Water Filtration Systems

FMA – 4000

CPF1-10 24 & 220

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

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IMPORTANT WARNINGS

READ CAREFULLY AND FOLLOW THE DEVICE MANUAL INSTRUCTIONS. THE MANUFACTURER IS NOT RESPONSIBLE FOR THE DAMAGES OCCURED OR THE NEGLIGENCES HAPPENED AS A RESULT OF NOT READING THE MANUAL

This device has been manufactured in such a way that its performance does not bring about any risks for the designed usage, provided that:

Both the installation and the management, as well as the maintenance have to be carried out according to the manual instructions.

The facilities conditions and the supply voltage have to follow the specified instructions.

Any different usage from this will be incorrect, as well as the non authorized modifications made by the manufacturer. The damages occurred because of an incorrect usage will be the user responsibility what will automatically determine the warranty cancellation.

Remember that the device will contain electric components with voltage, and therefore, all the service operations or maintenance will be performed by qualified and skilled personnel, aware of the necessary precautions. Before having access to the interior parts, the electric supply has to be dismantled.

READ AND KEEP THIS INSTRUCTIONS

We really want you to save time and money!
We assure that this entire manual reading will guarantee the correct installation and a safe product usage.

BEWARE!

ELECTRICAL DISCHARGE RISK. THE OPERATIONS INDICATED WITH THIS SYMBOL WILL HAVE TO BE PERFORMED ONLY BY SKILLED TECHNICAL PERSONNEL

BEWARE!
 ESSENTIAL INFORMATION AND ASPECTS. HAVE THE DEVICE DOCUMENTATION AS A REFERENCE.

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Declaración de Conformidad CE

(Conforme a las Directivas Europeas 2006/42/CE sobre Máquinas-Anexo IIA, Directiva 97/23/CE sobre Equipos a Presión y Directiva 2006/95/CE sobre Material Eléctrico)

EC Declaration of Conformity

(As defined by "Machinery Directive 2006/42/EC, Appendix IIA", "Pressure Equipment Directive (PED) 97/23/EC" and "Electrical Equipment Directive 2006/95/EC")

Por el presente documento declaramos que los productos especificados a continuación cumplen los requisitos básicos de seguridad y salud conformes a las siguientes directivas que le son de aplicación:
We hereby declare that the products specified below meet the basic health and safety requirements, according to the next directives:

DIRECTIVA SOBRE MÁQUINAS 2006/42/CE / (Machinery Directive 2006/42/EC, Appendix IIA)

DESCRIPCIÓN DE LA MÁQUINA: *Machine Description:*	*FILTRO DE MALLA AUTOLIMPIANTE ELÉCTRICO* *AUTOMATIC SCREEN FILTER ELECTRICAL DRIVE*
FUNCIÓN: *Function:*	*RETENCIÓN DE SÓLIDOS EN SUSPENSIÓN* *SOLID ON SUSPENSION RETENTION*
MODELO / TIPO: *Model / Type:*	
CLIENTE: *Customer:*	
NÚMERO DE SERIE: *Serial Number:*	
LA MÁQUINA SE ENCUENTRA EN ANEXO IV? *The machine is included in Appendix IV?*	*NO*

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DIRECTIVA SOBRE EQUIPOS A PRESIÓN 97/23/CE / *("Pressure Equipment" Directive 97/23/CE)*

Con arreglo al Apartado 3.9 del Artículo 1, de la Directiva 97/23/CE, los equipos que correspondan a lo sumo a la Categoría I, quedan excluidos de los requisitos de la presente Directiva.

Based on Section 3.9 of Article 1, of this directive, the pressure equipment classified as no higher than category I, is excluded from the scope of this Directive.

DESCRIPCIÓN DEL EQUIPO: *Equipment:*	*FILTRO DE MALLA AUTOLIMPIANTE* *AUTOMATIC SCREEN FILTER ELECTRICAL DRIVE*
PRESIÓN DE DISEÑO / TEMPERATURA DISEÑO *Design Pressure / Design Temperature*	*PN10 / 50ºC*
FLUIDO A CONTENER/ GRUPO S. D 67/548/CEE *Fluid to contain / Fluid group S/D. 67/548/CEE :*	*AGUA / GRUPO 2* *WATER / GROUP 2*
CATEGORÍA DEL EQUIPO / MÓDULO *Category S/D.9-/2-EC / Module*	*NO APLICA (APARTADO 3 ARTICULO 3)* *NOT APPLY (SECTION 3 OF ARTICLE 3)*

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DIRECTIVA SOBRE MATERIAL ELÉCTRICO DESTINADO A UTILIZARSE CON DETERMINADOS LÍMITES DE TENSIÓN 2006/95/CE / *("Directive 2006/95/EC to electrical equipment designed for use within certain voltage limits")*

El Dossier Técnico de Fabricación de estos equipos se encuentran en nuestro domicilio social arriba indicado.

The Technical Construction File for these equipments are maintained at our corporate address, mentioned above.

La maquinaria, equipo, montaje o su-montaje al que se refiere esta Declaración de conformidad no debe ponerse en funcionamiento hasta que la unidad a la que se incorpore haya sido declarada de conformidad con las disposiciones de la(s) Directiva(s) que le resulte(n) aplicable(s).

The machinery, product, assembly or sub-assembly covered by this Declaration of Conformity must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the applicable Directive(s).

Monzón, 18 de marzo de 2016 / 18th March, 2016

Andrés Bellera
Departamento de Calidad / Quality Department

1. – INTRODUCTION

STF – FILTROS congratulates you on the acquisition of the self backwashing automatic filters.

All the products manufactured by STF – FILTROS are easy to install, use and maintain.

If you have any doubts about its performance after reading this manual, please contact the STF-Filtros Technical Department.

CONTACT

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WARRANTY CERTIFICATE

TWO YEAR LIMITED WARRANTY

STF-Filtros sells this product with the understanding that the user will perform all necessary tests to determine the suitability of this product for the user's intended application, and warrants to the original purchaser that this product will be free from defects in material and workmanship for twenty four (24) months from the product delivery date. Subject to the limitations set forth below, STF-Filtros will repair, replace or refund the purchase price as paid by the CUSTOMER.

The repair, replacement or refund remedy shall be the sole and exclusive remedy provided under the "Two year limited warranty" and shall not extend beyond the twenty four (24) months period set forth herein.

Exclusions and Limitations

1. The "Two-year limited warranty" is void if the product has been subjected to:

a) Misuse, neglect or accident.
b) Unathorized modification, improper installation or application.
c) Use in violation of our instructions for installation and maintenance.
d) Repair or modifications performed by non-qualified personnel
e) Power surges, flood, fire, accidental breakage or other events outside STF- FILTROS control.

2. The "Two year limited warranty" does not cover any transportation charge, customs clearance or any other costs for return of the products, for reshipment of any repaired or replaced products, or costs associated with installation, removal or reinstallation of the products.

3. Warranty claims will not be honoured if the type or serial number of the products of STF FILTROS have been altered, removed or made illegible.

4. Due to our high degree of customer loyalty, we can only grant the warranty stipulated in this certificate to our direct customers.

Model	
Serial Number	__ __ __/__ __ __ __

_____
Issue date

_____ _____
Delivery note No. Authorized signature

FILTER SAFE USE INSTRUCTIONS

THE INCORRECT USE AND MAINTENANCE OF THE EQUIPMENT MAY CAUSE PHYSICAL INJURIES.

IT IS STRONGLY RECOMMENDED TO RESPECT THE FOLLOWING INSTRUCTIONS IN ORDER TO AVOID RISKS.

USE ACCIDENT PREVENTION MEASURES THAT GUARANTEE YOUR SAFETY AND THE EQUIPMENT SAFETY.

1. Do not touch parts in motion.

Never place your hands, fingers or any other body parts near the filter parts in motion.

2. Do not touch the filter without protections.

Never use the filter without the protections are not perfectly settled in its place (e.g. Protection cover). If the maintenance operations require their renoval making sure that before using the new filter the protections are well fixed in its corresponding place.

3. Get protected in case of electric shocks.

Avoid equipment electric part accidental contacts with the metallic parts.

4. Switch off the filter.

Switch off the filter before performing any assistance, inspection, maintenance, backwashing, replacement or control of pieces.

