Sampling valve

PEML

Instruction manual

Reference: PEML_NOT_EN

Version E

SERVINOX

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1 OVERVIEW

1.1. The manufacturer

SERVINOX is a specialist in process equipment for the brewing, food, cosmetology and chemical sectors.

Process equipment expertise:
In the areas of tank protection, sampling, gas injection in liquids, pigging systems or cleaning with patented products.

SERVINOX is certified ***ISO 9001 :2015*** and offers products compliant with the following applicable standards and directives:

- Directive on Pressure Equipment ***(DESP) 2014/68/EU***
- European Directive relative to materials installed in an Explosive Atmosphere Explosive ***(ATEX) 2014/34/EU***
- 3A US manufacturers' hygienic standard

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

1.2. Instruction manual

To ensure equipment integrity and the safety of personnel, you must familiarise yourself with the information contained in this manual before proceeding with installation and use of the equipment.

Depending on the installation and the fluid, precise directives and rulings apply. These must be complied with.

In addition to the recommendations contained in this instruction manual, the general recommendations concerning safety at work and protection must be applied. Regulations relative to the protection of the environment must also be respected.

1.3. Presentation of the equipment

The PEML type sampling valve is especially suited to sampling of sticky and/or low pressure manometer fluids

This sampling valve must be used on circuits carrying group 2 clear or viscous liquids (compliant with §13 of European directive 2014/68/EU).

2 SAFETY RECOMMENDATIONS

The technical manual contains fundamental recommendations that must be respected. You must read this technical manual before assembly and cut-in.

2.1. Indications and symbols

The following pictograms are used to call your attention to important points relative to the safety of personnel and the integrity of the equipment:

SYMBOL	DEFINITION
	Direct danger for persons
	Possible deterioration of the product or its environment
	Useful information or application recommendations
	Minimum number of persons required for certain operations. (The number of persons shown in the pictogram indicates this minimum number).
	Minimum technical capacity level. (the figure in red indicates the minimum level required).

Certain interventions demand technical abilities and special authorisations, such as unscheduled maintenance work or work on electrical equipment.

3 levels indicate the required technical ability (knowledge of the material in question, experience, training, etc.).

	PROFILE OF PERSONS INVOLVED	DETAILS
Level 1	**End user** with no technical knowledge.	**Default level** if the ability pictogram is not present. Only authorised **general use and maintenance operations**.
Level 2	Experienced **professional**.	Trained and **experienced**. **Knows the equipment and technologies** used.
Level 3	**Manufacturer's personnel** / product expert	**Work reserved for the manufacturer** of the documented equipment.

2.2. Operator safety

The installation, control, adjustment, maintenance and replacement operations must be carried out:

- By qualified personnel
- In accordance with the recommendations indicated in this manual
- By integrating the measures ensuring safety at work, the procedures and specific means of the installer and the legal obligations relative to the prevention of accidents, in particular regarding the electrical installations

Non-compliance with the safety recommendations may result in the loss of all claims to damages.

2.3. Planned usage

Compliant utilisation

Using the supporting documents, make sure that the equipment has been selected for the intended use.

Operation overview

This valve is intended for sampling fluids on the installations.

In the standard version its drive head allows for partial opening of the sampling valve by pressing the lever (Picture 1) or complete opening by turning the lever 90° (Picture 2).

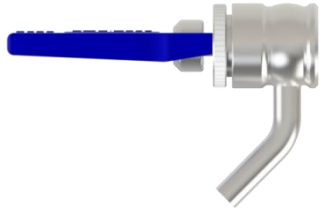
In the non-blocking version (dead man) the drive head allows for partial opening only of the sampling valve by pressing the lever (Picture 3). Complete opening is impossible even by turning the lever 90° (Picture 4).

The sampling valve sealing is obtained by a membrane and a counter spring maintains the sampling valve in the closed position.

The lever can be turned 360° with or without position holding.

Standard version

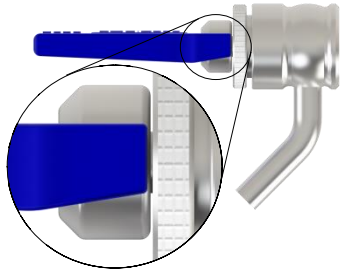
Picture 1



Picture 2

Non-blocking version (dead man)

Picture 3



Picture 4

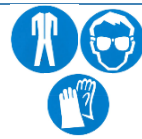
Inappropriate use

The equipment must not be used except for the usage for which it is intended. The manufacturer declines all responsibility in the event of contrary and inappropriate use.

