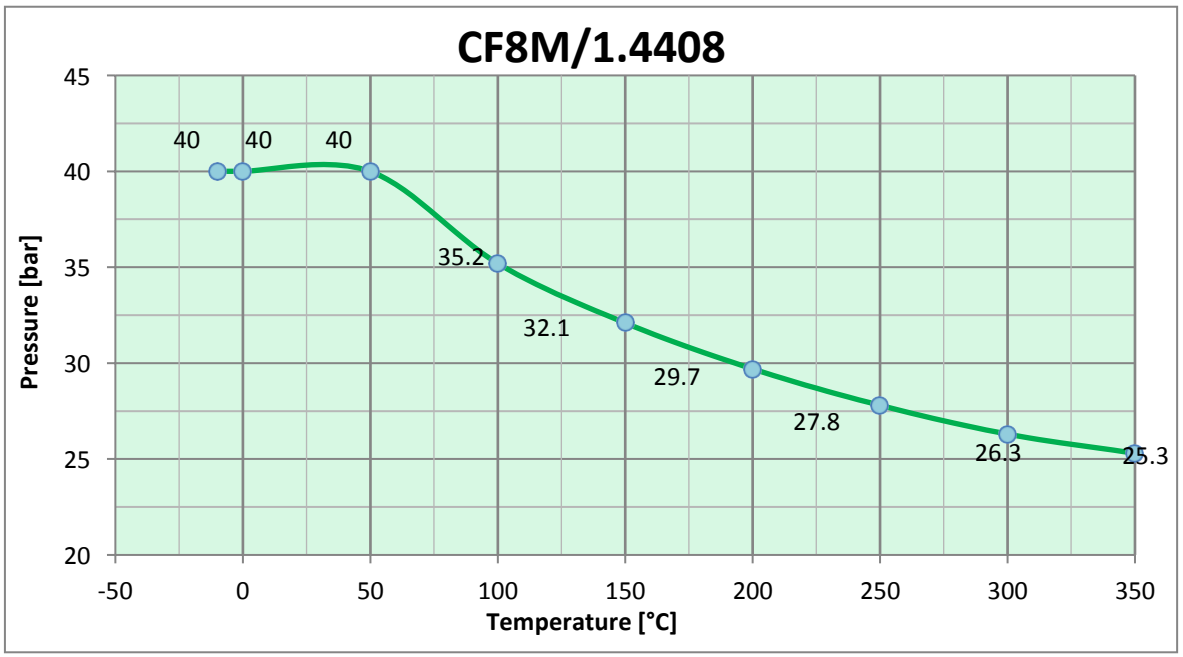

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6.2 Compatible fluids

FLUID TYPE	***Stainless steel** (AISI 316) S31600/1.4401- CF8M/1.4408*	***Stainless steel** (AISI 316L) S31603/1.4404- CF3M/1.4409*	***Carbon steel** WCB/1.0619*	***Cast iron** GJL-250 GJS-500-7*	***PEAK***	***FPM** - Viton*	***PTFE** - Teflon*	***FASIT 400***
Acetylene	A	A	A	A	o	o	o	o
Acetic Acid	A	A	D	D	o	x	o	o
Boric acid	B	B	D	D	o	o	o	o
Citric acid	B	B	D	D	o	o	o	o
Hydrochloric acid 20%	C	C	C	D	o	x	o	v
Formic acid	B	B	D	D	o	x	o	o
Phosphoric acid 10%	B	B	D	D	o	o	o	o
Nitric acid 50%	B	B	D	D	o	o	o	v
Sulphuric acid 5%	B	B	D	D	o	o	o	v
Distilled water	A	A	C	D	o	o	o	o
Ammonia solution	A	A	B	B	o	o	o	o
Air	A	A	A	A	o	o	o	o
Nitrogen N	A	A	A	A	o	o	o	o
Benzene	B	B	B	B	o	o	o	o
Petrol	A	A	A	B	o	o	o	o
Butane	B	B	B	B	o	o	o	o
Chloroform	A	A	A	B	o	o	o	v
Ethane	B	B	B	B	o	o	o	o
Ethylene glycol	A	A	B	B	o	o	o	o
Freon 22	A	A	B	D	o	x	o	v
Methane	B	B	B	B	o	o	o	o
Diesel	B	B	B	B	o	o	o	o
Fuel oil	A	A	B	B	o	o	o	o
Hydraulic oil (mineral)	A	A	B	B	o	o	o	o
Oxygen	A	A	B	B	o	o	o	o
Perchloroethylene	A	A	B	B	o	o	o	v
Propane	B	B	B	B	o	o	o	o
Caustic soda NaOH 5%	A	A	A	C	o	v	o	v
Caustic soda NaOH 20% E (1)	A	A	A	C	o	v	o	v
Caustic soda NaOH 50% E (1)	B	B	C	C	o	v	o	v
Caustic soda NaOH 75% E (1)	B	B	C	C	o	v	o	v
Toluene	A	A	B	A	o	o	o	o
Trichloroethylene	B	B	B	C	x	o	o	v
Steam Tmax=130°C-P=2.7 bar	A	A	A	A	o	v	o	o
Steam Tmax=170°C -P=8 bar	A	A	A	A	o	v	o	o
Steam Tmax= more than 170 °C (2)	A	A	A	A	o	v	o	o

Key:

A**: **Excellent Resistance

Materials which do not suffer any crucial size variations

B: Good resistance

Materials which can be attacked but which are generally used where a certain degree of corrosion is tolerated.

C: Poor resistance

Materials which are normally not considered suitable for use.

D: Not Recommended

Materials with too high corrosion speed to be taken into consideration.

o: *Type of seal Recommended*

v: *Type of seal to assess* according to the conditions of use

x: *Type of seal Not Recommend ed*

(1) "E" stands for boiling

(2) In the versions in which the temperature can reach this value

The data given in the previous table, where not expressly indicated, refer to a temperature of 21 °C.
The data given is of a general nature and is not valid for all possible working conditions. This data may be considerably affected by factors such as: temperature, concentration, fluid speed.
For safer and complete information, contact our technical department.
It is expressly forbidden to use the valve with explosive, easily flammable, oxidising or toxic gases. It is expressly forbidden to use the valve with liquids containing: chlorine, fluorine, bromine, iodine and derivative products.
Any derogations from these prescriptions may be issued for special applications, and only in writing, by our technical department.

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6.3 Δp SBS/16 valves CAST IRON

TABLE Δp OF SBS/16 CAST IRON VALVES

TAB: *SBS Δp PN16 Rev. 03 dated 14/05/2018*			Δp Valve							Valve definition N°
Control signal in PSI (1)			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	B	C	D	R	S	T	
15	3	200	16	16	16	16	16	16		1
	6;7;8	200	16	16	16	16	16	16		3
		275	16	16	16	16	16	16		4
	15	200	15	16	16	16	13	16		5
		275	16	16	16	16	16	16		6
	20	200	8	16	16	16	7	16		101
		275	16	16	16	16	16	16		102
20	8	200	16	16	16	16	16	16		7
		275	16	16	16	16	16	16		8
	15	200	15	16	16	16	13	16		9
		275	16	16	16	16	16	16		10
	20	200	8	16	16	16	7	16		13
		275	16	16	16	16	16	16		14
25	15	200	15	16	16	16	13	16		17
		275	16	16	16	16	16	16		18
	20	200	8	16	16	16	7	16		21
		275	16	16	16	16	16	16		22
	26	200	5	10	10	15	5	15		25
		275	13	16	16	16	12	16		26
		360	16	16	16	16	16	16		27
32	20	200	8	16	16	16	7	16		29
		275	16	16	16	16	16	16		30
	26	200	5	10	10	15	5	15		33
		275	13	16	16	16	12	16		34
		360	16	16	16	16	16	16		35
	31	200	4	8	8	12	4	12		37
		275	10	16	16	16	10	16		38
		360	16	16	16	16	16	16		39
40	26	200	5	10	10	15	5	15		41
		275	13	16	16	16	12	16		42
		360	16	16	16	16	16	16		43
	31	200	4	8	8	12	4	12		45
		275	10	16	16	16	10	16		46
		360	16	16	16	16	16	16		47
	38	200	2,8	5,5	5,5	8	2,8	8		49
		275	7	14	14	16	7	16		50
		360	14	16	16	16	14	16		51
		430	15	16	16	16	15			52
50	31	200	4	8	8	12	4	12		53
		275	10	16	16	16	10	16		54
		360	16	16	16	16	16	16		55
	38	200	2,8	5,5	5,5	8	2,8	8		57
		275	7	14	14	16	7	16		58
		360	14	16	16	16	14	16		59
		430	15	16	16	16	15			60
	48	200	1,6	3,2	3,2	4,5	1,6	4,5		61
		275	4	8	8	10,5	4	10,5		62
		360	8	16	16	16	8	16		63
		430	9,3	16	16	16	9,3			64

WITH DIAMETER SIDE 6-7-8, DEPENDING ON THE REQUIRED Kv, CONTACT THE TECHNICAL OFFICE FOR CLARIFICATIONS

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TAB: *SBS Δp PN16 Rev. 03 dated 14/05/2018*			Δp Valve							Valve definition N°
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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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	ØeSERV [mm]	Valve definition letters							
			A	**B**	**C**	**D**	**R**	**S**	**T**	
65	38	200	*2,8*	*5,5*	*5,5*	*8*	*2,8*	*8*		**65**
		275	*7*	*14*	*14*	*16*	*7*	*16*		**66**
		360	*14*	*16*	*16*	*16*	*14*	*16*		**67**
		430	*15*	*16*	*16*	*16*	*15*			**68**
	48	200	*1,6*	*3,2*	*3,2*	*4,5*	*1,6*	*4,5*		**70**
		275	*4*	*8*	*8*	*10,5*	*4*	*10,5*		**71**
		360	*8*	*16*	*16*	*16*	*8*	*16*		**72**
		430	*9,3*	*16*	*16*	*16*	*9,3*			**73**
	63	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*	*11*	*11*	*16*	*5,5*			**78**
		530	*7,4*	*16*	*14,8*	*16*			*16*	**79**
80	48	200	*1,6*	*3,2*	*3,2*	*4,5*	*1,6*	*4,5*		**80**
		275	*4*	*8*	*8*	*10,5*	*4*	*10,5*		**81**
		360	*8*	*16*	*16*	*16*	*8*	*16*		**82**
		430	*9,3*	*16*	*16*	*16*	*9,3*			**83**
	63	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*	*11*	*11*	*16*	*5,5*			**88**
		530	*7,4*	*16*	*14,8*	*16*			*16*	**89**
	78	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*			**93**
		530	*4,8*	*14,2*	*9,6*	*13,7*			*16*	**94**

Nota: Δp is obteined without air in the head

(1) In the NO valves in order to ensure the same Δp as the NC valves, the maximum control signal must be the sum of the two signals; thus, for example, in a NO valve with signal 3 ÷ 15 PSI take the maximum control signal to 18 PSI (3 + 15) to obtain the Δp of a similar NC valve.
In 3 way valves the Δp refers to the closed way when there is no air, to obtain the same Δp on the other way follow the same procedure to obtain the Δp in the NO valves.

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6.4 Δp SBS/16 valves in NODULAR CAST IRON with BELLOWS

TABLE Δp OF SBS/16 CAST IRON VALVES WITH BELLOWS

TAB: *SBS Δp PN16 Rev. 02 dated 14/05/2018*			Δp Valve							Valve definition N°
Control signal in PSI (1)			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	B	C	D	R	S	T	
15	3	200	4,5	8,5	8,5	11	4,5	11		1
		275	10,5	16	16	16	10,5	16		2
	6;7;8	200	4,5	8,5	8,5	11	4,5	11		3
		275	10,5	16	16	16	10,5	16		4
	15	200	4,5	8,5	8,5	11	4,5	11		5
		275	10,5	16	16	16	10,5	16		6
	20	200	4	8,5	8,5	11	4	11		101
		275	10	16	16	16	10	16		102
		360	16	16	16	16	16	16		103
20	8	200	4,5	8,5	8,5	11	4,5	11		7
		275	10,5	16	16	16	10,5	16		8
	15	200	4,5	8,5	8,5	11	4,5	11		9
		275	10,5	16	16	16	10,5	16		10
	20	200	4	8,5	8,5	11	4	11		13
		275	10	16	16	16	10	16		14
		360	16	16	16	16	16	16		15
25	15	200	4,5	8,5	8,5	11	4,5	11		17
		275	10,5	16	16	16	10,5	16		18
	20	200	4	8,5	8,5	11	4	11		21
		275	10	16	16	16	10	16		22
		360	16	16	16	16	16	16		23
	26	200	4	8	8	11	4	11		25
		275	10	16	16	16	10	16		26
		360	16	16	16	16	16	16		27
32	20	200	4	8,5	8,5	11	4	11		29
		275	10	16	16	16	10	16		30
		360	16	16	16	16	16	16		31
	26	200	4	8	8	11	4	11		33
		275	10	16	16	16	10	16		34
		360	16	16	16	16	16	16		35
	31	200	3,5	7,5	7,5	10,5	3,5	10,5		37
		275	9,5	16	16	16	9,5	16		38
		360	16	16	16	16	16	16		39
40	26	200	4	8	8	11	4	11		41
		275	10	16	16	16	10	16		42
		360	16	16	16	16	16	16		43
	31	200	3,5	7,5	7,5	10,5	3,5	10,5		45
		275	9,5	16	16	16	9,5	16		46
		360	16	16	16	16	16	16		47
	38	200	2,8	5,5	5,5	8	2,8	8		49
		275	7	14	14	16	7	16		50
		360	14	16	16	16	14	16		51
		430	15	16	16	16	15			52
50	31	200	3,5	7,5	7,5	10,5	3,5	10,5		53
		275	9,5	16	16	16	9,5	16		54
		360	16	16	16	16	16	16		55
	38	200	2,8	5,5	5,5	8	2,8	8		57
		275	7	14	14	16	7	16		58
		360	14	16	16	16	14	16		59
		430	15	16	16	16	15			60
	48	200	1,6	3,2	3,2	4,5	1,6	4,5		61
		275	4	8	8	10,5	4	10,5		62
		360	8	16	16	16	8	16		63
		430	9,3	16	16	16	9,3			64

WITH DIAMETER SIDE 6-7-8, DEPENDING ON THE REQUIRED Kv, CONTACT THE TECHNICAL OFFICE FOR CLARIFICATIONS

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TAB: SBS Δp PN16 Rev. 02 dated 14/05/2018			Δp Valve							Valve definition N°
Control signal in PSI (1)			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	**B**	**C**	**D**	**R**	**S**	**T**	
65	38	200	*2,8*	*5,5*	*5,5*	*8*	*2,8*	*8*		**65**
		275	*7*	*14*	*14*	*16*	*7*	*16*		**66**
		360	*14*	*16*	*16*	*16*	*14*	*16*		**67**
		430	*15*	*16*	*16*	*16*	*15*			**68**
	48	200	*1,6*	*3,2*	*3,2*	*4,5*	*1,6*	*4,5*		**70**
		275	*4*	*8*	*8*	*10,5*	*4*	*10,5*		**71**
		360	*8*	*16*	*16*	*16*	*8*	*16*		**72**
		430	*9,3*	*16*	*16*	*16*	*9,3*			**73**
	63	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*			**78**
		530	*UT*	*UT*	*UT*	*UT*			*UT*	**79**
80	48	200	*1,6*	*3,2*	*3,2*	*4,5*	*1,6*	*4,5*		**80**
		275	*4*	*8*	*8*	*10,5*	*4*	*10,5*		**81**
		360	*8*	*16*	*16*	*16*	*8*	*16*		**82**
		430	*9,3*	*16*	*16*	*16*	*9,3*			**83**
	63	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*			**88**
		530	*UT*	*UT*	*UT*	*UT*			*UT*	**89**
	78	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*			**93**
		530	*UT*	*UT*	*UT*	*UT*			*UT*	**94**

Nota: Δp is obteined without air in the head

(1) In the NO valves in order to ensure the same Δp as the NC valves, the maximum control signal must be the sum of the two signals; thus, for example, in a NO valve with signal 3 ÷ 15 PSI take the maximum control signal to 18 PSI (3 + 15) to obtain the Δp of a similar NC valve.
In 3 way valves the Δp refers to the closed way when there is no air, to obtain the same Δp on the other way follow the same procedure to obtain the Δp in the NO valves.

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6.5 Δp SBS/16 valves WCB – STAINLESS STEEL

TABLE Δp OF SBS/16 WCB-INOX VALVES

TAB: *SBS Δp PN40 Rev. 03 dated 14/05/2018*			Δp Valve							Valve definition N°
Control signal in PSI (1)			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	B	C	D	R	S	T	
15	3	200	40	40	40	40	40	40		1
	6-7-8	200	40	40	40	40	40	40		3
		275	40	40	40	40	40	40		4
	15	200	15	30	30	39	13	39		5
		275	35	40	40	40	32	40		6
	20	200	8	16	16	21	7	21		101
		275	20	40	40	40	18	40		102
		360	37	40	40	40	36	40		103
20	8	200	40	40	40	40	40	40		7
		275	40	40	40	40	40	40		8
	15	200	15	30	30	39	13	39		9
		275	35	40	40	40	32	40		10
	20	200	8	16	16	21	7	21		13
		275	20	40	40	40	18	40		14
		360	37	40	40	40	36	40		15
25	15	200	15	30	30	39	13	39		17
		275	35	40	40	40	32	40		18
	20	200	8	16	16	21	7	21		21
		275	20	40	40	40	18	40		22
		360	37	40	40	40	36	40		23
	26	200	5	10	10	15	5	15		25
		275	13	26	26	34	12	34		26
		360	25	40	40	40	24	40		27
		430	28	40	40	40	28			28
32	20	200	8	16	16	21	7	21		29
		275	20	40	40	40	18	40		30
		360	37	40	40	40	36	40		31
	26	200	5	10	10	15	5	15		33
		275	13	26	26	34	12	34		34
		360	25	40	40	40	24	40		35
		430	28	40	40	40	28			36
	31	200	4	8	8	12	4	12		37
		275	10	20	20	30	10	30		38
		360	21	40	40	40	20	40		39
		430	23	40	40	40	23			40
40	26	200	5	10	10	15	5	15		41
		275	13	26	26	34	12	34		42
		360	25	40	40	40	24	40		43
		430	28	40	40	40	28			44
	31	200	4	8	8	12	4	12		45
		275	10	20	20	30	10	30		46
		360	21	40	40	40	20	40		47
		430	23	40	40	40	23			48
	38	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	15	30	30	40	15			52

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TAB: *SBS Δp PN40 Rev. 03 dated 14/05/2018*			Δp Valve							Valve definition N°
Control signal in PSI (1)			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	B	C	D	R	S	T	
50	31	200	4	8	8	12	4	12		53
		275	10	20	20	30	10	30		54
		360	21	40	40	40	20	40		55
		430	23	40	40	40	23			56
	38	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	15	30	30	40	15			60
	48	200	1,6	3,2	3,2	4,5	1,6	4,5		61
		275	4	8	8	10,5	4	10,5		62
		360	8	16	16	21	8	21		63
		430	9,3	16,8	16,8	24	9,3			64
65	38	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	15	30	30	40	15			68
	48	200	1,6	3,2	3,2	4,5	1,6	4,5		70
		275	4	8	8	10,5	4	10,5		71
		360	8	16	16	21	8	21		72
		430	9,3	16,8	16,8	24	9,3			73
	63	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	11	11	16	5,5			78
		530	7,4	29,5	14,8	21			40	79
80	48	200	1,6	3,2	3,2	4,5	1,6	4,5		80
		275	4	8	8	10,5	4	10,5		81
		360	8	16	16	21	8	21		82
		430	9,3	16,8	16,8	24	9,3			83
	63	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	11	11	16	5,5			88
		530	7,4	29,5	14,8	21			40	89
	78	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	3,50			93
		530	4,8	14,2	9,6	13,7			29,8	94

Nota: Δp is obteined without air in the head

(1) In the NO valves in order to ensure the same Δp as the NC valves, the maximum control signal must be the sum of the two signals; thus, for example, in a NO valve with signal 3 ÷ 15 PSI take the maximum control signal to 18 PSI (3 + 15) to obtain the Δp of a similar NC valve.
In 3 way valves the Δp refers to the closed way when there is no air, to obtain the same Δp on the other way follow the same procedure to obtain the Δp in the NO valves.

