

# STAINLESS-STEEL PNEUMATIC SERVO CONTROL SERIES BBITV FAMILY 16 - GROUP 152

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IT AEOF 15 0974



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ATTESTATO N° 0425 ATEX 2519  
ATTESTATO N° 0425 ATEX 1318  
ATTESTATO N° 0425 ATEX 2868



## DICHIARAZIONE DI CONFORMITA' UE

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### DECLARATION OF UE CONFORMITY

## SERVOCOMANDI PNEUMATICI INOX SERIE BBITV PNEUMATIC SERVO CONTROLS STAINLESS STEEL SERIES BBITV

(in tutte le 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.*

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CLASSIFICAZIONE DELLE VALVOLE / CLASSIFICATION OF THE VALVES  
**ART 4.3 per fluidi del gruppo 2 – ART 4.3 for fluids group 2**

ALTRE DIRETTIVE EUROPEE APPLICATE:  
*OTHER EUROPEAN STANDARDS APPLIED:*

**2014/34/UE**

Marcatura dell'apparecchiatura:  
*Marking of equipment:*

 II 2 G Ex h IIC T6 Gb X  
II 2 D Ex h IIIC T6 Db X

NORME TECNICHE 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 002868-01**

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, 08/01/2020

Legale rappresentante  
*Legal representative*

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## 1 Introduction

The BBITV-series actuator is a device that performs a certain mechanical work by exploiting the pneumatic energy supplied from the outside. Usually the pneumatic actuators are the motor of the modulating valves, where the modulated pneumatic signal that is supplied, turns into linear movement of the valve plug.

This signal can usually allow the valve to open or close depending on whether the actuator is normally closed [N.C. (air opens)] or normally open [N.O. (air closes)].

The BBITV-series of actuators are completely made of stainless steel, have different control signal fields on 3 sizes of heads to fully cover the different characteristics and conditions of the 2- or 3-way modulating valves.

The diaphragm / spring combinations provided inside the pneumatic head cover the following input signal ranges on the diaphragm: 3 # 15 psi [0.2 ÷ 1.0 bar]; 6 # 18 psi [0.42 ÷ 1.26 bar]; 6 # 30 psi [0.42 # 2.1 bar]; 9 # 32 psi [0.6 / 2.24 bar].

The servo control yoke is provided with a NAMUR connection and is set up for the SIEMENS SIPART PS2 electro-positioner, for ever more performing and timely modulation.

### 1.1 Commissioning

**Normally-Closed Actuator (N.C.):** (for element references see page 16)

**For air-release port**, unscrew the eye bolt (1) and reducing fitting (34) male 1/8"G / M6. Then screw in quick L fitting d. 1/8"G (19) for plastic hoses D= 6 [mm].

- **THE AIR SUPPLY TO ACTUATOR MUST BE PROVIDED THROUGH THE 1/8 "G FITTING BELOW THE LOWER HEAD.**
- **THE AIR DRAIN MUST BE CARRIED OUT BY THE 1/8 "G FITTING SUPERIOR TO THE UPPER HEAD.**

**Normally-Open Actuator (N.O.):** (for element references see page 17)

**For supply**, unscrew the eye bolt (1) and reducing fitting (33) male 1/8"G / M6. Then screw in quick L fitting d. 1/8"G (19) for plastic hoses D= 6 [mm].

- **THE AIR SUPPLY TO ACTUATOR MUST BE PROVIDED THROUGH THE 1/8 "G FITTING BELOW THE UPPER HEAD.**
- **THE AIR DRAIN MUST BE CARRIED OUT BY THE 1/8 "G FITTING SUPERIOR TO THE LOWER HEAD.**

## 2 Technical Features

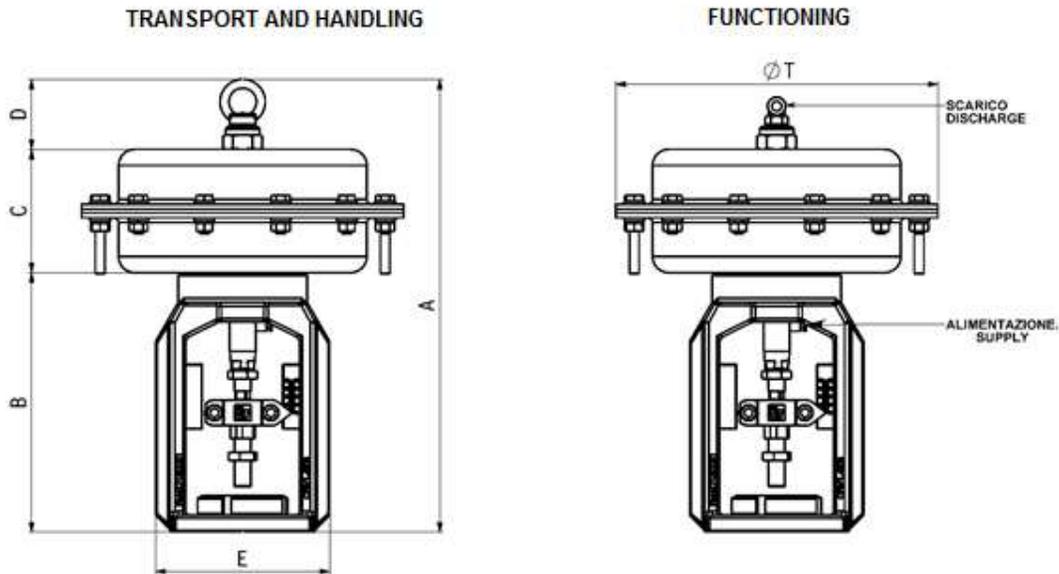
<b>Feeding</b>	<i>Pneumatic – Instrument Air – Inert Gases</i>					
<b>Type</b>	<i>Shaped-Membrane</i>					
<b>Yoke Material</b>	<i>Stainless steel 304</i>					
<b>Membrane Material</b>	<i>NBR + Polyester-Canvas Support</i>					
<b>Sizes</b>	200 mm		275 mm		360 mm	
<b>Versions</b>	NC	NO	NC	NO	NC	NO
<b>Stroke</b>	15mm - 20mm		15mm - 20mm		15mm	
<b>Control Signals</b>	3#15 psi		6#18 psi		9#32 psi	
<b>Feeding Pmax</b>	1,2 bar		1,4 bar		2,2 bar	
<b>Working Temperature</b>	-10 ÷ +80 °C					
<b>Feeding Connection</b>	1/8" GAS					
<b>Drain Connection</b>	1/8" GAS					

### 2.1 Version Table

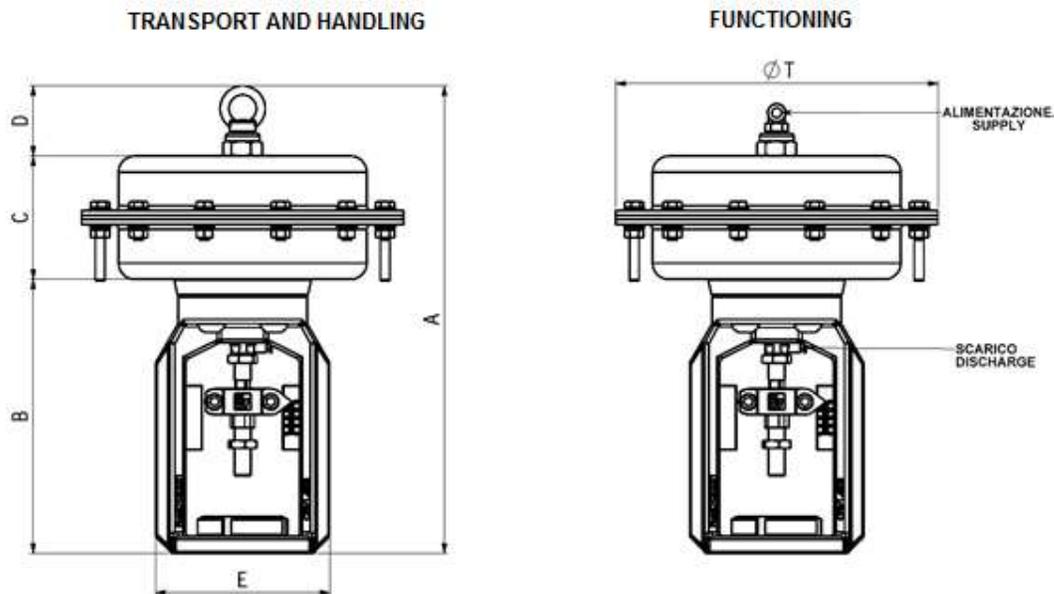
CODE		HEAD	CONTROL SIGNAL		FEEDING Pmax	STROKE
N.C.	N.O.	[mm]	[psi]	[bar]	[bar]	mm
15846	16018	Ø 200	6÷18	0,42÷1,26	1,4	20
15845	16019		3÷15	0,21÷1,05	1,2	20
15847	16020		6÷30	0,42÷2,1	2,2	20
16010	16021	Ø 275	6÷18	0,42÷1,26	1,4	20
16011	16022		3÷15	0,21÷1,05	1,2	20
16012	16023		6÷30	0,42÷2,1	2,2	20
16013	16024		9÷32	0,62÷2,4	2,4	20
16014	16025	Ø 360	6÷18	0,42÷1,26	1,4	20
16015	16026		3÷15	0,21÷1,05	1,2	20
16016	16027		6÷30	0,42÷2,1	2,2	20
16017	16028		9÷32	0,62÷2,4	2,4	20
16268	16606	Ø 200	6÷18	0,42÷1,26	1,4	15
16030			3÷15	0,21÷1,05	1,2	15
16031			6÷30	0,42÷2,1	2,2	15
16032		Ø 275	6÷18	0,42÷1,26	1,4	15
16033	16593		3÷15	0,21÷1,05	1,2	15
16034			6÷30	0,42÷2,1	2,2	15