The equipment must not be used over and above the following operating limits:

PARAMETERS	LIMITS
Maximum permitted pressure Minimum pressure (depending on DN)	6 bars (model DN06) 5 bars (model DN10) Vacuum
Admissible fluid temperature	120°C (depending on sealing)

2.4. Analysis of the generic risks

DANGER / RISK			
	Hot fluid	Very hot surfaces	Aggressive fluid
DAMAGE	Burns	Burns	Burns
PREVENTION			
	Suitable clothing, glasses, gloves	Suitable gloves	Suitable gloves, glasses, mask

3 TECHNICAL SPECIFICATIONS

3.1. Standard version

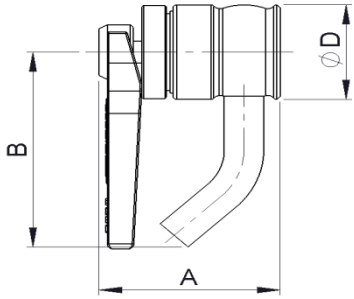
Specifications

SPECIFICATIONS	SERVINOX OFFER
MAXIMUM service pressure (closing)	6 bars (DN06) / MAX. viscosity: 200 cp 5 bars (DN10) / MAX. viscosity: 2000 cp
Materials: • Parts in contact with the product • Other parts • Membrane • Lever	 1.4404 (316L) stainless steel 1.4307 (304L) stainless steel VMQ, EPDM, FPM, NBR PA + FV Glass-filled polyamide (Standard), Stainless steel

Dimensions

Dimension in standard assembly

SIZES	DN06	DN10
A	51	52
B	56	76
D	24.5	34.5



Equipment view

Model: DN06, DN10

Standard version with blocking

3.2. Options

- Different body, SERVINOX can supply numerous body versions on request
- 1 output and 1 input CIP/SIPP
- Stainless steel lever
- Automatic opening (single acting cylinder)
- Opening detection (automatic version only)
- Non-blocking opening (dead man)

  This type of valve allows drive head opening just by pressing the lever. ***There is no possibility of keeping it open.***
- Silicone cap on output
- Stainless steel cap on output

ATEX options

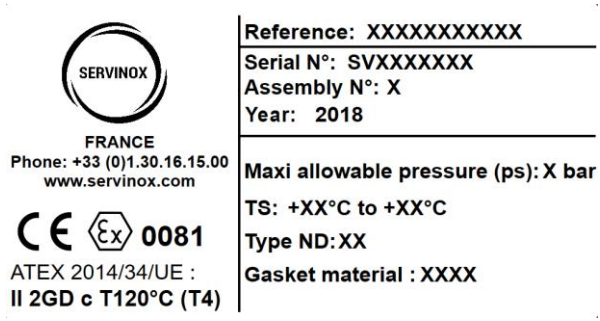
Version ATEX 2014/34/EU , zones 1 & 21, gas and dust.

This equipment is intended for use in surface installations (group II).

Category 2 protection level is suitable for normal operation and malfunctions occurring frequently and for which the operating defects are usually taken into account. This equipment is intended for an environment where explosive atmospheres are due to mixes of air and gas (G), vapours, mist or where mixes of air with dust (D) are likely to occur.

The maximum surface temperature is the temperature of the fluid.

This PEML type sampling valve, compliant with ATEX zones 1 and 21, bears a Servinox sticker like the model below:



The “ATEX” equipment retains the same technical characteristics as the standard version.

4 CUT-IN

4.1. *Transport/ Delivery acceptance/ Handling*

On delivery receipt, check*:*

- that ***the packaging is in good condition***
- that the mixer ***delivered is conform to the order***
- that the equipment ***has not been damaged***

If the equipment is damaged, it must not be mounted on the installation. Contact the manufacturer or, where appropriate, your distributor.

4.2. *Storage*

If the equipment is not installed immediately after delivery, it should be ***stored according to accepted practice***.

It must be stored in its original packaging, in a covered area and protected from dirt, rain, snow, insects and not subject to shocks or vibrations.

The risk-free storage temperature is between 5°C and 40°C, with a relative air humidity of < 50%.

If the equipment is stored in negative temperature conditions, you must take into account the materials' cold resistance (example: the seals).

If the storage period is above one year, the seals must be replaced before cut-in.

4.3. *Installation*

General observations

Before using the equipment, users must carry out a visual inspection to check the condition: no corrosion or packaging residue.

If the fluid is harmful, inflammable, toxic, etc., equip the installation with a discharge pipe leading to a secure place.

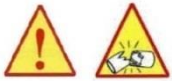
However, we recommend that you check the compatibility of these products with the seals and materials before use.

The operators

The tasks detailed below must be carried out by persons who are qualified and experienced.

The personnel must be equipped with gloves, safety helmets and safety boots.

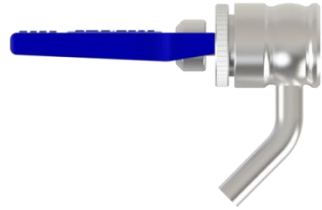
Connection welding



The sampling valve drive head must be dismounted before welding the body on its support in order not to damage the membrane.

