

INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

NLR REGULATING SEAT VALVE



c/Telers, 54 Apto. 174
E-17820 Banyoles - Girona (Spain)



Original Manual
10.210.30.06EN
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EC DECLARATION OF CONFORMITY

(in accordance with Directive 2006/42/EC, Annex II, Part A)

The Manufacturer:

c/ Telers, 54
17820 Banyoles (Girona) - SPAIN

Hereby declares, that the product:

REGULATING SEAT VALVE	NLR
Name	Type

conforms to the specifications of the Council Directive:

Machine Directive 2006/42/CE, and complies with the essential requirements of the Directive and Harmonised Standards:

UNE-EN ISO 12100-1/2:2004
UNE-EN 953:1997
UNE-EN ISO 13732-1:2007

Pressure Equipment Directive 97/23/EC: the abovementioned equipment has been designed and manufactured in accordance with the requirements of this Directive.

Max. operating Pressure: DN-25/1" to DN-100/4" = 10 bar

Diameter: DN-25

Equipment category: SEP = Sound Engineering Practice, determined according to Article 3 Section 1.3.a, first paragraph Annex II, Table 6

This material SHALL NOT carry CE marking.

Diameter: DN-25 < X < ó = DN-100

Equipment category: Category I, determined according to Article 3, Section 1.3.a, first paragraph Annex II, Table 6

This material SHALL carry CE marking.


Conformity Assessment Module: Module A

In compliance with **Regulation (EC) 1935/2004** relating to materials and articles intended to come into contact with food (repealing Directive 89/109/EEC), the materials in contact with the product do not transfer their constituents to the product in quantities which could endanger human health.

Declaration of Incorporation (Directive 2006/42/EC, Annex II, Part B):

The abovementioned equipment must not be put into service until the machine into which it is to be incorporated has been found and declared to be in conformity with the provisions of the Machine Directive.

Banyoles, 2013


 Marc Pons Bague Technical Manager

1. Safety

1.1. INSTRUCTION MANUAL

This instruction manual contains basic indications that should be fulfilled during the installation, start-up, and maintenance of this product.

The information published in the instruction manual is based on updated data. INOXPA reserves the right to modify this instruction manual without prior notice.

1.2. INSTRUCTIONS FOR START-UP

This instruction manual contains essential and useful information for the correct operation and maintenance of the valve.

The safety instructions detailed in this section as well as all the special measures and recommendations included in the other sections of this manual must be observed and fulfilled. These instructions must be kept in a safe location near the installation area.

1.3. SAFETY

1.3.1. Warning symbols



Danger for people in general



Danger of injury caused by moving equipment parts



Electric hazard



Danger! Caustic or corrosive agents



Danger! Suspended loads



Danger for the correct operation of the equipment



Mandatory to ensure safety at the workplace



Mandatory use of safety goggles

1.4. GENERAL SAFETY INSTRUCTIONS



Read the instruction manual carefully before installing and starting up the valve. Contact INOXPA in case of doubt.

1.4.1. During installation



The *Technical Specifications* in Section 8 should always be observed.

The installation and use of the valve must always be carried out in accordance with applicable health and safety regulations.

Before starting up the valve, verify that it is correctly assembled and that the shaft is perfectly aligned. An incorrect alignment and/or excessive force used when installing the valve may cause serious mechanical problems in the valve.

1.4.2. During operation



The *Technical Specifications* Section 8 should always be observed. Under no circumstances can the specified limit values be exceeded.



NEVER touch the valve and/or the pipes that are in contact with the liquid during operation. There is a risk of burns when working with hot products.



The valve contains parts with linear movement. Never put the hands or fingers on the closing area of the valve. This can cause serious injuries.

1.4.3. During maintenance



The *Technical Specifications* in Section 8 should always be observed.

NEVER disassemble the valve until the pipes have been emptied. Bear in mind that the liquid in the line may be dangerous or extremely hot. Consult the regulations in effect in each country for these cases.

Do not leave loose parts on the floor.



All electrical work must be carried out by authorised personnel.

1.4.4. Compliance with the instructions

Any failure to comply with the instructions may impose a risk for the operators, the environment and the machine, and may ultimately result in the loss of the right to claim damages.

This non-compliance may result in the following risks:

- Failure of important machine/plant functions.
- Failure of specific maintenance and repair procedures.
- Possible electrical, mechanical and chemical hazards.
- Risk to the environment due to the type of substances released.

1.5. WARRANTY

Any warranty will be void immediately and lawfully, and, in addition, we will request compensation for any claims of civil liability presented by third parties, in the following cases:

- The installation and maintenance work has not been carried out according to the instructions in this manual.
- The repairs are not carried out by our personnel or have been carried out without our written authorisation.
- The parts used are not INOXPA genuine parts.
- Modifications have been carried out on our material or equipment without written authorisation.
- The material or equipment has been improperly used, has been used negligently, or has not been used according to the instructions and their intended use as specified in this manual.

The general conditions of delivery that are already in your possession are also applicable.

Please do not hesitate to contact us in case of doubts or if further explanations are required regarding specific data (adjustments, assembly, disassembly, etc.).