## 2.2 Dimensions

### N.C. SERVO CONTROL



### N.O. SERVO CONTROL

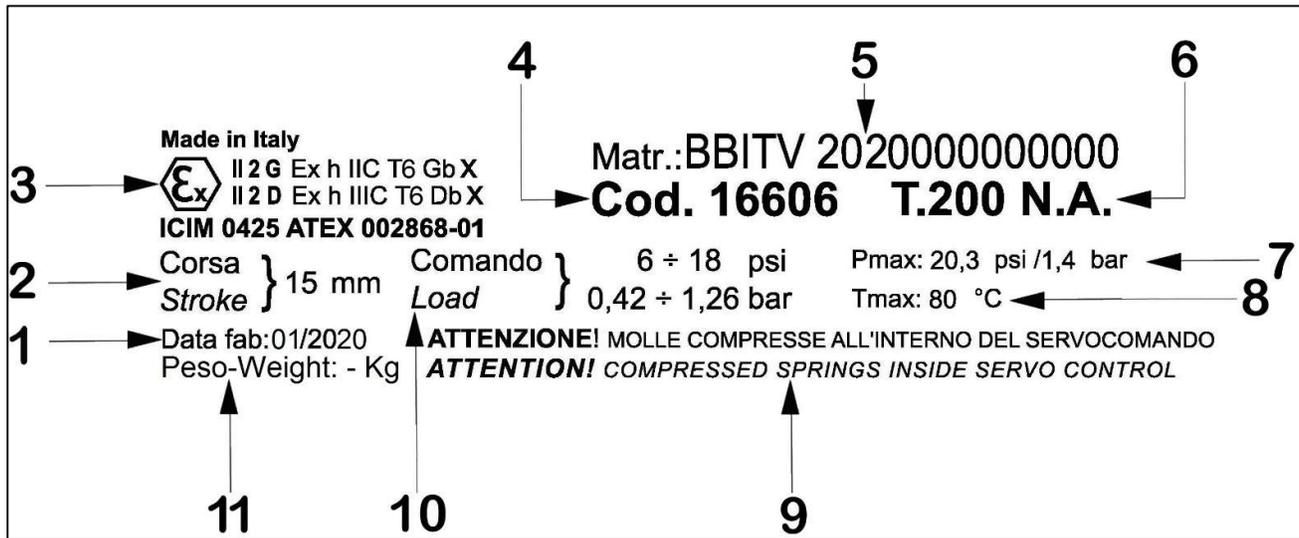


SERVO CONTROL		A	B	C	D	E	F	$\varnothing T$
N.C.	200	236	160	77	30	108	90	200
N.O.		279	169	77	33	108	90	200
N.C.	275	279	160	89	30	108	90	275
N.O.		290	168	89	33	108	90	275
N.C.	360	280	160	90	30	108	90	360
N.O.		291	169	90	33	108	90	360

## 2.3 Weights

CODE		HEAD [mm]	Weight [Kg]	
N.C.	N.O.		N.C.	N.O.
15846	16018	Ø 200	5,1	5,6
15845	16019			
15847	16020			
16010	16021	Ø 275	8,6	9,2
16011	16022			
16012	16023			
16013	16024			
16014	16025	Ø 360	13,5	13,6
16015	16026			
16016	16027			
16107	16028			
16268	16606			
16030		Ø 200	5,4	5,6
16031				
16032		Ø 275	7,5	8,6
16033	16593			
16034				

### 3 Marking Description BBITV Actuator



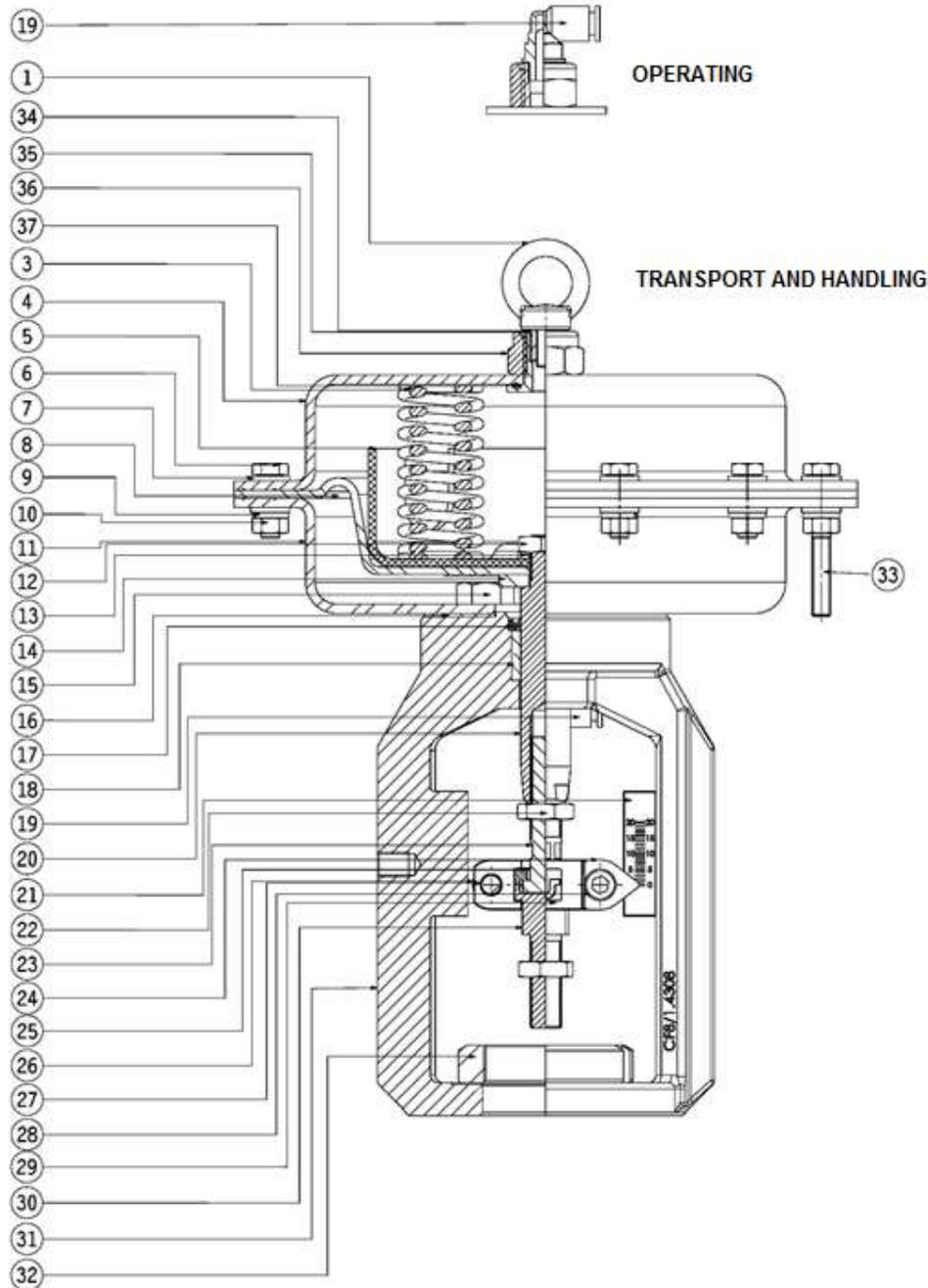
N°	Description
1	Production Date (Month/Year)
2	Stroke of the valve [mm]
3	ATEX Marking
4	Servo Control Code
5	Serial Number (To be used for a y communication with Manufacturer).
6	Description: Ø Head [mm] – NC/NO (Normally-Closed – Normally-Open)
7	Maximum Feeding Pressure [psi] [bar]
8	Maximum Working Temperature [°C]
9	Pre-Compressed Spring Warning
10	Modulating-Pressure Range [psi] [bar]
11	Weight of the servo control [Kg]