5. Discharge filter pressure.

Remove the equipment pressure before performing any assistance, inspection, maintenance, backwashing, change or control of pieces.

6. Working area.

Keep the working area clean and from time to time remove the unnecessary tools. The equipment may produce sparks while it is running, never use the equipment if there is polish, petrol or any other fuel or explosive material.

7. Filter maintenance.

Follow this manual instructions, revise the greasing, inspect the supply wire periodically, if it is damaged get it repaired by skilled personnel. Check that the external appearance has not got visual faults.

8. Check that screws, bolts and covers are firmly fixed.

Check that they are adjusted from time to time.

9. Make the equipment to run at a nonimal tension

Pay attention to the specified voltage in this manual and the characteristics plate in the filter.

10. Never use the filter if it is faulty.

If the filter runs making weird noises, a lot of vibrations or it looks faulty, stop its running immediately and check its functionality.

11. Use only original spare pieces.

The use of no original spare pieces invalidates the warranty.

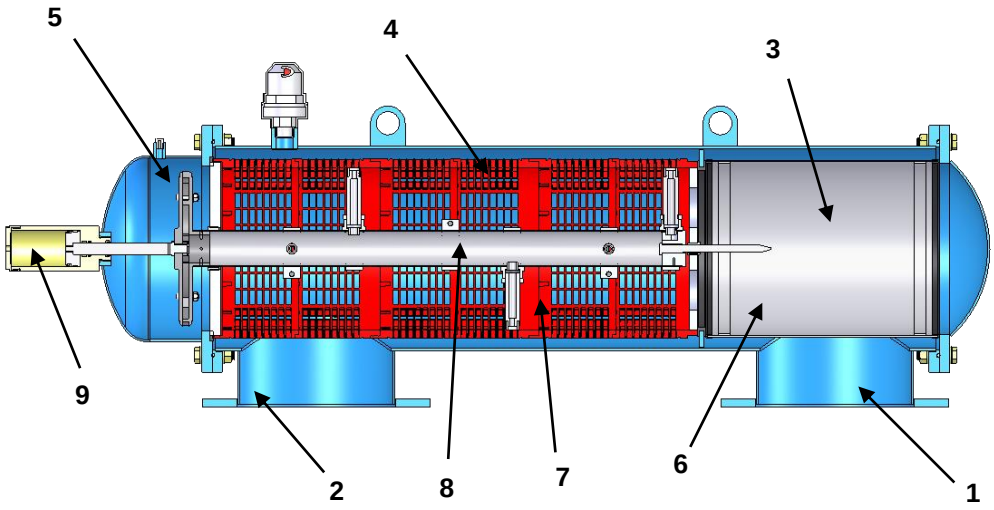
12. Do not modify the filter.

A non authorized modification can diminish the equipment performance qualities and produce harsh accidents if people have not the appropiate technical knowledge.

13. Switch off and drain off the equipment.

When the filter is not running switch off the supply equipment and drain off the filter to get its life extended.

The filter comprises an outer casing in which are housed three different cameras. A first chamber prefilter that matches the inlet water to the filter; and wherein the mesh coarse. A second filter chamber in which a fine mesh in which the filtration process and a third cleaning chamber occurs is located is situated.



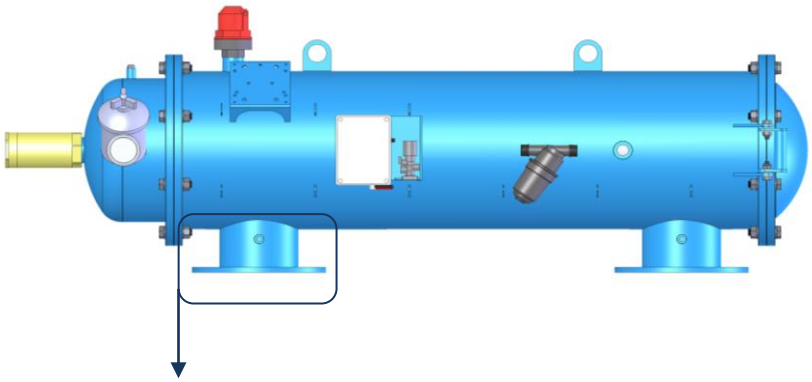
1.	Water inlet	6.	Filtering cartridge
2.	Water outlet	7.	Scanner set
3.	Roughing chamber	8.	Actuation mechanism
4.	Filtering chamber		
5.	Cleaning chamber		

The water flows from inside the filter body outward. Remaining suspended solids (dirt) retained in the filter element, ie in the mesh. This camera coincides with the outlet of the filtered water to the desired application: potable water, process water, cooling water, etc..

The retained dirt is forming a cake on the grid, generating a loss given load. Filter cleaning is supported by a second chamber, the cleaning chamber, whose output is connected to the drain valve that allows the evacuation of the wash water when the self-cleaning process is generated. The cleaning chamber is separated from the filtration by special seals.

Finally as a vital element of this technology, we find the suction scanner. This scanner occupies the exact position that would occupy the central axis of the filter cartridge, and is hydraulically connected to the cleaning chamber. In turn, and in the area that it occupies in the filter chamber, are arranged perpendicularly suction nozzles, reaching with nylon bristles to few microns of the mesh. The position of these nozzles on the suction scanner is studied to contact the entire inner surface of the mesh, the spiral movement thanks to the electric motor provides the scanner: combining a longitudinal displacement and rotation.

The minimum pressure is 2 bar for a micronage of 125 µm, for the rest of microns, is necessary to consult.



$P_{mín}$ = 2,5 bar
For 125 µm
Other microns consult.

1. Water gets into the filter through the prefiltration chamber, where thick particles are retained, as it was a strainer.

(*) If available: FMA-2000, FMA-4000, FMA-5000

2. Water gets into the filtering chamber, goes through from inside to outside the **filtering screen**, producing the **surface mechanic**. High quality water is obtained according to the filtration degree choosen for the filtratrion screen which can vary from 10 microns to 2000 microns.

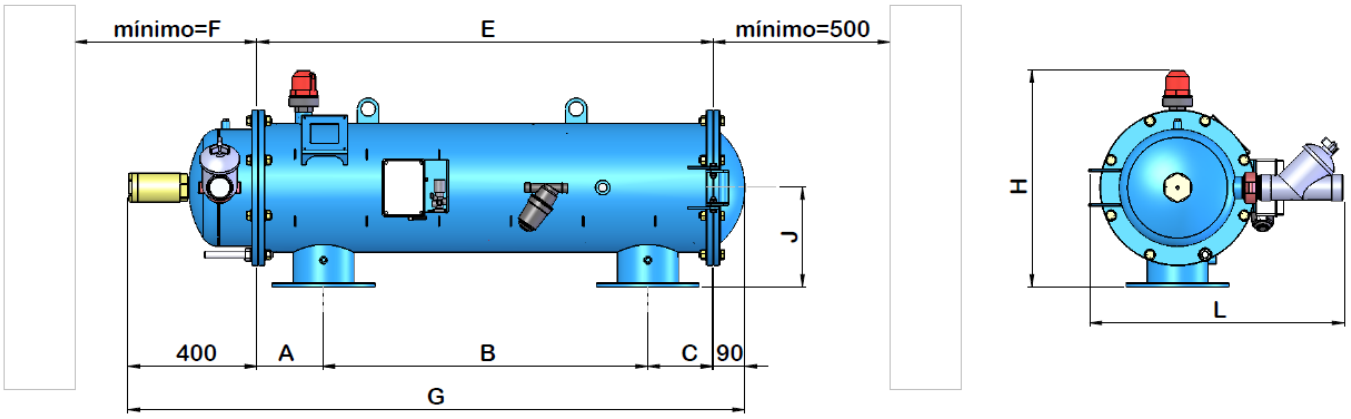
(*) FMA-1000 filtration degrees between 80 and 1000 microns.
FMA-4000 filtration degrees between 74 and 1500 microns.
FMA-1000E filtration degrees between 80 and 1000 mircrons.

3. Dust remains on the thin screen interior what produces head loss between the filter inlet and outlet gradually. Two analogic transducers will indicate the backwashing sequence when the DP becomes 0.3 (3 m.c.a). There are other possibilities to make the filter backwashing: Time backwashings, time and pressure combination, continuous backwashing option.