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6.6 Δp SBS/16 valves WCB – STAINLESS STEEL with BELLOWS

TABLE Δp OF SBS/16 WCB-INOX VALVES WITH BELLOWS

TAB: *SBS Δp PN40 Rev. 02 dated 14/05/2018*			Δp Valve							Valve definition N°
Control signal in PSI (1)			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	B	C	D	R	S	T	
15	3	200	4,5	8,5	8,5	11	4,5	11		1
		275	10,5	20	20	20	10,5	20		2
	6	200	4,5	8,5	8,5	11	4,5	11		3
		275	10,5	20	20	20	10,5	20		4
	15	200	4,5	8,5	8,5	11	4,5	11		5
		275	10,5	20	20	20	10,5	20		6
	20	200	4	8,5	8,5	11	4	11		101
		275	10	20	20	20	10	20		102
		360	20	20	20	20	20	20		103
20	8	200	4,5	8,5	8,5	11	4,5	11		7
		275	10,5	20	20	20	10,5	20		8
	15	200	4,5	8,5	8,5	11	4,5	11		9
		275	10,5	20	20	20	10,5	20		10
		360	20	20	20	20	20	20		11
	20	200	4	8,5	8,5	11	4	11		13
		275	10	20	20	20	10	20		14
		360	20	20	20	20	20	20		15
25	15	200	4,5	8,5	8,5	11	4,5	11		17
		275	10,5	20	20	20	10,5	20		18
		360	20	20	20	20	20	20		19
	20	200	4	8,5	8,5	11	4	11		21
		275	10	20	20	20	10	20		22
		360	20	20	20	20	20	20		23
	26	200	4	8	8	11	4	11		25
		275	10	20	20	20	10	20		26
		360	16	20	20	20	16	20		27
		430	20	20	20	20	20			28
32	20	200	4	8,5	8,5	11	4	11		29
		275	10	20	20	20	10	20		30
		360	20	20	20	20	20	20		31
	26	200	4	8	8	11	4	11		33
		275	10	20	20	20	10	20		34
		360	16	20	20	20	16	20		35
		430	20	20	20	20	20			36
	31	200	3,5	7,5	7,5	10,5	3,5	10,5		37
		275	9,5	18	18	20	9,5	20		38
		360	18	20	20	20	18	20		39
		430	20	20	20	20	20			40
40	26	200	4	8	8	11	4	11		41
		275	10	20	20	20	10	20		42
		360	16	20	20	20	16	20		43
		430	20	20	20	20	20			44
	31	200	3,5	7,5	7,5	10,5	3,5	10,5		45
		275	9,5	18	18	20	9,5	20		46
		360	18	20	20	20	18	20		47
		430	20	20	20	20	20			48
	38	200	2,8	5,5	5,5	8	2,8	8		49
		275	7	14	14	20	7	20		50
		360	14	20	20	20	14	20		51
		430	15	20	20	20	15			52

WITH DIAMETER SIDE 6-7-8, DEPENDING ON THE REQUIRED Kv, CONTACT THE TECHNICAL OFFICE FOR CLARIFICATIONS

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TAB: ***SBS Δp PN40 Rev. 02 dated 14/05/2018***			Δp Valve							Valve definition N°
Control signal in PSI [1]			3÷15	6÷18	6÷30	9÷32	3÷9	9÷15	20÷40	
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	1,4÷2,8	
Max control pressure BAR			1	1,26	2,21	2,4	0,8	1,2	2,9	
ND	Øseat [mm]	$Ø_e$SERV [mm]	Valve definition letters							
			A	**B**	**C**	**D**	**R**	**S**	**T**	
50	31	200	***3,5***	***7,5***	***7,5***	***10,5***	***3,5***	***10,5***		**53**
		275	***9,5***	***18***	***18***	***20***	***9,5***	***20***		**54**
		360	***18***	***20***	***20***	***20***	***18***	***20***		**55**
		430	***20***	***20***	***20***	***20***	***20***			**56**
	38	200	***2,8***	***5,5***	***5,5***	***8***	***2,8***	***8***		**57**
		275	***7***	***14***	***14***	***20***	***7***	***20***		**58**
		360	***14***	***20***	***20***	***20***	***14***	***20***		**59**
		430	***15***	***20***	***20***	***20***	***15***			**60**
	48	200	*1,6*	*3,2*	***3,2***	*4,5*	***1,6***	***4,5***		**61**
		275	*4*	*8*	***8***	*10,5*	***4***	***10,5***		**62**
		360	*8*	*16*	***16***	*20*	***8***	***20***		**63**
		430	*9,3*	*18*	***18***	*20*	***9,3***			**64**
65	38	200	*2,8*	*5,5*	*5,5*	*8*	*2,8*	*8*		**65**
		275	*7*	*14*	*14*	*20*	*7*	*20*		**66**
		360	*14*	*20*	*20*	*20*	*14*	*20*		**67**
		430	*15*	*20*	*20*	*20*	*15*			**68**
	48	200	*1,6*	*3,2*	*3,2*	*4,5*	*1,6*	*4,5*		**70**
		275	*4*	*8*	*8*	*10,5*	*4*	*10,5*		**71**
		360	*8*	*16*	*16*	*20*	*8*	*20*		**72**
		430	*9,3*	*18*	*18*	*20*	*9,3*			**73**
	63	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*			**78**
		530	*UT*	*UT*	*UT*	*UT*			*UT*	**79**
80	48	200	*1,6*	*3,2*	*3,2*	*4,5*	*1,6*	*4,5*		**80**
		275	*4*	*8*	*8*	*10,5*	*4*	*10,5*		**81**
		360	*8*	*16*	*16*	*20*	*8*	*20*		**82**
		430	*9,3*	*18*	*18*	*20*	*9,3*			**83**
	63	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*			**88**
		530	*UT*	*UT*	*UT*	*UT*			*UT*	**89**
	78	275	*1,5*	*3*	*3*	*4*	*1,50*	*4*		**91**
		360	*3*	*6*	*6*	*8,5*	*3*	*8,5*		**92**
		430	*3,5*	*7*	*7*	*10,5*	*3,50*			**93**
		530	*UT*	*UT*	*UT*	*UT*			*UT*	**94**

Nota: Δp is obteined without air in the head

[1] In the NO valves in order to ensure the same Δp as the NC valves, the maximum control signal must be the sum of the two signals; thus, for example, in a NO valve with signal 3 ÷ 15 PSI take the maximum control signal to 18 PSI (3 + 15) to obtain the Δp of a similar NC valve.
In 3 way valves the Δp refers to the closed way when there is no air, to obtain the same Δp on the other way follow the same procedure to obtain the Δp in the NO valves.

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6.7 Installation of SBS/16 2 way valves

ND	Ø Seat [mm]	Kv(1)					
		LINEAR		EQUIPERCENTUAL		L.	E.
		C. 15 [mm]	C. 20 [mm]	C. 15 [mm]	C. 20 [mm]	C. 30 [mm]	
15	6	UT	UT	UT	UT		
	15	4.3 *(5)		4.5 *(5.2)			
	20	5 *(5.8)		5 *(5.8)			
20	8	UT	UT	UT	UT		
	15	6 *(7)		4.8 *(5.6)			
	20	8 *(9.3)		7.5 *(8.7)			
25	15	5.4 *(6.3)		5.3 *(6.2)			
	20	9.3 *(10.8)		9.1 *(10.6)			
	26	11.8 *(13.7)		11.3 *(13.1)			
32	20	9.6 *(11.2)	10.2 *(11.8)	9.5 *(11)	10.5 *(12.2)		
	26	14.5 *(16.9)	14.9 *(15.4)	13.5 *(15.7)	15.4 *(17.9)		
	31	20 *(23.3)	18.9 *(22)	15.2 *(17.7)	18.9 *(22)		
40	26	16.5 *(19.2)	18.1 *(21.1)	15.6 *(18.4)	18.5 *(21.4)		
	31	21.9 *(25.5)	24.5 *(28.5)	19 *(22.1)	24.7 *(28.7)		
	38	26 *(30.2)	29.3 *(34.1)	22.3 *(25.9)	28.3 *(32.9)		
50	31	22.1 *(25.7)	25.1 *(29.1)	19.1 *(22.2)	25.1 *(29.1)		
	38	27.6 *(32.1)	33.8 *(29.3)	23 *(26.7)	32 *(37.2)		
	48	38.4 *(44.7)	42.4 *(49.3)	34.6 *(40.2)	44.7 *(52)		
65	38	27,9 *(32,4)	34,1 *(39,7)	24 *(27,9)	33 *(38,4)		
	48	45,5 *(53,5)	56,9 *(66,9)	42 *(49,4)	55 *(64,7)		
	63	61 *(71,0)	74,8 *(87,1)	36,3 *(42,3)	63,1 *(73,5)	UT	UT
80	48	43,2 *(50,3)	55,5 *(64,6)	41,6 *(48,4)	53,5 *(62,3)		
	63	62,2 *(72,4)	76,6 *(89,2)	37 *(43,1)	62,2 *(72,4)	UT	UT
	78	61,9 *(72,1)	85,8 *(99,9)	43,16 *(50,3)	77,9 *(90,7)	UT	UT

The Kv was calculated with the FLOWSimulation fluid dynamics programme in compliance with standard UNI EN 1267:2001 and refers to a 2-way valve.
(*) The Anglo-Saxon system of measurement adopts the coefficient CV which defines the flow of water (at 60°F), expressed in GPM (GALLONS per minute) with a differential pressure of 1 psi. (1 Kv = 0.86 Cv).
UT-> Contact the technical office for special Kv on request.
For 3-way valves, during presizing it is possible to adapt a Kv equal to 78% of that of the corresponding 2 way valve; for more detailed calculations contact our technical office.
For valves with bellows consider S.15.

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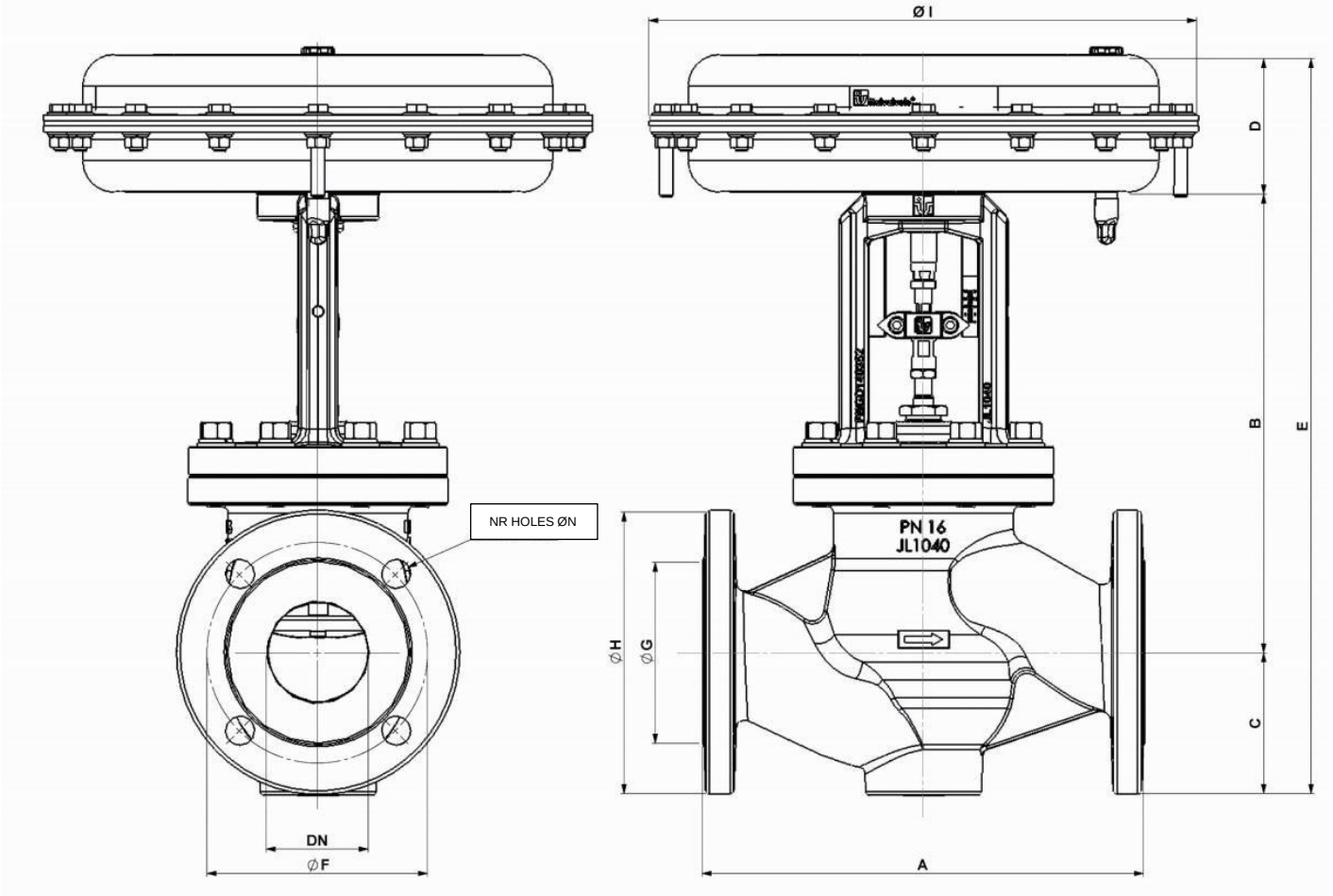
6.8 Overall Dimensions of SBS/16 valves.

6.8.1 SBS/16 2 way



DN	A	B		C	D				E								Ø F	Ø G	Ø H	Ø I	Ø N	No° holes
					Ø servocontrol																	
		N.C	N.O		200	275 360	430	530	200		275 360		430		530							
									N.C	N.O	N.C	N.O	N.C	N.O	N.C	N.O						
15	130	228	238	48	77	89	123	205	353	363	364	374					65	45	95	Depending on the □ p seal required (200-275-360-430-530)	14	4
20	150	228	238	53					358	368	369	379					75	58	105			
25	160	228	238	58					363	373	374	384					85	65	115			
32	180	251	261	70					398	408	410	420	444	454	526	536	100	76	140		19	
40	200	249	259	75					401	411	412	422	447	457	529	539	110	84	150			
50	230	247	257	83					407	417	418	428	453	463	535	545	125	99	165			
65	290	302	312	93					468	478	484	494	517	527	599	609	145	118	185			4* / 8
80	310	299	309	100					476	486	488	498	522	532	604	614	160	132	200			8

*the flange sizes are the same for bodies PN16-PN25-PN40, and differ only by thickness, with the exception of the DN65 valve where PN16 has 4 holes, PN25 and PN40 have 8 holes

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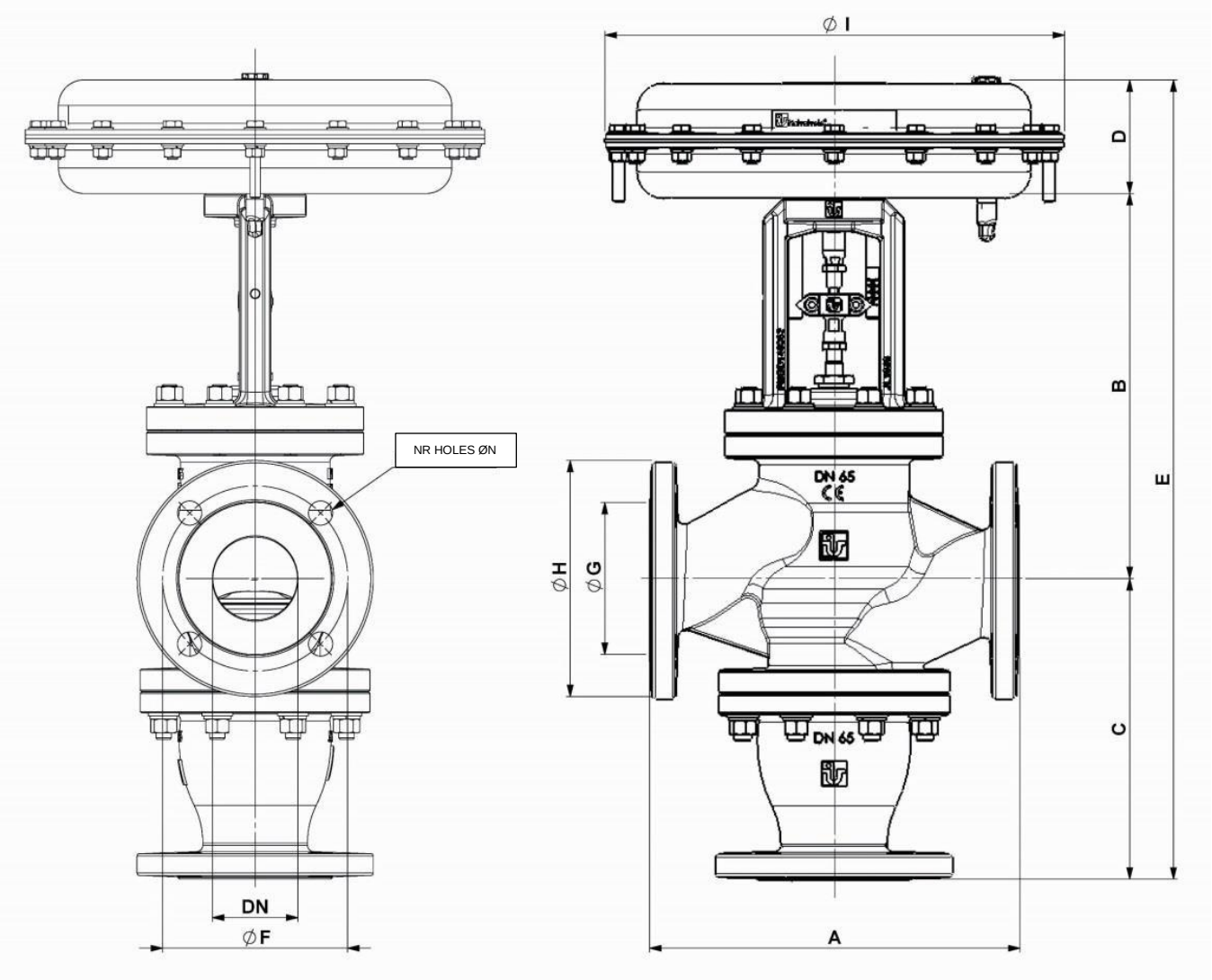
6.8.2 SBS/16 3 way



	DN	A	B		C	D				E								Ø F	Ø G	Ø H	Ø I	Ø N	No° holes
						Ø servocontrol																	
			N.C	N.O		200	275 360	430	530	200		275 360		430		530								
										N.C	N.O	N.C	N.O	N.C	N.O	N.C	N.O						
NORM. CLOSED (MIX.) NORM. OPEN (DEV.)	15	130	225	235	111	77	89	123	250	413	423	424	434					65	45	95	Depending on the Δp seal required (200-275-360-430-530)	14	4
	20	150	225	235	111					413	423	424	434					75	58	105			
	25	160	225	235	125					427	437	439	449					85	65	115			
	32	180	248	258	143					468	478	480	490	514	524	526	536	100	76	140		19	
	40	200	246	256	144					466	476	478	488	512	522	529	539	110	84	150			
	50	230	244	254	161					482	492	493	503	528	538	535	545	125	99	165			
	65	290	301	311	236					614	624	626	636	660	670	599	609	145	118	185			4* / 8
	80	310	299	309	238					614	624	626	636	660	670	604	614	160	132	200			8