## 4 Disassembly and Assembly Instruction – N.C. Actuator

For disassembly and assembly of the actuator, refer to Drawing N° 140386 below.

Any disassembly and assembly operation must be carried out by specialized personnel in hydraulic and pneumatic industrial operations, equipped with all processing and safety equipment. Before any operation on systems and valves inquire about operating temperatures and pressures, as well as any particular conditions, and take all safety measures, paying particular attention to the type of present environment. Whenever operating on the valves, it is mandatory to completely remove the fluid. The same operation is mandatory on the servo control.

**NOTE: Read the procedures completely before proceeding with operations.**



Drawing N° 140386

## 4.1 Disassembly

**ATTENTION! Inside the actuator there are pre-compressed springs:** it is necessary to use suitable equipment that does not allow the abrupt removal of the two head of the actuator when all the screws are removed.

### 4.1.1 Disassembly of Junction Clamp

Unscrew the two cylindrical-head screws [28] from the hexagonal nuts [27] and the elastic washers [26]; at this point the two rings [28] and the two arrow plates [24] will be separated thus freeing the lower adjustment screw [30] with hexagonal nut [22]. Unscrew the hexagonal nut [22] located on the upper adjustment screw [23], taking care to block the rotation of the servo control shaft [20] with a 13 mm wrench; then, completely unscrew the upper adjustment screw [23] together to movable washer [25] from the servo control shaft [20]. At this point the junction clamp pack is completely disassembled.

### 4.1.2 Disassembly of Head

**ATTENTION! COMPRESSED SPRINGS, CARRY OUT THIS OPERATION WITH DUE CAUTIONS AND PRECAUTIONS.**

Unscrew all the hexagonal head screws [6] with the flat washer [7] from the hexagonal nut [10], spring washer [9] and flat washer [7], of the actuator head. Lastly unscrew the screws [33], which allow the internal springs of the actuator to be released.

**ATTENTION! Inside the actuator there are pre-compressed springs:** it is necessary to use suitable equipment that does not allow the abrupt removal of the two head of the actuator when all the screws are removed [6] and [33]. Remove upper head [4] with eye bolt [1].

Remove springs [3] from plate [5]; gently remove the block with membrane [8] from yoke [31]. Now the head is completely disassembled.

### 4.1.3 Disassembly of Membrane

Lock the servo control shaft [20] between soft jaws to avoid damaging the surface, take care that it does not rotate when disassembling this block with the help of the 13-mm wrench to prevent rotation.

Unscrew the hexagonal nut [12] and remove the spring washer [13], the spring plate [5], the membrane [8] and the support washer [14]. At this point the membrane block is completely disassembled.

### 4.1.4 Disassembly of Gaskets

Block the yoke [31] in a vice, unscrew the four hexagonal screws [15], remove the lower head [11] from the yoke [31]. Remove the actuator gasket [16] located on the upper flange of the yoke [31].

With the help of a flat screwdriver, remove the BA gasket [17] from the appropriate seat of the yoke [31].

Now the actuator is completely disassembled so you can replace the worn components and proceed with the assembly phase.

The components that may be subject to temporal operating wear and that once dismantled should be replaced are the following: membrane [8] servo control gasket [16] and BA gasket [17].

## 4.2 Assembly

### 4.2.1 Assembly of Gaskets

Block the yoke [31] in a vice, insert the BA gasket [17] in its seat, paying attention to the assembly direction: follow the indications in drawing N ° 140374.

Position the servo control gasket [16] aligning the holes in correspondence with those of the upper flange of the yoke [31]. Position the lower head [11] on the servo control gasket [16] always matching the drilling. Put the right amount of thread locker on the hexagonal head screws [15] and tighten them at a torque of 30 Nm in order to fix the lower head [11] on the yoke [31] of the servo control. At this point the whole group of gaskets is assembled.

### 4.2.2 Assembly of Membrane

Lock the servo control shaft [20] between soft jaws to avoid damaging the surface, take care that it does not rotate during the assembly of this assembled block with the help of the 13-mm wrench to prevent rotation.

Fit the support washer [14], the diaphragm [8], according to the direction shown in the drawing, the spring plate [5] and finally the spring washer [14] on the threaded upper end of the servo-control shaft [20].

Put a drop of thread-locker on the hexagonal nut [12] and screw it to close the whole block. The control that everything is closed correctly is in the proof that the membrane [8] does not rotate with respect to the stem but that it is a single block. At this point the whole membrane assembly is assembled.

### 4.2.2 Assembly of Head

Fasten the assembled lower head [11] to the yoke [31] in a vice, carefully insert the servo control shaft [20] assembled on the diaphragm [8] onto the yoke [31].

**WARNING!** In this operation it is necessary to operate when inserting the stem into the yoke, so as not to damage the BA gasket [17]. At this point, load the springs [3] onto the spring plate [5].

Position the upper head [4] on the springs [3] and align the drilling of the heads with the membrane so that the screws can be fitted. With suitable equipment, compress the springs so as to bring the two heads closer together. In this phase, as soon as possible, begin tightening the screws [33], with relative washers and lower nuts.

**ATTENTION! Make sure there is no possibility of a sudden removal of the two heads before they are fixed with the appropriate screws.** Fit the hexagonal head screws [6] complete with flat washers [7] along all the holes of the upper head [4]. Insert respectively the hexagonal-head screws [6] which protrude from the lower head [11], the flat washers [7], the elastic washers [9] and screw everything together with the hexagonal nuts [10] so as to firmly compact the head. Release the equipment that held the two heads compressed. At this point the head is completely assembled.

**NOTE: tightening the screws [6] and [33] must compress the membrane so that it holds but does not pierce it outwards.**

### 4.2.3 Assembly of Junction Clamp

Insert the movable washer on the upper adjustment screw [23] and then screw the hexagonal nut [22] on it and then screw the whole on the rod [20] of the servo control until the hexagonal nut [22] on the stem [20] is closed. Screw the hex nut [22] onto the lower adjustment screw [30] and couple with the upper adjustment screw [23] and block with the two bushings [29]. On the valve front, where there is the stroke indicator plate [21], fit the cylinder head screw [28] including the arrow plate [24].