Standard version

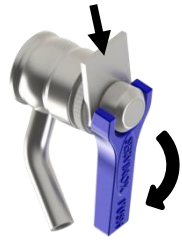
1) To dismount the head, just tilt the lever upwards 90°, which will open the sampling and thereby keep the spring compressed:



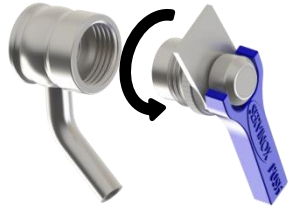
2) Then loosen the head (Ref.2.1) from the body (Ref.1), using the knurled part of the head:

Non-blocking version (dead man)

1) To dismount the head, just tilt the lever down 90°, which will open the sampling and allow the opening plate to be inserted to keep the spring compressed:

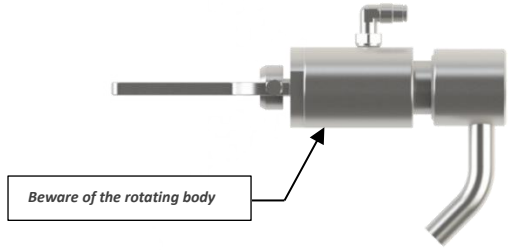


2) Then loosen the head (Ref.2.1) from the body (Ref.1), using the knurled part of the head:

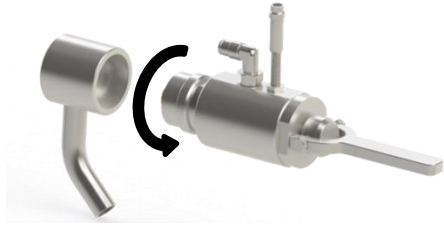


Automatic version

1) To dismount the head with its cylinder, just tilt the lever upwards 90°, which will open the sampling:



2) Loosen the head from the body using a wrench (no.24) with a maximum thickness of 7mm, or the specific tools supplied by SERVINOX.



The equipment must be welded on installation by qualified personnel as per the prevailing directives in the country of installation. There must be no impurities in the weld and must be done in a hygienic manner.

After any welding and/or polishing work, the equipment must be cleaned to remove all residue, dust, etc.

After welding

3) The head is remounted by keeping the lever at 180° relative to the body (standard version) or with the opening plate (non-blocking version).

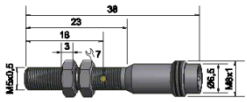
If this procedure is not complied with the membrane may be destroyed.

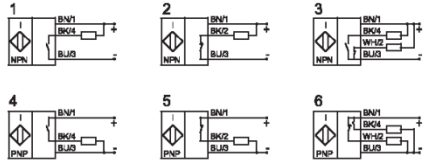
Inductive sensor (automatic option)

Détecteurs inductifs Série 10 - PNP

Boîtier M 5 x 0,5
- Matière du boîtier: Acier inox VA N° 1.4305 / AISI 303
- Portée normalisée Sn 1,5 mm
- Embase de connexion M 8 x 1

Caractéristiques techniques	Montage noyable
Portée normalisée S_n	1,5 mm
Version électrique	3 pôles - DC
Fonction de sortie	Fermeture
Type NPN	
Code Art.	
Schéma de raccordement N°	
Type PNP	**IAS-10-M5-S-Y7**
Code Art.	**IA 0328**
Schéma de raccordement N°	**4**
Tension d' alimentation (U_B)	10...30 V DC
Courant de sortie max. (I_a)	200 mA
Tension de déchet max. (U_d)	≤ 2,0 V
Ondulation résiduelle max. admissible	20 %
Consommation à vide (I_o)	10 mA typique
Fréquence de commutation max.	3 kHz
Plage de température opérationnelle	-25...+70 °C
Voyant LED	Jaune
Circuits de protection	Intégrés
Indice de protection (Norme IEC 60529)	IP 67
Norme	EN 60 947-5-2
Raccordement	Embase M 8 x1
Matériau du boîtier	Acier inox N° 1.4305 / AISI 303
Face active	PA
Fermeture arrière	-
Accessoires (inclus dans la fourniture)	2 écrous M 5





Made in Hungary

Sous réserve de modification des caractéristiques sans préavis. (13.10.2014)

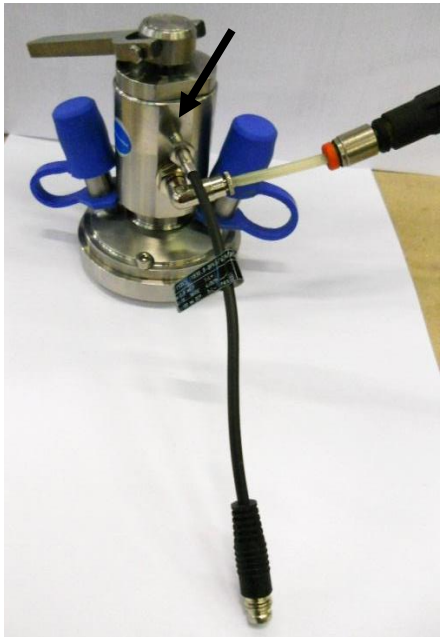
Pneumatic connection

The pneumatic connection of the cylinder is intended for a 6mm polyamide tube on push-in fittings.

Installing the inductive sensor

1) Maintain the cylinder under pressure and check that the cylinder rod is extended.

2) ***Screw*** the sensor not connected tight in the M5 tapped hole on the cylinder body (Ref.2.8).



3) ***Loosen the sensor one half-turn***, then tighten the locknut to maintain the sensor in position.