*the flange sizes are the same for bodies PN16-PN25-PN40, and differ only by thickness, with the exception of the DN65 valve where PN16 has 4 holes, PN25 and PN40 have 8 holes

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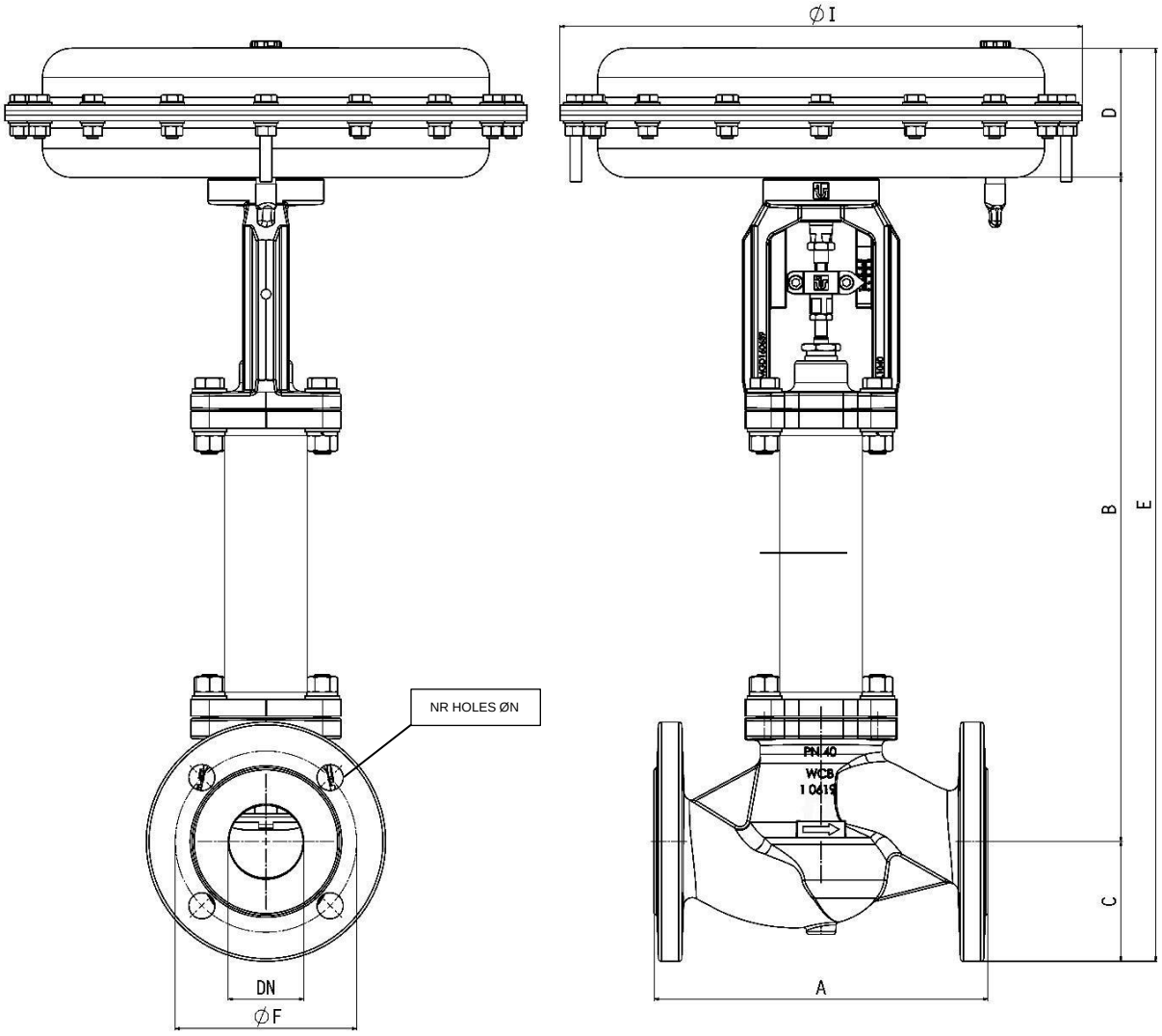
6.8.3 SBS/16 2 way with safety BELLOWS



DN	A	B		C	D				E								Ø F	Ø G	Ø H	Ø I	Ø N	No° holes
					Ø servocontrol																	
		N.C	N.O		200	275 360	430	530	200		275 360		430		530							
									N.C	N.O	N.C	N.O	N.C	N.O	N.C	N.O						
15	130	443	453	48	77	89	123	205	568	578	580	590					65	45	95	Depending on the Δp seal required (200-275-360-430-530)	14	4
20	150	443	453	53					573	583	585	595					75	58	105			
25	160	442	452	58					577	587	589	599					85	65	115			
32	180	462	472	70					609	619	621	631	655	665	737	747	100	76	140		19	
40	200	460	470	75					612	622	624	634	658	668	740	750	110	84	150			
50	230	458	468	83					618	628	630	640	664	674	746	756	125	99	165			
65	290	490	500	93					660	670	672	682	706	716	788	798	145	118	185			4* / 8
80	310	489	499	100					666	676	678	682	712	722	794	804	160	132	200			8

*the flange sizes are the same for bodies PN16-PN25-PN40, and differ only by thickness, with the exception of the DN65 valve where PN16 has 4 holes, PN25 and PN40 have 8 holes

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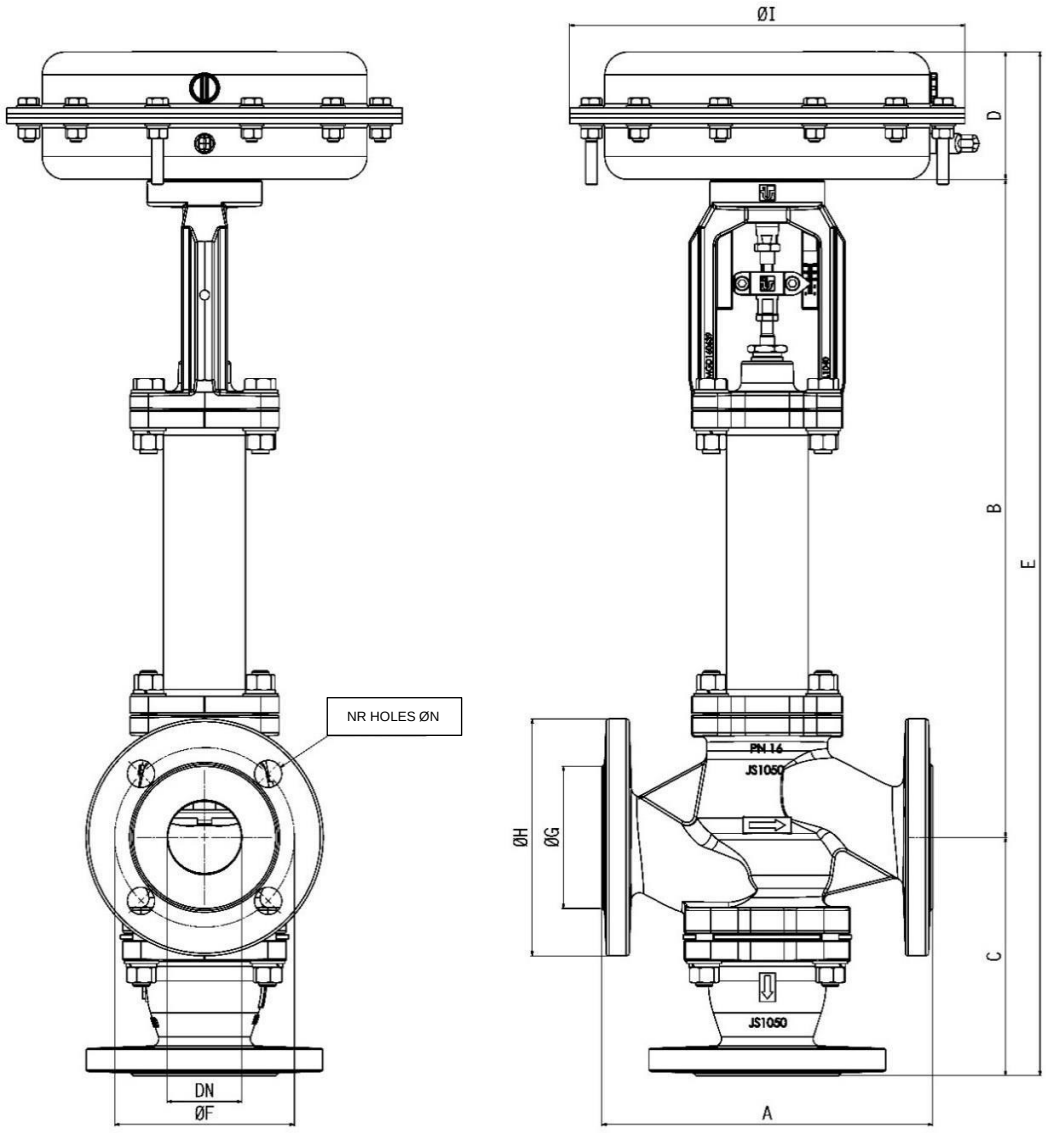
6.8.4 SBS/16 3 way with safety BELLOWS



	DN	A	B		C	D				E								Ø F	Ø G	Ø H	Ø I	Ø N	No° holes
						Ø servocontrol																	
			N.C	N.O		200	275 360	430	530	200		275 360		430		530							
										N.C	N.O	N.C	N.O	N.C	N.O	N.C	N.O						
NORM. CLOSED (MIX.) NORM. OPEN (DEV.)	15	130	443	453	116	77	89	123	205	636	646	648	658					65	45	95	Depending on the Δp seal required (200-275-360-430-530)	14	4
	20	150	443	453	116					636	646	648	658					75	58	105			
	25	160	442	452	130					649	659	661	671					85	65	115			
	32	180	462	472	147					686	696	698	708	732	742	814	824	100	76	140		19	
	40	200	460	470	149					686	696	698	708	732	742	814	824	110	84	150			
	50	230	458	468	166					701	711	713	723	747	757	829	839	125	99	165			
	65	290	490	500	241					808	818	820	830	854	864	936	846	145	118	185			4* / 8
	80	310	489	499	243					809	819	821	831	855	865	937	947	160	132	200			8

*the flange sizes are the same for bodies PN16-PN25-PN40, and differ only by thickness, with the exception of the DN65 valve where PN16 has 4 holes, PN25 and PN40 have 8 holes

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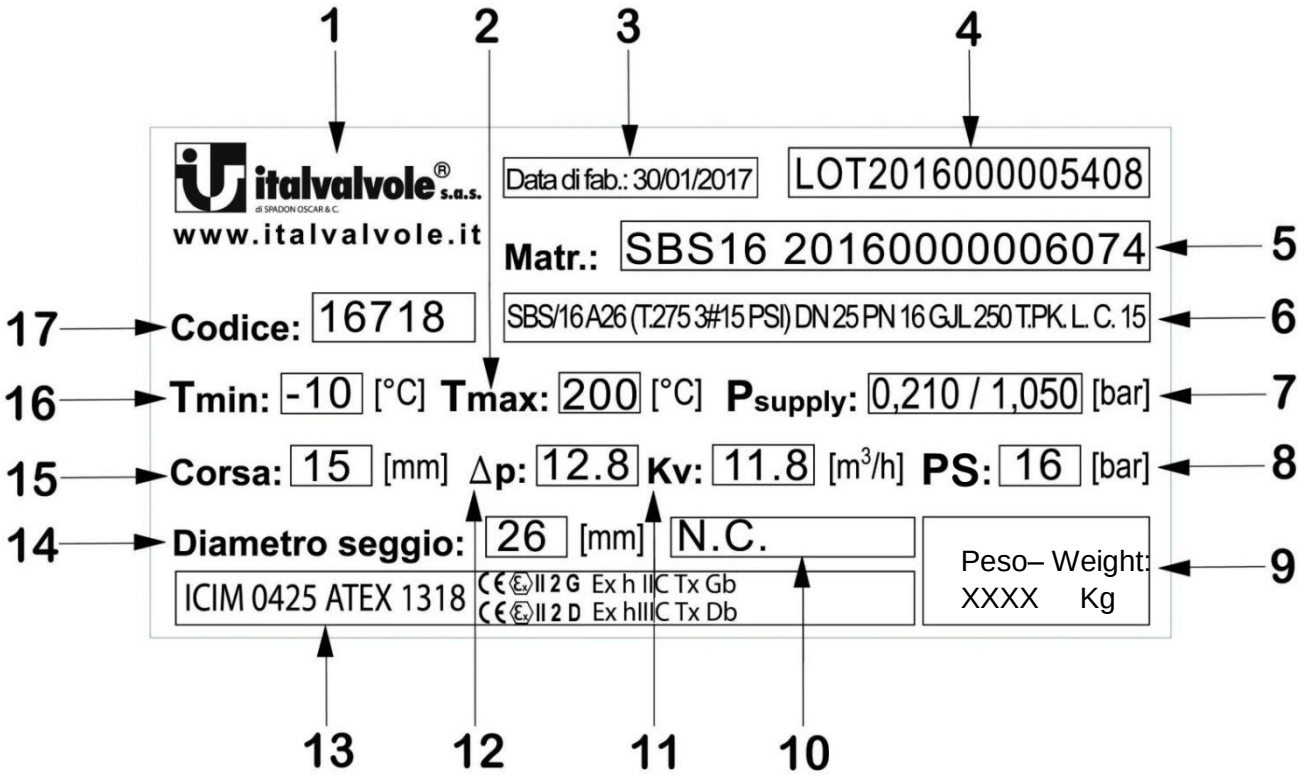
7 Description of SBS/16 valve plates



No.	Description
1	Manufacturer's brand
2	Maximum working temperature expressed in °C
3	Date of manufacture
4	Production batch
5	Valve serial number
6	Valve description
7	Feed pressure of the pneumatic servocontrol expressed in bar
8	Maximum pressure of exercise expressed in bar
9	Weight [Kg] / (Authorised dealer brand where applicable)
10	Valve closing/opening position in lack of signal
11	Rated Kv expressed in m3/h
12	Rated Δp of the valve, fluid seal pressure under the shutter
13	ATEX marking (If required only for valves made to meet this standard - on specific request)
14	Valve seat diameter expressed in mm
15	Valve stroke expressed in mm
16	Minimum working temperature expressed in °C
17	Valve code

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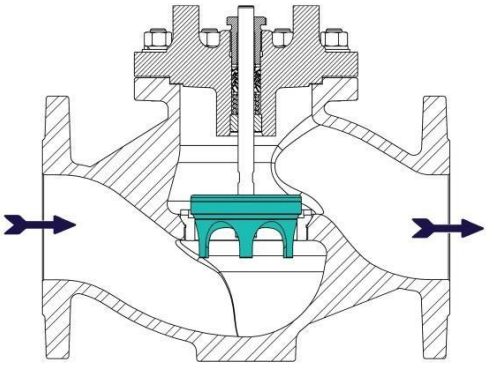
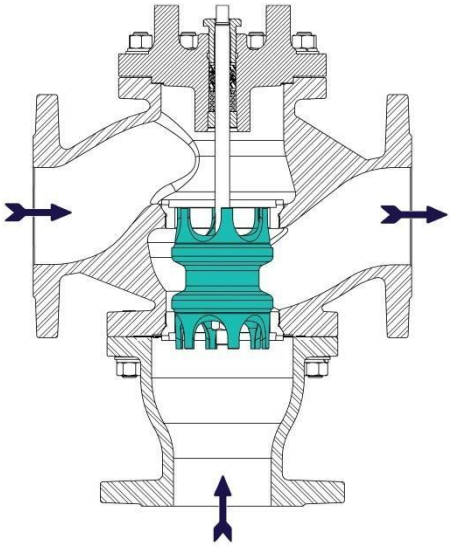
7.1 Correct valve installation

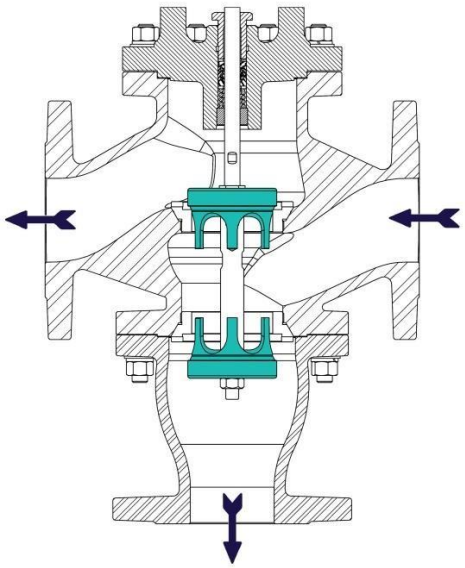
The arrow direction indicates the correct flow of the working fluid.



2 WAY N.C



3 WAY MIXER N.C



3 WAY DEVIATOR N.O

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8 Storage, installation, inspection and maintenance

8.1 Transport, storage and handling

During transport and assembly, the valves and any accessories must be handled with great care, avoiding knocks and unnecessary stress, particularly impact of the servocontrol could cause misalignment and compromise the good operation of the valve.

For safe handling and lifting, refer to the weight indicated on the data plate.

The protection against dust on all connections must be removed only at the time of assembly.

Store the valves away from sunlight, to prevent the membranes and seals inside from drying or early ageing.

Storage temperatures must be between 0°C and + 50°C.

8.2 Installation instructions

8.2.1 General application information

!!! UNDER NO CIRCUMSTANCES MUST THE VALVE BE DISASSEMBLED OR MODIFIED: to avoid annulment of any type of warranty

The indications on the labels and valve body cast must be complied with at all times. The threaded plug on the unused air coupling must not be touched.

Only prior to assembly, the valve body protections must be removed and immediately after that, check that no debris/impurities have got inside (if necessary, use a jet of compressed air).

Check the state of the pipes:

- size and seal under pressure must be checked: the insides must be free of foreign particles and/or weldings before being connected to the valve
- the weight of the valve and any accessories must be bearable (appropriate pipes) also using specific supports

Pneumatic control and servocontrol breather feed pipes and hoses must be located in such a way as to be protected from external damage.

The control compressed air must be instrument air with pressure between the usage values of the servocontrol and never more than 3 bar; with feed pipes in nylon or copper.

The male air couplings must be threaded, 1/8” GAS (head Ø 200) or 1/4" (head Ø 275, Ø 360, Ø 430, Ø 530).

The recommended installation requires that the valve be assembled vertically with the servocontrol at the top (space may justify horizontal or angled installation).

If the continuous operation of the system is required even during maintenance, a suitable by pass should be installed with the relative manual on-off and control valves.

WARNINGS: there must be minimum required room for disassembly of the pneumatic servocontrol and internal parts during maintenance and operating inspections.

Pay full attention to assembling the valve on the piping, make sure it is assembled by following the indications on the body cast, following the fluid direction in the pipes. Proceed to tighten the flange nuts diagonally and uniformly, to compress the seals uniformly and avoid harmful tensions on the valve body.

It is advisable to use joints between the pipes on the system and the valve connections, to discharge any tension which could damage the valve.

After assembly, with the pneumatic valve in the maximum open position, carefully clean the line using suitable pressurised fluid to remove foreign bodies, weld burrs and debris which could damage the valve seal surfaces.

Connect the pneumatic signal output from the pilot regulator or the remote-control panel with a specific threaded coupling on the servocontrol.

