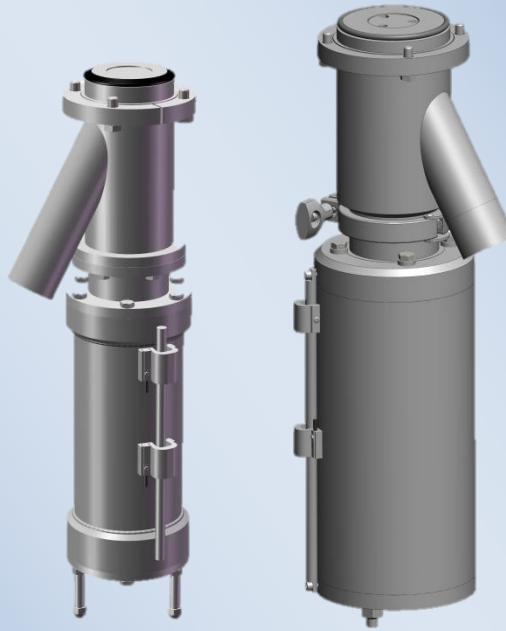
Powder feed valve

RT



Instructions

Reference: RT_NOT_EN

Version C

SERVINOX

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1 INTRODUCTION

1.1. The manufacturer

SERVINOX specialises in the manufacturing of process equipment for the brewing, food, cosmetic and chemical industries.

Expertise in process equipment:
Including tank protection, sampling, gas injection into liquid, and pipe scraping and cleaning with patented products.

SERVINOX is ***ISO 9001:2008*** certified and manufactures products that comply with the following standards and directives:

- Pressure Equipment Directive ***(PED) 2014/68/EU.***
- European Directive concerning equipment for potentially explosive atmospheres ***(ATEX) 2014/34/EC.***
- Sanitary standard for manufacturers US 3A.

We are an active member of the ***EHEDG France*** association (sanitary standard for European manufacturers).

1.2. Instructions

To ensure the integrity of the device and the safety of people, you must read the information contained in these instructions before installing and using the device.

Depending on the type of installation and fluid, specific directives and regulations apply and should be complied with.

In addition to these instructions, general instructions on safety at the workplace and protection should be applied. Environment protection regulations must also be complied with.

1.3. Equipment overview

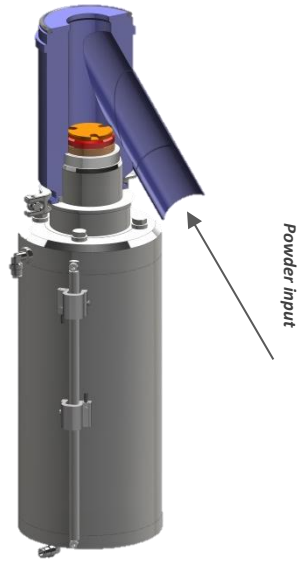
SERVINOX powder feed valves are designed to perform vacuum injection of any type of powder into the bottom of a tank.

This valve is a piping accessory pursuant to the article 4, paragraph 3 of European Directive 2014/68/EU.

This valve must be used on a circuit conveying dry substances and clear or viscous liquids from group 2 (Article 13 of European Directive 2014/68/EU).

How it works

This valve comprises a compressed air cylinder that opens the valve to allow***pressurised injection of the dry substance (powder)*** into a vacuum tank. NEP substances can be used in the valve.



The actuator comprises a self-closing spring which keeps the valve shut without air pressure, improving valve closure. The design of the valve allows for use of the device in an ATEX environment (category 2).

1.4. Signs

If you encounter problems that cannot be solved by these instructions, please ask for further information from the manufacturer or the equipment distributor.

You must mention the SERVINOX order and/or batch number starting with SVX for all special requests (spare parts, etc.).

2 SAFETY INSTRUCTIONS

This technical manual contains basic instructions that must be followed. You must therefore read this manual before installation and commissioning.

2.1. Indications and symbols

The following pictograms are designed to draw your attention to important aspects that affect the safety of people and the integrity of the equipment:

SYMBOL	DEFINITION
	Direct hazard to people
	Possible damage to the product or its environment
	Essential information
	Minimum number of staff required for certain operations. (The number of figures in the pictogram indicates the minimum number of persons).
	Minimum technical skill level. (the red number indicates the minimum level required).

Some jobs require special technical skills and qualifications, such as for corrective maintenance or work on electrical equipment.

There are three levels to indicate the technical skill required (knowledge of the equipment concerned, experience, training, etc.):

	WORKER'S PROFILE	SPECIFICATIONS
Level 1	**End user** with no technical knowledge.	**Default level** where there is no skill pictogram present. Permits only **ordinary use and routine maintenance**.
Level 2	Experienced **professional.**	Trained and **experienced**. Is **knowledgeable about the equipment and the technologies** used.

Level 3	The **manufacturer's staff**/product expert	**Work to be carried out exclusively by the manufacturer** of the equipment in question.

2.2. Safety of workers

Installation, testing, adjustment, maintenance and replacement must be performed:

- by qualified staff;
- in line with the recommendations and instructions set out in this manual;
- by incorporating provisions to ensure safety at the workplace, and the procedures and resources of the fitter, as well as the legal requirements concerning accident prevention, especially in the case of electrical equipment.

Failure to comply with these safety instructions may result in the loss of any right to claim for damages.

2.3. Intended use

Correct use

Check that the chosen device is suitable for its intended use using the certification documents supplied with it.

Incorrect use

The device must not be used for any purpose other than its intended use. The manufacturer shall not be held liable if the device is used incorrectly.

The device must not be used in excess of the following operating limits:

PARAMETER	LIMITS
Maximum acceptable pressure	6 bars
Min/max temperature	+10°C/120°C

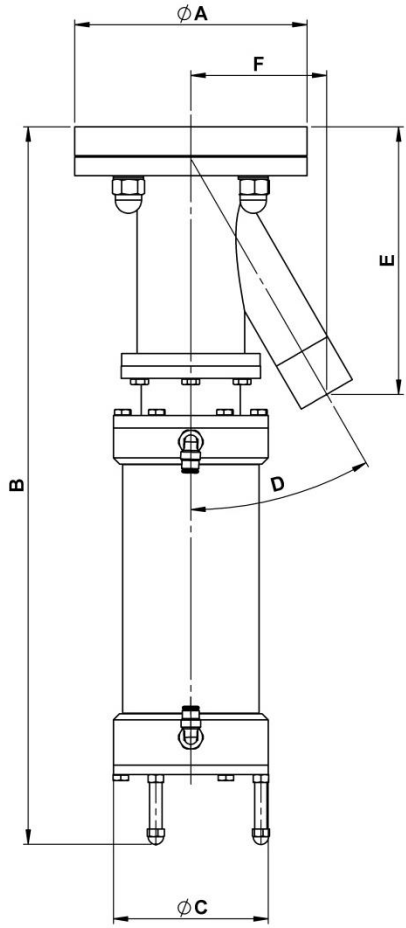
3 TECHNICAL SPECIFICATIONS

3.1. Features

SPECIFICATIONS	SERVINOX VALUES
Connection	*POWDER INPUT CONNECTION* Welding, socket, plug, clamp TANK CONNECTION: Servinox welding flange
Operating temperature	MIN: +10°C MAX: +120°C
Pressure	*TANK*: -1 bar to 3 bars MAX (single-acting actuator) -1 bar to 6 bars MAX (double-acting actuator) SUBSTANCE: 6 bars MAX ACTUATOR CONTROL AIR: 3 bars MIN/8 bars MAX
Materials	PARTS IN CONTACT WITH THE SUBSTANCE: Stainless steel 1.4404 (316L) OTHER PARTS: Stainless steel 1.4307 (304L) SEALS IN CONTACT WITH THE SUBSTANCE: EPDM, VITON, PU, PEEK, PTFE OTHER SEALS: EPDM, NITRILE

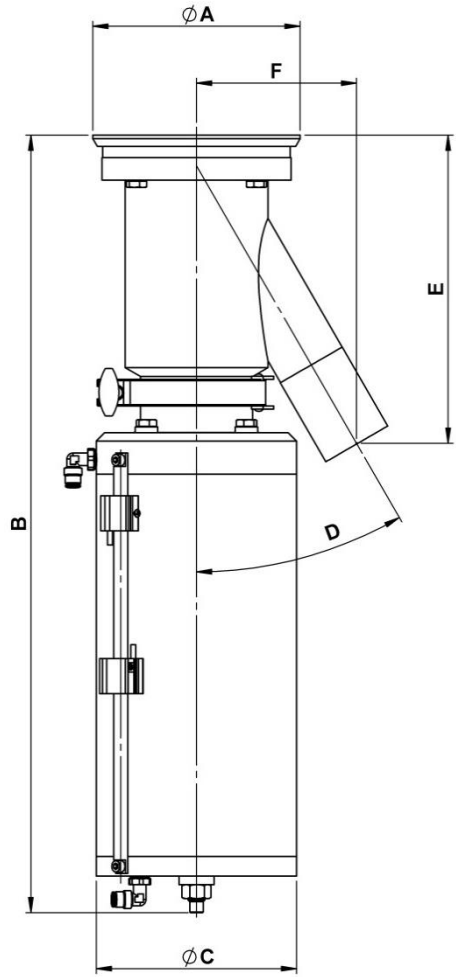
3.2. Dimensions

RT15, RT25 and RT38 valves



	ØA	B	ØC	D	L	F
RT15	90 mm	251 mm	60 mm	45°	62 mm	-
RT25	109 mm	370 mm	83 mm	45°	104 mm	-
RT38	123 mm	410 mm	100 mm	30°	165 mm	-

RT50 valves



	ØA	B	ØC	D	L	F
RT50	148 mm	554 mm	143 mm	30°	220 mm	115 mm

3.3. ATEX option

Overview

ATEX 2014/34/UE ***version, zones 1 & 21, gas and powder.***

The ATEX version of the product does not alter the specifications of the product or its components by any means.