4) Connect the inductive sensor electrically and manually control the cylinder to check that the sensor is working correctly.

Observe the sensor body:

Orange light on = sampling valve open (sampling of fluid)

Light off = sampling valve closed

5 OPERATION

5.1. Checking the operation

- Check that there are no leaks
- Ensure the valve is maintained correctly in closed position
- Check the correct assembly of the equipment on the installation
- Check the drive head tightening

5.2. Adjustment

Adjustments are reserved for the manufacturer of the documented equipment.

Please contact Servinox or, where appropriate, your distributor.

5.3. Sterile utilisation

For sampling valves with one output ***before sampling***, we recommend flame sterilising (butane torch type) of the output tube for 1 minute.

For sampling valves with 2 outputs, the second output allows for CIP liquid intake outside the sampling, the other evacuation duct is the sampling output.

6 SERVICING AND MAINTENANCE

6.1. General

The equipment requires periodic servicing to ensure correct operation.

An inspection must be carried out at regular intervals. You must comply with an initial 6 month inspection period.

Certain fluid properties (corrosive, aggressive, abrasive, residual, viscosity, etc.) and certain environmental conditions (climate, pollution, etc.) may require the periods between the inspections to be shortened.

SERVINOX provides spare parts for the correct maintenance and equipment guarantee.

We can provide you with replacement packs for worn parts (seals, etc.) and we recommend that you keep a few packs in stock for quick repairs.

You can also contact SERVINOX for all matters regarding the maintenance of the equipment.

6.2. Inspections and servicing

The following elements at least must be inspected:

- Traces of corrosion
- Tightening of the drive head
- Absence of leaks
- Check the state of the PA lever tabs only

Mandatory servicing periods:

Annually:

- Change the membrane

We recommend you check the membrane material before replacing to avoid any chemical compatibility problems.

We recommend noting all the servicing and inspection operations carried out on the installation in a table of the following type:

Date	Company	Name of the operator	Signature
PREVENTIVE MAINTENANCE			
			Other (describe)
CHECKING THE CORRECT OPERATION AND GOOD CONDITION			

Material required

Medium thread lock

1 flat-blade screwdriver

1 multi-grip pliers

1 spindle ∅3mm, 100mm long ***(Servinox supply on request)***

1 opening plate ***(non-blocking option)***

1 wrench no.24 (thickness 7mm max) or SERVINOX tooling ***(automatic version)***

The operators

The tasks detailed below must be carried out by persons who are qualified and experienced.

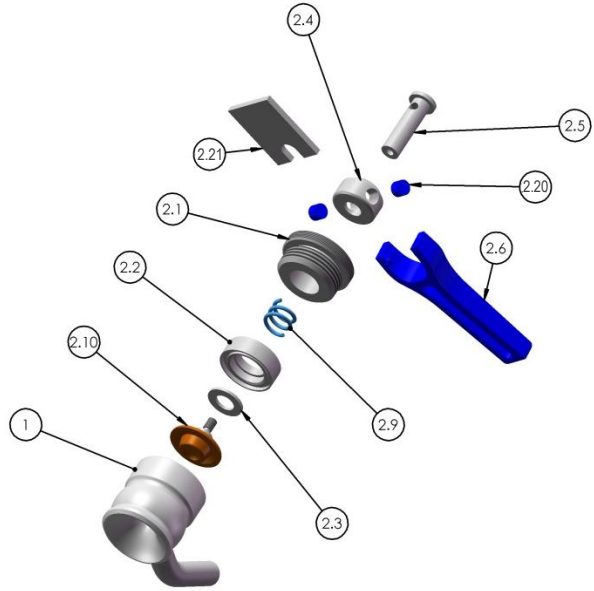
The personnel must be equipped with gloves, safety helmets and safety boots.

6.3. Replacing worn parts

To change worn parts, contact Servinox to guarantee a standard replacement.

The use of parts other than those supplied by SERVINOX may result in cancellation of the guarantee.

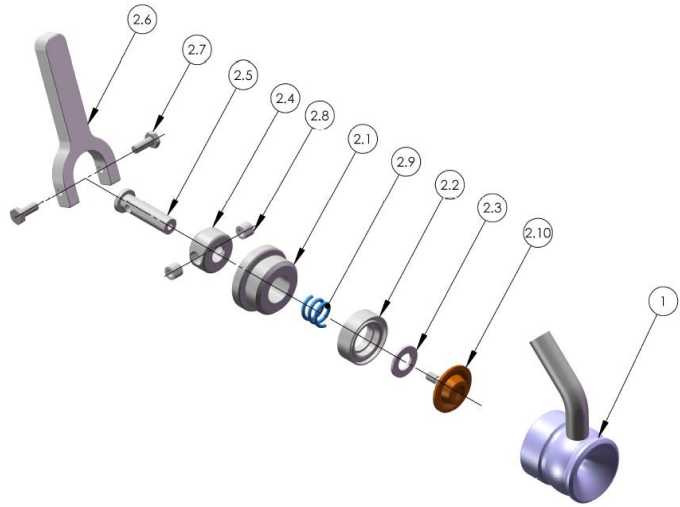
Equipment exploded view (PA lever / standard version)