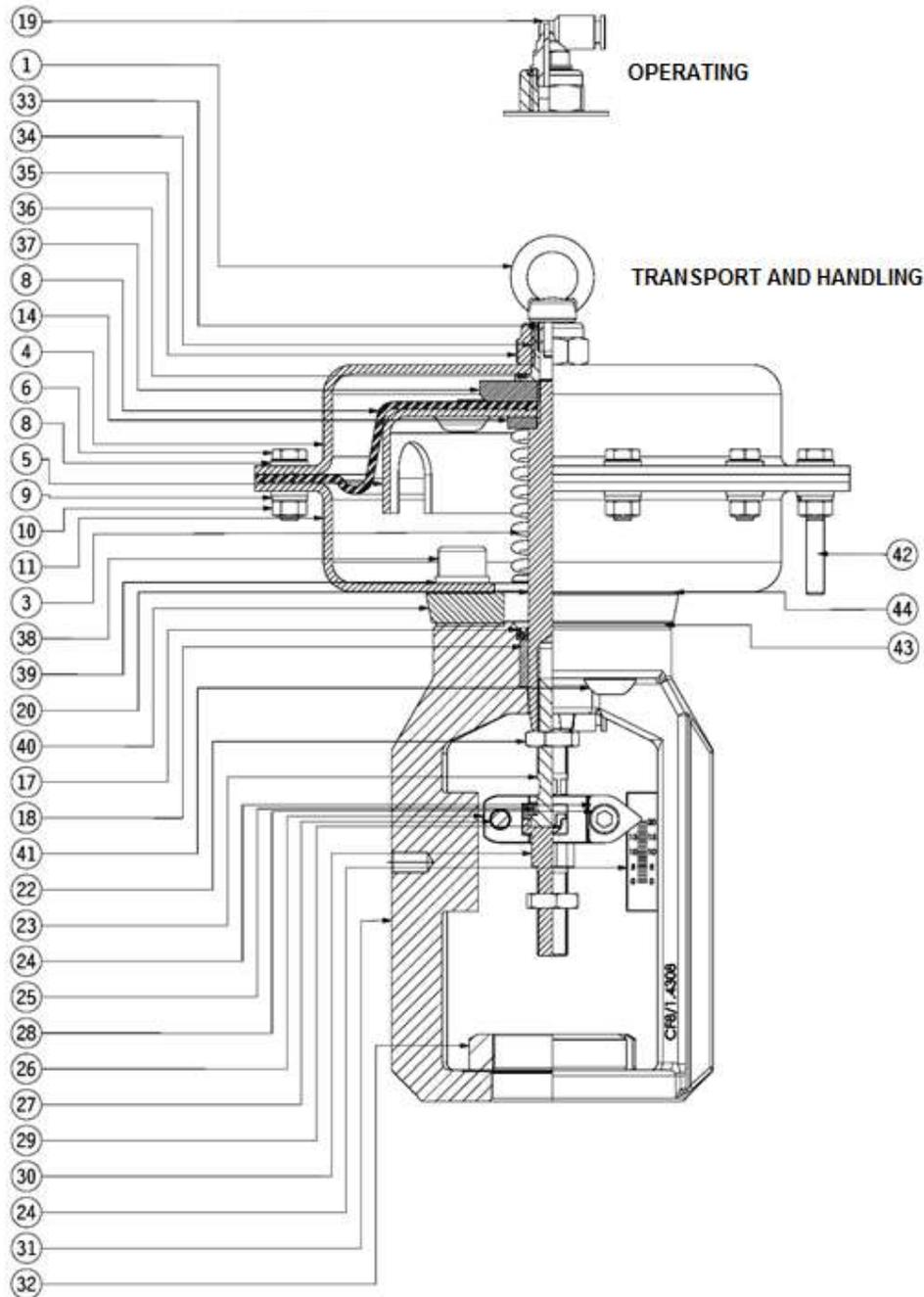
Screw the hex nut [27] with spring washer [26] onto the protruding thread of the cylinder head screw [28] on the back of the valve, thus closing the small block of clamp [29]. At this point the servo control has been completely reassembled.

## 5 Disassembly and Assembly Instruction – N.O. Actuator

For disassembly and assembly of the actuator, refer to Drawing N° 140167 below.

All disassembly and assembly operations must be carried out by personnel specialized in hydraulic and pneumatic industrial operations, equipped with all processing and safety equipment. Before any operation on systems and valves inquire about operating temperatures and pressures, as well as any particular conditions, and take all safety measures, paying particular attention to the type of present environment. Whenever operating on the valves, it is mandatory to completely remove the fluid. The same operation is mandatory on the servo control.

**NOTE: Read the procedures completely before proceeding with operations.**



Drawing N° 140167

## 5.1 Disassembly

**ATTENTION! Inside the actuator there are pre-compressed springs:** it is necessary to use suitable equipment that does not allow the abrupt removal of the two head of the actuator when all the screws are removed.

### 5.1.1 Disassembly of Junction Clamp

Unscrew the two cylindrical-head screws [28] from the hexagonal nuts [27] and the elastic washers [26]; at this point the two rings [28] and the two arrow plates [24] will be separated thus freeing the lower adjustment screw [30] with hexagonal nut [22].

Unscrew the hexagonal nut [22] located on the upper adjustment screw [23], taking care to block the rotation of the servo control shaft [20] with a 13-mm wrench, then completely unscrew the complete upper adjustment screw [23] of movable washer [25] from the servo control shaft [20]. At this point the clamp pack is completely disassembled.

### 5.1.2 Disassembly of Head

**ATTENTION! COMPRESSED SPRINGS, CARRY OUT THIS OPERATION WITH DUE CAUTIONS AND PRECAUTIONS.**

Unscrew all the hexagonal-head screws [6] with the flat washer [7] from the hexagonal nuts [10], spring washer [9] and flat washer [7], of the actuator head.

Lastly unscrew the screws [42], which allow the internal springs of the actuator to be released.

**ATTENTION! Inside the actuator there are pre-compressed springs:** it is necessary to use suitable equipment that does not allow the abrupt removal of the two heads of the actuator when all the screws [6] and [42] are unscrewed. Remove the upper head [4] complete with air connection.

Gently slide the assembled block of the membrane [8] out of the remaining assembled block. Remove the springs [3] from the lower head [11]. At this point the head is completely dismantled.

### 5.1.3 Disassembly of Membrane

Lock the shaft for servo control [20] between soft jaws to avoid damaging the surface, take care that it does not rotate when disassembling this assembled block with the help of the 13-mm wrench to prevent rotation.

Unscrew the hexagonal nut [12] and remove the spring washer [13] (\*\* for the Ø200 head unscrew the locknut [37] with a compass wrench), remove the membrane [8] and the spring plate [5], and the support washer [14]. At this point the membrane block is completely dismantled.

### 5.1.4 Disassembly of Gaskets

Take the upper head [4] complete with air connection and lock it in an easy position to operate on the air connection. Using a 22-mm and 21-mm wrench, gently unscrew the M14 self-locking hex nut [35] from the air connection hub [34] and remove it from the upper head. [4].

Remove the OR gasket [36] from the air connection hub [34].

Lock the yoke [31] in a vice, unscrew the four pan-head screws [39], remove the lower head [11], paying attention to the two gaskets [43] and [44], including the joint flange [38] from the yoke [31]. With the help of a flat screwdriver, remove the BA gasket [17] from the appropriate seat of the yoke [31].

At this point the actuator is completely disassembled so you can replace the worn components and proceed with the assembly phase.

The components that can be subject to temporal operating wear and that once disassembled should be replaced are the following: membrane [8] OR gasket [36] and BA gasket [17].

## 5.2 Assembly

### 5.2.1 Assembly of the Gaskets

Lock the yoke [31] in a vice, insert the gasket BA [17] in its seat, paying attention to the assembly direction, follow the indications in drawing N ° 140375.

Position the first seal [43] on the castle, then position in succession the coupling flange [38], gasket [44], lower head [11] matching the drilling. Put the right amount of thread locker on the pan-head screws [41] and screw them in order to fix the lower head [11] on the yoke [31] of the servo control.

Fasten the upper head [4] in a vice, grease with silicone grease and fit the OR gasket [36] into the special seat on the air connection hub [34] and insert it into the central hole of the upper head [4]. Holding the air connection hub [34] with a 22-mm wrench, tighten the M14 self-locking nut [35] paying attention to close well so that there are no air leaks during the regular operation of the servo control.

Screw the air fitting onto the air connection hub [34]. At this point the whole group of gaskets is assembled.

### 5.2.2 Assembly of Membrane

Lock the servo control shaft [20] between soft jaws to avoid damaging the surface, take care that it does not rotate during the assembly of this assembled block with the help of the 13-mm wrench to prevent rotation.

Fit the support washer [14], the spring plate [5], the membrane [8], according to the direction shown in the drawing, and finally the spring washer [on the upper threaded end of the servo-control shaft [20] 14]. Put a drop of thread locker on the hexagonal nut [12] and screw it to close the whole block (\*\* for the Ø200 head put a drop of thread locker on the locknut [37] and screw with a compass wrench to close the whole block).

The verification that everything is closed correctly is in the proof that the membrane [8] does not rotate with respect to the stem but that it is a single block. At this point the whole membrane assembly is assembled.