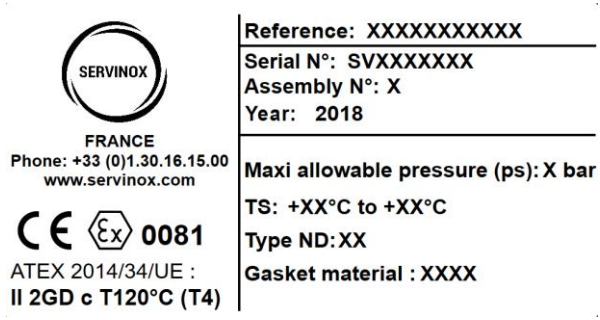
This device is designed to be used in surface equipment (group II).

The category 2 protection level is suitable for normal operation and for disruptions that occur on a regular basis and whose malfunctions are normally taken account of.

This device is designed for use in an environment with explosive atmospheres generated by mixtures of air and gas (G), vapour, fog, or mixtures of air and dust (D), which are likely to occur.

The maximum surface temperature is the same as the temperature of the fluid.

RT equipment complies with ATEX 1 and 21 zones and is affixed with a Servinox sticker like the one shown below:



4 COMMISSIONING

4.1. Transport/Reception/Handling

During transport, ensure that the device is protected from external hazards (impact, shock, vibrations, etc.)

On receipt, ensure:

- that ***the packaging is in good condition;***
- that the device ***is delivered as ordered;***
- that the device ***has not been damaged;***

If the device is damaged, do not assemble onto equipment and machinery. Contact the manufacturer or your distributor.

4.2. Storage

If the device is not fitted immediately after delivery, it should be ***stored carefully according to the guidelines***.

It must be stored in its original packaging, in a covered area protected from dirt, rain, snow and insects, and sheltered from impact.

The device can be stored safely at a temperature between 5°C and 40°C, with relative air humidity of < 50%.

If the device is stored at temperatures below zero, consider the resistance of the materials to the cold (e.g. the seals).

If the device is stored for more than a year, the seals should be replaced before commissioning.

4.4 Installation

Overview

Before using the device, the user must ***visually inspect the device to ensure that it is in good physical condition, e.g. no corrosion, no packaging residue, etc.***

If the fluid is harmful, toxic, ignitable, etc., fit discharge piping to the equipment that leads to a protected area.

However, the user should ensure that these substances are compatible with the seals and materials before use.

The device must be fitted to isolated and inert equipment only (no pressure and no risk of fluid transfer).

Workers

The operations described below must be performed by ***qualified and experienced staff.***

Staff must be supplied with personal protection equipment against hazards linked to leakage or contact with the fluid (burns, noise, sprays, etc.)

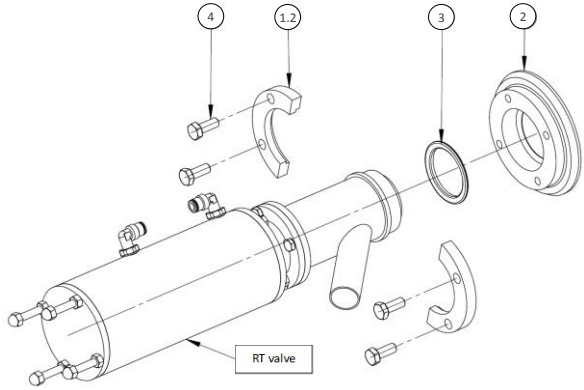
- ***Preparing the tank***:

The tank must be drilled in line with the outside diameter of the flange with no clearance.

- ***Preparing the flange***:

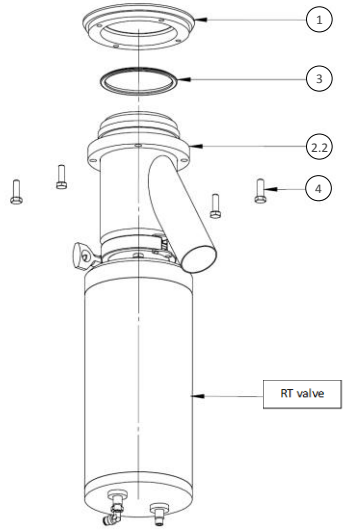
RT15, RT25, and RT38 powder valves

The RT valve must be dismantled from the welding flange (Ref. 2) with the two semi-flanges (Ref. 1.2) and screws (Ref. 4). Remove the seal (Ref. 3).



RT50 powder valve

The RT valve must be dismantled from the welding flange (Ref. 1) with the rotating flange (Ref. 2.2) and screws (Ref. 4). Remove the seal (Ref. 3).



Check and take note of the interior dimensions of the flange at every diameter so that these can be checked again after welding.

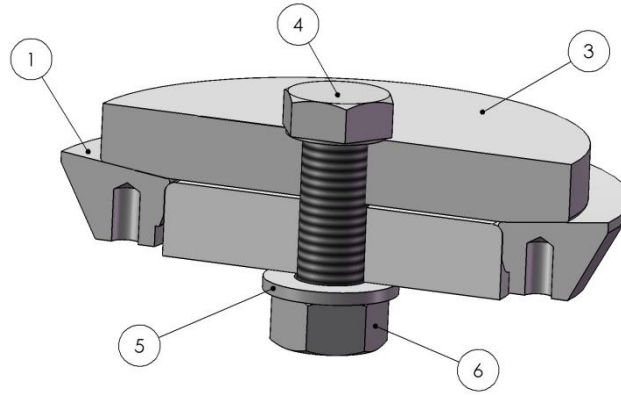
- ***Preparing the flange for welding***:

1) The flanges must be fitted in their intended positions to ensure correct flow of the fluid.

2) ***Check and clearly identify the tapped holes*** to assemble the device.

3) Nonetheless, flanges must be assembled to ensure that they are flush with the inside wall.

The SERVINOX welding pad (Ref. 3) must be used, which will need to be ordered with the flange (Ref. 1) so that there is minimum risk of significant warping during welding.



4) ***Insert a pad inside the flange to prevent warping during welding.***

- ***Welding the flange***:

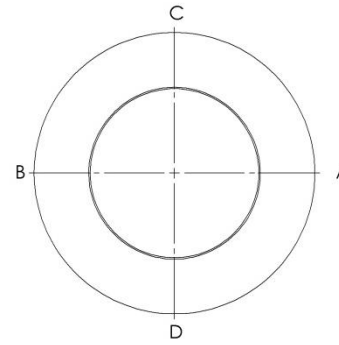
The device must be welded by qualified staff in accordance with the directives in force in the country of installation. The weld must be free from impurities and must be made in sanitary conditions.

After welding and/or polishing, the device must be cleaned of any residue, dust, etc.

1) Align the flange with the inside of the tank.

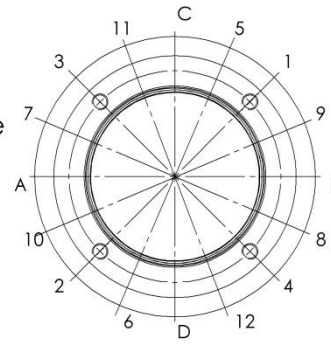
2) ***Align the flange inside*** the tank by following: A, B then adjust if needed, and then align C and D.

Vue intérieure
View from inside

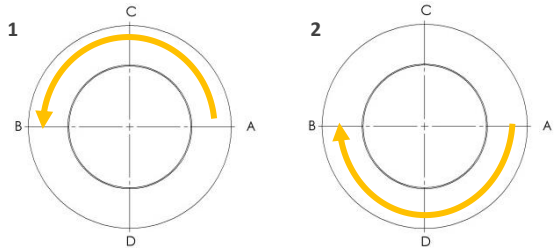


3) ***Align the flange from the outside*** in 12 points using an inerting system inside: follow the welding diagram from 1 to 12 below.