The user must assess if the dust depositing on the valve can reach the maximum permissible valve temperatures without triggering an explosion; otherwise isolate the valve. The ambient air must not exceed 40°C. Make sure that the valve actuator does not exceed a temperature of 80°C. It is very important that the place of installation has a room temperature that is no higher than the minimum ignition temperature in a potentially explosive atmosphere.

Connect the earthing terminals and/or equipotential connection to the pipes. All equipment is supplied with an earthing terminal identified by the specific symbol.

If necessary make an additional equipotential connection between the body and the valve (in the specific point) and the interface pipes.

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8.2.2 Valve lifting diagram

- Lifting by preventing the valve from overturning and inclination, after having checked the lifting system capacity.
- Do not leave the valves suspended for long periods of time (for example during the work interruption).
- Before lifting, make sure that the area is free from obstacles, safe, and that the operator is wearing appropriate personal protective equipment.

A Method

Direct band with two buttonholes on hook. Total two bands with winding around inlet and outlet (straight way) flanges neck.

B Method

Direct band and in a loop with only one buttonhole on hook. Total two bands with winding around inlet and outlet (straight way) flanges neck.

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8.3 Installation diagrams

8.3.1 Installation of SBS/16 2 way valves

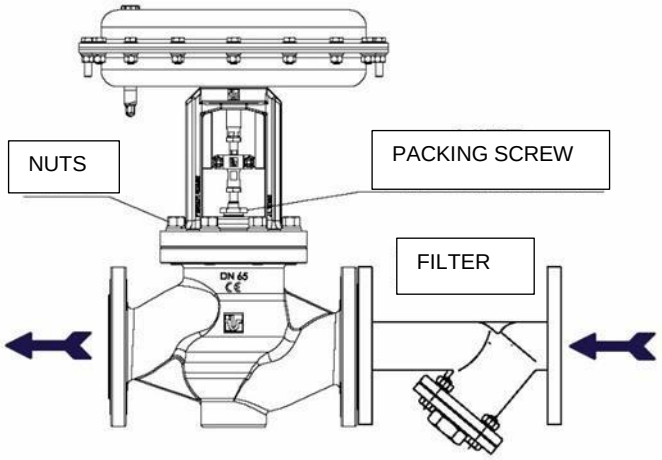

Figure 1

When installing SBS/16 2 way valves, place a filter on the valve intake to collect any impurities which could damage the seal. Mount the SBS/16 2 way valve as shown in figure 1, respecting the direction arrows on the valve. After the first hours of use when hot, lightly screw the packing screw (1 turn) and check the tightening on the nuts indicated.

8.3.2 Installation of SBS/16 3 way deviator valves

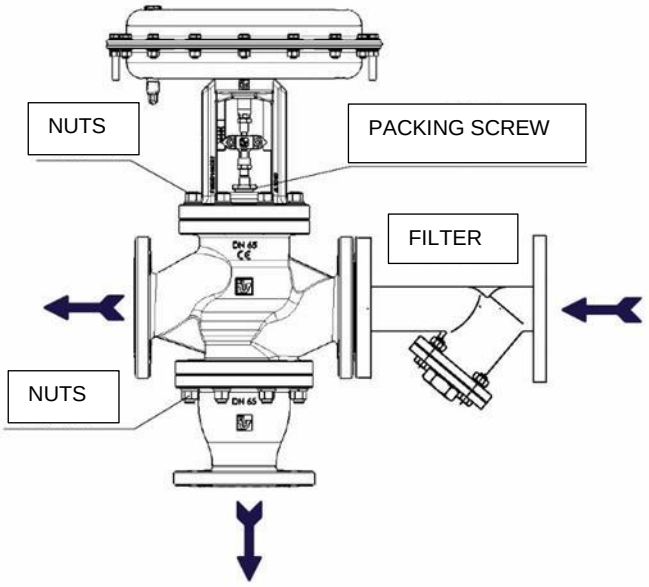

Figure 2

When installing SBS/16 3 way deviator valves, place a filter on the valve intake to collect any impurities which could damage the seal. Mount the SBS/16 3 way deviator valve as shown in figure 2, respecting the direction arrows on the valve. After the first hours of use when hot, lightly screw the packing screw (1 turn) and check the tightening on the nuts indicated in the diagram.

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8.3.3 Installation of SBS/16 3 way mixer valves

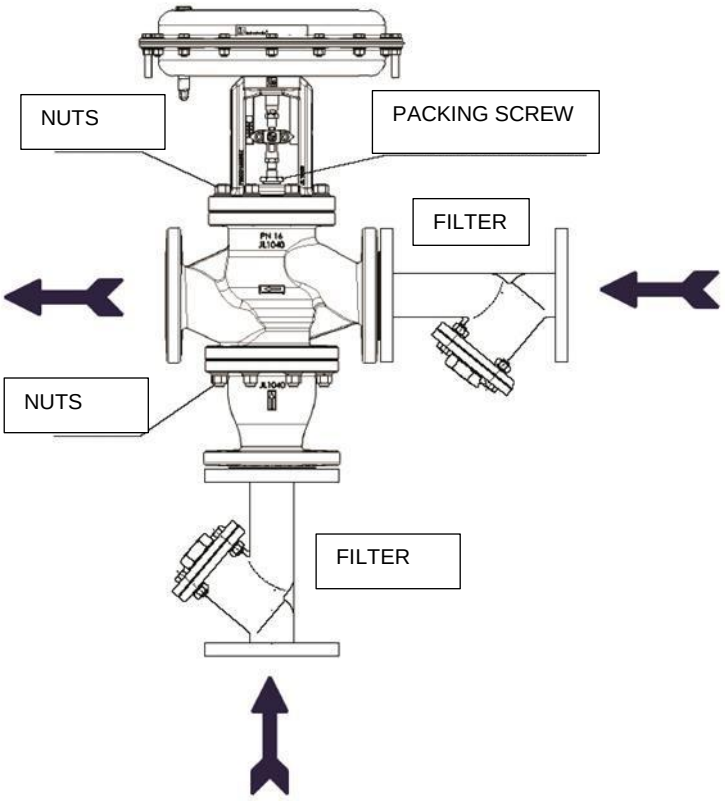

Figure 3

When installing SBS/16 3 way mixer valves, place a filter on each of the two valve intakes to collect any impurities which could damage the seal. Mount the SBS/16 3 way mixer valve as shown in figure 3, respecting the direction arrows on the valve. After the first hours of use when hot, lightly screw the packing screw (1 turn) and check the tightening on the nuts indicated.

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8.4 Operating test

(This must be done prior to starting the plant and after any repairs or servicing)

For valves with N.C. normally closed servocontrol:

1) Send the fluid in the valve under the shutter at working pressure (check that it is always below the maximum permissible pressure indicated on the valve data plate).
2) Enter the minimum value on the control signal present on the data plate in the servocontrol (the valve should start to open, detail that can be read on the stroke plate).
3) Enter the maximum value on the control signal present on the data plate in the servocontrol (the valve should be completely open, detail that can be read on the stroke plate).
4) Remove the air from the servocontrol.
5) Repeat the operation 5 times.
6) Check with the air off that there are no leaks from the valve.
7) Check with the air on that there are no leaks from the servocontrol.

For valves with N.A. normally open servocontrol:

1) Send the fluid in the valve under the shutter at working pressure (check that it is always below the maximum permissible valve pressure).
2) Enter the minimum value on the control signal present on the data plate in the servocontrol (the valve should start to close, detail that can be read on the stroke plate).
3) Enter a pressure valve equal to the sum of the two maximum and minimum control signals on the data plate in the servocontrol (the valve should close, detail that can be read on the stroke plate).
4) Repeat the operation 5 times.
5) Check with the air on (with a pressure value equal to the sum of the two signals e.g. 3/15 =18 PSI) that there are no leaks from the valve.
6) Check with the air on that there are no leaks from the servocontrol.

8.5 Troubleshooting

Note: To ensure the correct operation of the valve, the rod must move freely and with no friction as the air pressure on the diaphragm varies.
The valve serial number is stamped on the data plate on the servocontrol. Please refer to the serial number for all spare parts requests and in all correspondence.

8.5.1 Fluid passage with valve closed

If the valve is in the closed position, check that there are no foreign bodies between the shutter and the seat and that the contact surface is not damaged.
In the event of effective damage that marks the seat, replace the shutter seat (to disassemble the valve see below).

8.5.2 Diaphragm (membrane)

If the rubber membrane inside the servocontrol is broken, the valve will not run the full stroke.
If the membrane is broken or has lost elasticity, replace it (see below for the correct procedure).
In all cases of incorrect operation during adjustments, immediately check that the pneumatic connections between the pilot controller and the valve and relative couplings have no air leaks.
Also make sure that the regulator is correctly calibrated (action direction, proportional band, automatic reset, etc.) and that it is working correctly.

8.6 Periodical maintenance

Routine maintenance must be performed in addition to any maintenance performed in the event of a fault, which requires immediate intervention.
The maintenance interval is 300,000 cycles or three years, whichever is the shorter; it involves the complete disassembly of the valve, replacing all the seals and fully cleaning of all the other valve components.
After a first period of operation, a fundamental part that requires particular care is the packing gland. During the first hours of operation check that there are no leaks, otherwise remove them by turning the tightening nut very carefully (maximum rotation one quarter of a turn for glands in teflon- graphite), taking care not to exceed the closing force in order to avoid excessively increasing the friction on the rod which would compromise the operation of the system.
If despite tightening other leakages are found, replace the packing gland completely.

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8.7 List of materials

The list of materials used for each valve part is given below:

				MATERIALE			
				GJL 250	GJS 500	WCB	CF8M
		VITERIA		Galvanised Fe (*)			Stainless steel Inox 304
S	SERVOCONTROL	S1	Upper head	Painted Fe			Inox 304 (1)
		M	Membrane	Rubberised fabric NBR			
		PPM	Spring holder plate	Fe-P04 (Aluminium Ø530)			
		S2	Spring	Steel for springs			
		S3	Lower head	Painted Fe			Inox 304 (1)
		S4	Servocontrol gasket	Expanded graphite			
		BA	BA seal	NBR			
		BG	Self-lubricating bushing	Bronze			
		S6	Large flat washer	Galvanised Fe			Inox 304
		D	Coupling flange	ASTM A105			Inox 304
		ST	Servocontrol shaft	S30400			
		C	**YOKE**	GJL 250		WCB	INOX CF8M
GG	CLAMP UNIT	G	Clamp	CF8			
		G1	Mobile spacer washer	S30400			
		G2	Adjusting screw	S30400			
		G4	Indicator	Aluminium			
		G5	Lower adjusting screw	S30400			
GPS	GLAND UNIT	**O1**	**SHUTTER ROD**	S30400			S31600
		P1	GPS spacer washer	AISI 316			
		PV	Gland nut	Galvanised Fe (*)			
		PPS	Gland nut	PTFE + PTFE/GRAFITE + FPM			
		PM	GPS spring	Steel for springs			
OTT	METAL-PEEK SHUTTER	PI	Insert holder	S30400			S31600
		IK	Ketron insert	KETRON PEEK 1000			
		IO	Metallic insert	S30400			S31600
		OD	Lower rod	S30400			S31600
		O2	Guide	ASTM A305 (CF8 1.4308)			CF8M
		O3	Self-locking nut	AISI 304			AISI 316
BODY SIDE		**CV**	**VALVE BODY**	GJL250	GJL500	WCB	CF8M
		GI	Flat gasket	FASIT400/REINFORCED GRAPHITE			
		SCO	Conical seat	S30400			S31600
		P	Extensions	Painted Fe (**)			
		SF	Bellows	S30400 / S31600			
		F	**BOTTOM**	GJL250	GJL500	WCB	CF8M
		GSM	Spirometallic seal	GRAPHITE + AISI 316			

(1) on request also available in painted Fe

(*) on request also available in INOX 304

(**) on request also available in INOX 304

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8.8 Disassembly and assembly instructions for valve body side

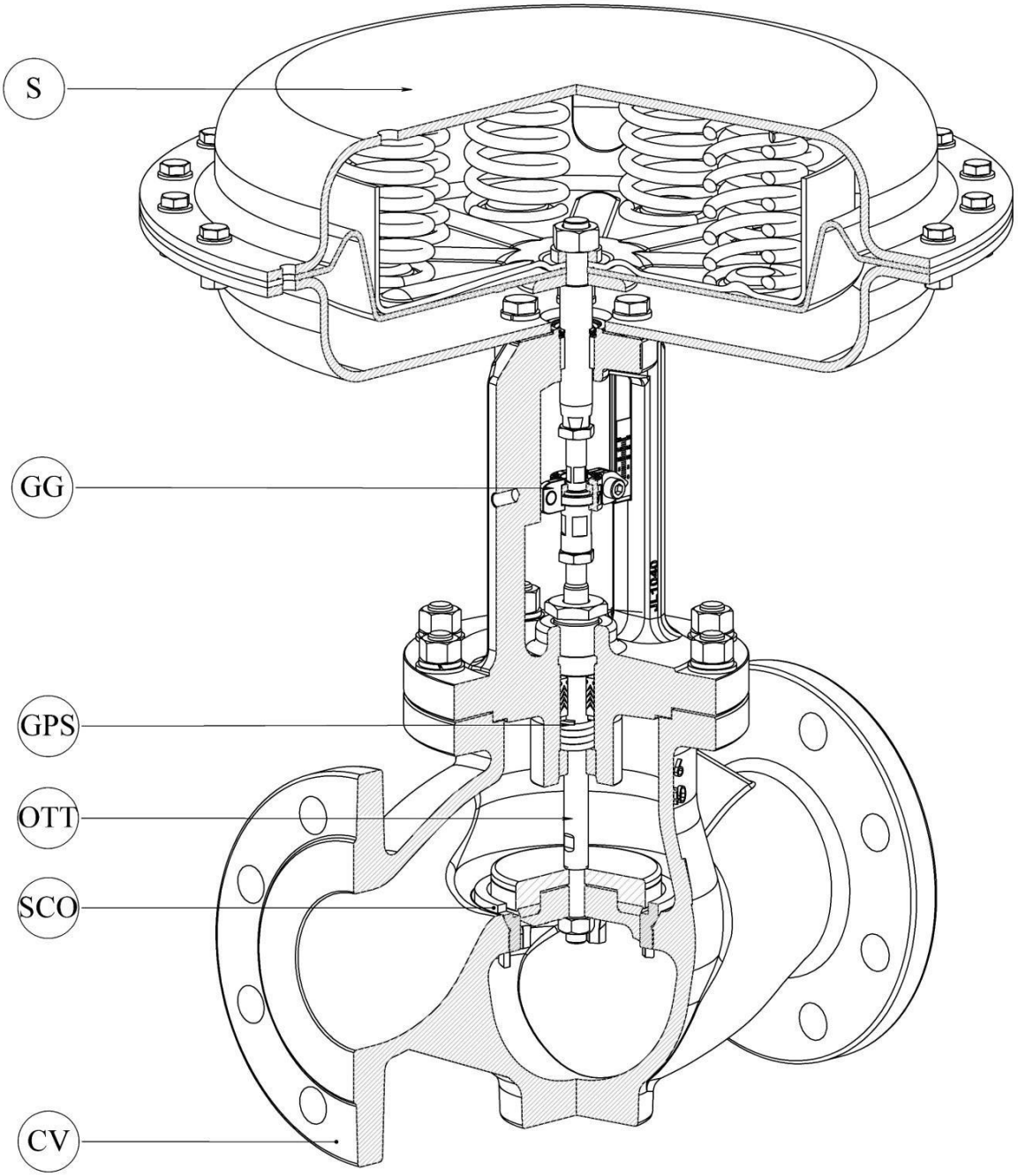
8.8.1 SBS/16 2 Way

For disassembly and assembly operations for SBS/16 2-way NC valves, refer to Drawing. No. 15282 annexed.

All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.

Whenever working on the valves, you must completely remove the fluid.

NOTE: Read the procedures fully before starting work.



Drawing No. 15282

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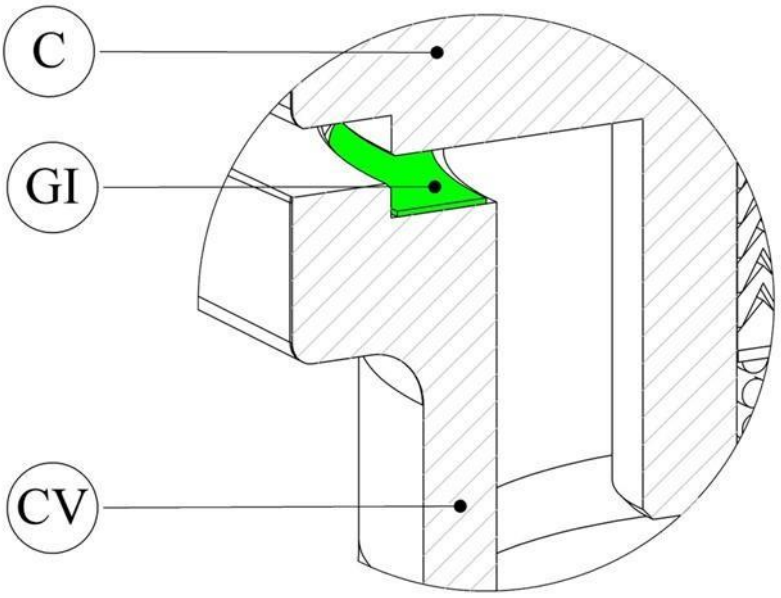
Disassembly:

Introduction: before starting disassembly or assembly operations, the valve and its component parts must be fixed carefully and firmly to a fixing device, working using the correct tools to preserve the components and work in safety!

1) **N.C. VERSION ONLY:** Add air to the servocontrol at a pressure equal to the maximum value shown by the signal. **Warning!: The servocontrol rod will move along its stroke upwards.**
2) Unscrew the nuts and slide the washers out from the stud bolts.
3) Separate the servocontrol with the shutter (OTT) from the valve body.
4) Proceed to remove the clamp unit (paragraph 8.11 page 47).
   N.C. VERSION ONLY; Warning!: Removing the air from the servocontrol, the rod will move downwards along the stroke.
5) Slide off the shutter (OTT) from the yoke (C).
6) Remove the body gasket (GI) from the valve body (CV).
7) Now the valve is completely disassembled, and the required parts can be replaced.
8) For servocontrol maintenance follow the disassembly procedure described in chapter 8.12.
9) To replace the packing gland unit (GPS) see chapter 8.14.
10) To remove the shutter (OTT) see chapter 8.13.



Detail of the flat gasket between the yoke and the body

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Assembly:

1) Replace the shutter (OTT) following the procedure described in chapter 8.13.1.
2) Insert the packing gland unit (GPS) in the yoke (C) following the procedure described in chapter 8.14.
3) Replace the servocontrol following the procedure described in chapter 8.12.
4) Insert the shutter (OTT) on the yoke (C) having fitted the packing gland unit (GPS), taking care to grease the shutter rod with silicone grease.
5) Position the body seal (GI) on the valve body (CV).
6) **N.C. VERSION ONLY:** Insert an air signal in the servocontrol equal to the maximum value of the signal. **Warning! The servocontrol rod will move along its stroke upwards.**
7) Slide the servocontrol (S) onto which the shutter (OTT) has been assembled, onto the stud bolts on the valve body (CV) taking care to slide the shutter (OTT) carefully onto the valve seat (SCO).
8) Slide the flat washers and elastic washers onto the stud bolts and screw the nuts to the torque indicated in the table (page 57).
9) Proceed to assembly the clamp unit (paragraph 8.11 page 47).

   N.C. VERSION: Warning!: Removing the air from the servocontrol, the rod will move downwards to meet the lower adjusting screw (G5).

   N.O. VERSION: Warning!: Removing the air from the servocontrol the rod will move upwards along the stroke.