### 5.2.3 Assembly of Head

Fasten the assembled lower head [11] in a vice [11], place the springs [3] on the lower head [11]. Insert the servo control shaft [20] assembled with the diaphragm [8] carefully on the castle [31]. **WARNING!** In this operation it is necessary to operate, when inserting the stem into the yoke, so as not to damage the gasket BA [17] and to center the springs with the protruding guides on the spring plate [5].

Position the upper head [4] and align the drilling of the heads with the membrane so that the screws can be fitted. With suitable equipment, compress the springs so as to bring the two heads closer together. In this phase, as soon as possible, begin tightening the screws [42], with relative washers and lower nut.

**ATTENTION! Make sure there is no possibility of a sudden removal of the two heads before they are fixed with the appropriate screws.** Fit the hexagonal head screws [6] complete with flat washers [7] along all the holes of the upper head [4]. Insert respectively the hexagonal head screws [6] which protrude from the lower head [11] the flat washers [7], the elastic washers [9] and screw everything together with the hexagonal nuts [10] in order to compact the head. Release the equipment that held the two heads compressed. At this point the head is completely assembled.

**NOTE: tightening the screws [6] and [33] must compress the membrane so that it holds but does not pierce it outwards.**

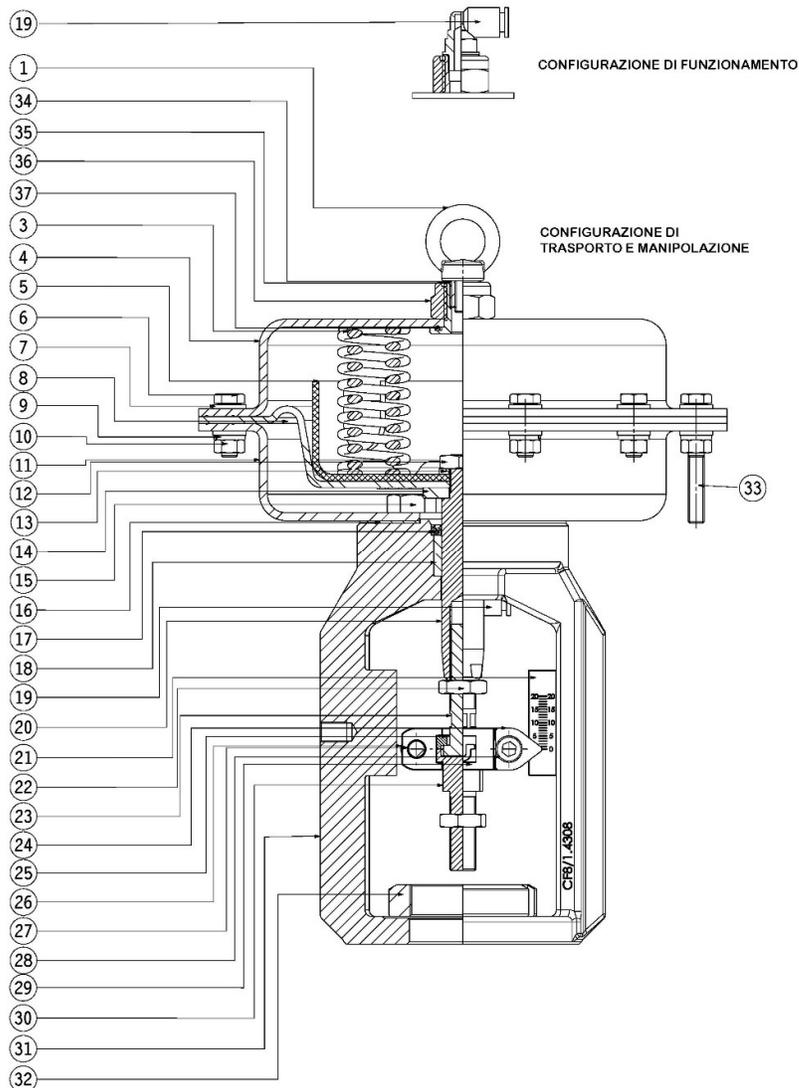
### 5.2.4 Assembly of Junction Clamp

Insert the movable washer on the upper adjustment screw [23] and then screw the hexagonal nut [22] on it and then screw the whole on the rod [20] of the servo control until the hexagonal nut [22] on the stem [20] is closed.

Screw the hex nut [22] onto the lower adjustment screw [30] and couple with the upper adjustment screw [23] and block with the two bushes [29]. On the valve front, where there is the stroke indicator plate [21], fit the cylindrical-head screw [28] including the arrow plate [24]. Screw the hex nut [27] with spring washer [26] onto the protruding thread of the cylinder head screw [28] on the back of the valve, thus closing the small block of clamp [29]. At this point the servo control has been completely reassembled.

## 6 Elements and Spares – Servo Control BBITV N.C

N°	DESCRIPTION	MATERIAL
1	Eye Bolt	AISI 304
2	Self-Locking Nut	AISI 304
3	Spring	Harmonic Steel
4	Upper Head	AISI 304
5	Spring Plate	Painted Steel
6	Hexagonal-Head Screw	AISI 304
7	Plan Washer	AISI 304
8	Membrane	NBR
9	Elastic Washer	S30400
10	Hexagonal Nut	AISI 304
11	Lower Head	AISI 304
12	Hexagonal Nut	AISI 304
13	Elastic Washer	AISI 304
14	Washer	AISI 304
15	Hexagonal-Head Screw	AISI 304
16	Gasket	Expanded Graphite
17	BA Gasket	NBR
18	Self-Lubricating Bushing	Bronze
19	Air Fitting G1/8"	Plastic
20	Servo Control Shaft	AISI 304
21	Stroke-Indicating Label	Aluminium
22	Hexagonal Nut	AISI 304
23	Upper Adjusting Screw	AISI 304
24	Arrow Label	Aluminium
25	Moving Washer	AISI 304
26	Elastic Washer	AISI 304
27	Hexagonal Nut	AISI 304
28	Cylindric-Head Screw	AISI 304
29	Clamp	CF8
30	Lower Adjusting Screw	AISI 304
31	Yoke	CF8
32	Locking Ring	AISI 304
33	Hexagonal-Head Screw	AISI 304
34	Threaded Bushing	Brass
35	Air-Connection Hub	AISI 304
36	Self-locking Nut M14	AISI 304