4. When the pressure switch indicates 0.3 bar, the drain valve receive the opening order, then it generates a pressure difference between outside (atmospheric pressure) and the inside of the filter (working pressure) that is why fast running water which is produced, goes through the screen and then goes outside through the nozzles internal orifice. Besides this, at this very moment the starting order is also sent to the engine.

5. The result of these actions is: the suction effect of the nozzles on the screen dust and the suction scanner spiral movement in the inside of the filter.

6. During the backwashing process that lasts 25 seconds, water is still being filtered and goes on flowing to the system or application. This fact whis is is due to the filters design allows that the backwashing water consumption is **minimum** and the working system is **continuous.**



DIMENSIONS									
Model	A	B	C	E	F	G	H	J	L
FMA - 4003	156	360	196	712	500	1202	598,5	275	705
FMA - 4004	111	770	106	987	690	1477	598,5	275	705
FMA - 4006	181	900	181	1262	970	1752	598,5	275	705
FMA - 4008	231	1100	206	1537	1240	2027	598,5	275	705
FMA - 4010	231	1370	211	1812	1520	2302	598,5	275	705

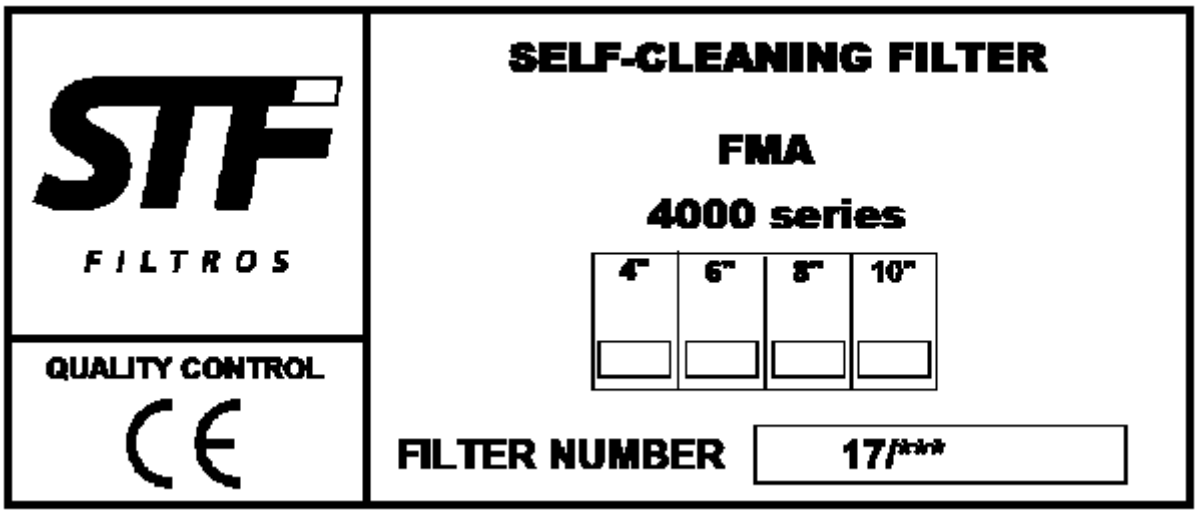
MODEL	4003	4004	4006	4008	4010
GENERAL FEATURES					
Diameter Inlet/Outlet (1)	DN-80 (3”)	DN-100 (4”)	DN-150 (6”)	DN-200 (8”)	DN-250 (10”)
Max./mín. working pressure	2.5 bar / 10 bar (Others consult us)				
Max. fluid temperature	50 ºC				
STAINLESS STEEL INJECTION MESH SUPPORT					
Maximum flow rate (m^3/h)	110	200	270	410	580
Gross filtering area (cm^2)	2.475	4.950	7.425	9.900	12.375
Dry weight (kg)	100	115	130	145	165
Filtration sizes	1500, 1000, 500, 300, 200, 125, 100, 74 microns				
BACKWASH					
Backwash valve	G-2” thread				
Duration of wash cycle	20-40 seconds				
Wash flow (m^3/h)	3	6,5	14	23	28
Water consumption per wash (liters)	25	49	110	178	238
ELECTRICAL DATA					
Operating voltage	4 pilas 1.5 V LR 14-C / (optional 220 V AC 50 Hz)				
Control voltage	6 V DC / (24 V DC optional 220 V AC)				
STANDARD MATERIALS					
Filter body and caps	S-235-JR Carbon steel				
Finish treatment	Oven-cured epoxy polyester powder paint coating				
Suction scanner	AISI-304 Stainless steel				
Filtering mesh	AISI-316 Stainless steel				
Suction nozzle	PVC with AIS 316 stainless steel ring and nylon bristles				
Cleaning valves	Polypropylene				
Screws	5,6 Bichromated				
Gaskets	NBR – EPDM - Viton				

SPECIAL MATERIALS (OPTIONAL)	
Filter body and caps	AISI 304 stainless steel / AISI 316 / Duplex / SuperDuplex
Finish treatment	Inner coating suitable for sea water, outer coating suitable for marine environment.
Suction scanner	Duplex or Superduplex Stainless steel
Filtering mesh	254 SMO Avesta Stainless steel
Cleaning valves	254 SMO Avesta Stainless steel
Screws	SA-193-B8M
Gaskets	Please consult

7. – IDENTIFICATION STICKER FMA-4000

FMA-4000 equipment is identified by an identification sticker affixed to the filter.

- FMA-4000



One of the sizes is selected by placing a check mark in the corresponding box, and the corresponding filter number is indicated.

- Filter number:
  The number 17 indicates: the year of manufacture, in this case 2017.
  The asterisks *** indicate: the manufacturing position from filter 001, in that year.

Available sizes are the following:

FMA-4000
4 ‘’
6 ‘’
8 ‘’
10 ‘’

1. Take precautions to prevent the filter from striking, the equipment lifting by means of the upper anchor points.

2. Make sure that the installation point has the minimum operation pressure.
   - The backwashing pipe has to be measured so that it gets a minimum flow head loss of 25 m³/h.
   - In installations with a working pressure superior to 6 bar, it is advisable to install a ball valve in the backwashing pipe to adjust the backwashing flow.

NOTE	
	THE MINIMUM WORKING PRESSURE IS 2 BAR BETWEEN THE FILTER OUTLET AND THE DRAIN VALVE. (*) FMA-1000 AND FMA-4000 MINIMUM PRESSURE IS 2,5 BAR. IN CASE THE DRAIN IS RECONDUCTED, IT IS NECESSARY TO INCREASE THE WORKING PRESSURE IN ORDER TO COMPENSATE FOR THE HEAD LOSS THAT MAY APPEAR IN THE DRAIN PIPE

3. Install the filter horizontally, check that there is enough room so that the filter can be easily accessed in safe conditions for future treatments and for its maintenance. See se section 6.

4. Position the filter in the driving obeying the arrows indicating the water running direction.

5. Inlet and outlet shut-off valves are recommended to be installed in order to insulate it. It is recommended to install a by-pass in order to avoid power cuts during the maintenance.

6. It is recommended to install an outlet backflow in order to avoid water hammer on the filter.

7. According to section 12.1 the electrical wiring can only be installed by a skilled electrician.

8. In the filter installation it has to be avoided that water splashes over the electrical components or the control panel.

1. Check previous section instructions.

2. Start with the following valve configuration:
   - Inlet valve: OPEN
   - Outlet valve: CLOSE.
   - By – pass (If it exists): CLOSE

3. Switch on the filter, put the circuit breaker ON

4. Make sure that the programmable relay is operational.

5. Manual backwash by pressing the limp button.

6. Open outlet valve.

7. A drop in pressure and water flow increase is produced when the water mains is filled in. That is why it is advisable to install an outlet pressure valve, making sure that the water mains filling is controlled.

NOTE

IN CASE A SUPPORTING PRESSURE IS NOT INSTALLED, DURING THE WATER MAINS FILLING, CLOSE THE OUTLET VALVE UNTIL GETTING 2 BAR IN THE CLEAN WATER PRESSURE GAUGE.
(*) FMA-1000 AND FMA-4000: 2,5 BAR.

ONCE THE WATER MAINS IS PRESSURIZED, OPEN THE OUTLET VALVE TO GET A CORRECT OPERATION.