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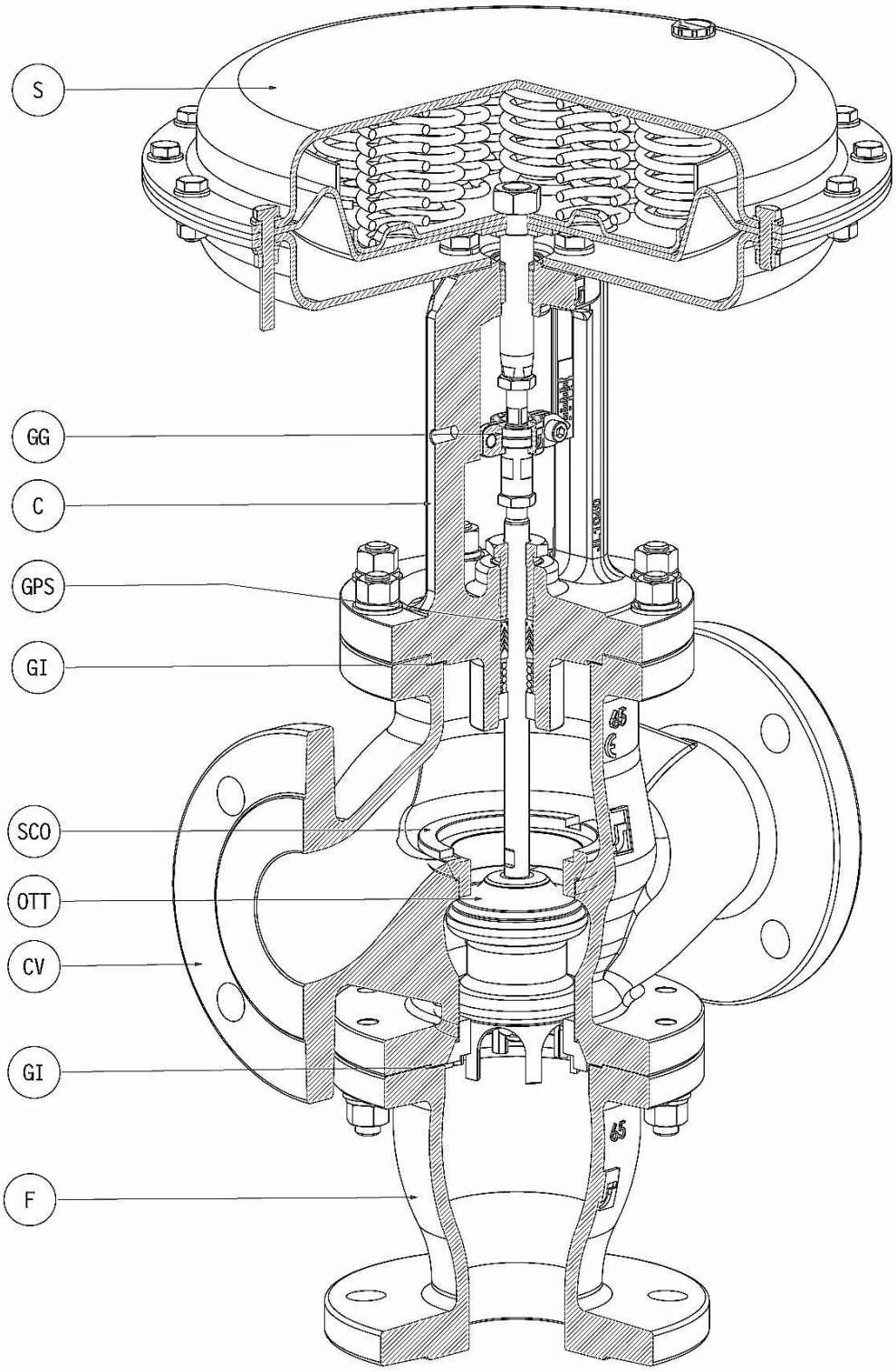
8.8.2 SBS/16 3 way Mixer

For disassembly and assembly operations for SBS/16 3-way NC valves, refer to Drawing. No. 160240 annexed.
All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves, you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



Drawing N°160240

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Disassembly:

Warning: before starting disassembly or assembly operations, the valve and its component parts must be fixed carefully and firmly to a fixing device, working using the correct tools to preserve the components and work in safety!

1) Separate the junction clamps (G), then proceed to disassemble the clamp unit (see paragraph 8.11 page 47).
   N.C. VERSION ONLY: Insert an air signal in the servocontrol equal to the maximum value of the signal. **Warning!: Inserting air, the servocontrol rod will move upwards along the stroke.**
2) Unscrew the nuts and slide the washers out from the stud bolts.
3) Separate the servocontrol from the valve body: the shutter (OTT) will remain in the valve body
   N.C. VERSION ONLY: Remove the air from the servocontrol, **Warning! Removing the air, the servocontrol rod will move downwards along the stroke.**
4) Remove the body gasket (GI) from the valve body (CV). (see detail on page 35).
5) Unscrew the nuts and slide the washers from the stud bolts from the bottom of the third way.
6) Slide out the bottom (F) and remove the body gasket (GI) from the valve body (CV).
7) Unscrew the third way seat using the special spanner, taking great care not to dent the seal seat or damage the shutter still inside the valve.
8) Remove the shutter (OTT) from the valve body (CV); to disassemble see paragraph 8.13.2 page 53.
9) When the valve is completely disassembled the required parts can be replaced.
10) For servocontrol maintenance follow the disassembly procedure described in chapter 8.12.
11) To replace the packing gland unit (GPS) see chapter 8.14.
12) To remove the shutter (OTT) see chapter 8.13.2.

Assembly:

1) Refit the shutter (OTT) following the procedure described in chapter 8.13.2.
2) Insert the packing gland unit (GPS) in the yoke (C) following the procedure described in chapter 8.14.
3) Refit the servocontrol following the procedure described in chapter 8.12.
4) Insert the shutter (OTT) on the valve body (CV) sliding it on from the L-shaped way.
5) Screw the third way seat using the special spanner, taking great care not to dent the seal seat or damage the shutter inside the valve.
6) Position the body seal (GI) on the valve body (CV).
7) Slide the bottom (F) with the body gasket (GI) on the valve body (CV) and proceed to fix it by screwing the nuts to the correct torque (tightening torque table on page 57)
8) Fit the body gasket (GI) on the valve body (CV).
9) **N.C. VERSION ONLY:** Insert an air signal in the servocontrol equal to the maximum value of the signal. **Warning!: The servocontrol rod will move along its stroke upwards.**
10) Slide the servocontrol (S) onto the shutter (OTT) rod inside the valve body (CV), taking care to grease the shutter rod with silicone grease and then on the stud bolts on the valve body (CV) taking care to slide it in the right direction.
11) Slide the flat washers and elastic washers onto the stud bolts and screw the nuts to the torque indicated in the table (page 57).
12) Proceed to assembly the clamp unit (paragraph 8.11 page 47).
    N.C. VERSION: Warning!: Removing the air from the servocontrol, the rod will move downwards to meet the bottom adjusting screw (G5).
    N.O. VERSION: Warning!: Removing the air from the servocontrol the rod will move upwards along the stroke.

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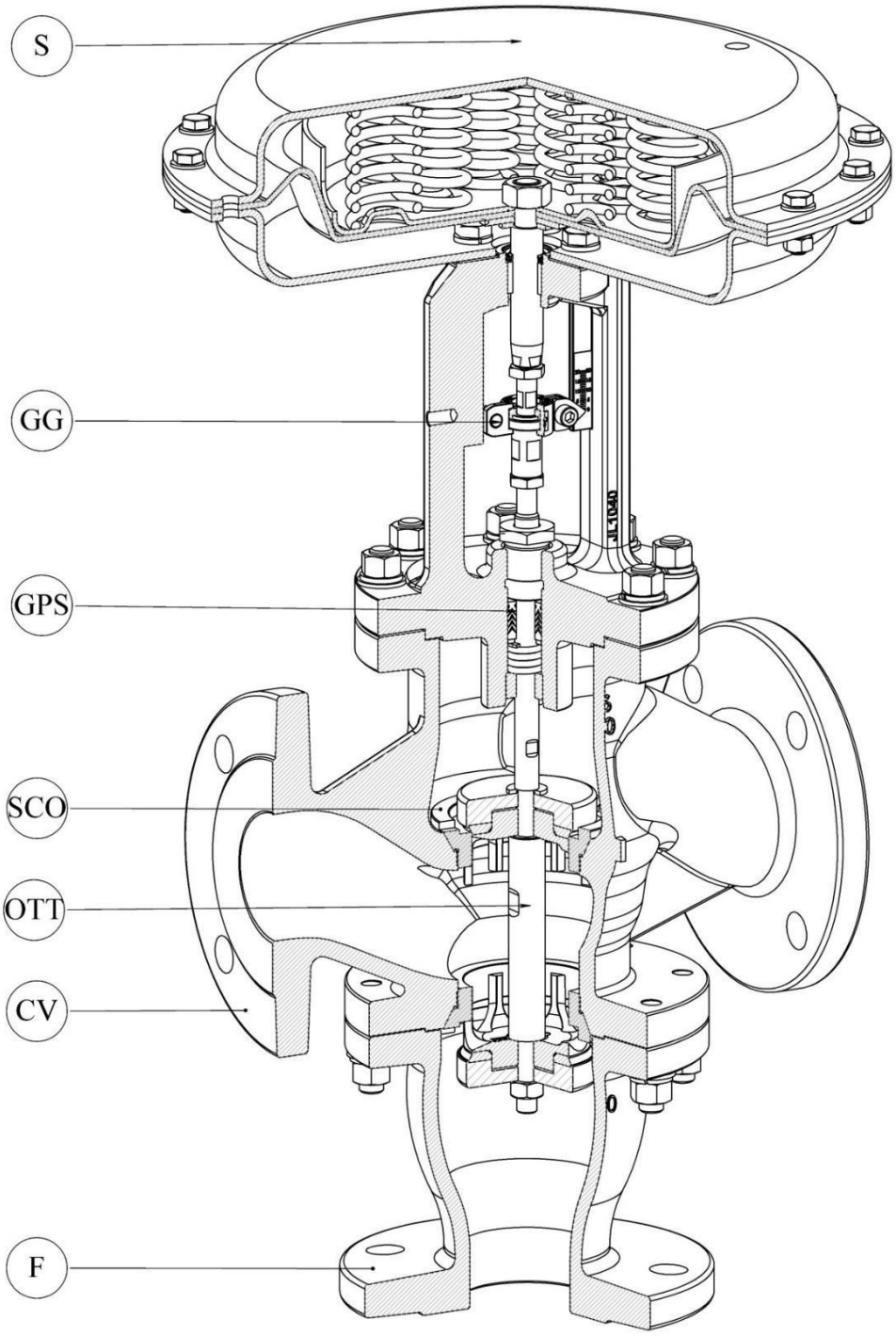
8.8.3 SBS/16 3 way deviator

For disassembly and assembly operations for SBS/16 3 way NO valves, refer to Drawing. No. 16711 annexed.
All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves, you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



Drawing N°16711

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Disassembly:

Warning: before starting disassembly or assembly operations, the valve and its sub-component parts must be fixed carefully and firmly to a fixing device, working using the correct tools to preserve the components and work in safety!

1) Separate the junction clamps (G), then proceed to disassemble the clamp unit (see paragraph 8.11 page 47).
2) **N.O. VERSION ONLY:** Insert an air signal in the servocontrol equal to the maximum value of the signal. **Warning!: The servocontrol rod will move along its stroke upwards.**
3) Unscrew the nuts and slide the washers out from the stud bolts.
4) Unscrew the nut (G6) and bottom adjusting screw (G5) taking care to mark the position, (see paragraph 8.11).
5) Separate the servocontrol from the valve body: the shutter (OTT) will remain in the valve body.
6) **N.O. VERSION ONLY:** Remove the air from the servocontrol, **Warning! The servocontrol rod will move along its stroke downwards.**
7) Remove the body gasket (GI) from the valve body (CV). (See Detail on page 35).
8) Unscrew the nuts and slide the washers from the stud bolts from the bottom of the third way.
9) Slide out the bottom (F) and remove the body gasket (GI) from the valve body (CV).
10) Place the spanner inside the inlet mouth and hold the shutter (OTT) steady from the key cut, unscrewing the nut keeping the shutter closed.
11) Slide the insert and insert-holder off the shutter (OTT) rod taking care not to drop the remaining parts. (see complete instructions in chapter 8.13.3).
12) Remove the remainder of the shutter (OTT) from the valve body.
13) Now the valve is completely disassembled, and the required parts can be replaced.
14) For servocontrol maintenance follow the disassembly procedure described in chapter 8.12.
15) To replace the packing gland unit (GPS) see chapter 8.14.
16) To completely remove the shutter (OTT) see chapter 8.13.3.

Assembly:

1) Refit the first part of the shutter (OTT) following the procedure described in chapter 8.13.3.
2) Insert the packing gland unit (GPS) in the yoke (C) following the procedure described in chapter 8.14.
3) Refit the servocontrol following the procedure described in chapter 8.12.
4) Insert the shutter (OTT) on the yoke (C) having fitted the packing gland unit (GPS), taking care to grease the shutter rod with silicone grease.
5) **N.O. VERSION ONLY:** Insert an air signal in the servocontrol equal to the maximum value of the signal. **Warning!: The servocontrol rod will move along its stroke upwards.**
6) Position the body seal (GI) on the valve body (CV).
7) Slide the servocontrol (S) with the shutter (OTT), and then onto the stud bolts on the valve body (CV) taking care to slide it in the right direction.
8) Slide the flat washers and elastic washers onto the stud bolts and screw the nuts to the torque indicated in the table (page 57).
9) Slide the insert and insert holder onto the shutter (OTT) rod protruding from the third way.
10) Applying the force of the nut and counternut on the upper part of the rod (O1) of the shutter (OTT), it is possible to screw the lower nut to assemble it, or, where possible, place a spanner in the inlet mount and hold the shutter (OTT) from the key cut and screw the self-locking nut keeping the shutter closed. Remember to grease the thread copper to avoid the risk of the self-locking nut seizing.
11) Slide the bottom (F) with the body gasket (GI) onto the valve body (CV).
12) Slide the washers onto the stud bolts from the bottom of the third way (F) and screw the nuts to the torque indicated in the table (page 57).
13) Proceed to assembly the clamp unit (paragraph 8.11 page 47).
    N.C. VERSION: Warning!: Removing the air from the servocontrol, the rod will move downwards to meet the bottom adjusting screw (G5).
    N.O. VERSION: Warning!: Removing the air from the servocontrol the rod will move upwards along the stroke.

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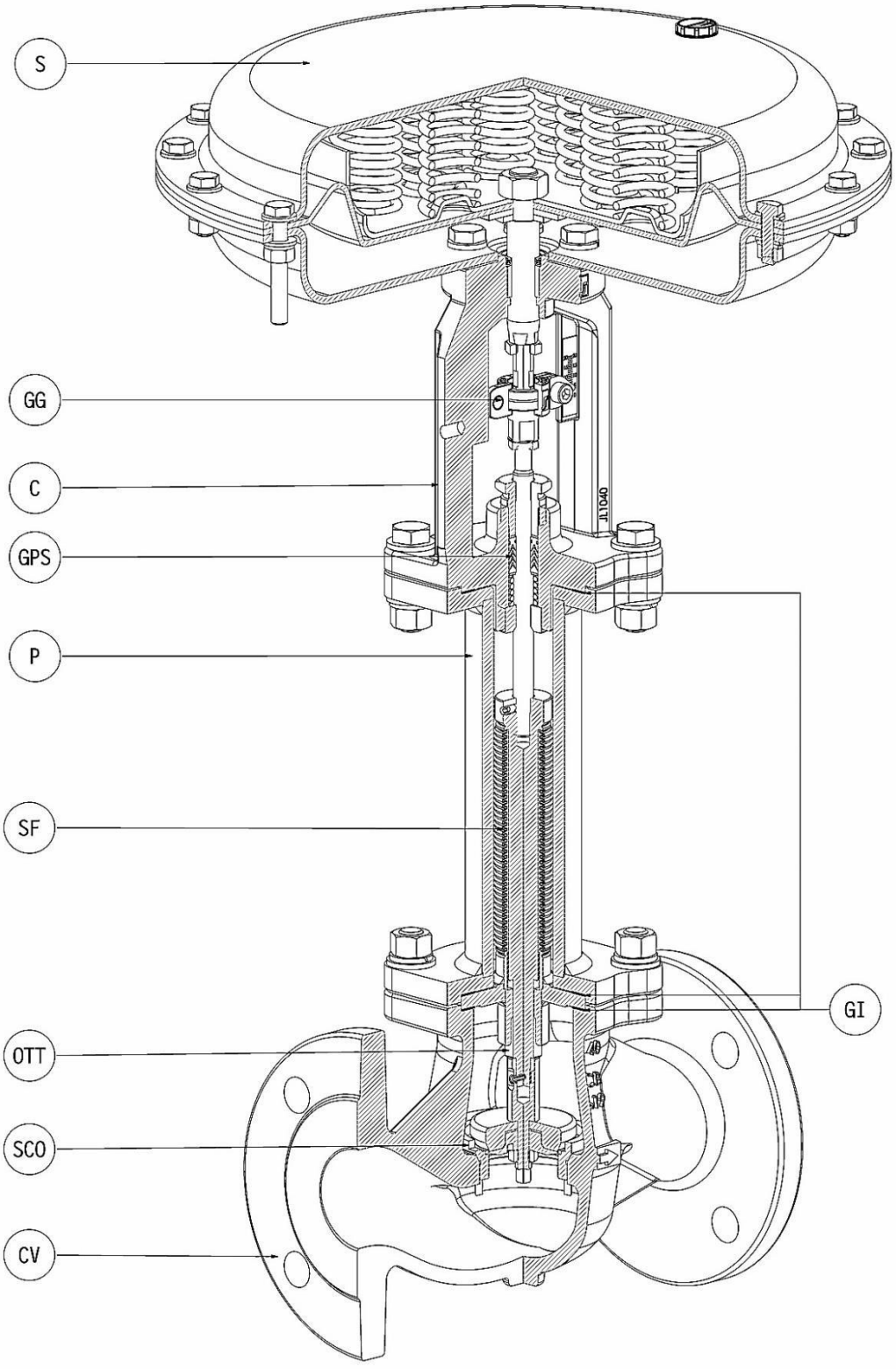
8.8.4 SBS/16 DN 2 Way with bellows

For disassembly and assembly operations for SBS/16 2-way NC valves with bellows, refer to Drawing. No. 17611 annexed.
All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves, you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



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Disassembly:

1) Unscrew the nuts from the clamp unit (see paragraph 8.11) and separate the junction clamps (G).
   Warning!: Inserting air, the servocontrol shaft will move upwards.
2) Remove the air from the servocontrol and unscrew the nuts, slide off the washers and screws between the yoke (C) and the extension (P).
3) Separate the servocontrol from the extension
4) Slide off the gasket.
5) Unscrew the nuts, slide off the elastic washers and flat washers from the extension and valve body.
6) Slide off the yoke extension
7) Remove the intermediate body with bellows (SF) with the upper rod and the shutter (OTT) connected to it from the valve body along with the two upper and lower seals from the intermediate piece with bellows
8) Unscrew the grub screw, then the upper rod from the intermediate body with bellows (SF).
9) To remove the shutter, pull out the locking pin.
10) Remove the servocontrol following the procedure described in chapter 8.12.2.
11) Now the valve is completely disassembled, and the required parts can be replaced.