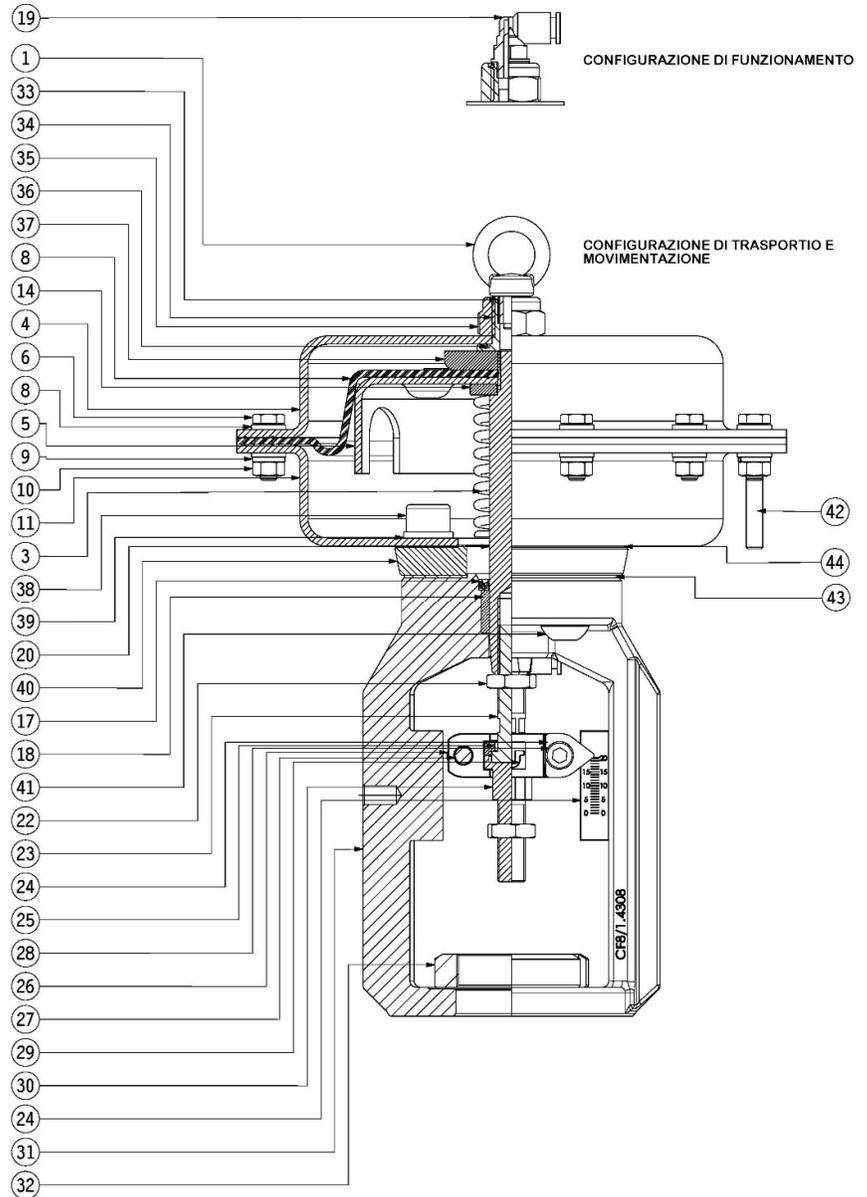


### SPARE CODES:

Ø servo control	SPARE CODE (Part. N° 8-16-17)
Ø 200	16310
Ø 275	16311
Ø 360	16312

## 8 Elements and Spares – Servo Control BBITV N.O.

N°	DESCRIPTION	MATERIAL
1	Eye Bolt	AISI 304
2	Self-Locking Nut	AISI 304
3	Spring	Harmonic Steel
4	Upper Head	AISI 304
5	Spring Plate	Painted Steel
6	Hexagonal-Head Screw	AISI 304
7	Plan Washer	AISI 304
8	Membrane	NBR
9	Elastic Washer	S30400
10	Hexagonal Nut	AISI 304
11	Lower Head	AISI 304
12	Hexagonal Nut	AISI 304
13	Elastic Washer	AISI 304
14	Washer	AISI 304
15	Hexagonal-Head Screw	AISI 304
16	Gasket	Expanded Graphite
17	BA Gasket	NBR
18	Self-Lubricating Bushing	Bronze
19	Air Fitting G1/8"	Plastic
20	Shaft	AISI 304
21	Stroke-Indicating Label	Aluminium
22	Hexagonal Nut	AISI 304
23	Upper Adjusting Screw	AISI 304
24	Arrow Label	Aluminium
25	Moving Washer	AISI 304
26	Elastic Washer	AISI 304
27	Hexagonal Nut	AISI 304
28	Cylindric-Head Screw	AISI 304
29	Clamp	CF8
30	Lower Adjusting Screw	AISI 304
31	Yoke	CF8
32	Locking Ring	AISI 304
33	Threaded Bushing	Ottone
34	Air-Connection Hub	AISI 304
35	Self-Locking Nut M14	AISI 304
36	O-Ring	GACO
37	Locknut	Steel
38	Cylindric-Head Screw	AISI 304
39	Elastic Washer	AISI 304
40	Junction Flange	AISI 304
41	Pan-Head Screw	AISI 304
42	Hexagonal-Head Screw	AISI 304
43	Servo Control Gasket	Expanded Graphite
44	N.O. Servo Control Gasket	Expanded Graphite



### CODICI RICAMBI:

Ø servo control	SPARE CODE (Part. N° 8-16-17)
Ø 200	16313
Ø 275	16314
Ø 360	16315

## 9 Storage, Installation, Inspection and Maintenance

During transport and assembly, the actuator and any accessories must be treated with the utmost care, avoiding bumps and abnormal stresses. In particular, impacts on the actuator could cause misalignments and compromise the correct functioning of the valve on which it will be mounted.

**To carry out the lifting operations in safety, refer to the weight indicated in paragraph 2.3 of this guide.**

Dust protections on all connections must not be removed until the moment of assembly.

It is good to store these valves in non-sunny places, to prevent the membrane and the seals inside from drying out and aging prematurely.

Storage temperatures must be between 0 ° C and + 40 ° C.

### 9.1 Installation Instructions

#### 9.1.1 Application Information

**IN NO EVENT SHALL THE SERVO CONTROL BE DISASSEMBLED AND MODIFIED: under penalty of forfeiture of any type of guarantee.**

The indications contained in this guide and on the marking of the actuator head must be strictly respected.

Only before assembly, the protections must be dismantled checking that no slag / impurities have entered (if necessary, use a jet of compressed air).

It is good to check the condition of the pipes:

- dimensions and sealing under pressure must be checked: the interiors must be free of foreign particles and / or welding before being connected to the valve
- the weight of the actuator and any accessory must be sustainable (adequate pipes) also through the use of special supports

Supply pipes for the pneumatic control and the drain of the actuator, both rigid and flexible, must be located so as to be protected from external damage.

The control compressed air must be instrument air with a pressure between the values of use of the actuator and never higher than 3 bar; with nylon or copper feeding pipes.

The male air connections must be 1/8"G-threaded couplings (Ø 200 head) or 1/4"G (Ø 275, Ø 360 head).

The recommended installation requires that the valve for which the actuator is intended is mounted vertically with the actuator at the top (reasons of size may require inclinations or horizontality, to be considered however as a fallback solution).

If you want to ensure continuous operation of the system even during maintenance, it is advisable to provide for an adequate by pass with relative shut-off valves and manual adjustment.

**WARNINGS: *it is necessary to foresee a minimum space for the disassembly of the pneumatic actuator and internal organs during maintenance and inspection during operation.***

Pay the utmost attention to the assembly of the valve on the pipe, make sure to mount it following the instructions on the body fusion, in the direction of the fluid through the pipeline. Proceed with a cross and uniform tightening of the flange bolts in order to uniformly compress the gaskets and avoid the onset of harmful tensions on the valve body.

It is advisable to use joints between the system piping and the valve connections, designed to discharge any tensions that could damage the valve itself.

After assembly, with the pneumatic valve in the fully open position, carefully clean the line with adequate pressurized fluid to eliminate foreign bodies, welding slag and debris that could damage the sealing surfaces of the valve.

Connect the pneumatic signal output from the pilot regulator or from the remote-control panel with the appropriate threaded connection of the actuator.

## 10 Servo Control BBITV in accordance with Directive 2014/34/EU (ATEX)

### 10.1 Premises

These instructions and information complete this "Guide to Selection, Use and Maintenance", as far as the servo controls specifically provided and ordered for compliance with the 2014/34/EU (ATEX) directive are concerned.

Not to follow the instructions in this chapter can lead to serious damage to people and things.

In this document, the generic term "equipment" means the BBITV SERIES PNEUMATIC STAINLESS-STEEL SERVO CONTROL, intended to be applied to a modulating action valve, to regulate the process fluid, which can be 2-way or 3-way in the diverting or mixing function, installed inside a potentially explosive atmosphere. The installation is foreseen in environments not directly exposed to atmospheric agents.

The appliances meet the requirements of Directive 2014/34/EU as regards group II, category 2.

NOTE (1): All data, statements and recommendations contained in this chapter are based on information believed to be reliable by ITALVALVOLE. Since the conditions of actual use are beyond the control of ITALVALVOLE, the products are sold under the condition that it is the user himself to evaluate these conditions before adopting these recommendations for the purpose or intended use. The marking defines the field of use.

NOTE (2): The BBITV actuator does not present ignition risks in normal operating conditions, within the fields defined on the valve label itself, and compliance with correct installation.

#### 10.1.1 General Information – Technical Specifications

The data shown in the following table, unless expressly indicated, refer to a room temperature between -10°C e 40°C.