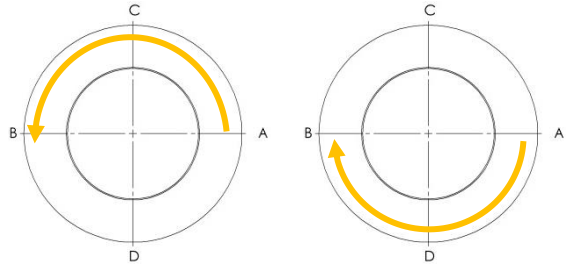
Vue extérieure
View from outside



4) ***Weld*** (using the lowest possible amperage) from the outside between A, C and B then between A, D and B.



5) Create a weld cap inside the tank between A, C and B, then between A, D and B.



Do not remove the welding pad until the weld has cooled naturally.

- ***<u>After welding</u>***:

1) Wait for the flange to cool naturally.
2) Remove the welding pad
3) ***Check all inside diameters to ensure that these are unchanged.***
4) ***Polish the inside of the tank following the desired Ra, making sure to never touch the seal bearing.***
5) ***Ensure that there are no other particles present.***
6) Reassemble the RT valve, being careful to fit the seal properly (Ref. 3).

- ***Preparing and welding the piping***:

The device must be welded by qualified staff in accordance with the directives in force in the country of installation. The weld must be free from impurities and must be made in sanitary conditions.

After welding and/or polishing, the device must be cleaned of any residue, dust, etc.

1) Use a connection that can be dismantled earlier if welding a smooth outlet to facilitate maintenance work on the valve.
2) ***The valve entry must be facing down (unless specifically required otherwise).***
3) Disconnect the actuator from the valve body (see chapter, 'servicing and maintenance').
4) Weld the smooth outlet and clean the inside of the valve body
5) Mount the actuator onto the valve body (see chapter, 'servicing and maintenance')

Pneumatic connection of the actuator

The pneumatic connection of the cylinder is designed to accommodate a polyamide pipe of 6 mm on quick 1/4" T-shaped connections. Provide an air supply at a sufficient pressure/flow of MIN 3 bars/MAX 8 bars.

Detecting the position of the actuator's piston

The RT valve actuator has a magnetic insert in the piston and features a magnetic induction sensor system on the outside. These sensors are able to detect the valve's two positions (open/closed).

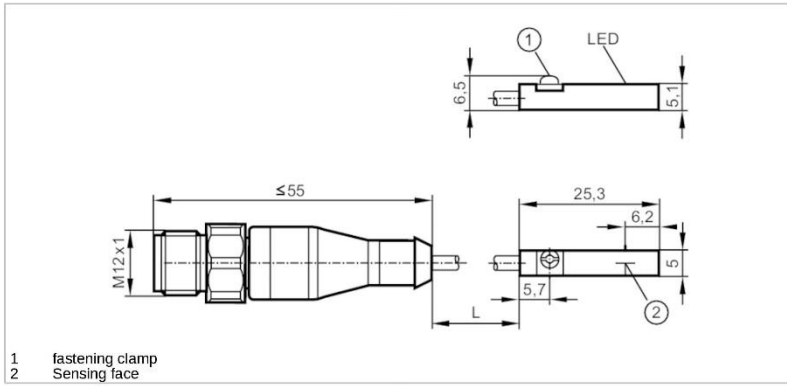
When starting up the device, check the following points:

- the position setting
- the sensors' electrical connection must comply with the regulations in force and the wiring guidelines specified in the sensor instructions (set out on the following pages).

MK5111

T-slot cylinder sensor

MKT3028BBPKG/G/0,3M/-H/US



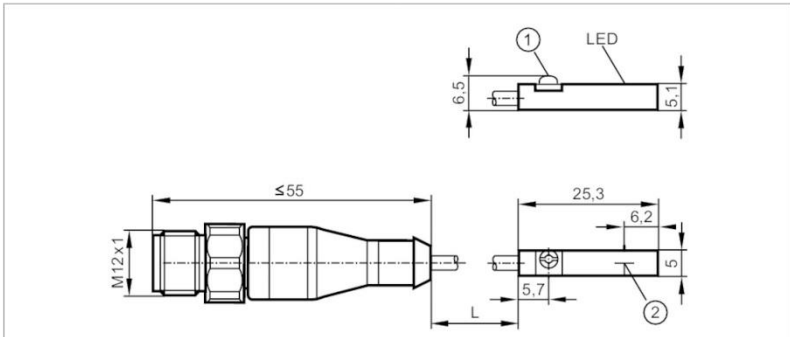
1 fastening clamp
2 Sensing face

Electrical data		
Operating voltage	[V]	10...30 DC; ("supply class 2" to cULus)
Current consumption	[mA]	< 10
Protection class		III
Reverse polarity protection		yes
Max. power-on delay time	[ms]	30
Outputs		
Electrical design		PNP
Output function		normally open
Max. voltage drop switching output DC	[V]	2.5
Permanent current rating of switching output DC	[mA]	100
Switching frequency DC	[Hz]	10000
Short-circuit protection		yes
Overload protection		yes
Detection zone		
Response sensitivity	[mT]	2.8
Travel speed	[m/s]	> 10
Accuracy / deviations		
Hysteresis	[mm]	1.5
Repeatability	[mm]	< 0.2
Operating conditions		
Ambient temperature	[°C]	-25...85
Protection		IP 65; IP 67; IP 69K

MK5111

T-slot cylinder sensor

MKT3028BBPKG/G/0,3M/-H/US



1 fastening clamp
2 Sensing face

Electrical data		
Operating voltage	[V]	10...30 DC; ("supply class 2" to cULus)
Current consumption	[mA]	< 10
Protection class		III
Reverse polarity protection		yes
Max. power-on delay time	[ms]	30
Outputs		
Electrical design		PNP
Output function		normally open
Max. voltage drop switching output DC	[V]	2.5
Permanent current rating of switching output DC	[mA]	100
Switching frequency DC	[Hz]	10000
Short-circuit protection		yes
Overload protection		yes
Detection zone		
Response sensitivity	[mT]	2.8
Travel speed	[m/s]	> 10
Accuracy / deviations		
Hysteresis	[mm]	1.5
Repeatability	[mm]	< 0.2
Operating conditions		
Ambient temperature	[°C]	-25...85
Protection		IP 65; IP 67; IP 69K

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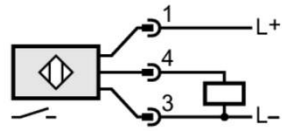
MK5111

T-slot cylinder sensor

MKT3028BBPKG/G/0,3M/-H/US

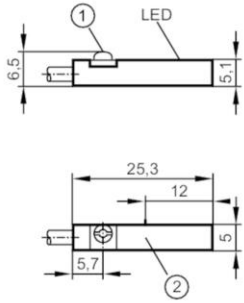
Connection



MK502A

T-slot cylinder sensor

MKT2020-N/--/A/6,0M/-H/1G/1D



1 fastening clamp
2 Sensing face

Electrical data		
Connection to switching amplifiers		yes
Switching amplifiers		connection to certified intrinsically safe circuits with the max. values: U = 15 V / I = 50 mA / P = 120 mW
Nominal voltage DC	[V]	8.2
Current consumption	[mA]	target not detected: ≤ 1; target detected: ≥ 2,2
Protection class		III
Outputs		
Electrical design		NAMUR
Output function		normally open
Switching frequency DC	[Hz]	2000
Detection zone		
Response sensitivity	[mT]	2
Travel speed	[m/s]	> 10
Accuracy / deviations		
Hysteresis	[mm]	1
Repeatability	[mm]	< 0.2
Operating conditions		
Ambient temperature	[°C]	-25...70
Protection		IP 65; IP 67

MK502A

T-slot cylinder sensor

MKT2020-N/-/A/6,0M/-H/1G/1D

Tests / approvals			
Approval		BVS 09 ATEX E164; IECEx BVS 09.0065	
ATEX marking		II 1G Ex ia IIC T4 Ga	
		II 1D Ex ia IIIC T135°C Da	
EMC		EN 61000-4-2 ESD	- kV CD / 8 kV AD
		EN 61000-4-3 HF radiated	10 V/m
		EN 61000-4-4 Burst	2 kV
		EN 61000-4-6 HF conducted	10 V
		EN 55011 emission	class B
MTTF	[years]	2142	
Safety classification			
Max. internal capacitance	[nF]	140	
Max. internal inductance	[µH]	400	
Mechanical data			
Weight	[g]	93.9	
Mounting		flush mountable	
Type of mounting		fastening clamp with combined slot / hexagon socket, width across flats 1.5	
Cylinder type		T-slot cylinders	
Dimensions	[mm]	25 x 5 x 6.5	
Materials		housing: PA; fastening clamp: stainless steel	
Displays / operating elements			
Display		switching status	1 x LED, yellow
Accessories			
Accessories (supplied)		rubber placeholder: 1 Cable clip: 1	
Remarks			
Pack quantity		1 pcs.	