8. Make sure that water flow and pressure installation correspond with the maximum values defined for this manual model. See section 6

9. Check the equipment operation and the head loss when the starting up is finished.

10. – MAINTENANCE INSTRUCTIONS

1. Switch off the enery supply filter before any maintenance operation.

2. Make sure that the filter is unpressurized before loosening the screws.

3. Avoid splashes and water leaks by minimizing the personnel risk sliding or being electrocuted and the damage that humidity can cause to the equipment.

4. After completing the treatment rearm the transmission mechanism protecting covers.

5. Make the manual backwashing of the filtering cartridge by using pressurized. If necessay acid or any other chemical products will be used. This process has to be done following the material instructions and not putting the operator or the rest of the people at risk.

6. Drain the equipment when it is not used for long time.

Note

Open and closethe valves slowly and gradually.

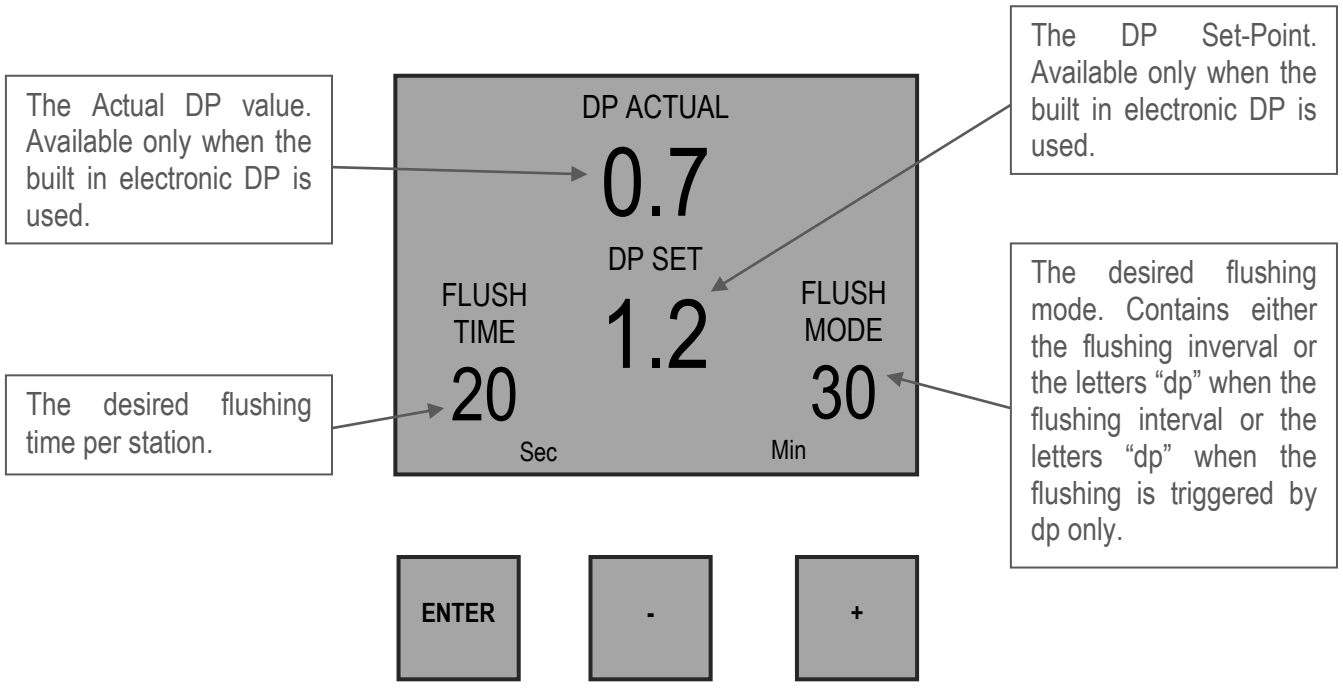
MAINTENANCE	TIME	ELEMENT	ACTION
		EXTERNAL	
Working check over	1000 backwashing cycles	Complete filter	Filter on + manual backwashing button. Control: Valve opening Efective backwashing cycle ($P_1 = P_2$)
Anticorrosion treatment	12 months	FMA casing	Check over the anticorrosion treatment in the necessary points. Apply Epoxi - Polyester treatment
		INTERNAL	
Anticorrosion treatment	12 months	FMA casing	Check over the anticorrosion treatment in the necessary points Apply Epoxi - Polyester treatment
Suction nozzle	12 months	Suction nozzle	Suction nozzles condition revision, nylon fibers condition, cartridge proximity.
Smoothing cartridge	12 months	Smoothing cartridge	Smoothing cartridge backwashing
Filtering cartridge	Inactivity period	Filtering cartridge	Backwash manually by using water under pressure, if necessary, acid or any other chemicals products will be used
Joints	12 months	Inside joints	Check over the inner joints. In case they are deteriorated, they will be replaced.
Overhaul of turbine	12 months	Turbine Motor arm	Check over that the conductions aren't plugged and it can be operated.
Overhaul of piston	12 months	Internal joints Plunger Stop cap Piston	Check over the elements that make up the mechanism of the piston: the plunger, the guide bush and the piston. If any is deteriorated, the replacement will proceed.

List of features

- The "CPF1-10 24 & 220" is a modular backflushing controller for automatic filters of 1 to 10 stations. There exist DC and AC models.
- The DC model can be powered either by 6v DC or 12v DC and it activates 2 wired 12v DC latching solenoids. The voltage for the solenoids switching is boosted by a charge pump.
- The AC model contains an internal transformer that generates the 24v AC for the solenoids.
- Flushing cycles may be triggered either by time or by the embedded electronic DP sensor reaching the set point, or by a dry contact signal from an external DP sensor.
- Endless looping problems can be eliminated by detecting repeated consecutive cycles passing beyond a predefined limit.
- The unit can optionally handle a Pressure-Sustaining / Main valve, and an Alarm output. The unit is equipped with a customized LCD display and key board.
- The unit counts separately the number of flushing cycles triggered by DP, by time and manually.

How to program the contraller

The controller is equipped with an LCD display and 4 keys as displayed below. When the unit is left untouched for a minute the display is switched off and the only life signal is given by a beep sound that can be heard every 20 seconds. Holding down any of the keys for a few seconds will bring the screen back to life



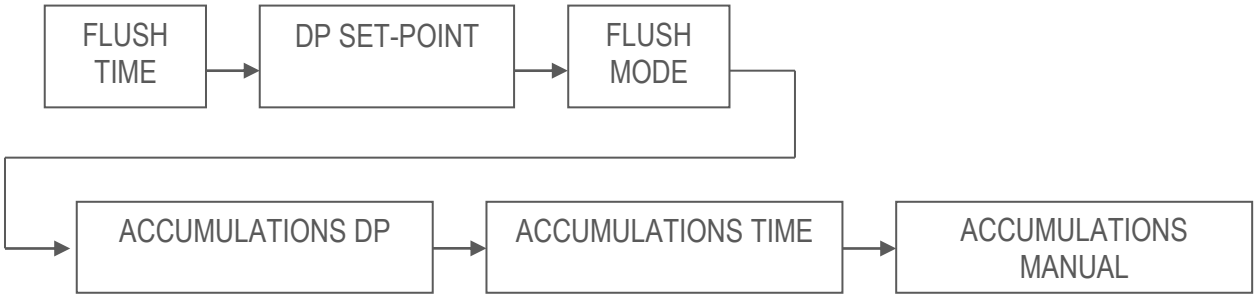
The screen consists of several fields, some of them are editable and some of them are not. For inserting **edit mode** the **enter** key has to be pushed. The **edit mode** is indicated by blinking of the characters at the currently editable field. Each time the **enter** key is pushed again, the next editable field becomes under focus and starts blinking. While in **edit mode** the “+” and “-“ keys can be used for changing the value under focus. Pushing the **enter** key again will set the selected value to the current field and move the focus to the next editable field which will start blinking. Once entering this process of passing through the edible fields, the user has no way back but by pushing the **enter** key repeatedly, he passes through the chain of edible fields until arriving back to the **flush time** field, meeting no more blinking fields.