Equipment parts list (PA lever)

REFERENCE	DESCRIPTION	QUANTITY
1	Body	1
2.1	Knurled head	1
2.2	Membrane press	1
2.3	Washer	1
2.4	Support washer	1
2.5	Lift spindle	1
2.6	Lever (different if non-blocking option)	1
2.9	Spring	1
2.10	Membrane	1
2.20	Silicon wafer	2
2.21	Opening plate (option)	1

Equipment exploded view (stainless steel lever)



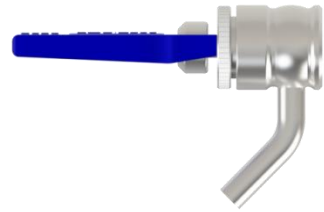
Equipment parts list (stainless steel lever)

REFERENCE	DESCRIPTION	QUANTITY
1	Body	1
2.1	Knurled head	1
2.2	Membrane press	1
2.3	Washer	1
2.4	Support washer	1
2.5	Lift spindle	1
2.6	Stainless steel lever	1
2.7	Screw	2
2.8	Machined washer	2
2.9	Spring	1
2.10	Membrane	1

Replacing the membrane (standard version)

To disassemble the sampling valve, proceed as follows:

1) Position for head dismounting.

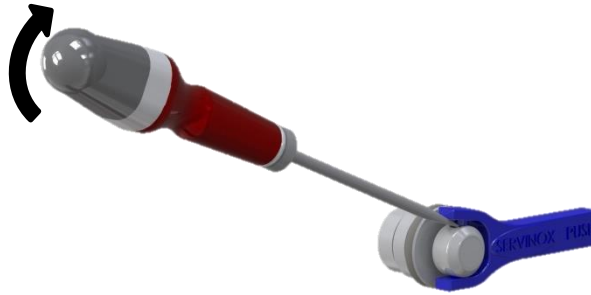


2) Loosen the head (Ref.2.1) in the body (Ref.1), using the knurled part of the head.

3) Dismount the lever (Ref.2.6) from the support washer (Ref.2.4).

PA lever:

- To dismount the lever, remove it using snap-ring pliers or a screwdriver as shown below.



- Remove the small silicon wafers (Ref. 3.8) that maintain the lever in any rotation position (Ref. 2.6).

Stainless steel lever:

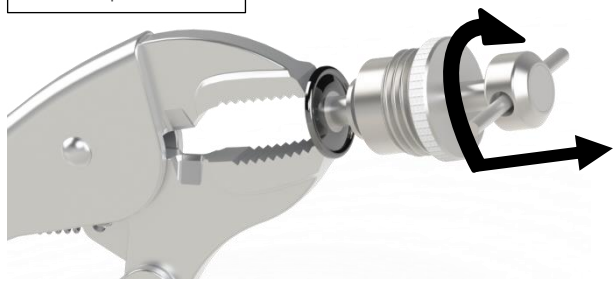
- Dismount the hexagonal screws (Ref.2.7) to remove the stainless steel lever (Ref.2.6).
- Remove the machined washers (Ref. 2.8).

4) Place a 3mm diameter and 100mm long rod in the support washer drill hole (Ref. 2.4) and the lift spindle (Ref. 2.5) to block its rotation.

5) To remove the membrane, turn the support washer (Ref.2.4) with the lift spindle (Ref.2.5) using the rod, while blocking the rotation of the membrane (Ref.2.10) using pliers.

Beware of washer (Ref.2.3), spring (Ref.2.9) and membrane (Ref.2.10) ejection.

Block with pliers

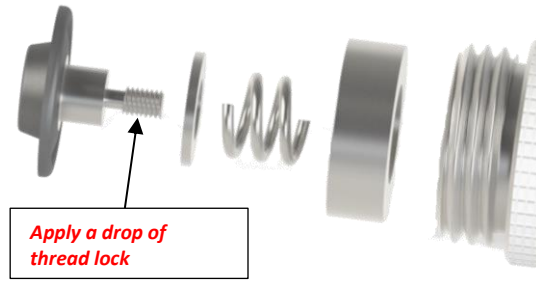


Remove the spring (Ref.2.9), membrane press (Ref.2.2) and the washer (Ref.2.3).

Re-assembling the sampling valve

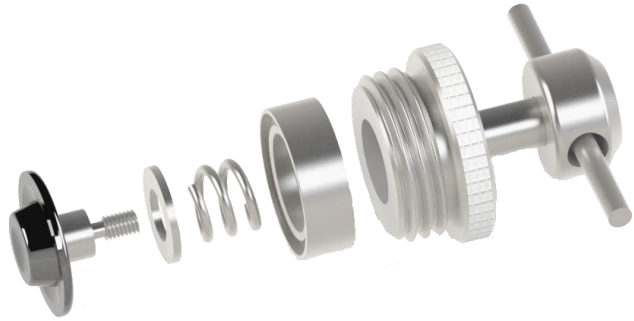
To re-assemble the sampling valve, proceed as follows:

1) Procure the new membrane (Ref.2.10) and position the washer (Ref.2.3), then add a drop of thread lock (medium) on the thread of the membrane.