MK502A

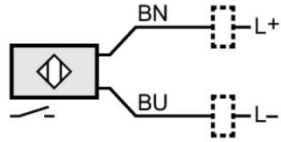
T-slot cylinder sensor

MKT2020-N/--/A/6,0M/-H/1G/1D

Electrical connection

Cable: 6 m, PVC; 2 x 0.14 mm²

Connection



	Core colours :
BN =	brown
BU =	blue

Pneumatic connection of the actuator

The pneumatic connection of the cylinder is designed to accommodate a polyamide pipe of 6 mm on quick 1/4" T-shaped connections. Provide an air supply at a sufficient pressure/flow of MIN 3 bars/MAX 8 bars.

The RT valve must be operated in a double-acting configuration to ensure quicker closure of the valve.

Detecting the position of the valve piston

The actuator's piston is fitted with a magnetic insert to detect the valve's two positions (open/closed). When starting up the device, check the following points:

- the sensors' electrical connection must comply with the regulations in force and the wiring guidelines specified in the sensor instructions (set out on the following pages).
- ***ATEX option***:
    - The RT valve must be earthed using braided cables connected to the body of the valve.
    - The user or fitter must ensure that all components making up the valve are equipotentially bonded before commissioning the device.
- Setting the open and closed positions of the RT valve.

5 USE

5.1. Inspection before commissioning

- ***RT15, RT25 and RT38 valves***: Check the condition of the seals (Ref. 5.15) and (Ref. 5.11); there must be no signs of impact or breakage. The seal (Ref. 5.15) must be fitted tightly around the piston rod (Ref. 5.5).
- ***RT50 valve***: Check the condition of the seals (Ref. 5.15) and (Ref. 5.14); they must show no signs of impact or breakage. The seal (Ref. 5.15) must be fitted tightly around the piston rod (Ref. 5.1.2).
- Ensure that there is no fluid leakage from the tank to the welding flange connection
- Ensure that there is no pneumatic leakage from the actuator
- Test the actuation of the cylinder (open/closed detection)

5.2. Adjustment

Any adjustments are to be carried out exclusively by the manufacturer of the equipment in question.

Contact SERVINOX or your distributor.

6 SERVICING AND MAINTENANCE

6.1. Overview

The device will require maintenance to ensure it continues to operate correctly.

An inspection should be carried out at regular intervals The first inspection interval of six months must be complied with.

Some properties of fluids (corrosive, aggressive, abrasive, residue, viscosity, etc.) and certain environmental conditions (climate, pollution, etc.) may require these inspection intervals to be reduced.

For the correct maintenance and guarantee of the device, SERVINOX provides spare parts. Specify the manufacturing number and product reference number on every order.

We provide pouches of wear parts (seals, etc.) and we suggest that you keep a few of these pouches in stock for quick maintenance work.

Contact SERVINOX for any help and advice on servicing and maintaining the device.

Maintenance precautions

Comply with the following instructions before carrying out any maintenance work:

- Isolate the device
- Depressurise the system
- The equipment must be empty
- The fluid must be cooled to ambient temperature
- Ventilate the conduits if the fluid is corrosive and aggressive

Workers

The operations described below be must be performed by ***qualified and experienced staff.***

Staff must be equipped with gloves, helmets and safety shoes.

6.2. Inspections and servicing

Mandatory periodic servicing:

Once a month:

- Clean the inside of the valve body to prevent build-up of dust that may form an explosive area.
- Check that there is no liquid or compressed air leakage
- Check tightness of screw connections
- ***RT15, RT25 and RT38 valves***: check the condition of the wiper seal (Ref. 5.15) and seal (Ref. 5.11)
- ***RT50 valve***: check the condition of the wiper seal (Ref. 5.15) and seal (Ref. 5.14)

Once a year:

- ***RT15, RT25 and RT38 valves:***
  - Replace all seals: (Ref. 3), (Ref. 5.11), (Ref. 5.13), (Ref. 5.14) and (Ref. 5.15).
  - Check for wear and tear on the cushions (Ref. 5.10), replace if necessary.
- ***RT50 valve:***
  - Replace all seals: (Ref. 3), (Ref. 5.14) , (Ref. 5.15), , (Ref. 5.17), (Ref. 5.18), and (Ref. 5.19) + the guide strip (Ref. 5.16)
  - Check for wear and tear on the cushions (Ref. 5.13 and 5.31), replace if necessary.

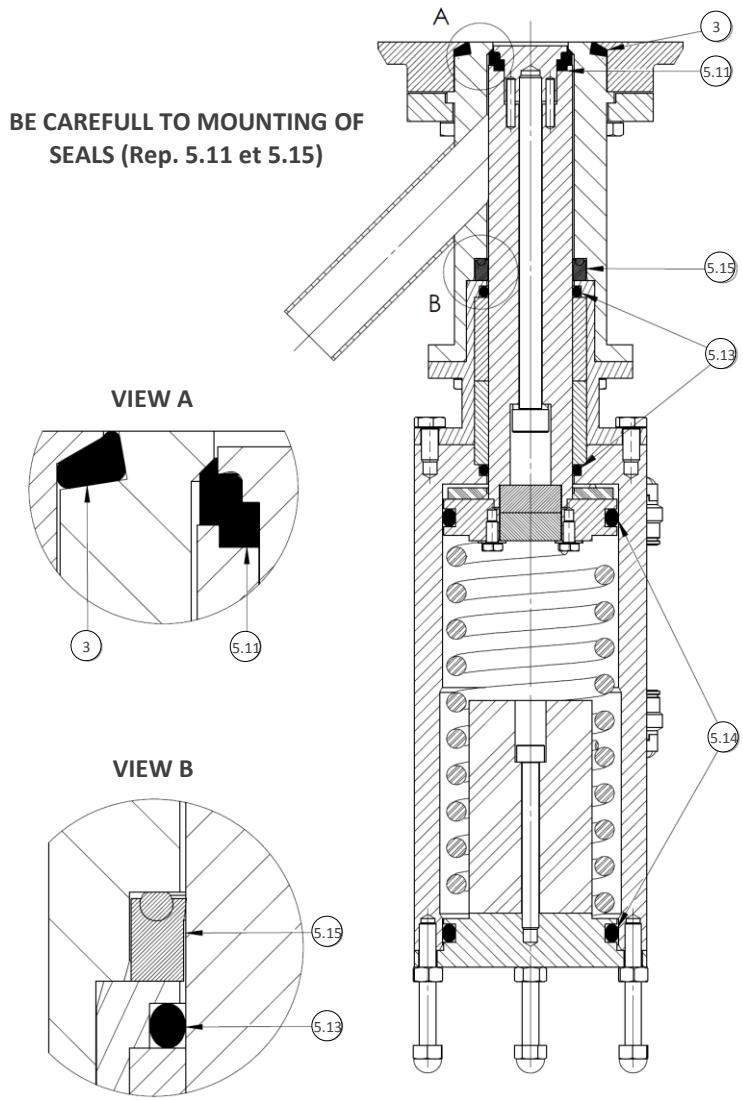
You should ensure that your substances are compatible with the seals and materials before use

We recommend that you record all maintenance and control operations carried out on the equipment in a table like so:

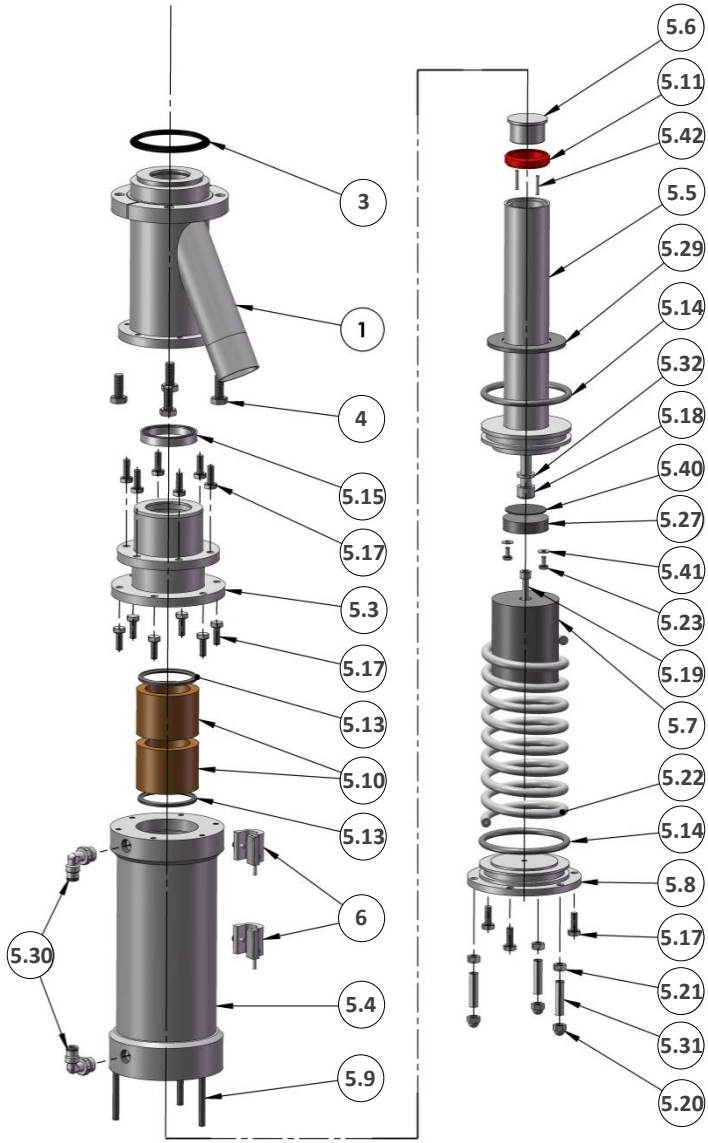
Date	Company	Name of worker:	Signature
PREVENTIVE MAINTENANCE			
Operations		**Others, Comments**	
CHECKS FOR CORRECT OPERATION AND GOOD WORKING ORDER			
Operations		**Others, Comments**	

6.3. RT15, RT25 AND RT38 maintenance operations

Fitting RT15, RT25 and RT38 seals



Exploded view of RT15, RT25 and RT38



List of RT15, RT25 and RT38 component names

REF.	NAME
1	Valve body
3	Seal
4	Screw or nut
5.3	Cross piece guide
5.4	Cylinder pipe
5.5	Piston rod
5.6	Upper piston
5.7	Stop
5.8	Cap
5.9	Pin
5.10	Cushion
5.11	Piston seal
5.13	Seal
5.14	Seal
5.15	Wiper seal
5.17	Screw
5.18	Screw
5.19	Screw
5.20	Dome nut
5.21	Nut
5.22	Spring
5.23	Screw
5.27	Magnet disc
5.29	Front stop
5.30	Pneumatic T-shaped connection
5.31	Pipe
5.32	Washer
5.40	Seal
5.41	Washer
5.42	Axle
6	Magnetic induction sensor

Inspecting the wiper joint (Ref. 5.15)

<u>To ensure the longevity of the valve</u>, the rod wiper seal (Ref. 5.15) and the seal (Ref. 5.11) should be inspected once a month. To do this, carry out the following:

1) Hold the actuator's piston rod (Ref. 5.5) in the retracted position (open valve position).
2) Take the actuator off the valve body (Ref. 1) by removing the screws (Ref. 5.17) screwed into the body (Ref. 1).
3) Pneumatically extract the actuator piston (valve in valve closed position)
4) Check that there is no air leakage around the piston rod (Ref. 5.5).
5) Check the condition of the seal (Ref. 5.15) and ensure that no substance residue has built up or congealed on the piston (Ref. 5.5) around the wiper seal.

The seal (Ref. 5.15) must be fitted tightly around the piston rod (Ref. 5.5).

If substance has congealed on the piston rod (Ref. 5.5) or there is air leakage around the piston rod (Ref. 5.5):

1) Dismantle and thoroughly clean the valve by following the RT valve dismantling instructions on the following page.
2) Carry out the following checks (if a fault is detected, replace the damaged components):
   - Check that there are no deep scratches on the piston rod (Ref. 5.5).
   - Check the condition of the rings (Ref. 5.10).
3) Replace the seals (Ref. 5.15, Ref. 5.13 and Ref. 5.14), then reassemble the RT valve.

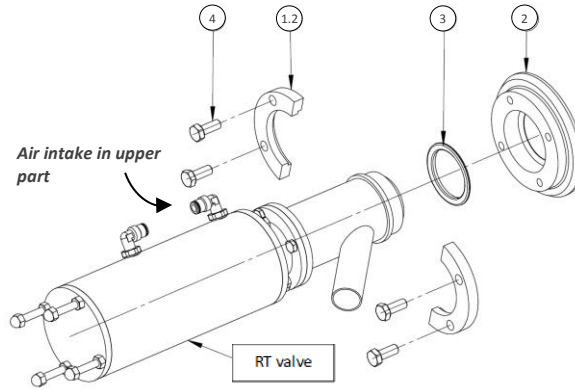
Dismantling RT15, RT25 and RT38 valves

Before carrying out any maintenance work on the device:
- Disconnect the air orifices.
- Disconnect the electric wires from the sensors.
- Ensure there is no pressure or fluid inside the tank.
- Remove the valve entry connection.

To dismantle the valve, follow the instructions below:

1) Remove the side duct connector.
2) Unscrew the screws (Ref. 4).
3) Remove the entire RT valve from the welding flange (Ref. 2).
4) Remove the seal (Ref. 3).
5) Place all equipment onto a workbench.

Never hold the cylinder tube by a clamp

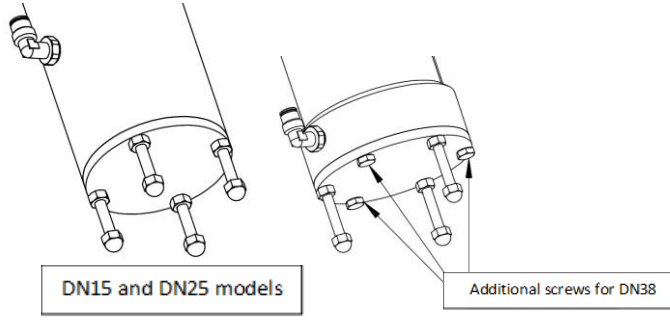


6) Attach a 6∅ compressed air pipe on the connector located in the upper part (see exploded view above), allow compressed air to flow in for the piston (Ref. 5.5) to retract into the actuator (open valve).
7) Remove the screws (Ref. 5.17) to disengage the valve body (Ref. 1).
8) Release the piston from its position by removing the compressed air that was let inside the cylinder
9) Remove the seal (Ref. 5.15).

10) Hold the cross piece guide in a soft jaw clamp by the lower part (Ref. 5.3).

11) Remove the screws (Ref. 5.17) (DN38 only) and the dome nuts (Ref. 5.20) with the pipes (Ref. 5.31).

When loosening the spring, do so with extreme caution.



12) Loosen the nuts (Ref. 5.21) until they are no longer in contact with the cap (Ref. 5.8). Now the spring is slack.

13) Take off the cap (Ref. 5.8) and remove the seal (Ref. 5.14).

14) Take out the spring (Ref. 5.22).

15) Remove the piston (Ref. 5.5) from the cylinder pipe (Ref. 5.4) and remove the seal (Ref. 5.14) from the piston.

16) Remove the front stop (Ref. 5.29).

17) Take out the screws (Ref. 5.23) with the washers (Ref. 5.41) and the magnet(s) (Ref. 5.27).

18) Remove the seal (Ref. 5.40) then unscrew the screw (Ref. 5.18) and washer (Ref. 5.32) to release the upper piston (Ref. 5.6).

19) Remove the upper piston (Ref. 5.6) then take out the piston seal (Ref. 5.11) and the two axles (Ref. 5.42).

20) Disconnect the cross piece guide (Ref. 5.3) from the cylinder pipe (Ref. 5.4) by unscrewing the screws (Ref. 5.17).

21) Remove the seals (Ref. 5.13) on the cylinder pipe and the cross piece guide (Ref. 5.3).

22) Remove the cushions (Ref. 5.10) ***if required.***

23) Clean and check the condition of all components.

Reassembling the RT Valve

BEFORE REASSEMBLY

- Clean all components, being careful not to introduce any impurities that may damage the seals.

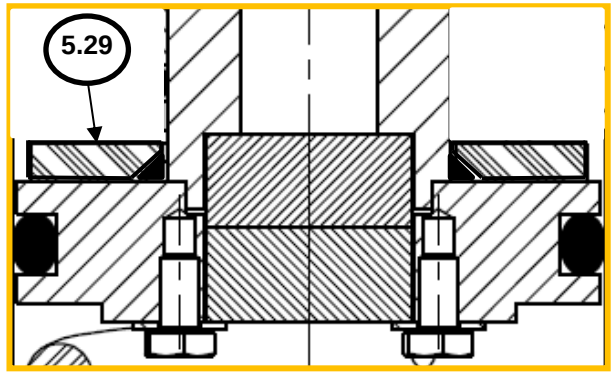
- All removed seals will need to be replaced before reassembly and the spring may need to be changed.