2. Table of contents

1. SAFETY	4
1.1. Instruction manual.....	4
1.2. INSTRUCTIONS FOR START-UP.....	4
1.3. Safety	4
1.4. General safety instructions.....	4
1.5. Warranty	5
2. TABLE OF CONTENTS	6
3. DELIVERY AND INSTALLATION	7
3.1. Checking the shipment	7
3.2. Delivery and unpacking	7
3.3. Identification.....	8
3.4. Placement	8
3.5. Direction of flow.....	9
3.6. Installation	9
3.7. Inspections and checks.....	9
3.8. Welding	10
3.9. Air connection.....	10
4. START-UP	11
4.1. Regulating valve applications	11
4.2. Start-up.....	11
4.3. Operation	11
5. OPERATING PROBLEMS: CAUSES AND SOLUTIONS.....	12
6. MAINTENANCE	13
6.1. General considerations	13
6.2. Maintenance	13
6.3. Cleaning	14
7. ASSEMBLY AND DISASSEMBLY.....	15
7.1. Disassembly / Assembly of the single-seat valve (NLR type).....	15
7.2. Disassembly / Assembly of the manually operated single-seat valve (NLRM type)	16
7.3. Disassembly / assembly of the actuator	17
8. TECHNICAL SPECIFICATIONS	18
8.1. Regulating valve dimensions.....	19
8.2. Exploded view and parts list.....	20

3. Delivery and Installation

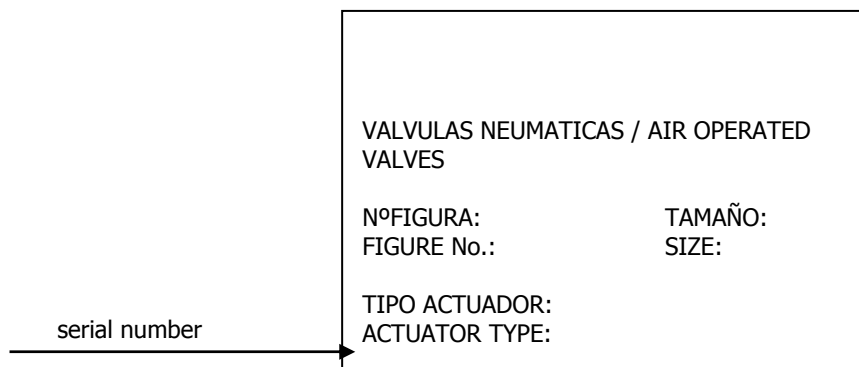
3.1. CHECKING THE SHIPMENT

The first thing to do on receiving the valve is to verify that it matches the delivery note.

INOXPA inspects all the equipment before packing, although it cannot guarantee that the goods will arrive intact to the user.

For this reason, the valve received and any other article should be checked and, if it is found not to be in good condition and/or not all parts are included, the carrier should submit a report as soon as possible.

Each valve has a manufacturing number engraved. Indicate the manufacturing number in all documents and correspondence.



3.2. DELIVERY AND UNPACKING



INOXPA will not be responsible for inappropriate unpacking of the valve and its components.

3.2.1. Delivery:

Check that all the parts indicated in the delivery slip are present.

- Complete valve
- Its components (if supplied)
- Delivery note
- Instruction manual

3.2.2. Unpacking:

- Remove all traces of packing materials from the valve or its parts
- Inspect the valve or its constituent parts for possible damage caused during transport
- Avoid any possible damage to the valve and its components

3.3. IDENTIFICATION

Family

Code

W013 0 – **0 06 52 050 1**

TYPE OF CONNECTION
0 – DIN 11851
1 – OD ASME

CONNECTIONS
0 – S/S
1 – M/M
7 – CL/CL

MATERIAL
06 - AISI 316L

SEAL MATERIAL
52 - EPDM
40 – NBR
80 – FPM

NOMINAL DIAMETER
025 - DN 25 (DN 1")
040 - DN 40 (DN 1 1/2")
050 - DN 50 (DN 2")
063 - DN 2 1/2"
065 - DN 65
076 - DN 3"
080 - DN 80
100 - DN 100 (DN 4")

VALVE ACTUATOR
1 – Manually operated
1 – Spring closure (NC)
2 – Double acting
3 – Spring opening (NO)

SHUT-OFF VALVE
W013 – NLR



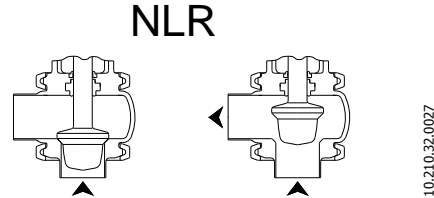
The buyer or user will be responsible for the assembly, installation, starting and operation of the valve.

3.4. PLACEMENT

Place the valve in such a way as to facilitate inspections and checks. Leave sufficient space around the valve for appropriate inspection, removal and maintenance (See Section 3.8.1)

3.5. DIRECTION OF FLOW

The recommended direction of flow of the product passing through each of the valve types is indicated below. Following these indications will prevent, as far as possible, any pressure surges and the consequences thereof, caused during single-seat valve closing operations. The recommended direction of flow is always contrary to the valve closing movement, that is to say, the valve shaft always works against the fluid pressure when closing the valve.



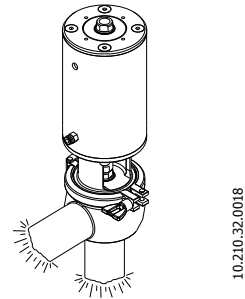
3.6. INSTALLATION

Once the desired installation location has been defined, the valve can be connected to the pipe by welding the valve body to it or by means of accessories (fittings). In the latter case, do not forget to install the appropriate gaskets and to tighten the joints well.