Assembly:

1) Refit the servocontrol following the procedure described in chapter 8.12.2.
2) Refit the shutter following the procedure described in paragraph 8.13.1.
3) Insert the sealing ring between the body and intermediate piece with bellows.
4) Screw the shutter (OTT) onto the intermediate body with bellows (SF), using thread sealant, remembering to replace the pin removed previously to fix it to the bellows.
5) Screw the upper rod onto the intermediate body with bellows (SF), and lock in place with the grub screw.
6) Position the first sealing ring removed before and insert the assembled intermediate body with bellows inside the valve body (CV).
7) Position the second seal on top of the intermediate body with bellows and place the yoke extension (P) on the stud bolts.
8) Screw the flat washers and elastic washers and tighten the nuts (see torque on page 57).
9) Position the last sealing ring between the extension and the yoke (C).
10) Position the servocontrol.
11) Slide the screws between the extension and the servocontrol with the washers and elastic washers, screw the four closing nuts to the torque indicated in the table (page 57).
12) Insert air in the servocontrol equal to the maximum value of the signal:
   Warning!: The rod on the servocontrol will move along its stroke upwards.
13) Proceed to assembly the clamp unit (paragraph 8.11 page 47).
   Warning!: Removing the air from the servocontrol, the rod will move downwards to meet the lower adjusting screw (G5).

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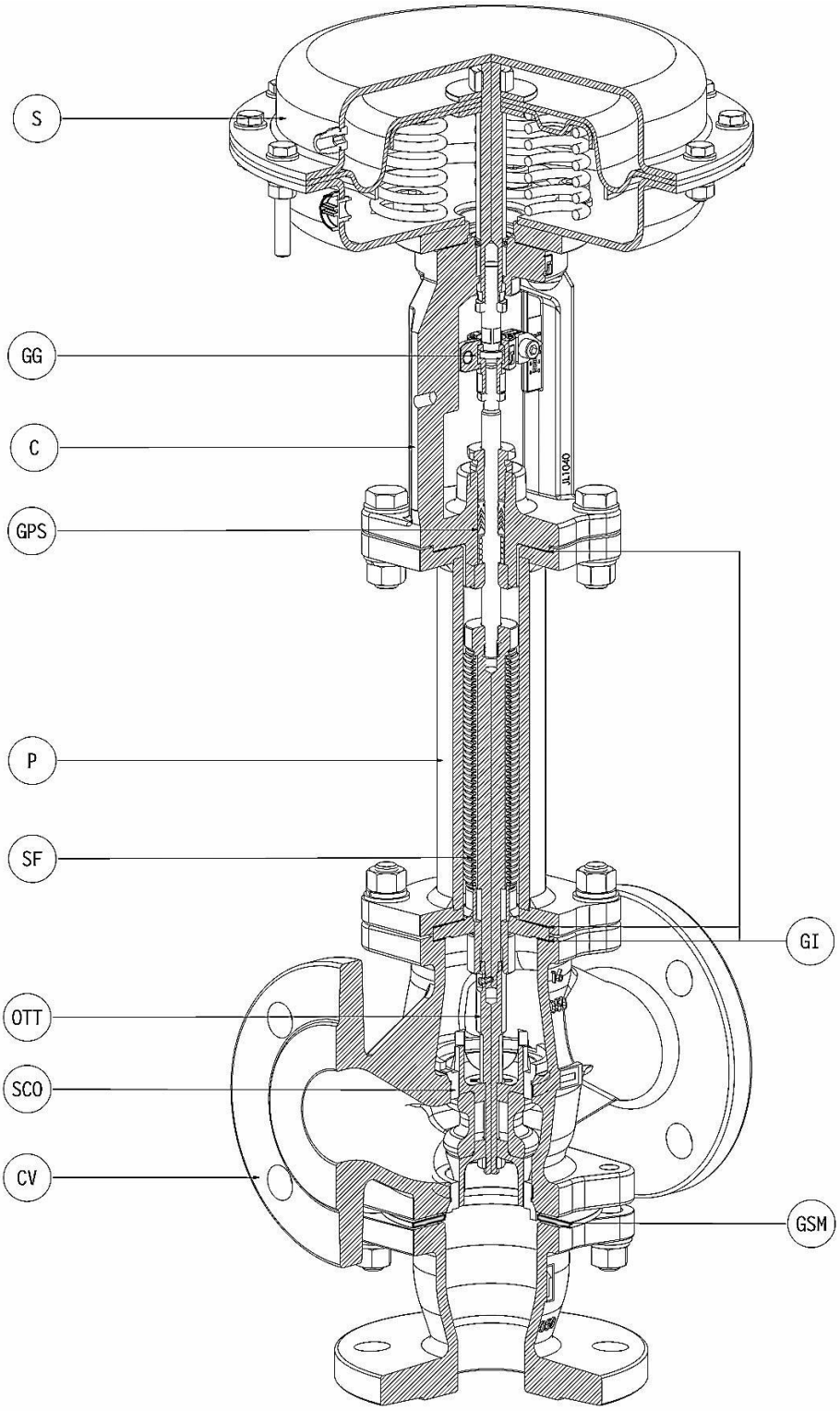
8.9 SBS/16 3 Way MIXER with BELLOWS

For disassembly and assembly operations for SBS/16 3-way NC mixer valves with bellows, refer to Drawing. No. 17696 annexed.
All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves, you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



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Disassembly:

1) Insert an air signal in the servocontrol equal to the maximum value of the signal: **Warning!: The servocontrol shaft will move along its stroke downwards.**
2) Proceed to remove the clamp unit (see paragraph 8.11 page 47).
Remove the air from the servocontrol: Warning!: The servocontrol shaft will move upwards
3) Unscrew the nuts, slide off the washers and screws between the yoke (C) and the extension (P).
4) Separate the servocontrol from the extension.
5) Slide off the gasket.
6) Turn the valve upside down and remove the bottom (F), then unscrew the nuts and slide off the washers and elastic washers.
7) Unscrew the lower conical seat (SCO), having removed the safety pin and then unscrew the metal self-locking nut from the shutter (O3), remove the main components and allow for the intermediate body with bellows (SF) to be extracted later.
8) Unscrew the nuts, slide off the elastic washers and flat washers from the extension (P) and valve body (CV).
9) Slide out the yoke extension (P).
10) Remove the intermediate piece with bellows (SF) with the upper rod and the shutter (OTT) connected to it from the valve body along with the two upper and lower seals from the intermediate body with bellows.
11) Unscrew the grub screw, then the upper rod from the intermediate body with bellows (SF).
12) To remove the shutter (see paragraph 8.13.2), pull out the locking pin.
13) Remove the servocontrol following the procedure described in chapter 8.12.1.
14) Now the valve is completely disassembled, and the required parts can be replaced.

Assembly:

1) Refit the servocontrol following the procedure described in chapter 8.12.1.
2) Screw only the shutter (OTT) rod onto the intermediate body with bellows (SF), then replace the pin removed previously to fix it to the bellows.
3) Screw the upper rod onto the intermediate body with bellows (SF), and lock in place with the grub screw.
4) Insert the assembled intermediate body with bellows inside the valve body (CV).
5) Position the yoke extension (P) on the intermediate body with bellows by the stud bolts.
6) Slide the flat washers and elastic washers onto the stud bolts and screw the nuts to the right torque.
7) Insert the shutter parts on the rod (previously connected to the intermediate body with bellows (SF)) to complete the assembly (see paragraph 8.13.2), passing from the bottom of the valve body; use thread sealant before screwing on the metal self-locking nut (O3).
8) Spread the contact area between the seat and valve body with silicone sealant, then screw the bottom seat (SCO) on and lock in place with the safety pin
9) Position the spiral-wound gasket (GSM) on the bottom (F).
10) Slide the bottom (F) onto the lower stud bolts, then add the flat washers and elastic washers and screw the lower nuts to the right torque. according to the table (page 57).
11) Position the seal between the extension and the yoke (C).
12) Slide the servocontrol into the yoke extension (P) and on the upper rod of the intermediate piece with bellows mounted in step “2”.
13) Slide the screws between the extension and the servocontrol with the washers and elastic washers, screw the four closing nuts to the torque indicated in the table (page 57).
14) Screw nut (G6) and the adjusting screw (G5) completely onto the upper rod of the intermediate body with bellows.
15) Insert air in the servocontrol equal to the maximum value of the signal:
Warning!: The servocontrol rod will move along its stroke downwards to meet the bottom adjusting screw.
16) Join the lower adjusting screw and the upper adjusting screw with the junction clamps (see clamp unit assembly in paragraph 8.11).
17) Remove the air from the servocontrol.

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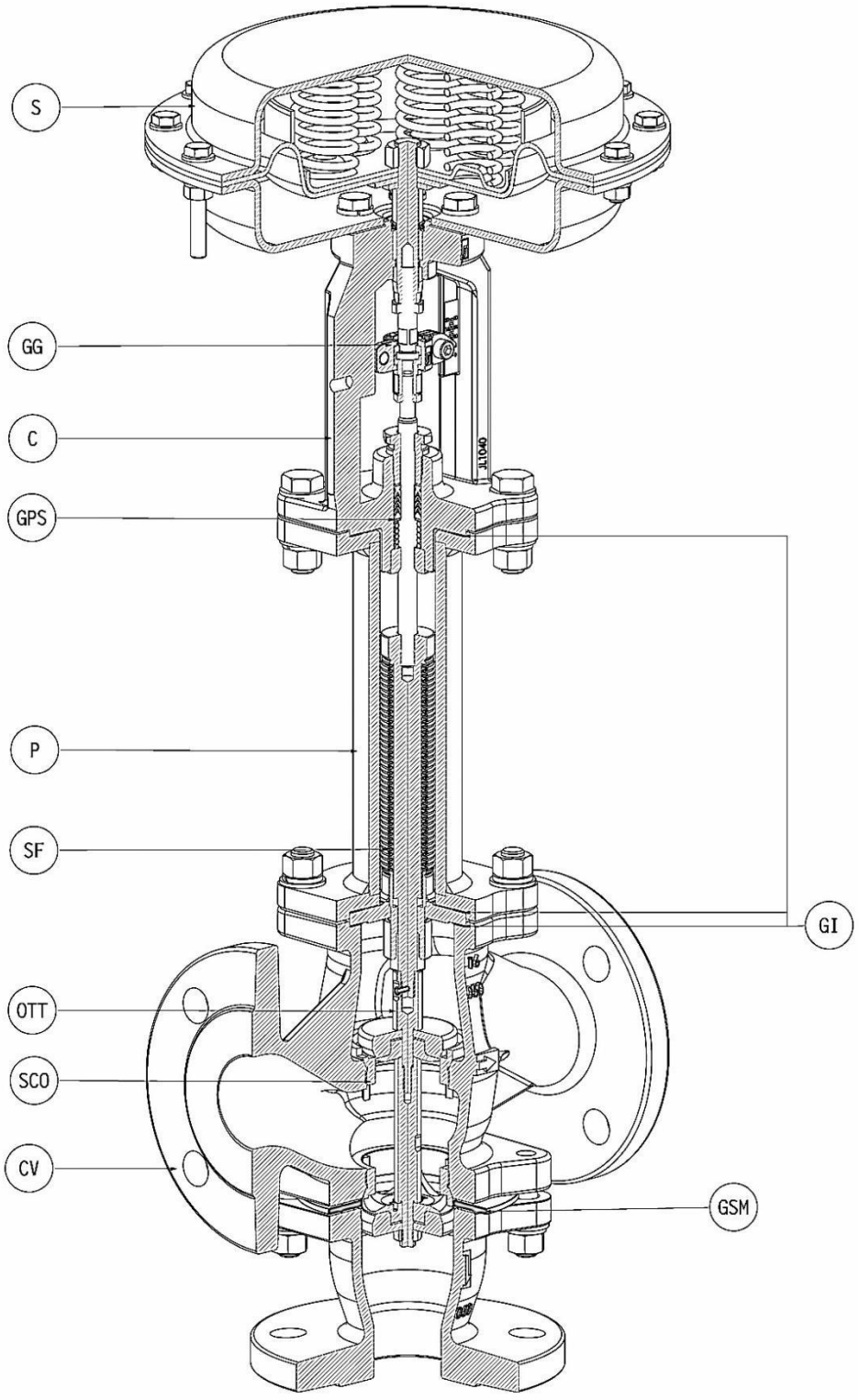
8.10 SBS/16 3 Way DEVIATOR with BELLOWS

For disassembly and assembly operations for SBS/16 3-way NC deviator valves with bellows, refer to Drawing. No. 17886 annexed.
All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



Drawing

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Disassembly:

1) Unscrew the nuts from the clamp unit (see paragraph 8.11) and separate the junction clamps (G).
Warning!: Inserting air, the servocontrol shaft will move upwards.
2) Remove the air from the servocontrol and unscrew the nuts, slide off the washers and screws between the yoke (C) and the extension (P).
3) Separate the servocontrol from the extension.
4) Slide off the gasket.
5) Turn the valve upside down and remove the bottom (F), then unscrew the nuts and slide off the washers and elastic washers.
6) Remove the shutter (OTT) by unscrewing the metal self-locking nut (O3), so that it is possible to slide out the lower components of the shutter so that the intermediate body with bellows can slide out.
7) Unscrew the nuts, slide off the elastic washers and flat washers between the extension (P) and valve body (CV).
8) Slide out the yoke extension (P).
9) Remove the intermediate body with bellows (SF) with the upper rod and the shutter (OTT) connected to it from the valve body along with the two upper and lower seals from the intermediate body with bellows.
10) Unscrew the grub screw, then the upper rod from the intermediate body with bellows (SF).
11) To remove the shutter (see paragraph 8.13.3), pull out the locking pin.
12) Remove the servocontrol following the procedure described in chapter 8.12.2.
13) Now the valve is completely disassembled and the required part can be replaced.

Assembly:

14) Refit the servocontrol following the procedure described in chapter 8.12.2.
15) Screw on the intermediate body with bellows (SF) the first part of the shutter (OTT) composed of the rod, insert-holder, insert and guide (see paragraph 8.13.3), remembering to refit the pin removed previously to fix it to the bellows.
16) Screw the upper rod onto the intermediate body with bellows (SF), and lock in place with the grub screw.
17) Insert the assembled intermediate body with bellows inside the valve body (CV).
18) Position the yoke extension (P) on the intermediate body with bellows by the stud bolts.
19) Slide the flat washers and elastic washers onto the stud bolts and screw the nuts to the right torque.
20) Insert the last shutter parts on the rod previously connected to the intermediate body with bellows (SF) to complete the assembly of the second part (see paragraph 8.13.3), all passing from the bottom of the valve body; use thread sealant before screwing on the metal self-locking nut (O3)
21) Position the spiral-wound gasket (GSM) on the bottom (F).
22) Slide the bottom (F) onto the lower stud bolts, then add the flat washers and elastic washers and screw the lower nuts to the right torque according to the table (page 57).
23) Position the seal between the extension and the yoke (C).
24) Position the servocontrol.
25) Slide the screws between the extension and the servocontrol with the washers and elastic washers, screw the four closing nuts to the torque indicated in the table (page 57)
26) Insert air in the servocontrol equal to the maximum value of the signal:
Warning!: The rod on the servocontrol will move along its stroke upwards.
27) Proceed to assembly the clamp unit (paragraph 8.11 page 47).
Warning!: Removing the air from the servocontrol, the rod will move downwards to meet the lower adjusting screw (G5).

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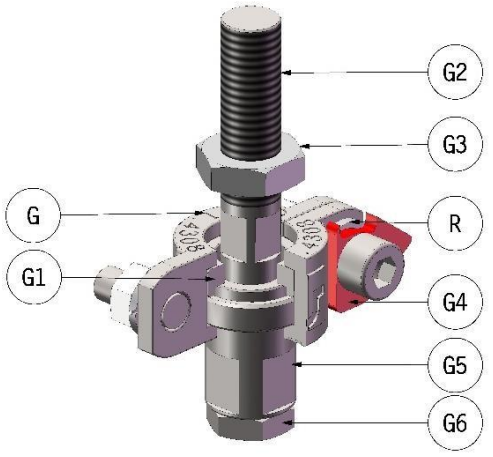
8.11 Clamp unit disassembly and assembly instructions

Disassembly:

Before performing this operation follow the valve disassembly instructions described in chapter 7.8. To perform this operation, remember that with 3-way valves, in the case of N.O. mixers and N.C. deviators, feed air into the servocontrol equal to the maximum value of the signal.
NOTE: Read the procedures fully before starting work.

1) Unscrew the two head cap screws and slide them off the clamps with the hex head nuts, washer (R), elastic washers and indicator arrow (G4).
2) Slide the two clamps (G) off the unit, to free the servocontrol (ST) rod from the shutter (OTT).
3) Add or remove air depending on whether it was fed before or not. The two rods will separate.
4) Loosen the nut (G3), firstly (a) marking the position on the upper adjusting screw (G2) complete with mobile spacer washer (G1), and unscrew the whole block from the servocontrol rod.
5) Loosen the nut (G6), taking care to (a) mark its position on the bottom adjusting screw (G5), and unscrew it all from the shutter (OTT) rod.



Detailed view of the CLAMP UNIT

Assembly:

Before performing this operation follow the valve disassembly instructions described in chapter 7.8. To perform this operation, remember to feed the servocontrol with air to the maximum value of the signal in valves with NC servocontrol to move the servocontrol rod (ST) upwards.

1) Screw the hex head nut (G6) onto the shutter (OTT) rod in the same position it was in before disassembling the valve to obtain the same calibration, and lock with the lower adjusting screw (G5).
2) Slide the mobile washer (G1) on the upper adjusting screw (G2) and screw on the nut (G3).
3) Screw the upper adjusting screw (G2) assembled earlier on the servocontrol rod (ST) and lock in the same position it was in before disassembling the valve to obtain the same calibration.
4) Remove the air supply from the servocontrol if previously fed or add air if the servocontrol is NO, to move the servocontrol rod (ST) towards the shutter (OTT).
5) Join the two clamps (G) to the mobile washer (G1) and lower adjusting nut (G5).
6) Screw the two head cap screws with the indicator arrow (G4) to the hex head nuts and washers to tighten the whole clamp unit.
7) Remove the air supply if the servocontrol was already fed.
8) The valve is completely operable.

[(a) this operation is very important to keep the valve control].