- Lubricate the cylinder pipe (Ref. 5.4) and coat the spring in a protective layer of edible fat only (Ref. 5.22).

To reassemble the valve, follow the instructions below:

1) Place the seal (Ref. 5.13) in the cross piece guide (Ref. 5.3).
2) Replace the 2 cushions (Ref. 5.10) in the cross piece guide (Ref. 5.3) ***if required.***
3) Place the seal (Ref. 5.13) on the piston pipe (Ref. 5.4).
4) Position the cross piece guide (Ref. 5.3) on the cylinder pipe (Ref. 5.4) and screw in the screws (Ref. 5.17).
5) Place the seal (Ref. 5.14) on the piston (Ref. 5.5).
6) Position the front stop (Ref. 5.29) on the piston (Ref. 5.5).

Ensure that the chamfer is positioned facing the piston weld (Ref. 5.5)



7) Engage the piston (Ref. 5.5) in the cylinder pipe (Ref. 5.4).
8) Insert the two axles (Ref. 5.42) onto the piston rod (Ref. 5.5).

9) Position the piston seal (Ref. 5.11) and tighten the upper piston (Ref. 5.6) using the screw (Ref. 5.18) and washer (Ref. 5.32).

10) Insert the die-cut seal (Ref. 5.40) into the piston (Ref. 5.5)

11) Place the magnets in position (Ref. 5.27) then screw in the screws (Ref. 5.23) and washers (Ref. 5.41).

12) Place the seal (Ref. 5.14) on the cap (Ref. 5.8).

13) Position the spring (Ref. 5.22) then the cap (Ref. 5.8).

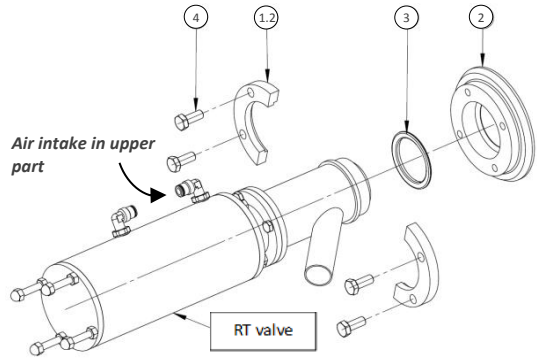
14) Screw the nuts in completely (Ref. 5.21) to compress the spring (Ref. 5.22) and hold the cylinder pipe in place (Ref. 5.4).

15) Screw the screws (Ref. 5.17) into the cap (Rep. 5.8), then position the pipes (Ref. 5.31) along the pins (Rep. 5.9) and screw in the dome nuts (Ref. 5.20).

16) Supply air to the actuator and extend and retract the cylinder 20 times.

17) Ensure that there is no air leakage around the cylinder.

18) Flush out the air in the cylinder, then allow compressed air to enter the upper part so that the piston rod (Ref. 5.5) retracts into the valve cylinder body.



19) Position the piston wiper seal (Ref. 5.15).

20) Engage the cylinder in the body (Ref. 1).

21) Position and tighten the screws (Ref. 5.17).

22) Release the piston from its position by flushing out the compressed air inside the cylinder.

23) Position the seal (Ref. 3). Engage the entire valve in the welding flange (Ref. 2).

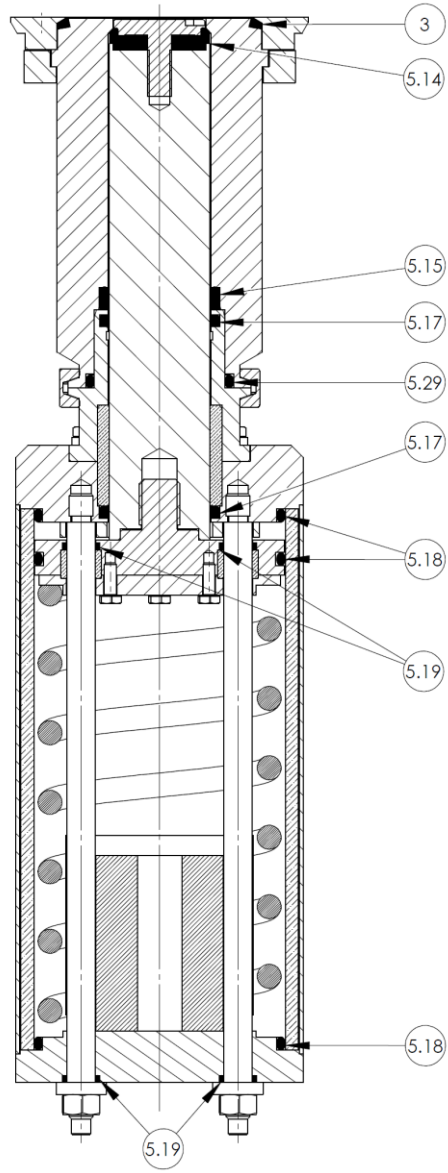
24) Position and tighten the screws (Ref. 4).

25) Connect the side duct connector.

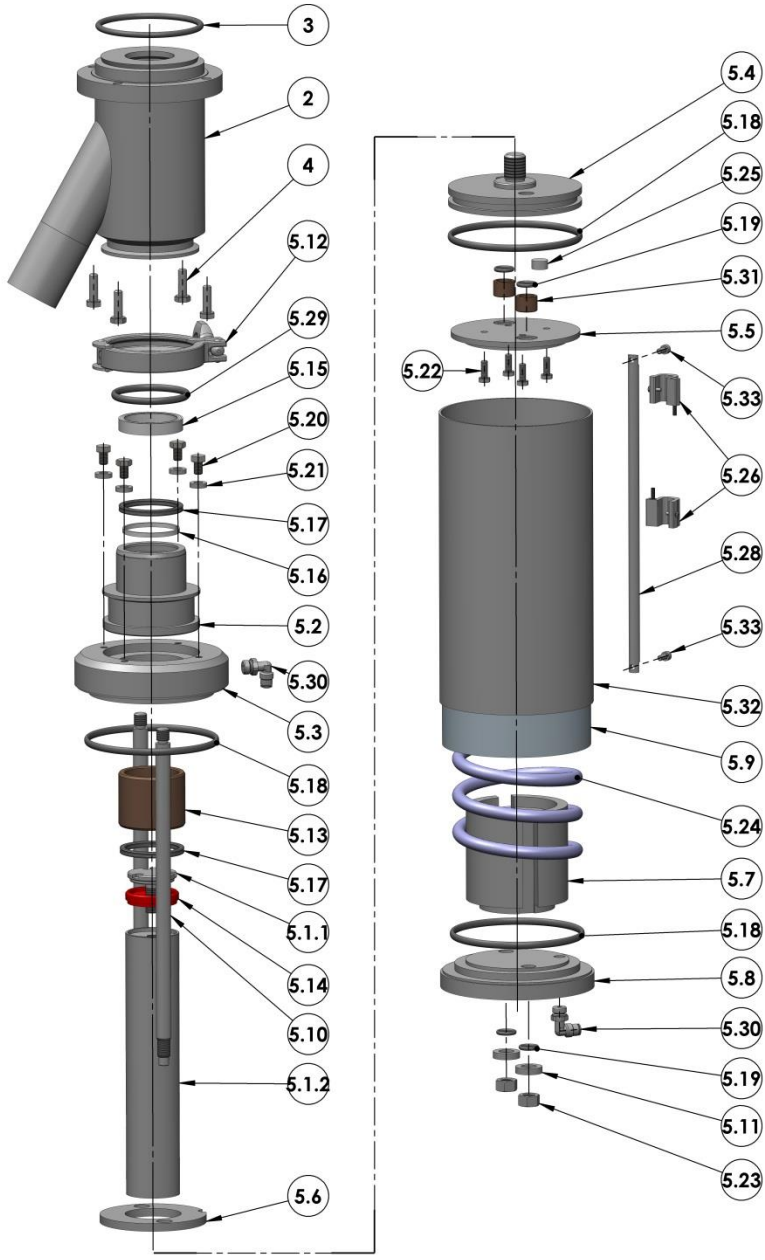
26) Connect the valve power, then, whilst the valve is empty, do a test run to make sure it operates correctly. Check sensor calibration.