Before welding the valve body to the pipework, disassemble the valve to prevent damage to the seals.

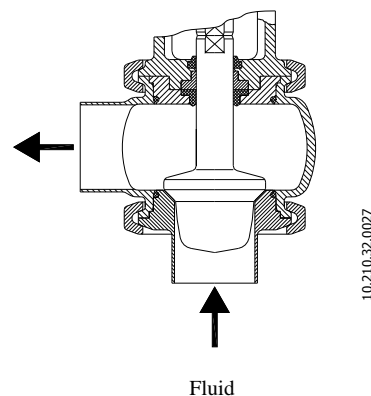
Excessive stress should be avoided during the installation of the valves, and special attention should be given to the following:

- Vibrations that may occur during installation
- Expansion of the pipes when hot fluids circulate through them
- The weight that the pipes can withstand
- Excessive welding current



3.7. INSPECTIONS AND CHECKS

- Check the following before use:
- Check that the clamps and the nuts are well tightened.
- Open and close the valve (by applying compressed air to the actuator or manually if a handle is available) several times to ensure that it operates correctly and check that the equal percentage plug fits smoothly against the valve body.



3.8. WELDING



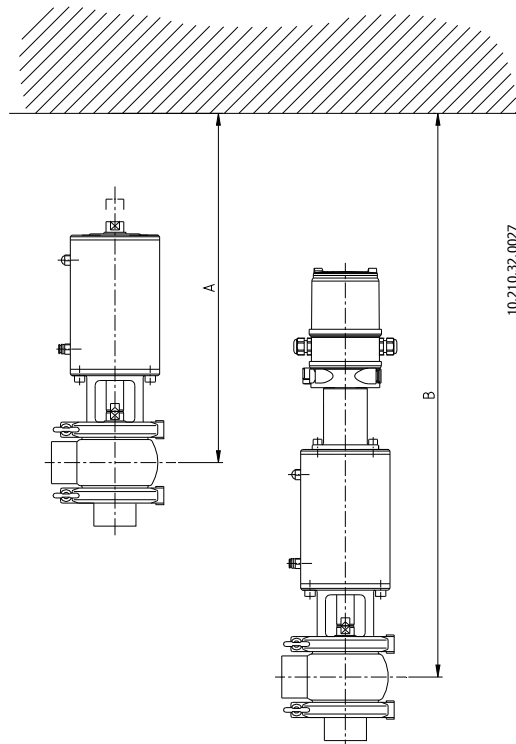
Any welding work may only be carried out by qualified personnel that has been suitably trained and equipped with the necessary means to carry out this work.

Disassemble the valve before starting the welding work.

3.8.1. Regulating valve with welded connection

- Disassemble the valve as indicated in Section 7. *Assembly and Disassembly*
- Weld the valve body or the lower valve port to the pipework. It is advisable to use fittings to connect one of the valve bodies in order to facilitate disassembly of the valve at a later stage.
- When welding the valve body, it is very important to maintain the minimum distance (dimension A) which will allow disassembly of the valve for future checks and replacement of valve parts (e.g. seals, springs, etc.), if required. It is important to identify if the valve is fitted with a control head (dimension B) and increase this distance if using the display on the head is required.

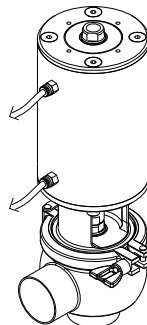
DN	A	B
25 – 1"	330	600
40 – 1½"	350	620
50 – 2"	440	710
65 – 2½"	510	780
80 – 3"	530	800
100 – 4"	585	855



3.9. AIR CONNECTION

- Connect and check the air fittings as required; double-acting or single-acting
- INOXPA valves are supplied with Ø6 tube connections and with a silencer in the case of S/E actuators.
- Ensure that the quality of the compressed air is in accordance with the technical specifications outlined in Section 8.

Pneumatic connections R
1/8" (BSP) thread



4. Start-up

The start-up of the valve can be performed provided the instructions in Section 3 – *Delivery and Installation* have been followed.

4.1. REGULATING VALVE APPLICATIONS

Regulating valves use an equal percentage plug for the control of fluids in an installation.

4.2. START-UP



Before operating the valve, the persons responsible should be duly informed about the operation of the valve and the safety instructions to follow. This instruction manual must be available to this personnel at all times.

The following should be taken into consideration before starting up the valve/actuator:

- Check that the pipes and the valve are completely clean and free from any welding residues or other foreign matter. Proceed to clean the system if required.
- Verify the smooth operation of the valve. If necessary, lubricate with special grease or soapy water.
- Check for possible leaks and verify that all the pipes and connections are tight and leak-free.
- If the valve was supplied with an actuator, ensure that the alignment of the valve shaft with the actuator shaft allows for smooth motion.
- Check that the compressed air pressure at the intake to the actuator is that indicated in the *Technical Specifications*.
- Ensure that the quality of the compressed air is in accordance with the technical specifications outlined in Section 8.
- Actuate the valve.

4.3. OPERATION



Do not modify the operating parameters for which the valve has been designed without prior written authorisation from.

Do not touch the moving parts of the coupling between actuator and valve when the actuator is connected to the compressed air supply.