REMARK

Notice that before the first use of the unit, it may be necessary to pass through the configuration process prior to defining the flushing program in order to adjust the features of controller to the specific application. The configuratin process is described below.

The chain of editable fields

Following is the chain of edible fields. The existence of the DP SET-POINT field depends on whether the system contains a built-in electronic DP or not.



The Flush Time

Defines the duration of the flushing time per station. The following options are selectable:

5-20 sec in steps of 1 sec
20-55 sec in steps of 5 sec
1-6 min in steps of 0.5 min

The DP Set Point

At this field the user defines the pressure difference between the filter's inlet and outlet that when reached, a flushing cycle will take place. This field appears only when the system includes the built in electronic DP sensor.

When the pressure is expressed in BAR the range of values is 0.1 – 2.0 BAR. When the pressure is expressed in PSI the range of values is 1- 30 PSI.

When the system does not include the built in electronic DP sensor but is connected to an external DP sensor, the flushing request signal arrives in the shape of a closed dry contact.

The Flush Mode

The Flush Mode defines how the flushing cycles is triggered. The selectable options are as follows:

OFF - no flushing will take place

By time – In this case the flushing cycles will be repeated in a selected interval or will be triggered by the DP signal depending on what happens first. No matter how was the flushing cycle started the interval to the next cycle will start to be measured again after each ending of a flushing sequence. The selectable intervals are the following:

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 minutes
2, 3, 4, 5, 6, 8, 12, 18, 24, 72, 120 hours

dp – flushing will be triggered by DP only.

REMARK

If the "+" and "-" keys are pressed and held down simultaneously the "Flush Mode" field will show the left time until next cycle, alternately hours and minutes.

The Accumulations

The unit accumulates and displays the number of flushing cycles caused by DP, by time, or manually. At each of the accumulation fields, the "+" or "-" keys may be used for clearing the accumulated value.

The configuration

In order to enter into the configuration process press and hold down the ENTER key for 3 seconds. The unit will detect how many "plug in" boards (each of 2 outputs) are used in the particular case. During the configuration process the following features are defined:

Main valve (sustaining valve) – Yes / No. When the answer is "Yes" the Pre Dwell delay between the Main Valve opening and the opening of Station No. 1 can be defined. The selectable delay steps are:

5, 10, 15, 20, 25, 30, 35, 40, 45, 50 sec
1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6 min

Dwell time - the delay between stations – 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 sec.

DP delay - the delay during which the DP sensor reading is expected to remain stable before reaction – 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 sec.

Looping limit - the number of consecutive flushing cycles triggered by the DP sensor before deciding that there is an endless lopping problem. The options are: 1-10 or "no" which means ignoring the looping problem.

Alarm - Yes/No – allocating one output for alarm activation.

Delay Valve - Yes/No – allocating an output for Delay Valve activation.

View Outputs - this is a special mode that enables passing through the list of outputs to see how each output was allocated. Use the + key to change the "no" into "yes" and confirm by "Enter", then keep using the + key to pass through the list. At the bottom left corner the ordinal number of the output is displayed and its allocated function appears in large letters at the center of the screen. Notice that the number of possible outputs that can be used is always an even number since it results from the number of "plug in" boards (each of 2 outputs) included. However if the number of outputs needed is not an even number, then the last valve allocated for flushing may be canceled by use of the manual operations key.

Pressure units - deciding about the units to be used for pressure measurement. Selecting between BAR or PSI.

Calibration- Zero calibration of the built in electronic DP sensor. While the sensor ports are disconnected select Calibration = Yes.

Handling Endless Looping problems

As explained above, endless looping problem will be declared when the number of consecutive flushing cycles triggered by the DP sensor exceeds the "Looping limit" defined during configuration. When endless looping problem was detected, the DP indication will no longer be considered as a trigger for flushing. The following flushing cycles will be triggered by the interval count down only.

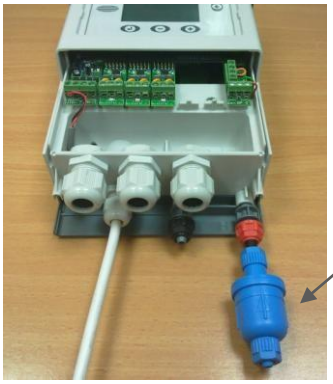
The problem will be considered as solved when the constant indication of the DP sensor will be removed.

Handling Low pressure

When a closed contact indication is received at the low pressure input of the controller, the symbol P will start to appear blinking at the display. All activities will stop including the countdown to the next flushing cycle. If the low pressure happened while a flushing sequence was in progress, when the low pressure condition terminates the flushing sequence will start from the beginning rather than continue from the stop point.

Connecting the DP sensor to the filter system

The DP sensor is connected to the filter system by 2 command tubes, the one which comes from the filter inlet (High pressure) will be connected to the red point, and the one that comes from the outlet (Lower pressure) will go to the black point. It is important to put a small filter of 120 mesh (not supplied) between the red point and the high pressure connection point.



The small filter to be added between the high pressure inlet and the red point. It is the user's responsibility to add this filter.