6.4. RT50 maintenance operations

Mounting the RT50 seals



RT50 exploded view



List of RT50 component names

REF.	NAME
1	Welding flange
2	Valve body
3	Seal
4	Screw
5.1.1	Upper piston
5.1.2	Plunger piston
5.2	Cross piece guide
5.3	Front flange
5.4	Piston
5.5	Spring guide
5.6	Front stop
5.7	Back stop
5.8	Back flange
5.9	Cylinder pipe
5.10	Beam
5.11	Washer
5.12	Sleeve clamp
5.13	Cushion
5.14	Seal
5.15	Wiper seal
5.16	Guide strip
5.17	Seal
5.18	Seal
5.19	Seal
5.20	Screw
5.21	Washer
5.22	Screw
5.23	Nut
5.24	Spring
5.25	Magnet disc
5.28	Detection beam
5.29	Seal
5.30	Pneumatic connector
5.31	Cushion
5.32	Protection ferrule
5.33	Screw
6	Magnetic induction detection

Dismantling the RT50 valve

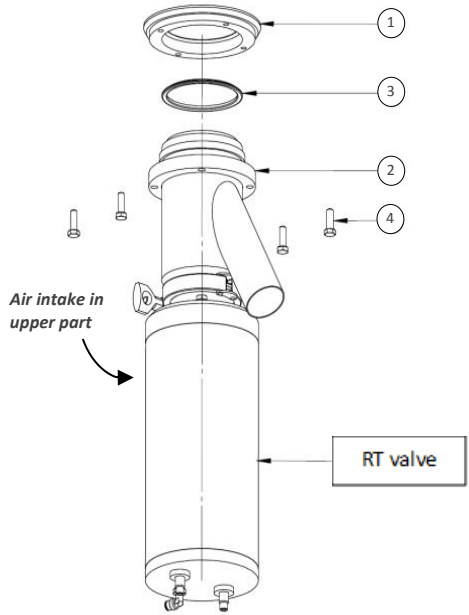
Before carrying out any maintenance work on the device:
- Disconnect the air orifices.
- Disconnect the electric wires from the sensors.
- Ensure there is no pressure or fluid inside the tank.
- Remove the valve entry connection.

To dismantle the valve, follow the instructions below:

1) Remove the side duct connector.
2) Unscrew the screws (Ref. 4).
3) Remove the entire RT valve from the welding flange (Ref. 1).
4) Remove the seal (Ref. 3).
5) Place all equipment onto a workbench.

Never hold the cylinder tube by a clamp.

6) Attach a 6∅ compressed air pipe to the connector located in the upper part, allow compressed air to flow in for the upper piston (Ref. 6) to retract (open valve).



7) Disconnect the clamp connection (Ref. 5.12).

8) Remove the control cylinder from the body (Ref. 2), then flush out the air that has been let into the cylinder.

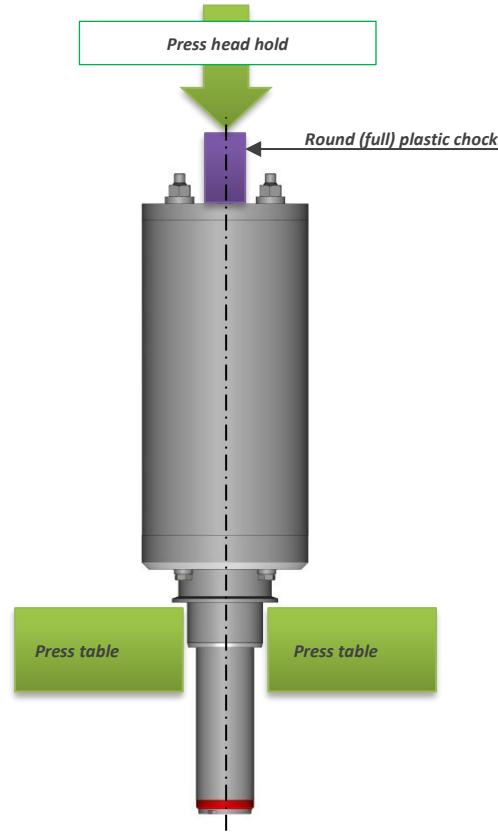
9) Using the SERVINOX key, loosen the upper piston (Ref. 5.1.1) and remove the seal (Ref. 5.14).

10) Remove the seals (Ref. 5.14, 5.15 and 5.29), then take off the detection beam (Ref. 5.28) and the two screws (Ref. 5.33).

When loosening the spring, do so with extreme caution.

11) Loosening the spring:

- Assemble as shown below using a hydraulic or pneumatic (recommended) press:



- Maintain slight pressure on the back flange (Ref. 5.8) using the press.
- Loosen the nuts (Ref. 5.23) and the washers (Ref. 5.11).
- Pull up the press head to loosen the spring (Ref. 5.24) against the back flange (Ref. 5.8).

12) Remove the bank flange (Ref. 5.8) and the seals (Ref. 5.18 and 5.19).

13) In the following order, remove: the stainless steel ferrule (Ref. 5.32), the cylinder pipe (Ref. 5.9), the spring, the back stop (Ref. 5.7), and the seal (Ref. 5.18) on the front flange (Ref. 5.3).

14) Extract the entire piston from the guide cross piece (Ref. 5.2).

15) Remove the front stop (Ref. 5.6).

16) Remove the screws (Ref. 5.22) to take out the spring guide (Ref. 5.5) and extract the magnetic disc (Ref. 5.25).

17) Remove the beam cushions (Ref. 5.31), the seals (Ref. 5.19) and the piston (Ref. 5.4) seal (Ref. 5.18).

18) Remove the seals (Ref. 5.17) and the guide strip (Ref. 5.16) from the guide cross piece (Ref. 5.2).

19) Take out the nuts (Ref. 5.20) and washers (Ref. 5.21).

20) Extract the guide cross piece (Ref. 5.2) in the front flange (Ref. 5.3).

21) Remove the cushion (Ref. 5.13).

22) Clean and check the condition of all components.

Reassembling the RT50 valve

BEFORE REASSEMBLY:

- Clean all components, being careful not to introduce any impurities that may damage the seals.

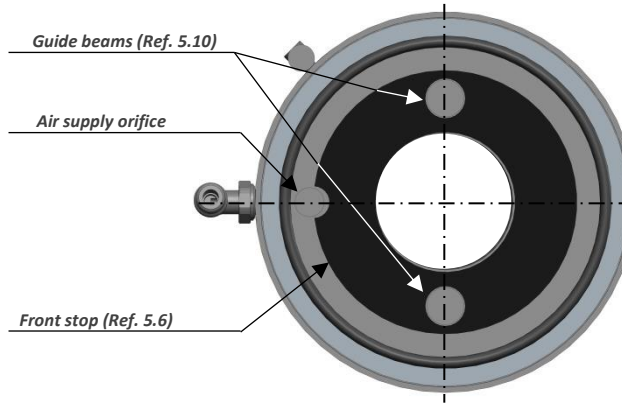
- All removed seals will need to be replaced before reassembly and the spring may need to be changed.

- Lubricate the cylinder pipe (Ref. 5.9) and coat the spring in a protective layer of edible fat only (Ref. 5.24).

To reassemble the valve, follow the instructions below:

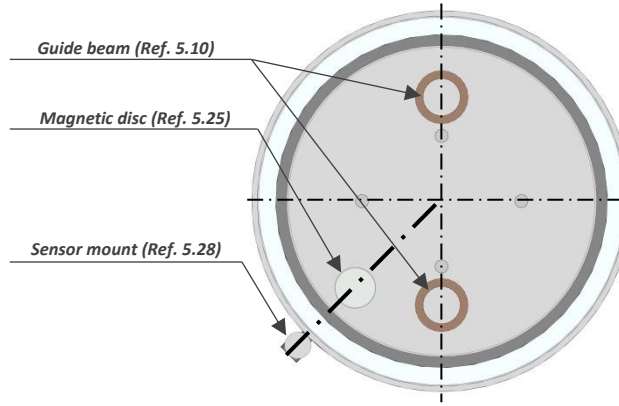
1) Replace the cushion (Ref. 5.13) and the seal (Ref. 5.17) in the guide cross piece (Ref. 5.2).
2) Mount the guide cross piece (Ref. 5.2) onto the front flange (Ref. 5.3), with the screws (Ref. 5.20) and washers (Ref. 5.21)
3) Place the second seal (Ref. 5.17) in the front flange (Ref. 5.3).
4) Adjust the guide strip (Ref. 5.16) in the guide cross piece (Ref. 5.2).
5) Position the rod seals (Ref. 5.19) and the cushions (Ref. 5.31) onto the piston (Ref. 5.1).
6) Mount the seal (Ref. 5.18) and the magnetic disc (Ref. 5.25) onto the piston (Ref. 5.4).
7) Re-position the spring guide (Ref. 5.5) onto the piston (Ref. 5.1) with the screws (Ref. 5.22).
8) Mount the front stop (Ref. 5.6) along the guide beams (Ref. 5.10)

Ensure that you mount the front stop (Ref. 5.6) along the beams (Ref. 5.10) in the right direction in relation to the supply orifice on the front flange (Ref. 5.3).