Burn Hazard! Do not touch the valve or pipes when hot fluids are circulating through them or when cleaning and/or sterilisation is being carried out.

5. Operating problems: causes and solutions

PROBLEM	CAUSE / EFFECT	SOLUTION
JERKING OF THE VALVE PLUG	The seal or guide bushing are worn out, deteriorated, or blocked.	<ul style="list-style-type: none"> • Replace the seals. • Replace the seals with others of different material and better suited for the product. • Lubricate with soapy water or lubricant compatible with the material of the seal and with the product.
	Insufficient air pressure.	<ul style="list-style-type: none"> • Replace the actuator with a larger one. • Increase the compressed air pressure.
	Incorrect configuration of the head.	<ul style="list-style-type: none"> • Adjust head parameters according to needs.
THE VALVE / DETECTOR DOES NOT OPEN / CLOSE	<p>Actuator spring in bad condition and/or jammed (dirt)</p> <p>Excessive pressure on the valve plug</p>	<ul style="list-style-type: none"> • Replace spring (clean). • Reduce pressure.
PRESSURE SURGE	The flow direction is the same as closing-movement direction.	<ul style="list-style-type: none"> • Flow direction must be contrary to the closing movement • Use secondary air on the spring side.

6. Maintenance

6.1. GENERAL CONSIDERATIONS

This valve, just like any other machine, requires maintenance. The instructions in this manual cover the identification and replacement of spare parts. The instructions are aimed at maintenance personnel and those responsible for the supply of spare parts.



Carefully read Section 8. *Technical Specifications* .

All replaced material should be duly disposed of/recycled according to the directives in effect in each area.

Assembly and disassembly of the valves must only be carried out by qualified staff.

Before starting any maintenance work, ensure that the lines are not pressurised.

6.2. MAINTENANCE

The following is recommended for correct maintenance:

- Regular inspection of the valve and its components
- Keep a record of the operation of each valve, noting any incidents
- Always have spare seals in stock

During maintenance, pay particular attention to the safety warnings indicated in this manual.



The valve and pipes should never be pressurised during maintenance.

The valve should never be hot during maintenance. Burn Hazard!

6.2.1. Maintenance of the seals

SEAL REPLACEMENT	
Preventive maintenance	Replace after twelve (12) months.
Maintenance after a leak	Replace at the end of the process.
Scheduled maintenance	Regularly check that there are no leaks and that the valve is operating smoothly. Keep a record of the valve. Use statistics to plan inspections.
Lubrication	During assembly, apply lubricants compatible with the seal material. See the following table.

SEAL MATERIAL	LUBRICANT	Class NLGI DIN 51818
NBR/ FPM	Klübersynth UH 1 64-2403	3
EPDM/ NBR/ FPM	PARALIQ GTE 703	3

The time interval between each preventive maintenance operation may vary according to the working conditions to which the valve is subjected: temperature, pressure, number of actuations per day, type of cleaning solutions used, etc.

6.2.2. Storage

The valves should be stored in an enclosed area, under the following conditions:

Temperature from 15°C to 30°C
Air humidity <60%

Outdoor storage of the equipment is **NOT** permitted.

6.2.3. Spare parts

To request spare parts, it is necessary to indicate the type of valve, the position and the description of the part which can be found in the section [Technical Specifications](#).

6.3. CLEANING



The use of aggressive cleaning products such as caustic soda and nitric acid may burn the skin.

Wear rubber gloves during all cleaning procedures.



Always wear protective goggles.

6.3.1. CIP (Clean-in-Place) cleaning

If the valve is installed in a system provided with a CIP process, its removal will not be required.

Cleaning solutions for CIP processes.

Only use clear water (chlorine-free) to mix with the cleaning agents:

a) Alkaline solution: 1% by weight of caustic soda (NaOH) at 70°C (150°F)

1 kg NaOH + 100 litres of water = cleaning solution

or

2.2 litres of 33% NaOH + 100 litres of water = cleaning solution

b) Acid solution: 0.5% by weight of nitric acid (HNO₃) at 70°C (150°F)

0.7 litres of 53% HNO₃ + 100 litres of water = cleaning solution



Check the concentration of the cleaning solutions; incorrect concentrations may lead to the deterioration of the valve seals.

To remove any traces of cleaning products, ALWAYS perform a final rinse with clean water at the end of the cleaning process.



Before beginning with the disassembly and assembly tasks, clean both the interior and exterior of the valve.

6.3.2. Automatic SIP (Sterilization-in-Place)

Steam sterilization is applied to all equipment including pigging.



Do NOT use the equipment during the steam sterilization process.

The parts/materials suffer no damage if the indications specified in this manual are observed.

No cold liquid can enter the equipment until the temperature of the equipment is below 60°C (140°F).

Maximum conditions during the SIP process with steam or overheated water

- a) Max. temperature: 140°C / 284°F
- b) Max. time: 30 min.
- c) Cooling: Sterile air or inert gas
- d) Materials: EPDM / PTFE (recommended)
FPM / NBR / VMQ (not recommended)

7. Assembly and disassembly



Proceed with caution. There is danger of personal injury.

Always disconnect the compressed air before beginning with the valve disassembly.



Never remove the valve clamps without first reading the instructions thoroughly.

Assembly and disassembly of the valves / actuator must only be carried out by qualified staff.