2) Replace on the spindle in order on the lift spindle (Ref.2.5): the head (Ref.2.1), membrane press (Ref.2.2), the spring (Rep.2.6).

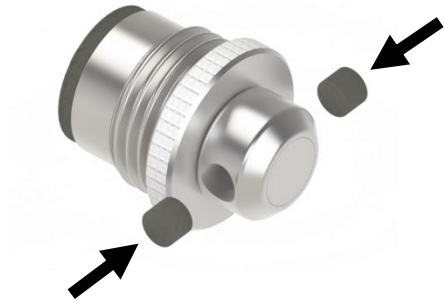
3) Screw the lift spindle unit (Ref.2.5) onto the membrane (Ref.2.10), using the 3mm diameter rod.



4) Assembling the lever

PA lever:

- Replace the two silicon wafers (Ref.2.11) in the support washer drill holes (Ref.2.4). See picture below.



- Mount the lever (Ref.2.6) on the support washer (Ref.2.4). To assemble the lever, first insert a tab in a support washer hole and then insert the second tab in the opposite opening, see picture below.

Stainless steel lever:

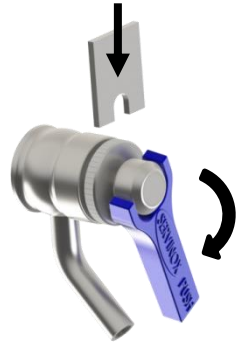
- Position the two machined washers (Ref.2.8) on the lift spindle (Ref.2.5)
- Assemble the lever (Ref.2.6) with the two screws (Ref.2.7)

5) Tighten the head ***WITHOUT TOOLS*** (Ref.2.1) in the body (Ref.1), using the knurled part of the head. The re-assembly position is therefore obtained by ***tightening the head in this position*** on the body.

If this procedure is not complied with the membrane may be destroyed.

Dismounting the sampling valve with non-blocking option

1) To dismount the head from its body, just tilt the lever (Ref.2.6) downwards and have ready the opening plate supplied with the PEMS (Ref.2.21). Place this plate between the support washer (Ref. 2.4) and the head (Ref.2.1).



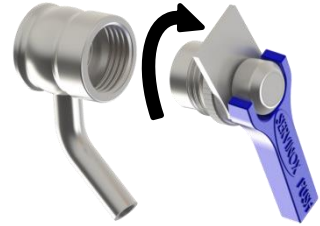
2) Loosen the head (Ref.2.1) in the body (Ref.1), using the knurled part of the head.

To replace the membrane, follow the procedure detailed in steps 2 to 6 the previous chapter "replacing the membrane".

Re-mounting the sampling valve with non-blocking option

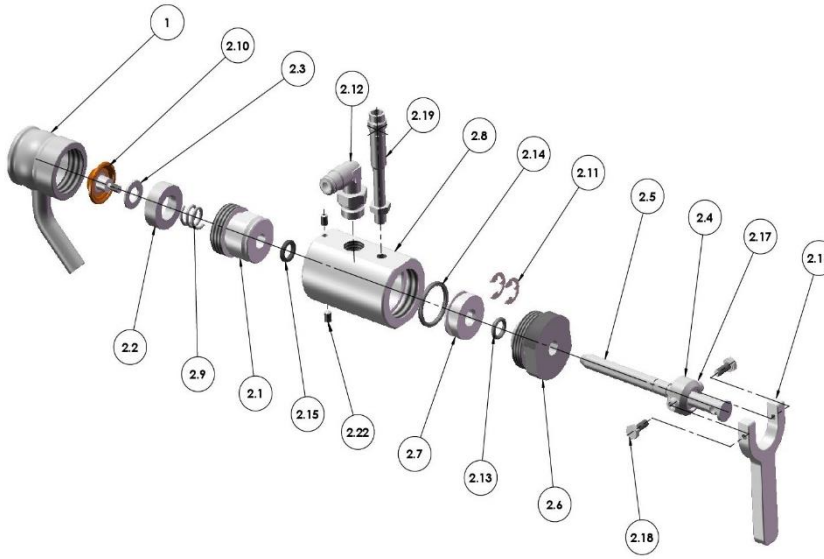
1) To mount the head on its body, just tilt the lever (Ref.2.6) downwards and have the opening plate ready (Ref.2.21). Place this plate between the support washer (Ref. 2.4) and the head (Ref.2.1).

2) Screw ***WITHOUT TOOLS*** the head (Ref.2.1) in the body (Ref.1). Using the knurled part of the head.



3) ***Once the PEMS head is mounted on its body, don't forget to remove the opening plate (otherwise continuous flow).*** For this, tilt the lever (Ref.2.6) downwards and remove the opening plate (Ref.2.21).