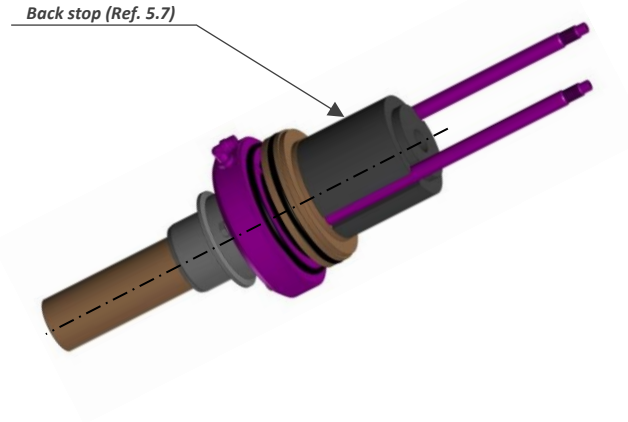
9) Mount the entire piston onto the guide cross piece (Ref. 5.2) along the guide beams (Ref. 5.10).

Ensure that you mount the piston (Ref. 5.4) along the beams (Ref. 5.10) in the right direction in relation to the position of the magnetic disc (Ref. 5.25).



10) Position the back stop (Ref. 5.7) along the guide beams (Ref. 5.10).

Ensure that you mount the back stop (Ref. 5.7) in the right direction along the beams (Ref. 5.10).



11) Place the seal (Ref. 5.18) on the front flange.

12) Position the spring (Ref. 5.24) on the spring guide (Ref. 5.5).

13) Engage the cylinder tube (Ref. 5.9) around the piston and position against the front flange (Ref. 5.3).

14) Mount the stainless steel ferrule (Ref. 5.32) around the cylinder pipe (Ref. 5.9).

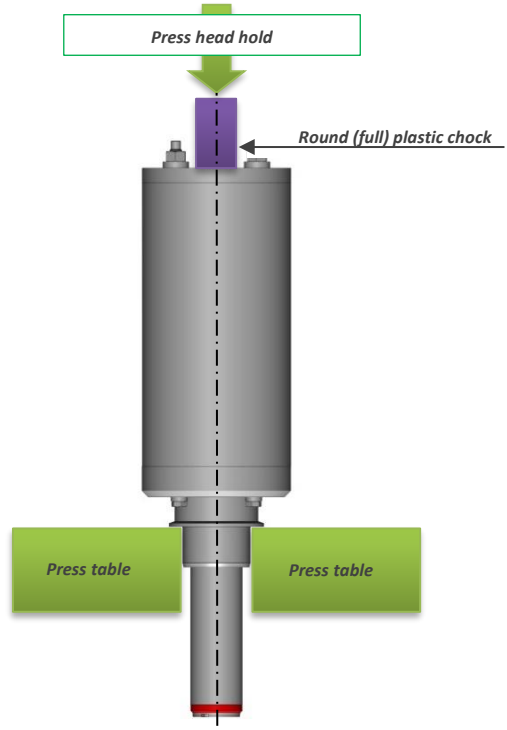
15) Place the seal (Ref. 5.18) on the back flange (Ref. 5.8) and engage the flange onto the guide beams (Ref. 5.10).

Ensure that you mount the back flange (Ref. 5.8) in the right direction along the beams (Ref. 5.10) to align with the tapped holes for the detection beam (Ref. 5.28).

When loosening the spring, do so with extreme caution.

16) Loading the spring (Ref. 5.7):

- Assemble as shown below using a hydraulic or pneumatic (recommended) press:



Ensure to check the following during spring compression:
- Compress the spring very slowly using manual action.
- Check that the cylinder pipe (Ref. 5.9) is aligned around the seals (Ref. 5.18).
- Check that the ferrule (Ref. 5.32) is aligned with the front (Ref. 5.3) and back (Ref. 5.8) flanges.

- Gently compress the back flange (Ref. 5.8) until it is in the end position against the stainless steel ferrule (Ref. 5.32).
- Place the seals (Ref. 5.19) on the back flange (Ref. 5.8) around the guide beams (Ref. 5.10).
- Position the washers (Ref. 5.11) and tighten the nuts (Ref. 5.23).
- Dismantle the equipment.

17) Place the seal (Ref. 5.14) on the cylinder rod (Ref. 5.1.2) and screw on the piston end piece (Ref. 5.1.1).

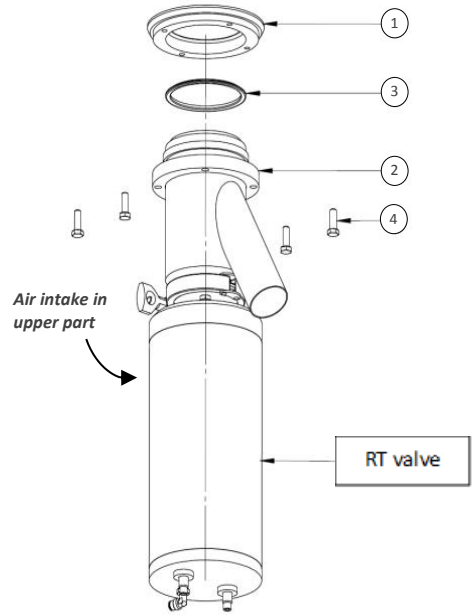
18) Tighten and lock in position the assembly above using the SERVINOX key (RP50516).

19) Supply air to the actuator and extend and retract the cylinder 20 times.

20) Ensure that there is no air leakage around the cylinder.

21) Position the seals (Ref. 5.15 and 5.29) on the cylinder.

22) Flush out the air in the cylinder, then allow compressed air to enter the upper part so that the piston rod retracts into the valve cylinder body.



23) Engage the actuator in the body (Ref. 2).

24) Position the sleeve clamp (Ref. 5. 12).

25) Release the piston from its position by flushing out the compressed air inside the cylinder.

26) Position the seal (Ref. 3). Engage the entire valve in the welding flange (Ref. 1).

27) Position and tighten the screws (Ref. 4).

28) Connect the side duct connector.

29) Connect the valve power, then, whilst the valve is empty, do a test run to make sure it operates correctly. Check sensor calibration.

7 DIAGNOSTICS AID

The table below is a diagnostics aid to help you resolve simple operating issues.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Valve locked in closed position	> No pneumatic or electrical supply	Ensure that there is a supply of compressed air or electricity, where appropriate
	> Faulty upstream control system	Ensure that the sensors operate and are positioned correctly
	> Pneumatic leakage outside the valve or leakage inside through the valve body (worn-out seals).	Check the condition of connections, dismantle the valve body and check the condition of the cylinder valves.
	> Congealed substance on the piston rod	Dismantle the valve body (Ref. 1 or 2) then clean the inside of the piston rod, the seals and the inside of the valve body. The valve may be dismantled if the substance has penetrated into the cylinder.
Pneumatic leakage	> Pierced cylinder supply pipe	Replace the ∅6 pipe
	> Leakage from connections	Check the condition of pneumatic connections and their tightness
	> Leakage from the cylinder	Check the tightness of the valve's screw connections. Check the condition of the cylinder seals.
Substance leakage from the tank through the valve	> Worn-out seals	Check the condition of the seals on the upper piston, the valve body and the cylinder. Change the seals where necessary
	> Seals not suitable for the substance	Contact SERVINOX for advice on choosing the right material for the seal.
	> Loose screw connections	Ensure that the flange and valve are screwed on tightly
	> Slack cylinder spring (lack of valve response)	Change the spring
	> Air supply to the cylinder is too weak	Adjust the cylinder supply to the required pressure specified in the instructions.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Valve locked in open position	Faulty upstream control system	Ensure that the sensors operate and are positioned correctly Check the cylinder air supply
	Pneumatic leakage outside the valve or leakage inside through the valve body (worn-out seals).	Check the conditions of connections, dismantle the valve body and check the state of the cylinder valves.
	Body or valve obstructed by a foreign object	Clean the body and the valve seat

8 WARRANTY

Unless otherwise stated in the proposal, ***the device is guaranteed for 12 months as of the delivery date***.

After an examination in our factory, the parts deemed faulty will be replaced at our expense.

Replacement of any of the device's components (wear parts, seals, etc.) must be carried out using original SERVNIOX parts.

The warranty does not cover damage as a result of:

- poor fitting, inappropriate or improper use;
- an accident or nonconforming installation;
- modification of the device;
- leakage that occurs after impurities have travelled through the device will not be covered;
- mandatory maintenance not carried out.

The warranty on our products covers the repair of returned parts free of charge when it can be proven that these parts became unusable prematurely, owing to a manufacturing or material fault.

We are not bound to any compensation or any other obligation of this kind.

This equipment was inspected before leaving the factory.

This equipment has been certified as having been inspected and authorised for sale

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