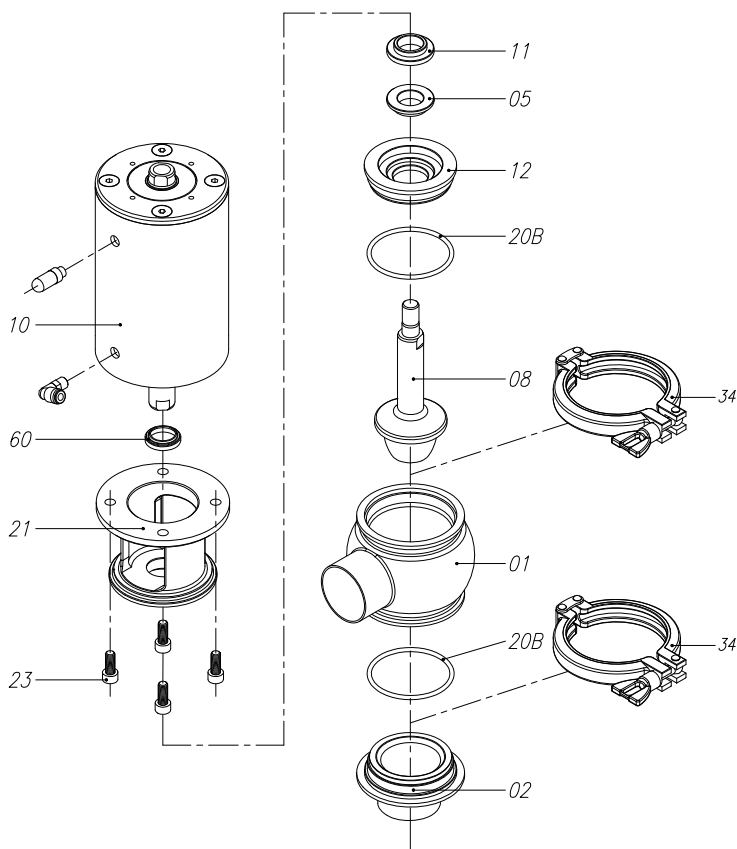
7.1. DISASSEMBLY / ASSEMBLY OF THE SINGLE-SEAT VALVE (NLR TYPE)

Disassembly

1. Apply compressed air to the actuator (10) in order to put the plug shaft (08) in the open position. (NC valve only)
2. Remove the upper clamp (34) and separate the actuator (10), lantern (21), shaft (08) and body cover (12) assembly from the valve body (01).
3. Release the compressed air from the actuator.
4. Separate the plug shaft (08) from the actuator shaft.
5. Remove the body cover (12) and the corresponding seals (20B and 05).
6. Remove the guide bushing (11).
7. Unscrew the Allen screws (23) on the lantern (21) and remove the scraper (60).
8. Remove the lower clamp (34) and separate the bottom port (02) and its seal (20B) from the valve body (01).

Assembly

9. Fit the scraper (60) and guide bushing (11) in the lantern (21).
10. Place the lantern (21) underneath the actuator and screw in the four Allen screws (23).
11. Lubricate the seals with soapy water, if necessary.
12. Fit the seals (20B and 05) on the body cover (12) and place this assembly on the lantern.
13. Join the plug shaft (08) with the actuator (10).
14. Apply compressed air to the actuator in order to put the plug shaft (08) in the open position. (NC valves only)
15. Mount the actuator (10), lantern (21), shaft (08) and body cover (12) assembly on the valve body (01) (can be rotated 360° to match users' needs), and secure it with the upper clamp (34).
16. Fit the gasket (20B) in the bottom port (02) and attach it to the valve (01) body using the lower clamp (34).
17. Release the compressed air from the actuator.



The following tools are required to disassemble the valve:

- 5 mm (DN-25/40), 6 mm (DN-50/80), and 10 mm (ND-100) Allen keys.
- Two 19 mm open end spanners



Proceed with caution. There is danger of personal injury.

Never remove the valve clamps without first reading the instructions thoroughly.

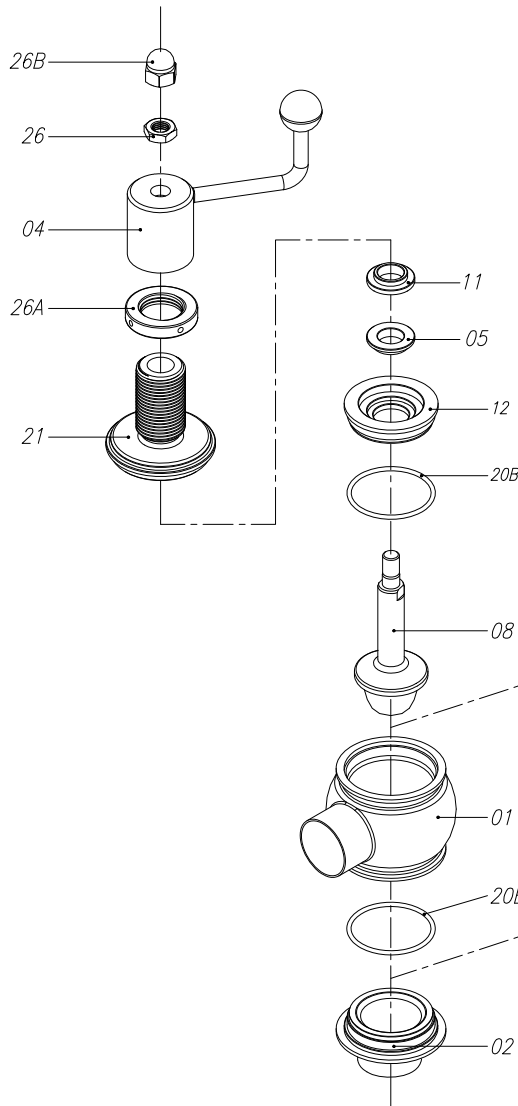


Assembly and disassembly of the valves / actuator must only be carried out by qualified staff.