<b>Feeding</b>	<i>Pneumatic – Instrument Air or Inert Gases</i>					
<b>Type</b>	<i>Membrane-Shaped in NBR + Polyester-Canvas Support</i>					
<b>Head Material</b>	<i>Stainless Steel 304</i>					
<b>Sizes</b>	<i>200 mm</i>		<i>275 mm</i>		<i>360 mm</i>	
<b>Versions</b>	<i>NC</i>	<i>NO</i>	<i>NC</i>	<i>NO</i>	<i>NC</i>	<i>NO</i>
<b>Control Signals</b>	<i>3#15 psi</i>		<i>6#18 psi</i>		<i>9#32 psi</i>	
<b>Feeding P<sub>max</sub></b>	<i>1,2 bar</i>		<i>1,4 bar</i>		<i>2,2 bar</i>	
<b>Working Temperature</b>	<i>-10 ÷ +80 °C</i>					
<b>Feeding Connection</b>	<i>1/8" G</i>					
<b>Stroke</b>	<i>15 mm</i>			<i>20 mm</i>		

## 10.2 Safety Informations

This chapter deals with the main topics concerning explosion protection and must be used together with the contents of the other chapters of this guide; whenever use in potentially explosive atmospheres is required.

Installation, commissioning, maintenance and repair operations can only be carried out by qualified personnel, who must take into consideration what follows:

- these specific instructions, together with any other instructions for the installed equipment;
- warning and information signs on equipment;
- the specific regulations and requirements for the plant in which the equipment will operate (national and regional regulations in force);
- any additional accessory that can be mounted on the equipment must be included in the appropriate ATEX certification or be certified separately;

The accessories that may be supplied with the actuator are accompanied by their specifications which supplement this document; it is necessary for the Customer to verify that the accessories not supplied with the equipment are suitable for classifying the area and compatible with the equipment itself (group, classification and temperature category).



**The user must evaluate whether the dust deposited on the actuator can reach the maximum permissible temperature of the actuator itself without an explosion triggering; if not, isolate the actuator. The room air should not exceed +40°C. Make sure that the actuator, mounted on the valve, does not exceed the temperature of +80°C. The installation area where the room temperature does not exceed the minimum ignition temperature of the potentially explosive atmosphere is very important.**

**Connect the earthing and / or equipotential bonding terminals with the pipes. Any servo control is equipped with an earthing terminal identified by a specific symbol.**

**If necessary, make an additional equipotential connection between the valve body and actuator (at the point provided) and the interface pipes.**

## 10.3 Responsibilities for ATEX Certification – Supply Spectrum

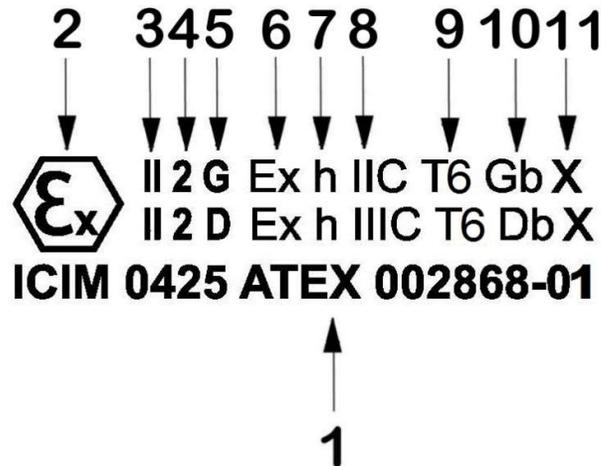
ITALVAVOLE will only be responsible for the materials and equipment supplied, selected on the basis of the data provided by the Customer and indicated in the order confirmation.

## 10.4 Marking

In case of use in areas with risk of explosion, it must be checked that the equipment is suitable for classifying the area and the substances present in the system.

The essential safety requirements against the risk of explosion in classified areas, as far as equipment is concerned, are set by the European Directive 2014/34/EU of 26/02/2014.

On  label, references of notified body where technical file is deposited and reference number.



1	2868	Technical file number assigned by notified body
2		Marking (specific) for protection against explosions
3	II	Appliance group II= equipment intended to work in places other than mines
4	2	Category 2= equipment intended for use on the surface. 2014/34/EU directive classifies equipment in categories, related to protection level and depending on grade of danger of the environment where they will operate
5	G D	Equipment suitable for installation in places where, during normal operation, there is the possibility of potentially explosive atmospheres due to gas/vapors/mists (G) or dust (D).
6	Ex	Identifies that an explosion protection mode has been adopted
7	h	Non-electrical equipment
8	IIC IIIC	Equipment intended for works other than underground work in mines and their surface plants which could be exposed to the danger of explosive atmospheres. - <b>IIC</b> : gas subgroup "C"; <b>IIIC</b> : suitable for installation in the presence of any dust.
9	T6*	See table of temperature classes in this paragraph
10	Gb Db	EPL (Equipment Protection Level) Gb= equivalent to category 2G EPL (Equipment Protection Level) Db= equivalent to category 2D
11	X	Specific conditions: to the air inlet and outlet servo control, connect the clean air circuit from a safe area

\*The construction must be chosen in such a way that the maximum surface temperature in operation does not reach the ignition temperature of any gas or vapor that may be present.

Temperature Class	Maximum Surface Temperature [°C]
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

## 10.5 Maximum Surface Temperature – Maximum Admittable Temperature

The maximum effective surface temperature does not depend only on the equipment, but on operating conditions such as the temperature of the process fluid, room temperature, the presence of external sources.

Consequently, under normal operating conditions, the maximum temperature on the surfaces of the valve and its servo control should correspond to the maximum temperature of the fluid contained by the same increased by a safety margin for a possible increase in temperature due to the movement of the fluid.

All data refer to room temperature between 0°C and +40°C.

## 10.6 Responsibilities

It is the responsibility of the user to ensure that the conditions for the correct operation of the actuator are never exceeded, especially the maximum allowable temperatures of the fluid contained in the valve on which it is mounted. The user must ensure regular inspections and maintenance for correct operation.

If this cannot be ensured by the user, the user must prepare suitable monitoring devices.

## 10.7 Installation

### 10.7.1 Inspections

Before installation. It is necessary an inspection on equipment.

Identification:

- Make sure that the data label of the equipment and its accessories comply with the requirements relating to the area in which explosive atmospheres may work, the category and the group;
- Possible damage: the installed equipment and its accessories must not be damaged and must have been correctly stored before installation. In case of doubt or detection of damage, contact the supplier;

Assembly:

- The equipment must be mounted on the appropriate valve body, by means of a special ring nut, and joined the stems by means of the appropriate clamps. This connection must allow the electrical continuity of the whole assembly.
- The user must evaluate whether the powders which can be deposited on the external surfaces once the maximum permissible temperatures of the equipment have been reached do not constitute a possible cause of triggers of an explosion. Otherwise, the valve must be isolated to prevent dust deposits from coming into contact with the hot surfaces of the valve.
- Make sure that the actuator is adequately fixed to the valve that supports it;

The actuator must be mounted on the system in order to ensure correct operation, taking into account its resistance to mechanical stress and / or foreseeable environmental influences.

Also take into account the effects of gravity and impacts (check that the actuator is not placed in a position where it can be hit during normal work and maintenance of the systems). In the event of unscheduled activities, protect the part of the system containing the actuator from possible knocks and / or damage due to activities carried out improperly.

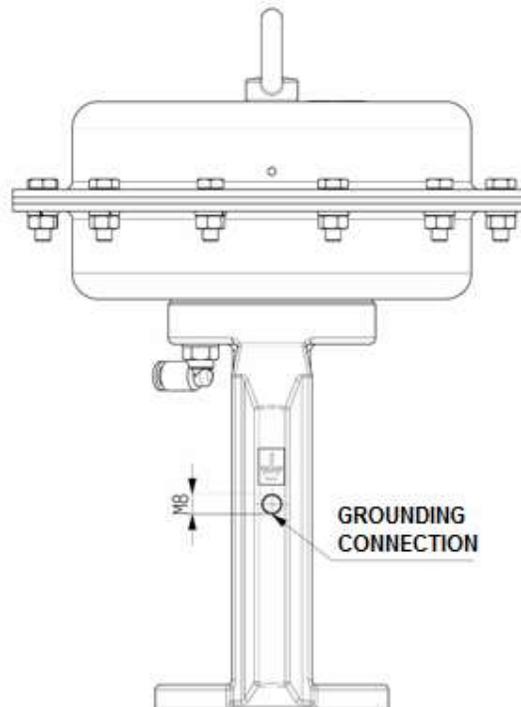


The supply pipes of the pneumatic control of the actuator, both rigid and flexible, must be located so as to be protected from foreseeable damage.