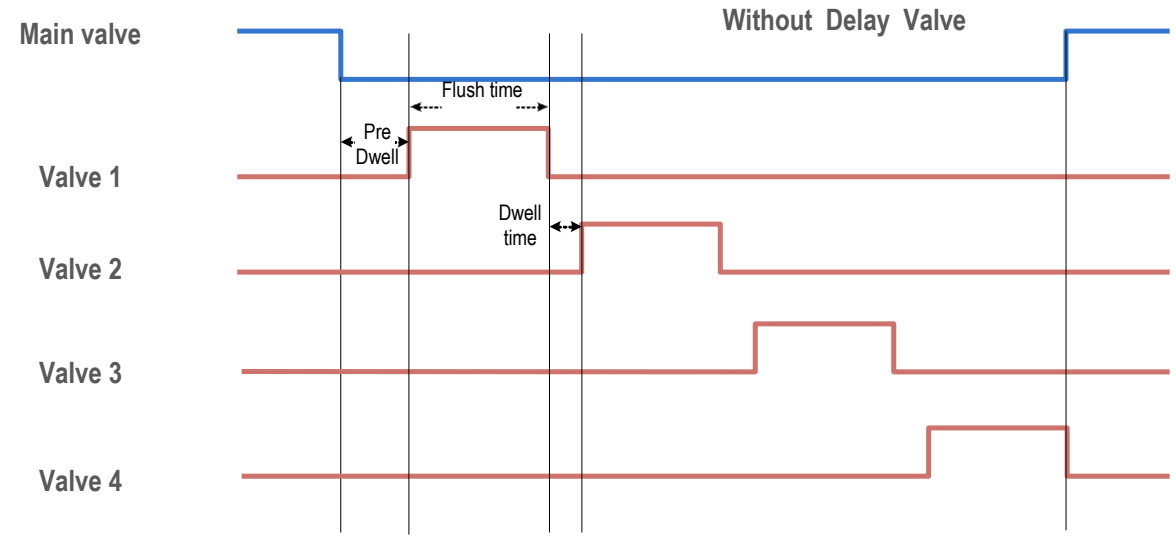
Low battery

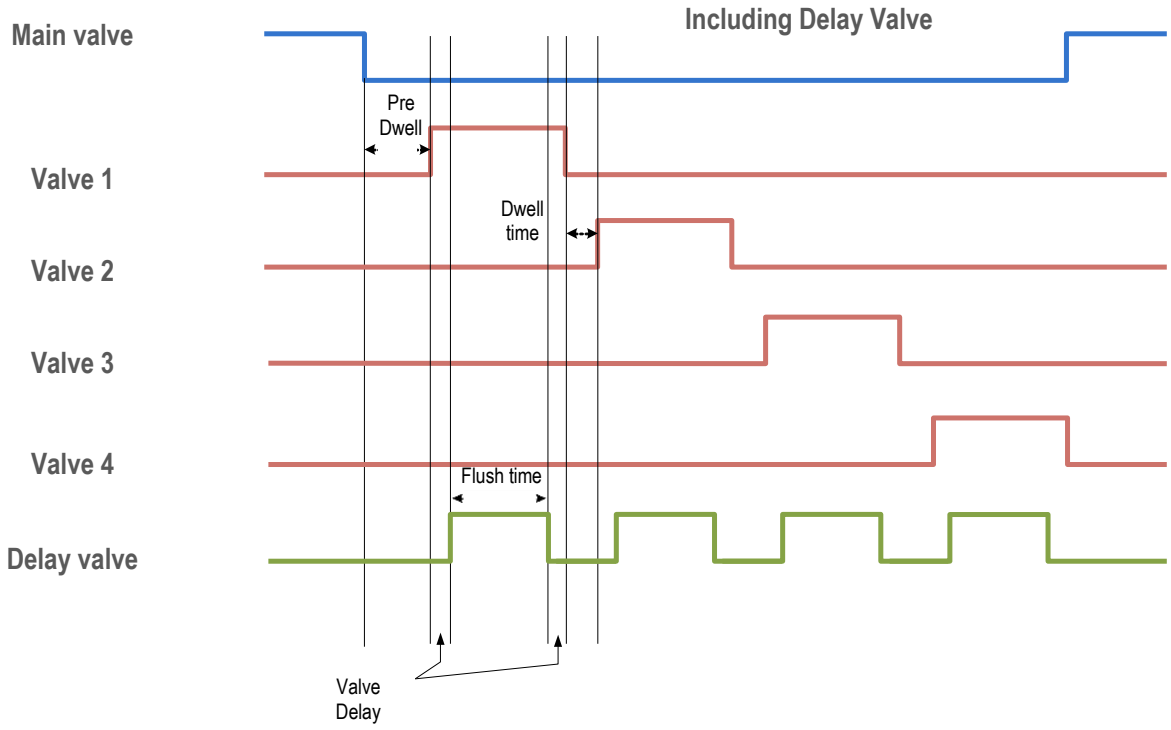
The unit has two levels of low battery indication. At the first level when the battery voltage drops to the first level, the sign will start to appear at the screen. When the battery voltage drops further and reaches the second level, all outputs will shut down, the screen will be cleared leaving only the low battery icon.

Manual activation

A flushing sequence can be manually activated by the "MANUAL" key. When manually activated the icon will appear on the display. The same key will be used for manually terminating a sequence in progress.

Timing Diagram





Wiring Diagram

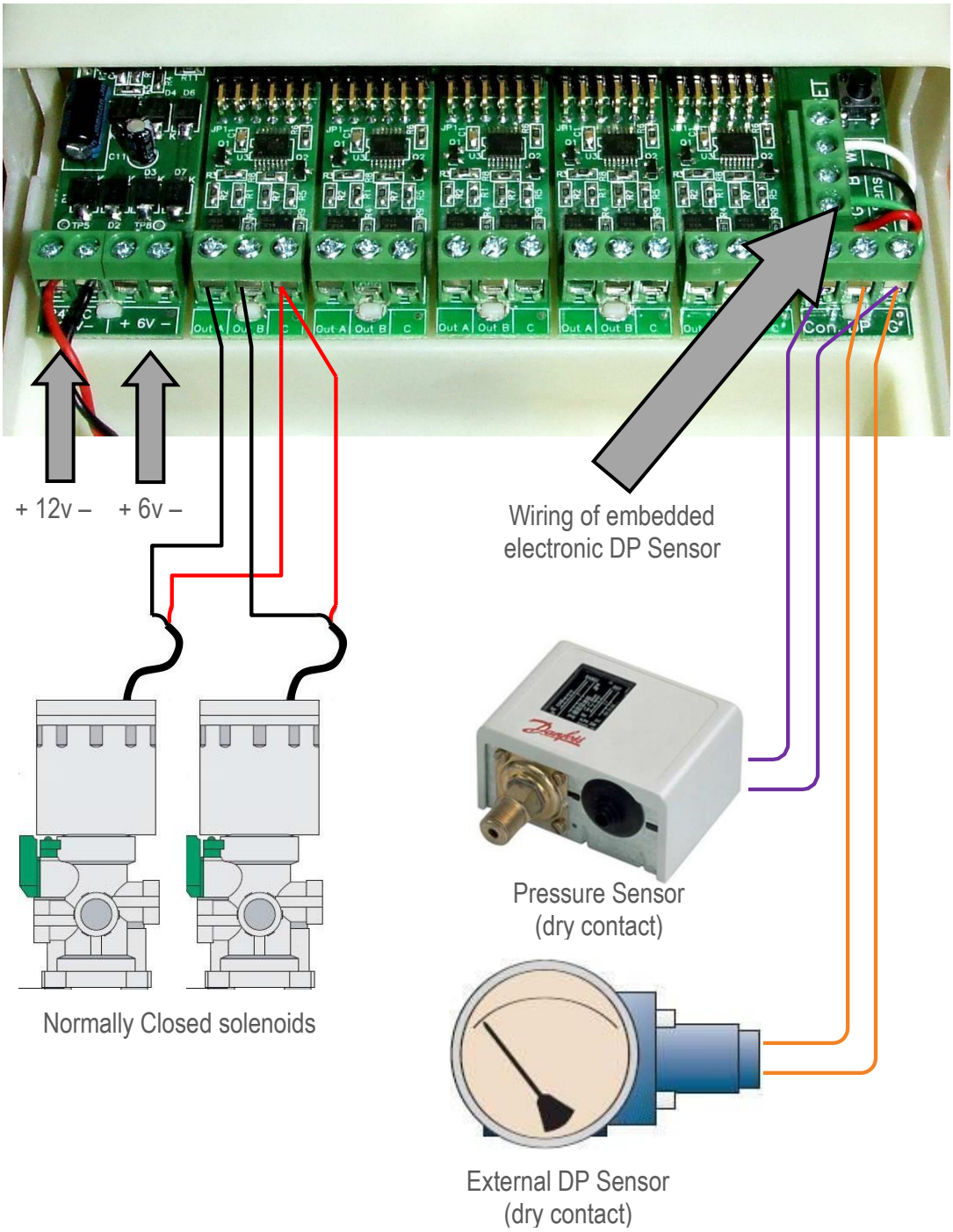
DC MODEL

The drawing below shows the wiring of the DC model of the controller.
Notice that:

1. The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.

2. The powering of the unit can be either by 6v DC or 12v DC.

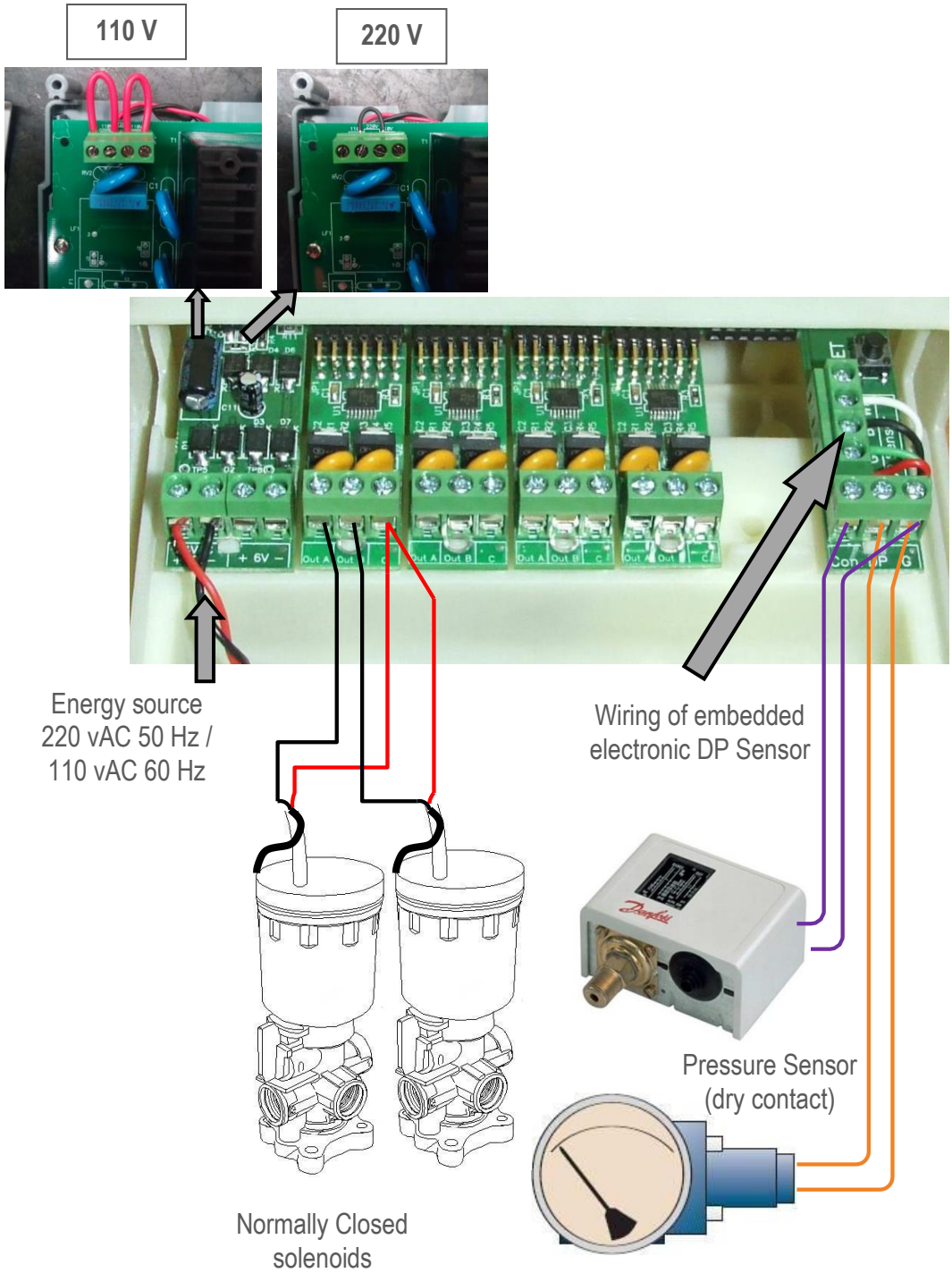
3. The solenoids will be of 12v DC latch.