7.2. DISASSEMBLY / ASSEMBLY OF THE MANUALLY OPERATED SINGLE-SEAT VALVE (NLRM TYPE)

Disassembly

1. Operate the handle (04) in order to put the plug shaft (08) in the open position.
2. Remove the upper clamp (34) and separate the handle (04), shaft (08) and body cover (12) assembly from the valve body (01).
3. Separate the plug shaft (08) from the handle by loosening the top nut (26B) and the hexagonal nut (26).
4. Remove the body cover (12) and the corresponding seals (20B and 05).
5. Remove the guide bushing (11) from the handle support (21).
6. Unscrew the handle (04) and the lock nut (26A) from the support (21).
7. Remove the lower clamp (34) and separate the bottom port (02) and its seal (20B) from the valve body (01).



Assembly

8. Place the lock nut (26A) and the handle (04) on the support (21).
9. Insert the guide bushing (11) in the support (21).
10. Fit the gaskets (20B and 05) on the body cover (12) and place this assembly on the support (21).
11. Lubricate the seals with soapy water, if necessary.
12. Attach the plug shaft (08) using the blind nut (26B) and the nut (26).
13. Operate the handle (04) in order to put the plug shaft (08) in the open position.
14. Mount the handle (04), shaft (08) and body cap (12) assembly on the valve body (01) (can be rotated 360° to match users' needs), and secure it with the upper clamp (34).
15. Fit the gasket (20B) in the bottom port (02) and attach it to the valve (01) body using the lower clamp (34).



The following tools are required to disassemble the valve:

- Two 24 mm open end spanners
- Two 19 mm open end spanners



Proceed with caution. There is danger of personal injury.

Never remove the valve clamps without first reading the instructions thoroughly.

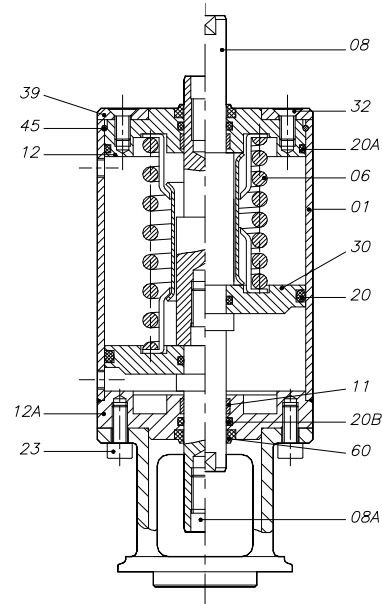


Assembly and disassembly of the valves / actuator must only be carried out by qualified staff.

7.3. DISASSEMBLY / ASSEMBLY OF THE ACTUATOR

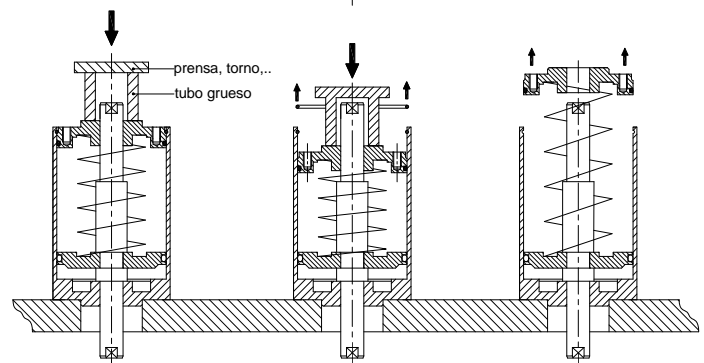
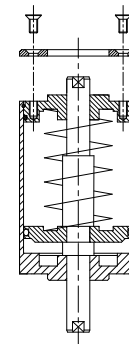
Disassembly

16. Loosen the 4 screws (32) and remove the back cover (39).
17. Place the actuator on the base of the press or in the lathe clamp. A thick tube and a plate must be used on the free end of the actuator.
18. Apply force to the plate. Once the cover (12) has been lowered 15-20mm, remove the retention ring (45).
19. Slowly reduce the force on the plate until the top cover is free (note that the spring is no longer applying pressure).
20. Remove the cover (12) and the internal components, the spring (06) and piston (30) assembly.
21. Remove the seals (20 and 20B) from the piston (30).
22. Remove the scraper (60), seal (20B) and the guide (11) from the actuator base (12A) and from the top cover (12).



Assembly

23. Fit the scraper (60), seal (20B) and the guide (11) on the actuator base (12A) and on the top cover (12).
24. Place the seals (20 and 20B) on the piston (30).
25. Place the piston (30) and the spring assembly (06) inside the cylinder (01).
26. Fit the top cover (12) on the cylinder.
27. Apply force to the plate to lower it by 15-20mm. Fit the retention ring (45)
28. Install the back cover (39) and secure it with the 4 screws (32).
29. Apply compressed air to verify the correct operation of the actuator.
30. If the valve is to be used as NO (normally open), turn the actuator by 180°.