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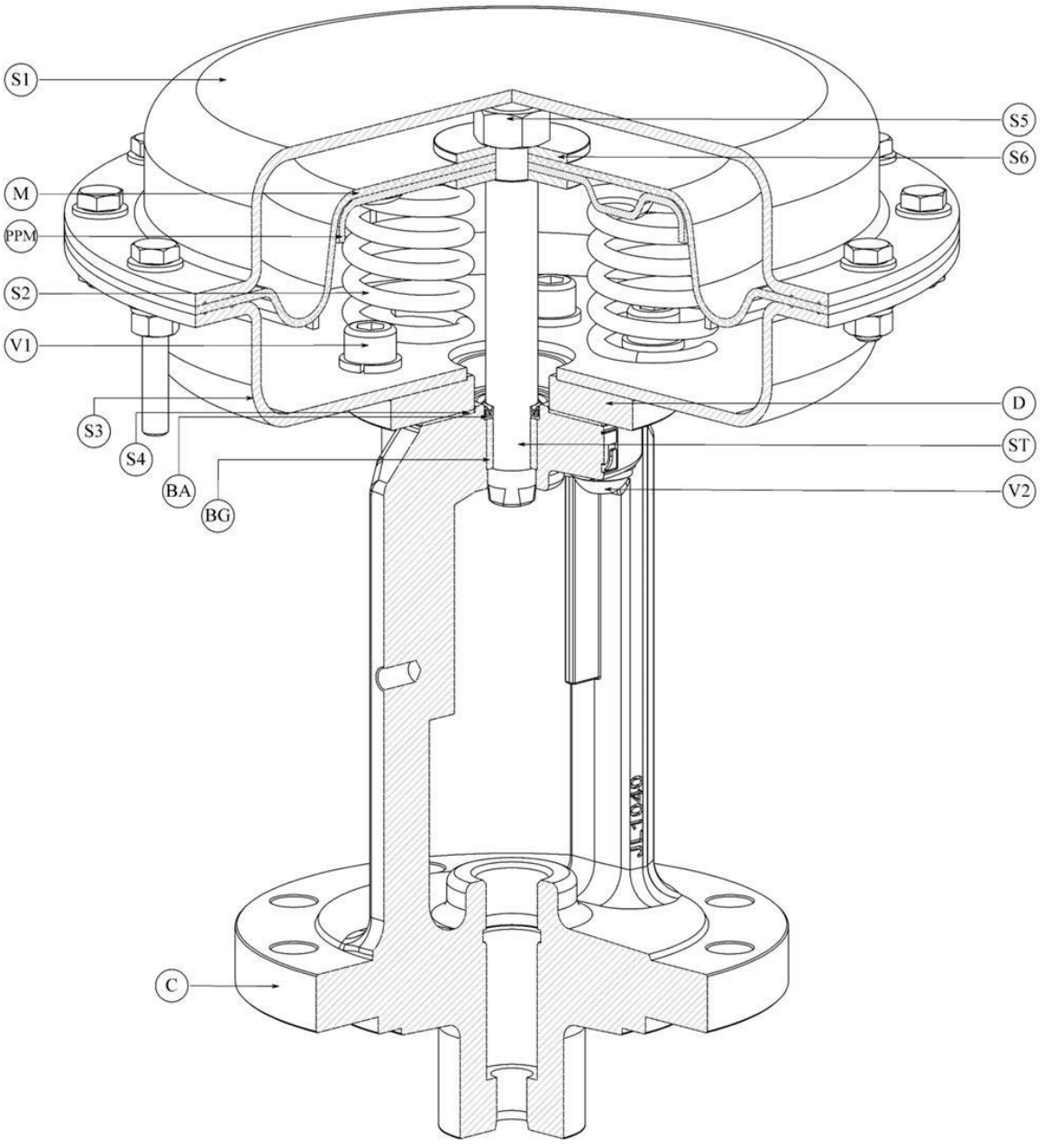
8.12 Disassembly and assembly instructions for valve air side

8.12.1 N.O. servocontrol maintenance

For NO servocontrol disassembly and assembly operations refer to Drawing. No. 170252A annexed. All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



Drawing N°170252A

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Disassembly:

1) Unscrew the screws along the circular crown on the servocontrol.
2) Warning! There are compression springs inside the servocontrol: unscrew the longest screws last to prevent the sudden movement of the upper head (S1) of the servocontrol when all the screws are unscrewed.
3) Slide off the upper head (S1).
4) Slide off the membrane unit (M), composed also of the spring-holder plate (PPM) and the rod (ST).
5) Lock the servocontrol rod (ST) between soft jaws. Unscrew the threaded disc (S5) or nut (S5) plus disc (S6), separate the spring-holder plate (PPM) and the membrane (M) from the servocontrol rod (ST). Take care to mark the position and alignment between the spring-holder plate (PPM) and the membrane holes (M).
6) Slide off the springs (S2) from the lower head (S3).
7) Remove the BA seal (BA) from the yoke (C).
8) The servocontrol is disassembled, it is now possible to replace the BA seal (BA) and the membrane (M).

Assembly:

1) Lock the servocontrol rod (ST) between soft jaws. Position the supporting washers (S6), the spring-holder plate (PPM), the membrane (M) on it and place on the disc (S6) and screw the whole block. Take care to mark the position and alignment between the spring-holder plate (PPM) and the membrane holes (M).
2) Position the springs (S2) in the position where they were removed from.
3) Insert the servocontrol rod (ST) in the yoke (C) positioning the membrane (M) on the lower head (S3) centring the springs on the studs present in the spring-holder plate (PPM).
4) Slide on the upper head (S1).
5) Use the longer screws to compress the springs to bring the two heads closer.
6) Close the servocontrol with the remaining screws combined with the flat washers, elastic washers and nuts.
7) Insert an air signal in the servocontrol equal to the maximum value of the signal.
Warning!: The servocontrol rod will be moved, check that there are no air leaks around the membrane or where the rod protrudes from the yoke.
8) The servocontrol is completely assembled.

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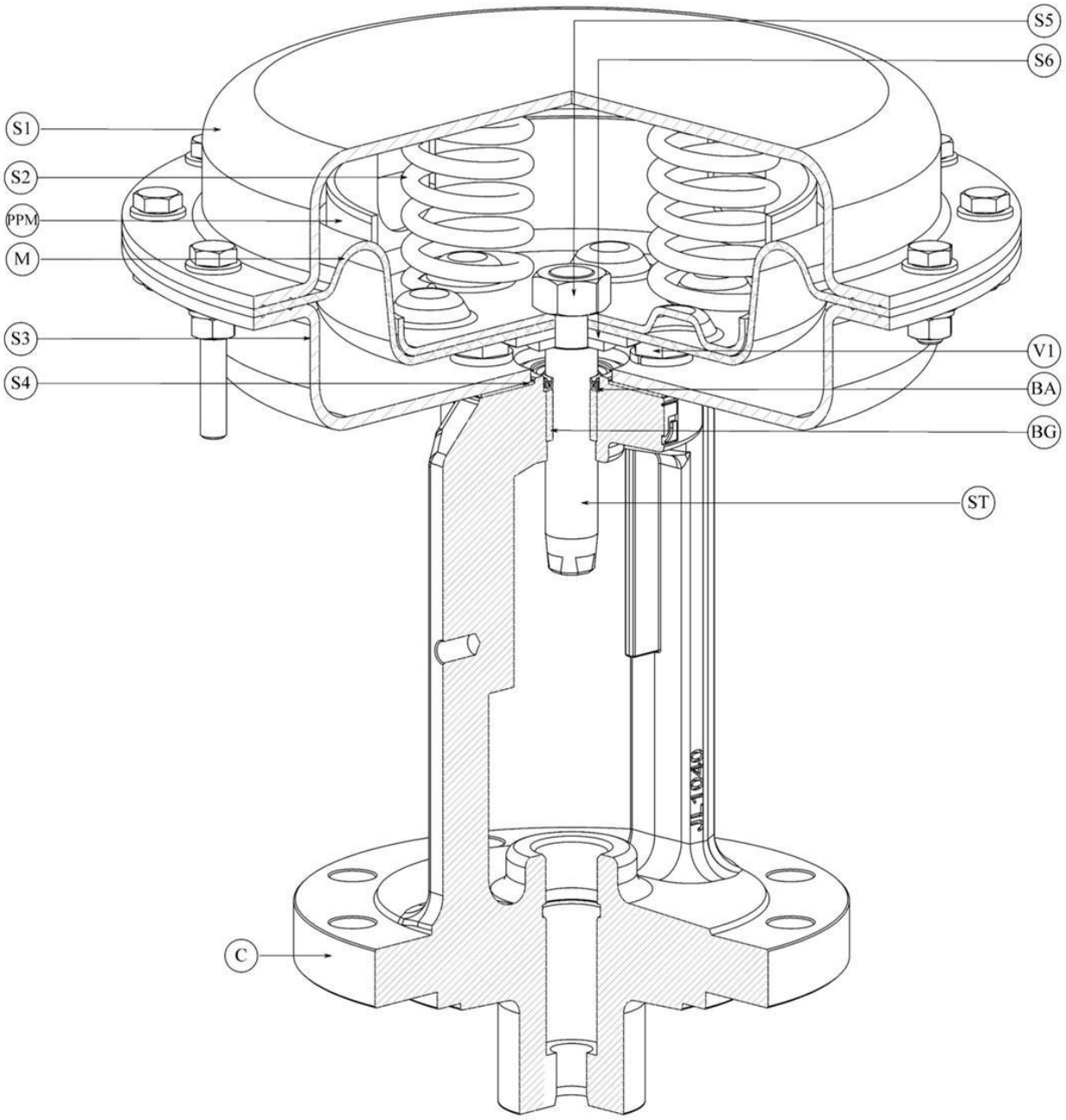
8.12.2 N.C. servocontrol maintenance

For NO servocontrol disassembly and assembly operations refer to Drawing. No. 170252 annexed. All disassembly and assembly operations must be performed by staff specialising in hydraulic and pneumatic industrial operations, using all appropriate working and safety equipment. Before any operations on the systems and valves, find out the operating temperature and pressure and any other specific conditions, taking all necessary safety precautions.
Whenever working on the valves, you must completely remove the fluid.
NOTE: Read the procedures fully before starting work.



Drawing No. 170252

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Disassembly:

1) Unscrew the screws along the circular crown on the servocontrol.
2) **Warning! There are compression springs inside the servocontrol:** unscrew the longest screws last to prevent the sudden movement of the upper head (S1) of the servocontrol when all the screws are unscrewed.
3) Slide off the upper head (S1).
4) Slide off the springs (S2) off the spring-holder plate (PPM).
5) Slide off the membrane unit (M), composed also of the spring-holder plate (PPM) and the rod (ST).
6) Lock the servocontrol rod (ST) between soft jaws. Unscrew the nut (S5), separate the spring-holder plate (PPM), the membrane (M) and the disc (S6) from the servocontrol rod (ST).
7) Remove the BA seal (BA) from the yoke (C).
8) The servocontrol is disassembled, it is now possible to replace the BA seal (BA) and the membrane (M).

Assembly:

1) Lock the servocontrol rod (ST) between soft jaws. Position the supporting washers (S6), the spring-holder plate (PPM), the membrane (M) on it and place on the nut (S5) and screw the whole block.
2) Insert the servocontrol rod (ST) in the yoke (C) positioning the membrane (M) on the lower head (S3)
3) Position the springs (S2) in the position where they were removed from.
4) Slide on the upper head (S1).
5) Use the longer screws to compress the springs to bring the two heads closer.
6) Close the servocontrol with the remaining screws combined with the flat washers, elastic washers and nuts.
7) Insert an air signal in the servocontrol equal to the maximum value of the signal.
   Warning! The servocontrol rod will be moved, check that there are no air leaks around the membrane or where the rod protrudes from the yoke.
8) The servocontrol is completely assembled.

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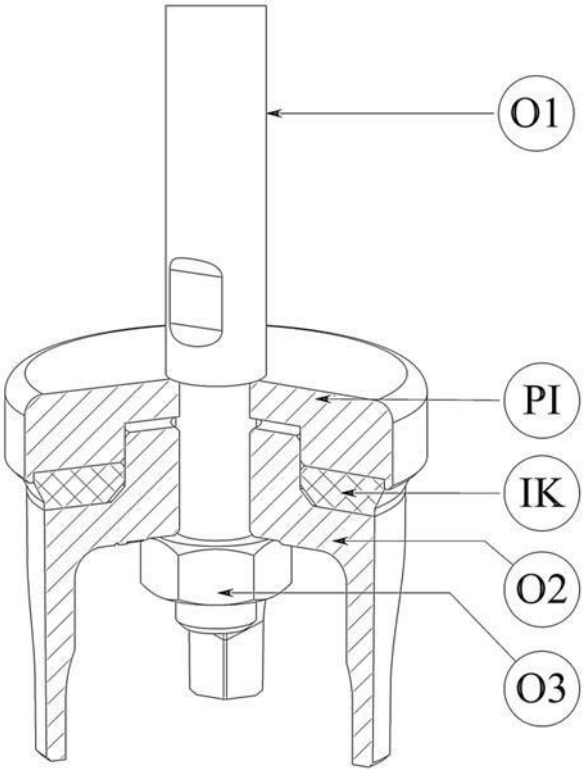
8.13 Instructions for disassembly, gasket replacement, reassembly of SBS/16 P.S. and M.S. shutters

8.13.1 2-way P.S. shutter diagram



Drawing No. 170242

Disassembly:

1) Keeping the shutter rod (O1) locked between the soft jaws, unscrew the self-locking nut (O3).
2) Slide out first the guide (O2), the insert (IK) (if it has a plastic seal) and the insert-holder (PI).
3) The shutter is completely disassembled.

Assembly:

1) Keeping the shutter rod (O1) firm in the soft jaws, apply (anti-seizing) copper grease on the thread
2) Slide on firstly the insert-holder (PI) then the insert (IK) (if it has a plastic seal) and finally the guide (O2).
3) Screw the self-locking nut (O3) to the torque indicated in the Table (Tightening torque).

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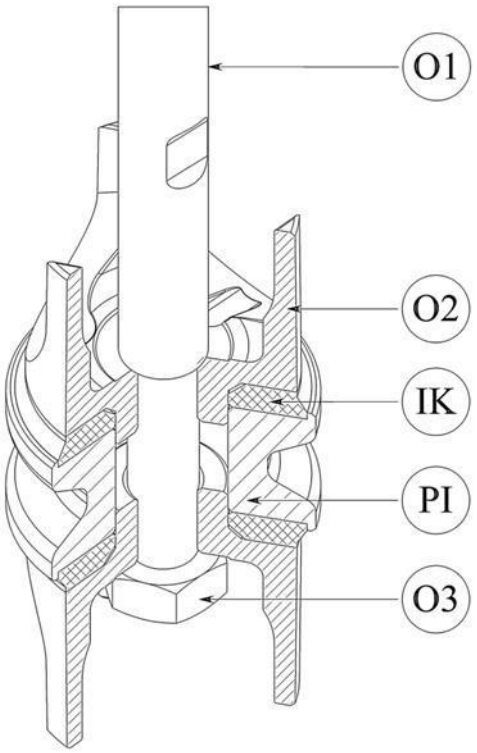
8.13.2 3-way mixer P.S. shutter diagram



Drawing No. 170240

Disassembly:

1) Keeping the shutter rod (O1) locked between the soft jaws, unscrew the self-locking nut (O3).
2) Slide out firstly the guide (O2), the insert (IK) (if it has a plastic seal) the insert-holder spacer (PI) the second insert (IK) (if it has a plastic seal) and the guide (O2).
3) The shutter is completely disassembled.

Assembly:

1) Keeping the shutter rod (O1) firm in the soft jaws, apply (anti-seizing) copper grease on the thread
2) Slide on firstly the guide (O2), the insert (IK) (if it has a plastic seal) the insert-holder spacer (PI) the second insert (IK) (if it has a plastic seal) and the guide (O2).
3) Screw the self-locking nut (O3) to the torque indicated in the Table (Tightening torque).

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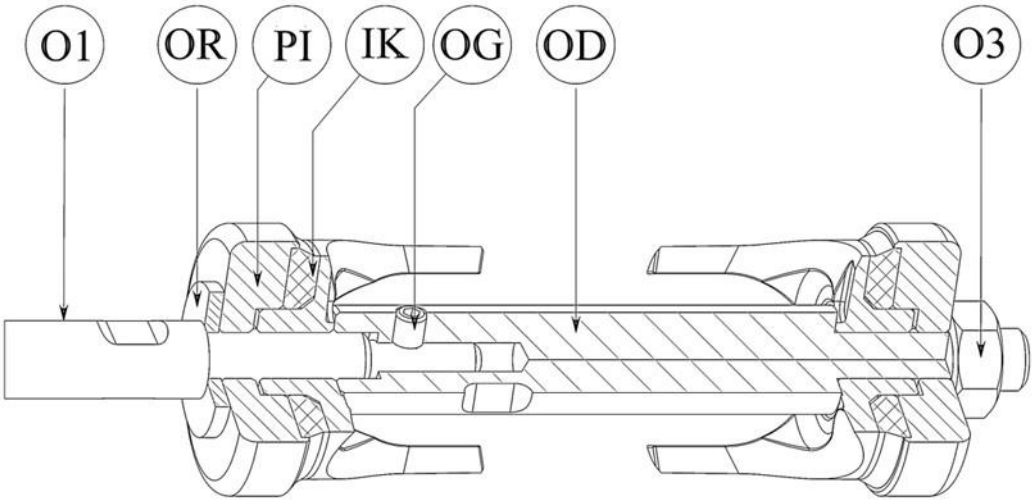
8.13.3 3 way deviator P.S. shutter diagram



Drawing No. 170241

Disassembly:

1) The first part of the shutter disassembly is performed on the valve. See 7.8.3.
2) Place the spanner inside the inlet mouth and hold the shutter (OTT) steady from the key cut, unscrewing the nut keeping the shutter closed.
3) Slide off the insert holder (PI) the insert (IK) and the shutter (OTT) rod guide. (see complete instructions in chapter 7.8.3).
4) Remove the remainder of the shutter (OTT) from the valve body.
5) Keeping the shutter rod (O1) locked between the soft jaws, unscrew the dowel (OG) from the lower rod (OD).
6) Unscrew the lower rod (OD) and slide out the shutter guide, the insert (IK) and insert-holder (PI) and the support washer (OR) from the shutter (OTT) rod.
7) The shutter is now completely disassembled

Assembly:

1) Lock the shutter rod (O1) in the soft jaws.
2) Slide on the rod (O1) and slide on the flat washer (OR), the insert-holder (PI), the insert (IK) and the shutter guide.
3) Screw on the lower rod (OD) and lock by screwing the dowel (OG).
4) Release the now-assembled shutter from the soft jaws and insert it in the valve body as described in chapter 7.8.3.
5) Slide the shutter guide, the insert (IK) and the insert-holder (PI) on the lower rod (OD)
6) Screw the self-locking nut (O3) to the torque indicated in the Table (Tightening torque).
7) Place the spanner inside the inlet mouth and hold the shutter (OTT) steady from the key cut, screwing the self-locking nut keeping the shutter closed. Remember to grease the thread copper to avoid the risk of the self-locking nut seizing.

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8.14 Disassembly and reassembly instructions for SBS/16 packing gland.

All disassembly and assembly operations must be performed by specialist staff using all appropriate working and safety equipment.

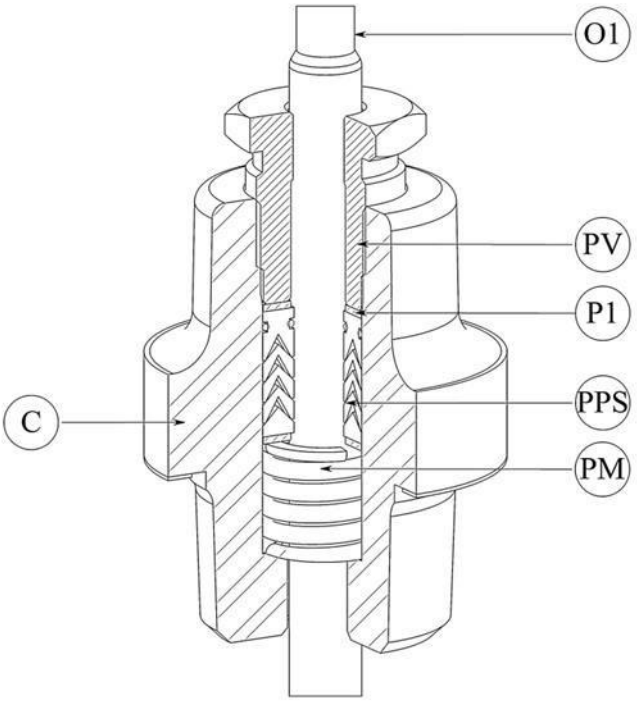
NOTE: Read the procedures fully before starting work.

Disassembly:

1) Having removed the yoke with intermediate piece from the valve body it is possible to replace the packing gland. Follow the disassembly operations described above.
2) Slide the shutter (01) off the packing gland unit.
3) Unscrew the packing screw (PV) off the yoke (C) and slide out the packing washer (P1) the packing gland (PPS) the second packing washer (P1) and finally the spring (PM) from inside. **Warning!: The packing screw** (PPS) **holds the packing spring** (PM) **in compression: take the required precautions to avoid the sudden release of the parts inside the yoke with the intermediate body once the packing screw** (PPS) **has been released from the thread.**
4) The packing gland unit is completely disassembled and the required parts can be replaced.