Exploded view (automatic version)



Equipment parts list (automatic version)

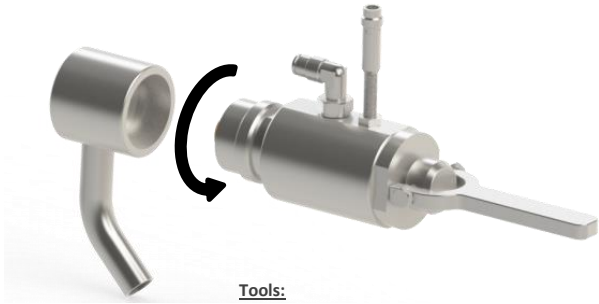
REFERENCE	DESCRIPTION	QUANTITY
1	Body	1
2.1	Brace	1
2.2	Membrane press	1
2.3	Washer	1
2.4	Support washer	1
2.5	Lift spindle	1
2.6	Cover	1
2.7	Piston	1
2.8	Cylinder tube	1
2.9	Spring	1
2.10	Membrane	1
2.11	Circlip for shaft	2
2.12	Pneumatic bracket	1
2.13	Seal	1
2.14	Seal	1
2.15	Seal	1
2.16	Stainless steel lever	1
2.17	Washer	2
2.18	Screw	2
2.19	Inductive sensor (connector M8)	1
2.22	Pointed end grub screw	2

Sampling valve disassembly (automatic version)

1) ⚠ Disconnect the inductive sensor at connector M8 level (Ref.2.19).

2) Dismount the head with its cylinder by tilting the lever horizontally 90°, which will open the sampling.

3) Loosen the drive head on the body using a no.24 (PEML, DN10) or no.17 (PEML, DN06) wrench with a maximum thickness of 7mm, or the specific tools supplied by Servinox.



Tools:
PEML DN10 = Ref. PE101023
PEML DN06 = Ref. PE051068

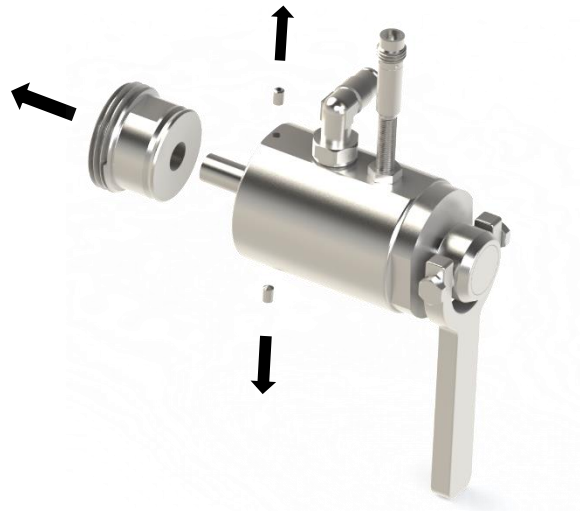
4) Turn the stainless steel lever 90° and dismount the hexagonal screws (Ref.2.18) to remove the stainless steel lever (Ref.2.16).

5) Remove the machined washers (Ref. 2.17) replacing them by a through spindle with a diameter of 3mm and 100mm long.

6) To dismount the membrane screwed on the lift spindle (Ref.2.5): using pliers, hold the membrane (Ref.2.10) and turn the lift spindle (Ref.2.5) with the 3mm spindle.

BEWARE of the possible ejection of the washer (Ref.2.3) due to the compressed spring (Ref.2.9).

7) Remove the washer (Ref.2.3), membrane press (Ref.2.2), spring (Ref.2.9) and the bracket (Ref.2.1). For bracket, remove screws (Ref.2.22).



8) Loosen the cover (Ref.2.6) on the cylinder tube (Ref.2.8).

9) Extract the seal (Ref. 2.15).

10) Dismount the circlip (Ref.2.11) on the membrane side.

11) Remove the piston (Ref.2.7) on the lift spindle (Ref.2.5) and dismount the seal (Ref.2.14).

12) Remove the seal (Ref.2.13).

Remounting the sampling valve (automatic version)

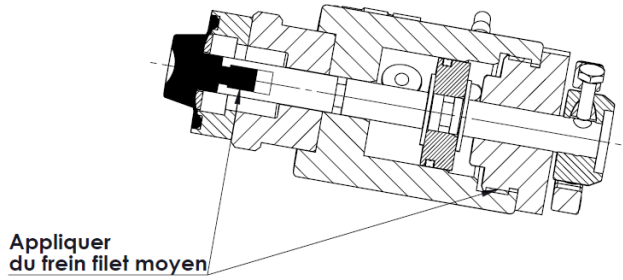
1) Replace the seals (Ref.2.15) and (Ref.2.13).

2) Replace the seal (Ref.2.14) and on the lift spindle (Ref.2.5) remount the piston (Ref.2.7).

3) Mount the circlip (Ref.2.11) on the membrane side.