The following tools are required to disassemble the actuator.

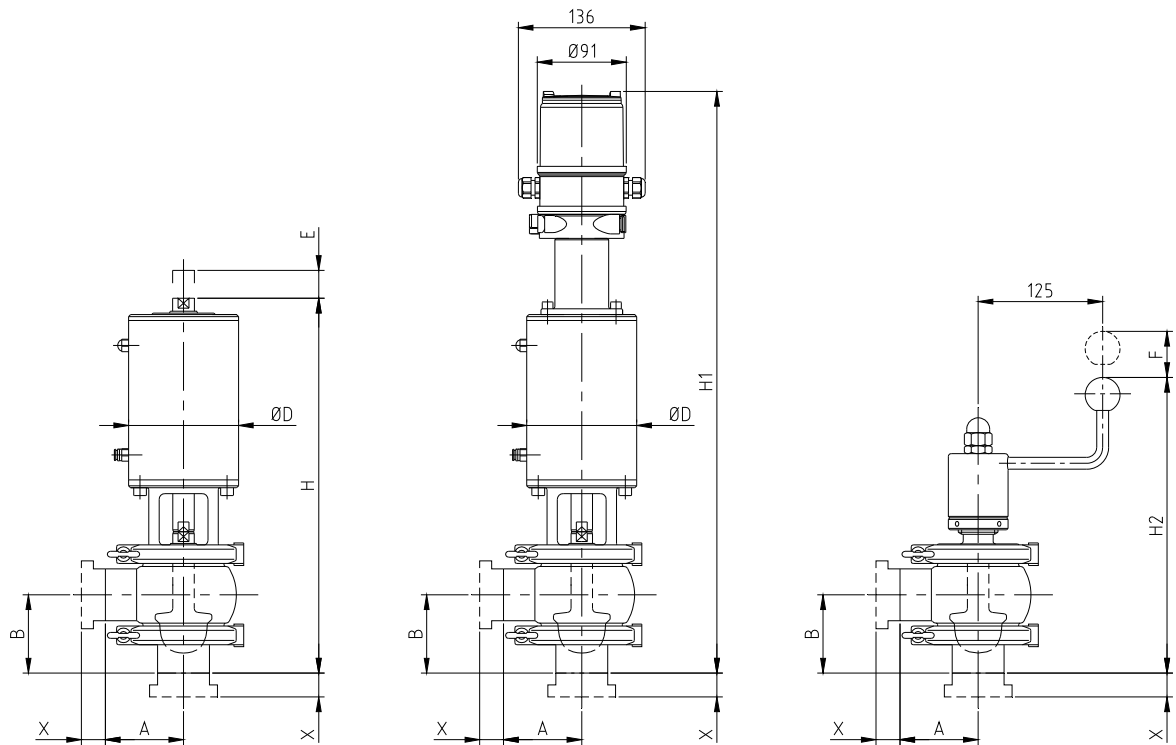
- 5 mm (DN-25/40), 6 mm (DN-50/80), and 10 mm (ND-100) Allen keys.
- Screwdriver (to remove the retention ring).
- Press or lathe (to compress the spring and open the actuator).

8. Technical specifications

GENERAL DATA FOR THE VALVE			
Maximum operating pressure	DN-40/100	10 bar	
Minimum operating pressure	Vacuum		
Maximum operating temperature	121°C (250 °F) Standard EPDM seals (other seal materials supplied for higher temperatures)		
Compressed air pressure	6-8 bar		
Compressed air quality	In accordance with DIN/ISO 8573.1 <ul style="list-style-type: none"> ○ <u>Solid particle content</u>: Class 3 quality / Max. particle size 5 micron / Max. particle density 5 mg/m³ ○ <u>Water content</u>: Class 4 quality / max. dew point +2°C. If the valve is used at higher altitudes or at low ambient temperatures, the dew point must be adapted accordingly ○ <u>Oil content</u>: Class 5 quality, preferably oil-free / max. 25 mg oil per 1 m³ air 		
Compressed air connection	R1/8" (BSP)		
Compressed air consumption (litres/cycle)	DN	SE (single-acting)	DE (double-acting)
	25	0.13	0.26
	40	0.13	0.26
	50	0.29	0.58
	65	0.5	1
	80	0.5	1
	100	1.5	3

VALVE MATERIALS	
Parts in contact with the product	AISI 316L (1.4404)
Other steel parts	AISI 304 (1.4301)
Seals in contact with the product	EPDM (Standard) - NBR - VITON
Surface finish	In contact with the product: Ra ≤ 0.8 µm Exterior surfaces: machined finish (turned on lathe)
Type of connections	DIN 11851 (standard) Welding, FIL-IDF, BS-RJT, SMS, clamp, flanges, Macon.