Assembly:

1) Insert into the yoke with intermediate body (C) the packing spring (PM) the first packing washer (P1) the packing gland (PPS) and the second packing washer (P1).
2) Screw the packing screw (PV) until it protrudes by approximately 13 mm from the yoke screw plane



Drawing N° 170178PV

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9 Spare parts for SBS/16

SPARE PARTS BODY SIDE
CAST IRON AND WCB

DN	2Way Cast iron/WCB		3Way Mixer Cast iron/WCB		3WayDeviator Cast iron/WCB	
	T.PK	T.M	T.PK	T.M	T.PK	T.M
15	17847					
15/20	17846	17851	17870	17879	17870	17879
20	17846	17851	17870	17879	17870	17879
25	17845	17851	17871	17879	17871	17879
32	17848	17852	17872	17880	17872	17880
40	17849	17852	17873	17880	17873	17880
50	17850	17852	17874	17880	17874	17880
65	16589	16664	16678	16680	16678	16680
80	16590		16679	16681	16679	16681

SPARE PARTS BODY SIDE
CF8M

DN	2Way CF8M		3Way Mixer CF8M		3WayDeviator CF8M	
	T.PK	T.M	T.PK	T.M	T.PK	T.M
15						
20						
25						
32						
40						
50						
65	16589	16664	16678	16680	16678	16680
80	16590		16679	16681	16679	16681

SPARE PARTS AIR SIDE

Ø Servocontrol	SPARE PART CODE
Ø 200	16665
Ø 275	16666
Ø 360	16667
Ø 430	16668
Ø 530	-

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10 Servocontrol springs

Øe SERV	STROKE (mm)	SIGNAL													
		3 ÷ 15		6 ÷ 18		6 ÷ 30		9 ÷ 32		3 ÷ 9		9 ÷ 15		20 ÷ 40	
		N°	CODE	N°	CODE	N°	CODE	N°	CODE	N°	CODE	N°	CODE	N°	CODE
200	15	3	MTD086100	3	MTD086101	6	MTD086100	6	MTD086102	3	MOLL092037	3	MOLL940412		
	20		MOLL110523		MOLL100804		MOLL110523								
275	15	3	MTD086106	6	MTD086107	6	MTD086106	6	MTD086108	3	MTD086107	3	MOLL092038		
	20		MOLL100528		MOLL100529		MOLL100528		MOLL100530						
360	15	6	MTD086106	12	MTD086107	12	MTD086106	12	MTD086108	6	MTD086107	6	MOLL092038		
	20		MOLL100528		MOLL100529		MOLL100528		MOLL100530						
430	15	4	MTD086103	8	MTD086104	8	MTD086103	8	MTD086105	4	MTD086104				
	20		MOLL100532		MOLL100533		MOLL100532		MOLL100534						
	30		MOLL950278		MOLL950279		MOLL950278		MOLL950280						
530	30	3	MOLL160411	6	MOLL160410	6	MOLL160411	6	MOLL160412					6	MOLL160413

11 Tightening torques

Parts Combinations	Tightening torque for threaded couplings on SBS/16 valves [N·m]												
	Coupl. Servocontrols Øe Serv.					Body coupling DN							
	200	275	360	430	530	15	20	25	32	40	50	65	80
SCREW S1-NUT S3	12	17			35								
V1-C	17												
BODY (C) NUTS						17			32				
SCO-CV						170	170	212	370	503	625	900	
O1-O3						9			19			32	
OD-O3						9			19			32	

12 Valve life

The SBS series valve was designed and manufactured to guarantee correct operation in the conditions and within the limits laid down in the technical features.
All fixed metallic parts not affected by the seal function have an expected life of 10 years. The seal parts and moving parts must be completely overhauled after either 300000 manoeuvres or three years, whichever comes first.
The overhaul operations must only be performed by specialist staff.
Routine maintenance must be performed in addition to any maintenance performed in the event of a fault, which requires immediate intervention.

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13 SBS/16 valves in conformity to Directive 2014/34/EU (ATEX)

13.1 Introduction

These instructions and information complete this “Guide to selection, use and maintenance”.

Failure to comply with the instructions contained in this chapter may cause serious damage to property and injury to persons.

The SBS/16 series valves meet the requirements of Directive 2014/34/EU concerning equipment in group II category 2G and 2D. More complex documentation is required for the supply of a valve for use in “ATEX” environments than that for an equivalent valve for normal use; at the time of order it is therefore necessary to specify “meets the requirements of directive 2014/34/EU”, along with the correct indication of the conditions of use.

NOTE (1): All data, statements and recommendations contained in this chapter are based on information deemed reliable by ITALVALVOLE®. As the effective conditions of use are beyond the control of ITALVALVOLE®, the products are sold on condition that the user assesses such conditions prior to adopting these recommendations for the intended use. The data plate on the valve defines the field of use.

NOTE (2): The SBS/16 valve does not have sources of ignition in normal operating conditions, within the fields defined on the valve data plate.

13.2 Safety information

This chapter deals with key issues concerning protection from explosions and must be used along with the guides to selection, use and maintenance, code 7597, code 12832 code 13812 and code 16222 supplied to the Client with the equipment.
Installation, putting into service, maintenance and repair must only be performed by qualified staff, who must take into account the following:
these specific instructions, along with all other instructions relating to the installed equipment;
the warning signals and information on the equipment;
the regulations and specific requirements for the plant in which the equipment is intended to operate (national and regional regulations in force);
all additional accessories which may be mounted on the equipment must be included in the ATEX certification or be certified individually;
the accessories supplied with the valve are provided with their own specifications which integrate this document;
the Customer must check that any accessories not supplied together with the equipment are suitable for the classification of the area and compatible with the equipment itself (group, classification and temperature category).

13.3 Responsibilities for ATEX certification – Supply spectrum

ITALVAVOLE® shall only be liable for the equipment supplied, selected according to the data provided by the Customer and indicated in the order confirmation.

13.4 Marking

When using in areas with a risk of explosion, check that the equipment is suitable for the classification of the area and the flammable substances present in the plant.
The essential safety requirements against the risk of explosion in classified areas, as concerns equipment, are set in EU Directive 2014/34/EU dated 26/02/2014.

The plate  , indicates the references of the notified body where the technical dossier was deposited and the assigned number.

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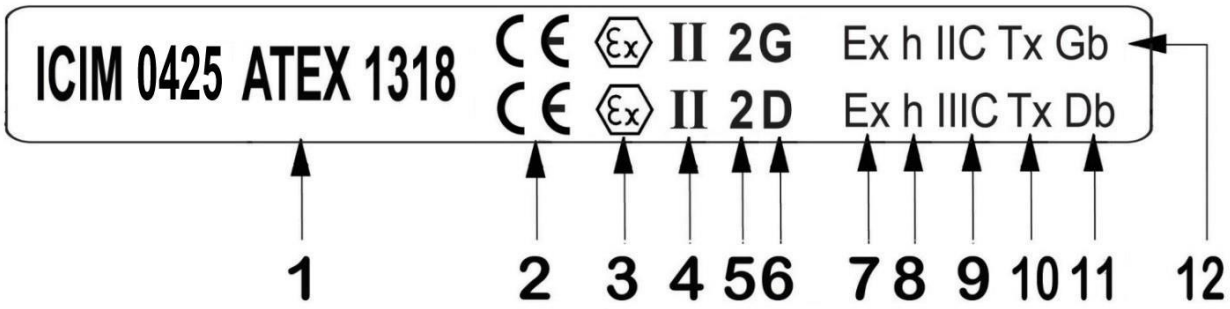
13.5 Summary of plate data relating to classification



1	1318	Number assigned by the notified body to the technical dossier
2	CE	EU directive conformity marking
3	Ex	Specific marking of protection against explosions
4	II	Equipment group II= equipment intended to work in places other than mines
5	2	Category 2= equipment intended for surface use. Directive 2014/34/EU classifies products into categories, in relation to the level of protection and the degree of hazardousness of the environment in which the equipment is used
6	G D	Equipment suitable for installation in places in which, during normal operation, there is a possibility that potentially explosive atmospheres may occur due to gases, vapours or mists (G) or dusts (D).
7	Ex	Indicates that protection against explosions has been adopted
8	h	Non-electrical equipment
9	IIC	Equipment intended for works other than those underground in mines and in related surface plants which could be exposed to the risk of explosive atmospheres. – gas sub-group “C”; suitable for installation in the presence of any dusts.
10	Tx*	General definition of the equipment temperature Tx= refer to the temperature indicated in the instruction manual, depending on the fluid processed.
11	Db	EPL Db= equivalent to category 2D
12	Gb	EPL Gb= equivalent to category 2G

*The construction must be selected so that the maximum surface and/or other temperature of the equipment does not reach the temperature of ignition of any gas or vapour which may be present

Temperature class	Maximum surface temperature [°C]
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

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13.6 Maximum surface temperature – Maximum permissible temperature

The effective maximum surface temperature does not depend on the equipment but on the operating conditions such as the temperature of the process fluid used, the ambient temperature, or the presence of external sources. Consequently, in normal operating conditions, the maximum temperature on the surfaces of the valve should correspond to the maximum temperature of the fluid it contains, increased by a safety margin to cover any possible increase in temperature due to the fluid movement.
All data refer to room temperatures of between 20°C and 40°C.
The maximum surface temperature must not exceed the lowest maximum permissible temperature between that indicated on the machine data plate and that indicated on the valve data plate.

13.7 Liability

The user is responsible for ensuring that the conditions required for the correct operation of the valve are never exceeded, particularly the maximum permissible temperatures of the fluid contained in the valve. The user must ensure inspections and regular maintenance to ensure the correct operation and tightness of the valve and its internal parts. If this cannot be ensured by the user, the user must adopt appropriate monitoring devices.

13.8 Installation

13.8.1 Controls

Prior to installation, inspect the equipment.

Identification:

- Make sure that the plate data of the equipment and related accessories conforms to the requirements of the area in which explosive atmospheres may occur, to the category and to the group;
- Make sure that the equipment installed, and related accessories are not damaged in any way. Make sure that they were stored correctly prior to installation. In case of doubt or if any damage is found, contact the supplier;

Assembly:

- The user must assess if the dusts depositing on the valve may reach the maximum permissible temperatures of the valve without triggering an explosion, otherwise the valve must be isolated to prevent dust deposits from coming into contact with the hot surfaces of the valve.
- The user must check that the valve is suitably fixed to the plant;
- The valve must be mounted on the plant in such a way as to guarantee the correct operation ⚠Comply with the flow direction indicated by the arrows on the valve body), appropriate tightness ⚠ Check the correct operation of the sealing rings between the valve body and the pipe flanges), the resistance to mechanical stress and/or foreseeable environmental influences ⚠ Assess the need to include dilation joints in the network to absorb any thermal dilation and/or stress due to abnormal vibrations, hammering, etc.).
- The valve positioning is indicated in the correct installation sheets, given in paragraph 8.3.
- Also consider the effects of gravity (including appropriate supports) and knocks (check that the valve is not positioned in a place where it could get knocked during normal work activities and plant maintenance). In the case of non-programmed activities, protect the part of the plant containing the valve from possible knocks and/or damage caused by improper activities.
- ⚠The valve must not be used for support purposes or as a step or a ladder.
- On installation check the correct main earthing and valve earthing
- ⚠ Pneumatic control and servocontrol breather feed pipes and hoses must be located in such a way as to be protected from external damage.
- The “Check list” (see paragraph 14) must be applied in all points.

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In addition to the installation information and warnings given in this guide, the following must also be considered:

- The effective maximum surface temperature does not depend on the valves but on the operating conditions such as the temperature of the process fluid used, the ambient temperature, or the presence of external sources;
- The temperature of heated air from other units does not compromise the valve environment; ambient air should not have a temperature of more than 40°C;
- The valves must not be mounted in places where the ambient temperature is higher than the minimum ignition temperature of the potentially explosive atmosphere;
- The valves must not be mounted near heat sources which could, by irradiation and/or conduction and/or convection heat the valve to a surface temperature higher than the minimum ignition temperature of the potentially explosive atmosphere;
- The valves must not contain fluids with temperatures higher than the maximum permissible temperature;
- It is expressly forbidden to use the valve with explosive, easily flammable, oxidising or toxic gases;
- Connect the earthing terminals and/or equipotential connection to the pipes. All equipment is supplied with an earthing terminal identified by the specific symbol;
- Make sure that the valve actuator does not exceed a max temperature of 80°C.

13.8.2 Working environment

- The equipment must be accessible for maintenance and inspection during operation;
- Ensure free air circulation around the servo control;
- Install separate earthing devices near the equipment;
- The equipment was designed to work in protected environments and not directly exposed to atmospheric agents.

13.8.3 Piping

- The pipes must be checked; their size and pressure tightness must be checked. The insides must be clean and free of foreign particles and/or weldings before being connected to the valve;
- The weight of the valve and any accessories must be supported by the pipes (if adequate) or by other supports to prevent the weight of the valve from causing damage to the pipes and any leaks between the piping and the valve;
- Check the electrical continuity between the valve and its accessories and the pipes it is connected to; if necessary, create an additional equipotential connection between the valve body (in the specific point) and the interface pipes.

13.8.4 Accessories

- Accessories must also be manufactured and certified for ATEX. They must therefore be chosen with a classification that is compatible with that of the valve.
- Users wishing to install their own accessories must certify the compatibility with ATEX classification
- For any checks refer to the regulations and product specifications and relative instructions. Also check that the instructions for use of the accessories do not contradict the conditions of use. In any case the most unfavourable conditions of use shall prevail.

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13.9 Start-up

The following precautions must be taken to protect against explosions:

- Make sure that the area around the valve is clean.
- Make sure that the inlet pipe is mounted solidly without leaks and that it is clean. Remove any weld particles in advance. The whole system must be free from solid particles. Install filters on the line upstream from the valve (as shown in the diagram on page 28/29). The filters must be cleaned constantly to avoid poor performance and malfunctions which could lead to hazards.
- Stop the valve immediately in the event of irregular operation or malfunction, paying particular attention to the initial functional tests on the plant.

Follow the instructions given below:

1. Before starting the plant, clean all the pipes with the valves fully opened, with the maximum possible fluid pressure, respecting the valve PN;
2. A filter must always be applied to the valve inlet to avoid foreign bodies entering between the seat and the shutter;
3. After the first hours of hot use, lightly turn (1 turn) the packing screw, at the same time tighten the nuts between the body and the yoke and the body and the bottom (in the case of 3 way valves) –**see chapter 8.3**–

(⚠The packing nut must be adjusted having disabled the area to make it safe!)

NOTE (3): The user must ensure that during valve installation there is no explosive atmosphere. This is even more important when local welding must be performed, as:

- live flames and/or electric arcs are not permitted.
- the welding operations could exceed the minimum ignition temperature of the majority of gases and vapours normally present in the plant.

13.10 Maintenance

In addition to the information and warnings in the user manuals supplied to the Customer with the equipment, the following must be complied with:

- All works must be carried out and supervised by expert, trained and competent staff;
- Before performing any operations on the equipment, disable the area to make it safe;
- Remove any dust deposits on the equipment daily, in a way that does not electrostatically charge the painted surfaces;
- Check the earthing terminal connections and the equipotential connections to the pipes periodically; restore them if required;
- Check the state of oxidation of the springs inside the actuator every six months and if damaged by rust replace with new springs;
- Check the outside of the equipment every week and make sure there are no parts damaged by rust. In the event of external rusting, replace the damaged parts;
- Check that all pre-compressed bolted gaskets are correctly tightened and check that, during activities, no abnormal vibrations are transmitted to the valve due to the malfunction of other equipment in the plant;
- The seal parts and moving parts must be completely overhauled after either 300,000 manoeuvres or 3 years, whichever comes first.

The disassembly and assembly instructions for SBS/16 valves in ATEX version correspond to those for standard valves – **see paragraph 8.8 (page 34)**–

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14 Limitation of risks via the "CHECK LIST"

14.1.1 During installation

- Check that the equipment has not been damaged following knocks and/or falls;
- Check that the pipes are connected and supported correctly. They must not cause excessive loads on the valve connections during operation, considering the weight of the fluid and any thermal dilation;
- Check that the breather air pipes are firmly connected;
- Check the seal of the connections on the inlet and outlet side;
- Check that no solid particles can enter the valve. The pipes must be cleaned after welding, removing any possible residues in the piping;
- Check that the filters upstream from the valve are clean;
- Check the correct alignment of the mobile parts after completing installation;
- Check that all accessories conform to ATEX standards and are compatible with the group and category of the equipment;
- Check that all requirements in the accessory instructions are met.

14.1.2 Before starting the equipment

- Check that all threaded joints are tightened to the required torque;
- Check that the servocontrol breather coupling is correctly connected to the specific pipe; the breather serves to create a lung inside the actuator chamber where the springs are to prevent overpressure or air vacuums, which could compromise the correct valve operation. It is important that the air entering and exiting this chamber is not that of a potentially explosive atmosphere which could cause concentrations of dusts or gases to form inside the actuator; remove and drain the air into an inert atmosphere;
- Check the correct assembly of the equipment;
- Check the correct assembly of the accessories.

14.1.3 When the equipment is in operation

- Check for any leaks and/or intervene according to the methods indicated in point 13.10 (Maintenance);
- Check and eliminate any dust accumulated on all the equipment surface, without electrostatically charging the painted surfaces;
- Check the integrity of the polyurethane coating on the body and yoke and the actuator of the valve. If damaged, repair immediately;
- Perform the checks laid down in the instructions relating to the accessories.

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15 Repairs

In the event of malfunction or damage, contact the supplier for repair/replacement.

16 Disposal

At the end of its useful life, to dispose of the valve dismantle it and divide the parts according to construction materials, using the tables annexed to the valve construction drawings, and dispose of in compliance with the laws in force.

The disassembly operations must be performed by specialised staff using all appropriate working and safety equipment. WARNING! There are compressed springs inside the servocontrol. When disassembling the valve, to dispose of its components, use all safety equipment required to prevent the sudden displacement of the upper head from the lower head once the servocontrol head fixing screws are removed.

NOTE (4): The user must ensure that when disassembling the valve there is no explosive atmosphere, particularly if operations are performed using live flames or equipment producing sparks, such as grinding wheel sparks which could ignite explosive atmospheres.

17 Warranty

Every valve is tested before leaving the factory. On customer's request a test certificate may be issued. The customer may inspect and test the material at our premises if required prior to shipment. This inspection is deemed final. All costs for special tests or requests by the customer shall be borne by the customer.

Our responsibility is limited to the replacement or repair of parts which may show material or construction defects within a period of 12 months from shipment and used in normal operating conditions. This commitment excludes all other obligations.

When the valve is removed from its original packaging we are no longer responsible for any damage to property or injury to persons during installation and/or maintenance.

All transport and accessory charges are in any case for the customer's account.

ITALVALVOLE® reserves the right to interrupt or change or modify the characteristics and construction of any product without the obligation to replace or assemble the modified parts on products already supplied.

WARNINGS:

The safety conditions cannot be guaranteed and any malfunctions cannot be attributed to the valves if:

- the disassembly, re-assembly, maintenance operations are not performed according to the methods described in the user and maintenance manual.
- original spare parts are not used.

It is prohibited to remove any pages of this document or make any corrections.

In the event of dispute, the manual revision considered is that in the Italian language

ITALVALVOLE® S.A.S. reserves the right to modify and/or vary its products and relative documentation without notice.

The use of the manual does not exempt the user from compliance with the laws in force.

Please note that some components may be of foreign origin (non-Italian).

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