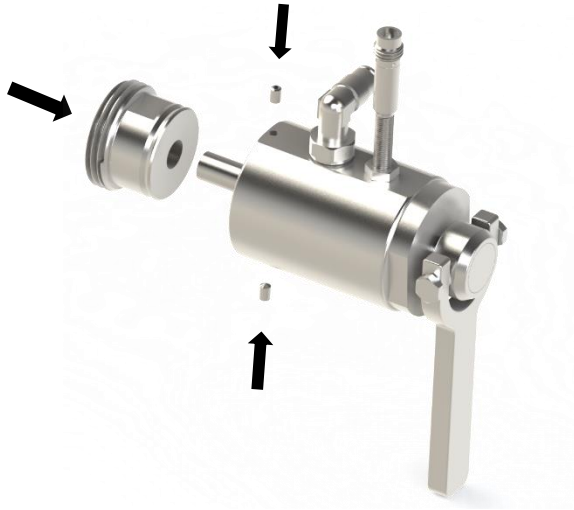
4) ***Make sure there are no impurities in the cylinder tube (Ref.2.8) and add the silicone grease.***

5) ***Apply a few drops of thread lock (medium) on the cover (Ref.2.6) and using a wrench tighten the cover*** with its unit [lift spindle (Ref.2.5) / piston (Ref.2.7) / lever (Ref.2.16)] on the cylinder tube (Ref.2.8).



[Apply thread lock (medium)]

6) On the lift spindle (Ref.2.5) mount the bracket (Ref.2.1) and fix the assembly using screws (Ref.2.22).



7) Then the spring (Ref.2.9), membrane press (Ref.2.2) and the washer (Ref.2.3).

8) ***Apply a few drops of thread lock (medium) on the thread of the new membrane (Ref.2.10) and screw the membrane on the lift spindle (Ref.2.5).***

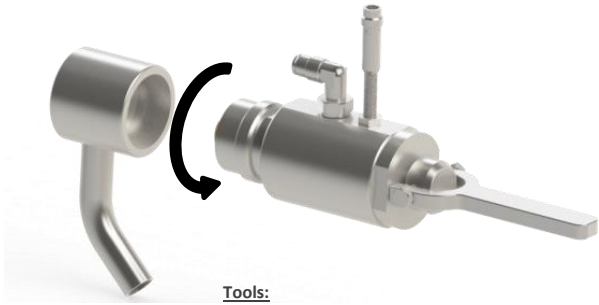
9) Withdraw the spindle 3 mm.

10) Position the two machined washers (Ref.2.17) on the lift spindle (Ref.2.5)

11) Assemble the lever (Ref.2.16) with the two screws (Ref.2.18).

12) ***Tilt the lever (Ref.2.16) horizontally in order to pull the membrane (Ref.2.10).***

13) ***Loosen the drive head on the body*** using a no.24 (PEML, DN10) or no.17 (PEML, DN06) wrench with a maximum thickness of 7mm, or the specific tools supplied by Servinox.



Tools:
PEML DN10 = Ref. PE101023
PEML DN06 = Ref. PE051068

If this procedure is not complied with the membrane may be destroyed.

The orientation of the pneumatic connection (Ref.2.12) and if necessary of the detector (Ref.2.19) can be changed according to need. To do this, slightly unscrew the two fixing screws (Ref.2.22), turn the cylinder tube (Ref.2.8) and tighten the screws (Ref.2.22) again.

14) Close the valve: turn the stainless steel lever 90° (Ref.2.16).

15) Test the sealing of the valve and the absence of any air leak on the cylinder.

16)  Connect the inductive sensor (Ref.2.19) and make sure it is working correctly.

7 DIAGNOSTIC ASSISTANCE

The table below provides assistance in troubleshooting and is intended to help you resolve simple operating incidents.

INCIDENT	POSSIBLE CAUSE	SOLUTION
Fluid leak	- Connection welding broken (poor welding on installation, corrosion, etc.)	> Repair the welding by qualified persons
	- Membrane worn out	> Replace the worn-out membrane > Adapt the membrane material to the fluid
	- Blocking of the lever in open position	> Opening plate not removed > Lever blocked by the surrounding installation or a foreign object. > Replace the spring
	- Incorrect tightening of the knurled head	> Tighten the head without the use of tools
	- Membrane dripping	> Check the membrane assembly
Dismounting the lever on the support washer during sampling	- Too much pressure applied on the lever	> Apply sufficient pressure to complete the required sampling
	- Tab(s) worn	> Replace the lever (contact Servinox) Any lever dismounted on the support washer during a sampling must be replaced

8 GUARANTEE

Unless stipulated otherwise in the offer, the ***equipment is guaranteed for 12 months as of the date of delivery.***

Parts deemed defective following expertise in our factory shall be replaced at no cost.

If any of the equipment components (worn parts, seal, etc.) need to be replaced, they must be replaced by SERVINOX original parts

The guarantee does not cover damage resulting from:

Incorrect assembly, inappropriate or abusive use,

An accident or installation that is not conform,

Equipment modification,

A leak following a passage of impurities shall not be taken into account,

Mandatory servicing not carried out.

The guarantee covering our products provides for free repairs on parts returned to us where it is proved that they have become unusable prematurely due to a manufacturing or material fault.

We shall not be held responsible for any damages due or any other obligation of this type.

The equipment has been checked prior to leaving the factory.

This equipment is certified inspected and authorised for sale.

Notes

solutions
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