8.1. REGULATING VALVE DIMENSIONS



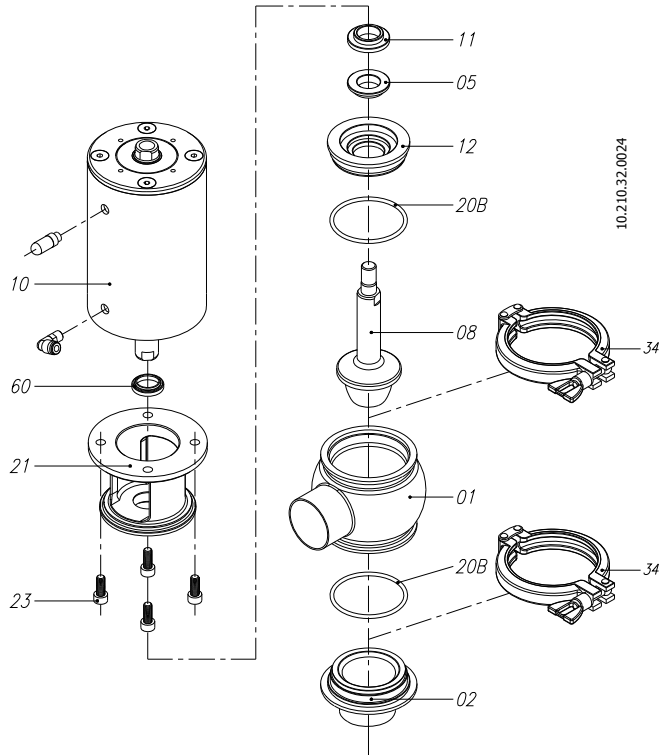
10.210.32.0027

DN	A	B	ØD	E	F	H	H1	H2	X		
									Macho-Male DIN	Tuerca-Nut DIN	Clamp DIN
25	50	55	87	22	22	310	515	258	22	15	21.5
40	60	65	87	22	22	330	535	274	22	15	
50	70	80	112.5	32	32	414	629	307	23	16	
65	80	90	145	36	36	471	690	325	25	17	28
80	90	100	145	36	36	492	711	343	25	17	
100	125	120	216	36	40	565	784	389	30	20	

DN	A	B	ØD	E	F	H	H1	H2	X		
									Macho-Male SMS	Tuerca-Nut SMS	Clamp OD
1"	50	55	87	22	22	310	515	258	19	15	13
1 1/2"	60	65	87	22	22	330	535	274	23	20	
2"	70	80	112.5	32	32	414	629	307	23	20	
2 1/2"	80	90	145	36	36	471	690	325	27	24	16
3"	90	100	145	36	36	492	711	343	27	24	
4"	125	120	216	36	40	565	784	389	35	30	

8.2. EXPLODED VIEW AND PARTS LIST

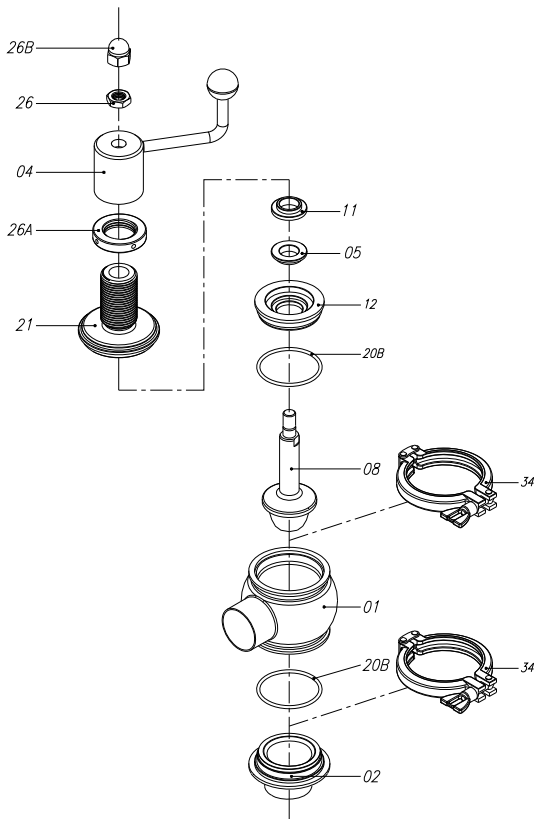
8.2.1. Exploded view and parts list FIG. NLR



• Fig. NLR pneumatic actuator

ITEM	DESIGNATION	MATERIAL	QUANTITY
01	Lower body L/T	AISI 316L	1
02	Bottom port	AISI 316L	1
05	Shaft seal	EPDM	1
08	Valve shaft	AISI 316L	1
10	Actuator	AISI 304	1
11	Guide bushing	PTFE	1
12	Body cover	AISI 316L	1
20B	O-ring	EPDM	2
21	Lantern	AISI 304	1
23	DIN 912 Allen screw	A2	4
34	Clamp	AISI 304	2
60	Scraper	NBR	1

8.2.2. Exploded view and parts list FIG. NLR MANUAL OPERATION



• Fig. NLRM Manual Operation

ITEM	DESIGNATION	MATERIAL	QUANTITY
01	Lower body L/T	AISI 316L	1
02	Bottom port	AISI 316L	1
04	Handle	AISI 304	1
05	Shaft seal	EPDM	1
08	Valve shaft	AISI 316L	1
11	Guide bushing	PTFE	1
12	Body cover	AISI 316L	1
20B	O-ring	EPDM	2
21	Handle support	AISI 304	1
26	Hexagonal nut	AISI 304	1
26A	Lock nut	AISI 304	1
26B	Cap nut	AISI 304	1
34	Clamp	AISI 304	2

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