AC MODEL

The drawing below shows the wiring of the AC model of the controller. Notice that:

1. The External DP sensor is optional and it is intender for use in cases there is no Embedded Electronic DP included.
2. The powering of the unit is by 24v AC transformed from 220/110 v AC
3. The solenoids will be of 24 v AC.



External DP Sensor
(dry contact)

TECHNICAL DATA

DC MODEL	
Power source	6v supplied by 4 x 1.5 “D” size alkaline batteries. Or 12v DC dry battery. Or 12v rechargeable battery with solar panel of 2 watts
Outputs	12v DC latching solenoids
DP	Embedded electronic analog DP sensor Or external dry contact DP sensor
Pressure Sensor	Dry contact pressure sensor
Operating temperature	0 – 60 ºC

AC MODEL	
Power source	220 OR 110 v AC 50 or 60 Hz with built in transformer to 24v AC
Outputs	24v AC solenoids
DP	Embedded electronic analog DP sensor Or external dry contact DP sensor
Pressure Sensor	Dry contact pressure sensor
Operating temperature	0 – 60 ºC

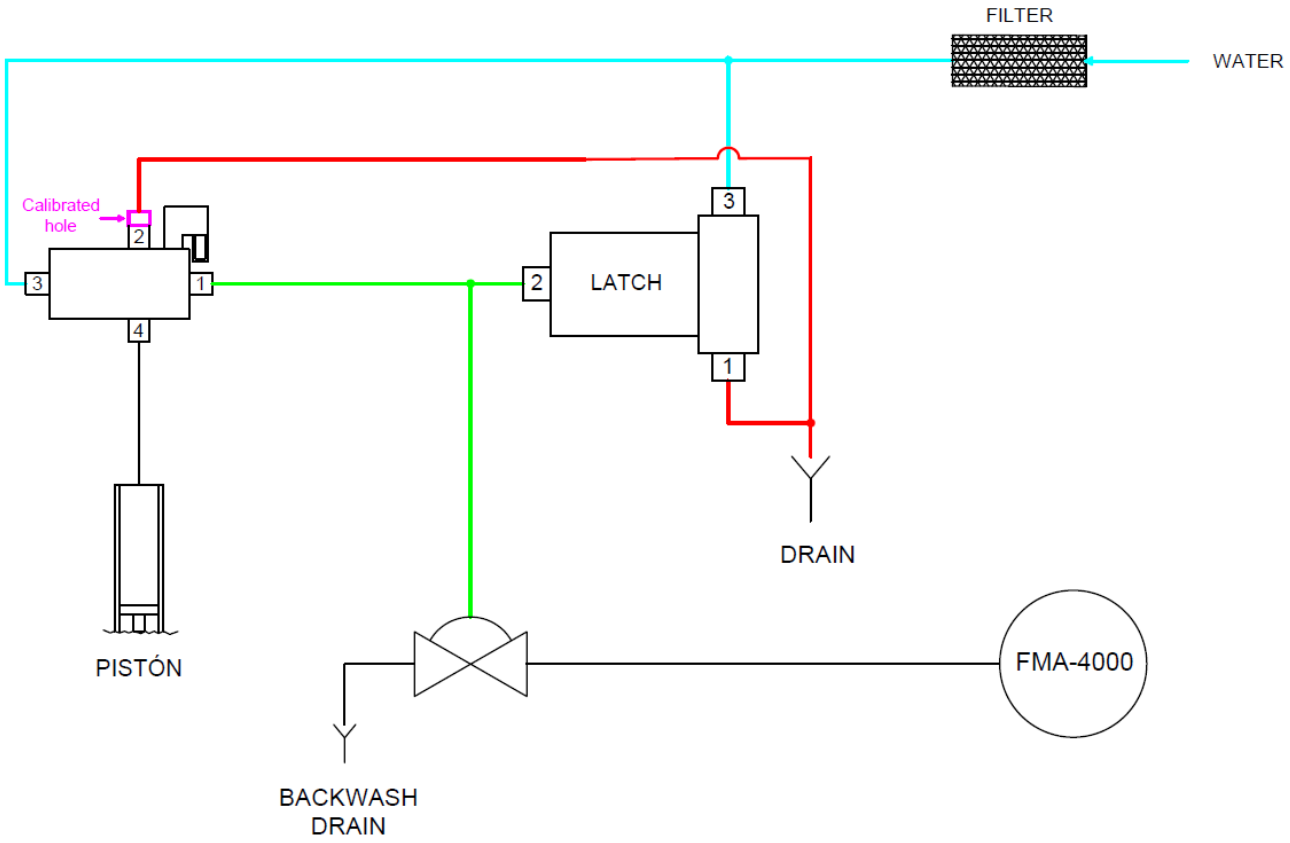
VALVE WITH ONE CHAMBER

The filter has a hydraulic valve in charge of evacuating the cleaning flow. The valve remains closed when water is received in the diaphragm chamber, it proceeds to open it by evacuating water in the chamber, closing when filling the chamber.

The valve has a mechanical adjustment, allowing to adjust the flow of cleaning, in installations above 6 bar pressure.