- “Check list” (see chapter 10) must be applied in any point of its.

In **addition** to installation information and warnings reported in this guide, it must be kept in consideration what follows:

- The maximum effective surface temperature does not depend on the actuator itself, but on the operating conditions such as the temperature of the process fluid used inside the valve for which it is intended, ambient temperature and presence of external heat sources;
- The temperature of the heated air coming from the other units must not affect the valve environment; the ambient air must not have a temperature above +40°C;
- The actuator must not be mounted in places where the ambient temperature is higher than the minimum ignition temperature of the potentially explosive atmosphere, with reasonable safety of at least +20°C less.
- The actuator must not be mounted near heat sources which can, by radiation and/or conduction and/or convection, heat it up to a surface temperature higher than the minimum ignition temperature of the potentially explosive atmosphere;
- The actuator must not contain fluids with a temperature higher than the maximum admissible temperature;
- The use of the actuator with operating fluid other than air is expressly prohibited;
- **Connect the grounding and / or equipotential connection terminals with the pipes. All the equipment is equipped with an earthing terminal identified by a specific symbol;**
- Make sure that the actuator which is mounted does not exceed the max temperature of +80°C.



### 10.7.2 Working Environment

- The equipment must be accessible for maintenance and inspection during operation;
- Free air circulation in the servo control / actuator area must be ensured;
- Adequate separate earthing devices must be provided near the equipment;
- The equipment has been designed to operate in sheltered environments and not directly exposed to atmospheric agents.

### 10.7.3 Piping

- The pipes must be checked and their dimensions and tightness checked under pressure. They must be internally cleaned and free of foreign particles and / or welding before being connected to the valve on which the actuator is mounted.
- The weight of the valve and any accessories must be supported by the pipes (if appropriate) or by special supports to prevent the weight of the valve itself from causing damage to the pipe and any leaks between the pipe and the valve;
- It is necessary to check the electrical continuity between the valve, the actuator and its accessories, and the pipes to which it is connected: if necessary, make an additional equipotential connection between the actuator (in the set point) and the interface pipes.
- 

### 10.7.4 Accessories

- The accessories must also be built and certified in the ATEX field. Therefore, they must be chosen with a classification compatible with that of the servo control.
- The user who wants to install his accessories must certify their compatibility with the ATEX classification.
- For any inspection, refer to the standards and product specifications and relative instructions. Also check that the instructions for use of the accessories do not conflict with the conditions of use. In any case, the more precautionary conditions of use always prevail.

## 10.8 Commissioning

For protection against explosions, following precautions are important:

- Make sure that the area around the actuator is clean.
- Make sure that the inlet piping is mounted securely, without leaks and is clean.

Any welding particles must be removed beforehand. The whole system must be free of solid particles. The filters predisposed for servo control and complete valve must be constantly cleaned in order to avoid performance degradation and malfunctions that can lead to dangerous situations.

- Stop the valve immediately in the event of irregular operating modes or malfunctions, paying particular attention to the first functional test operations on the system.

NOTE: The user must ensure that there is no explosive atmosphere at the time of installation / maintenance of the actuator. This is even more important if at site welding operations are required, since:

- open flames and / or electric arcs are not allowed.
- the welding operations would lead to exceeding the minimum ignition temperature of most of the gases and vapours normally present in the system.

## 10.9 Maintenance

In addition to the information and warnings in the user manuals, the following indications must be observed:

- All work must be carried out and supervised by experienced, trained and competent personnel;
- Before carrying out any operation on the equipment, make the area inert and make it safe;
- Daily remove any deposits of dust deposited on the equipment, in such a way as not to electrostatically charge the surfaces;
- Periodically check the grounding terminal connections and equipotential connection with the pipes; eventually restore them;
- Check the oxydation state of the springs located inside the actuator every six months and, if damaged, replace them with new ones;
- Check the external state of the equipment weekly, making sure that there are no parts damaged by rust. In case of external oxydation, replace the damaged parts;
- Check that all the pre-compressed seals by bolting are correctly tightened and check that, during the course of the activities, anomalous vibrations are not transmitted to the valve due to malfunctions of other equipment in the system;
- The sealing and moving parts must be completely overhauled in the shortest time interval between 150,000 operations and 1 year.

The disassembly and assembly instructions for the BBITV servo control in the ATEX version correspond to the **chapters 4 and 5**.

## 11 Risk Reduction via “CHECK LIST”

### 11.1.1 During Installation

- Check that the equipment has not been damaged due to knocks and / or falls;
- Check that the supply air pipes have been securely connected;
- Check the correct alignment of the moving parts after completing the installation;
- Check that all accessories comply with ATEX standards and compatible with the group and category of the equipment (for ATEX uses);
- Check that all requests for the accessory instructions have been met.
- Check the cleanliness of the filters upstream of the actuator;
- Check the tightness of the connections on the input and output side;

### 11.1.2 Before Commissioning

- Check that all the threaded joints have been tightened to the expected torque;
- Check the correct assembly of the equipment;
- Check the correct assembly of the accessories.
- Verify that the servo control vent connection has been correctly connected to the pipe for this purpose; the vent allows a lung to be created in the actuator chamber, where the springs are located, which prevents the formation of overpressures or air voids, which could compromise the functioning of the valve. It is important that the air entering and leaving this chamber is not that of the potentially explosive atmosphere since concentrations of dust or gas could form inside the actuator; it is therefore necessary to collect and discharge the air in an inert atmosphere;
- Check the correct assembly of the equipment;
- Check the correct assembly of the accessories.

### 11.1.3 While Equipment is running

- Check for leaks;
- Check and eliminate any accumulation of dust on the entire surface of the equipment, so as not to electrostatically charge the painted surfaces;
- In case of damage, repair immediately;
- Carry out the checks required by the accessory instructions.

## 12 Servo Control Lifetime

The BBITV actuator has been designed and built to guarantee correct operation under the conditions and within the limits set by the technical characteristics.

All fixed metal parts not affected by dynamic operation have an expected life of 10 years.

The parts dynamically stressed and in periodic movement during normal operation must undergo a complete overhaul in the shortest time interval between that corresponding to 500,000 maneuvers \*\* and 3 years.

This revision can only be carried out by specialized personnel.

Periodic maintenance must be carried out outside of those carried out due to possible breakdowns, which always require immediate intervention.

## 13 Disposal

At the end of use, for the disposal of the servo control it is necessary to disassemble the entire assembly and divide the details according to the materials they are made of, using the tables attached to the construction drawings, then dispose of the details referring to current legislation.

Disassembly operations must be carried out by specialized personnel equipped with all processing and safety equipment. **WARNING! Inside the servocontrol there are compressed springs. see CHAPTER 5.** -

Therefore, during disassembly, for the disposal of the components, all safety equipment must be provided that does not allow the upper head to move away suddenly from the lower head once the fixing screws of the servocontrol heads have been removed.

## 14 Warranty

Each servo control is tested before leaving the factory. At the customer's request, the test certificate can be issued. The customer can inspect and test the material himself at our factory before shipping. This inspection is considered final. All charges relating to special tests or requests from the customer are borne by the customer.

Our liability is limited to the replacement or repair of parts that present defects in materials or construction, within a period of 12 months from shipment and used in normal operating conditions. This commitment excludes any other obligations.

As soon as the actuator is removed from its original packaging, our liability for damage to people and / or things during the installation and / or maintenance phases lapses.

All transport and accessory costs are however charged to the customer. ITALVALVOLE® S.A.S. reserves the right to interrupt or change or modify the characteristics and construction of any of its products without incurring any obligation to replace or install the modified parts on the products already supplied.

\*\* by maneuver is meant the change of position greater than the stroke value divided by 10.

### **WARNINGS:**

The safety conditions cannot be guaranteed and malfunctions cannot be attributed to the servo controls if:

- disassembly, reassembly, maintenance operations are not carried out following the procedures described in the use and maintenance manual.
- original spare parts are not used.

It is forbidden to remove pages from this document or make corrections.

In case of controversies, the revision of the authentic manual is the one in Italian.

ITALVALVOLE® S.A.S. reserves the right to make changes and / or changes to its product and related documentation without notice. All updated manuals are available on the website [www.italvalvole.com](http://www.italvalvole.com)

It is known that some components may be of non-Italian origin.

The use of the manual does not exempt from compliance with applicable laws.