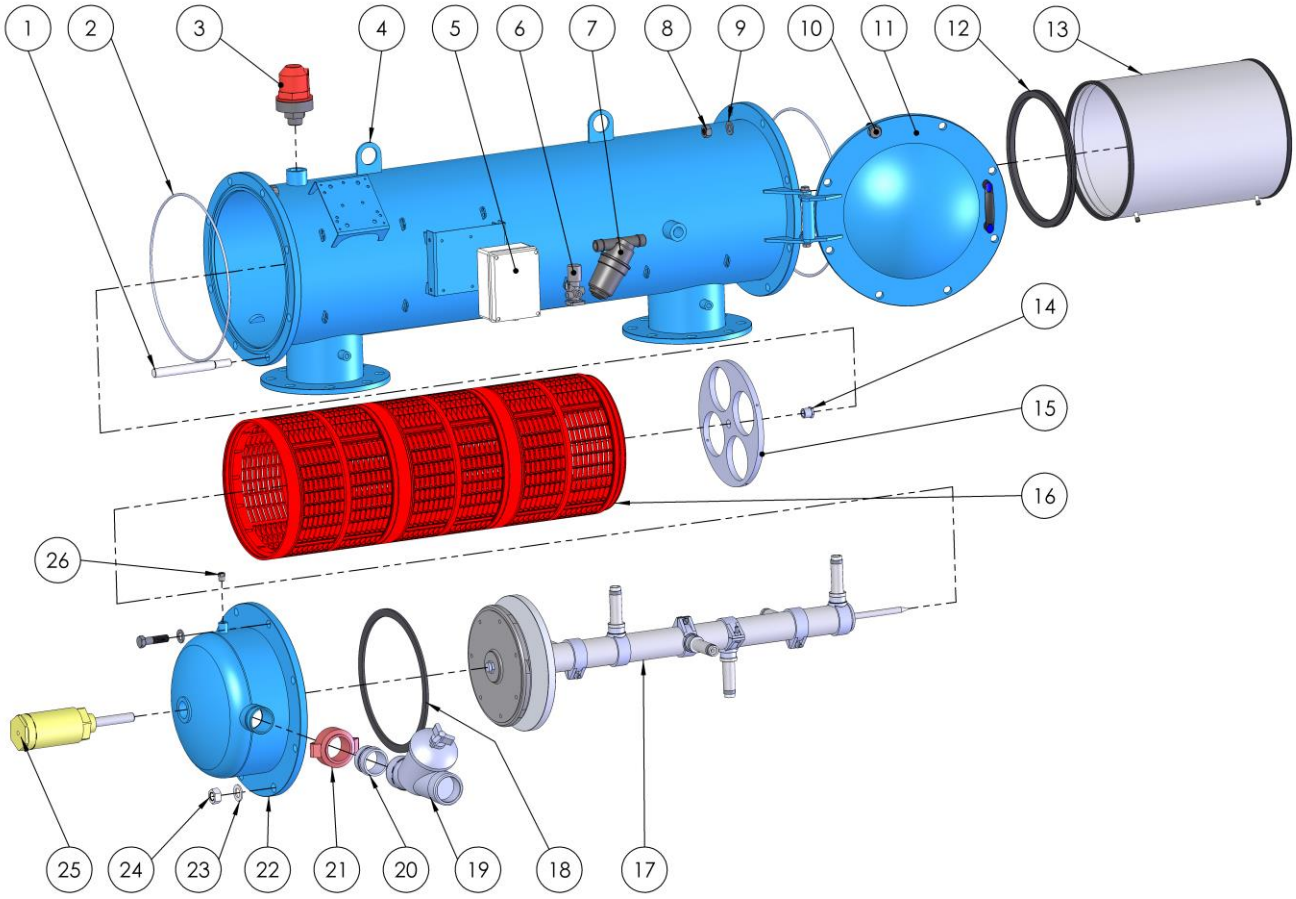
The opening and closing process is automated by a LATCH solenoid. As specified in the attached diagram.

A hydraulic relay is also installed to expedite the filling of the hydraulic piston.



Position	Equipment model	Description
1	FMA-4003 - FMA-4010	Cover centering rod
2	FMA-4003 - FMA-4010	O-ring ø365x5
3	FMA-4003 - FMA-4010	Gas male vent 1"
4	FMA-4003	Cover FMA-4003
	FMA-4004	Cover FMA-4004
	FMA-4006	Cover FMA-4006
	FMA-4008	Cover FMA-4008
	FMA-4010	Cover FMA-4010
5	FMA-4003 - FMA-4010	Electric panel with differential pressure switch (battery)
	FMA-4003 - FMA-4010	Electric panel with differential pressure switch (220v)
6	FMA-4003 - FMA-4010	Solenoid NO Lach (panel with battery) + Hydraulic relay
	FMA-4003 - FMA-4010	Solenoid NO 24v 50Hz (panel: 220v) + Hydraulic relay
7	FMA-4003 - FMA-4010	Fillter water intake 120 mesh M/M Gas-3/4"
8	FMA-4003 - FMA-4010	Nut M16
9	FMA-4003 - FMA-4010	Washer M16
10	FMA-4003 - FMA-4010	Screw M16x60
11	FMA-4003 - FMA-4010	Back side cover
12	FMA-4003 - FMA-4010	U-profile joint 60-VA-20
13		COARSE SCREEN
13.1	FMA-4003 - FMA-4010	U profile U 60VA80
13.2	FMA-4003 - FMA-4010	Coarse screen
13.3	FMA-4003 - FMA-4010	Plug GPN-280-ER8
14	FMA-4003 - FMA-4010	Centering bush
15	FMA-4003 - FMA-4010	Centering disc
16	FMA-4003	Cartridge INJECTION mesh ..... Microns
	FMA-4004	Cartridge INJECTION mesh ..... Microns
	FMA-4006	Cartridge INJECTION mesh ..... Microns
	FMA-4008	Cartridge INJECTION mesh ..... Microns
	FMA-4010	Cartridge INJECTION mesh ..... Microns
17		SCANNER
17.1	FMA-4003 - FMA-4010	Rotation screw
17,2	FMA-4003	Turbine FMA-4003
	FMA-4004	Turbine FMA-4004
	FMA-4006	Turbine FMA-4006
	FMA-4008	Turbine FMA-4008
	FMA-4010	Turbine FMA-4010
17.3	FMA-4003 - FMA-4010	Nut M16
17.4	FMA-4003 - FMA-4010	Bush guide
17.5	FMA-4003 - FMA-4010	Cleaning chamber disc
17.6	FMA-4003 - FMA-4010	Agglomerate screw A4x12
17.7	FMA-4003	Nut M8
	FMA-4004	Nut M8
	FMA-4006	Nut M8
	FMA-4008	Nut M8
	FMA-4010	Nut M8
17.8	FMA-4003	Nozzles collar 63 - 3/4"
	FMA-4004	Nozzles collar 63 - 3/4"
	FMA-4006	Nozzles collar 63 - 3/4"
	FMA-4008	Nozzles collar 63 - 3/4"

	FMA-4010	Nozzles collar 63 - 3/4"
17.9	FMA-4003	Screw M8x30
	FMA-4004	Screw M8x30
	FMA-4006	Screw M8x30
	FMA-4008	Screw M8x30
	FMA-4010	Screw M8x30
17.10	FMA-4003	Nozzles
	FMA-4004	Nozzles
	FMA-4006	Nozzles
	FMA-4008	Nozzles
	FMA-4010	Nozzles
17.11	FMA-4003	Nozzle nut 3/4"
	FMA-4004	Nozzle nut 3/4"
	FMA-4006	Nozzle nut 3/4"
	FMA-4008	Nozzle nut 3/4"
	FMA-4010	Nozzle nut 3/4"
17.12	FMA-4003	Support noozles bush
	FMA-4004	Support noozles bush
	FMA-4006	Support noozles bush
	FMA-4008	Support noozles bush
	FMA-4010	Support noozles bush
17.13	FMA-4003 - FMA-4010	Side centering cover
17.14	FMA-4003 - FMA-4010	Centering shaft
17.15	FMA-4003	Noozle-holder tube FMA-4003
	FMA-4004	Noozle-holder tube FMA-4004
	FMA-4006	Noozle-holder tube FMA-4006
	FMA-4008	Noozle-holder tube FMA-4008
	FMA-4010	Noozle-holder tube FMA-4010
18	FMA-4003 - FMA-4010	Joint ø320 x ø286 t=6
19	FMA-4003 - FMA-4010	Valve S-100 Gas 2" (on line)
20	FMA-4003 - FMA-4010	Vitaulic gas thread connection 2"
21	FMA-4003 - FMA-4010	Vitaulic Union 2"
22	FMA-4003 - FMA-4010	Cylinder side cover
23	FMA-4003 - FMA-4010	Washer M20
24	FMA-4003 - FMA-4010	Nut M20
25		PISTON
25.1	FMA-4003 - FMA-4010	Cylinder cover
25.2	FMA-4003 - FMA-4010	O-ring ø69x2.5
25.3	FMA-4003 - FMA-4010	NAP-300 joint 63x53x7
25.4	FMA-4003 - FMA-4010	Guide band 8x2.5
25.5	FMA-4003 - FMA-4010	Plunger
25.6	FMA-4003 - FMA-4010	Plunger
25.7	FMA-4003 - FMA-4010	Piston body
25.8	FMA-4003 - FMA-4010	O-ring ø37x4
25.9	FMA-4003 - FMA-4010	Quadric gasket EQ-16
25.10	FMA-4003 - FMA-4010	NI-150 joint 20x28x5.5
26	FMA-4003 - FMA-4010	Gas male plug 1/4"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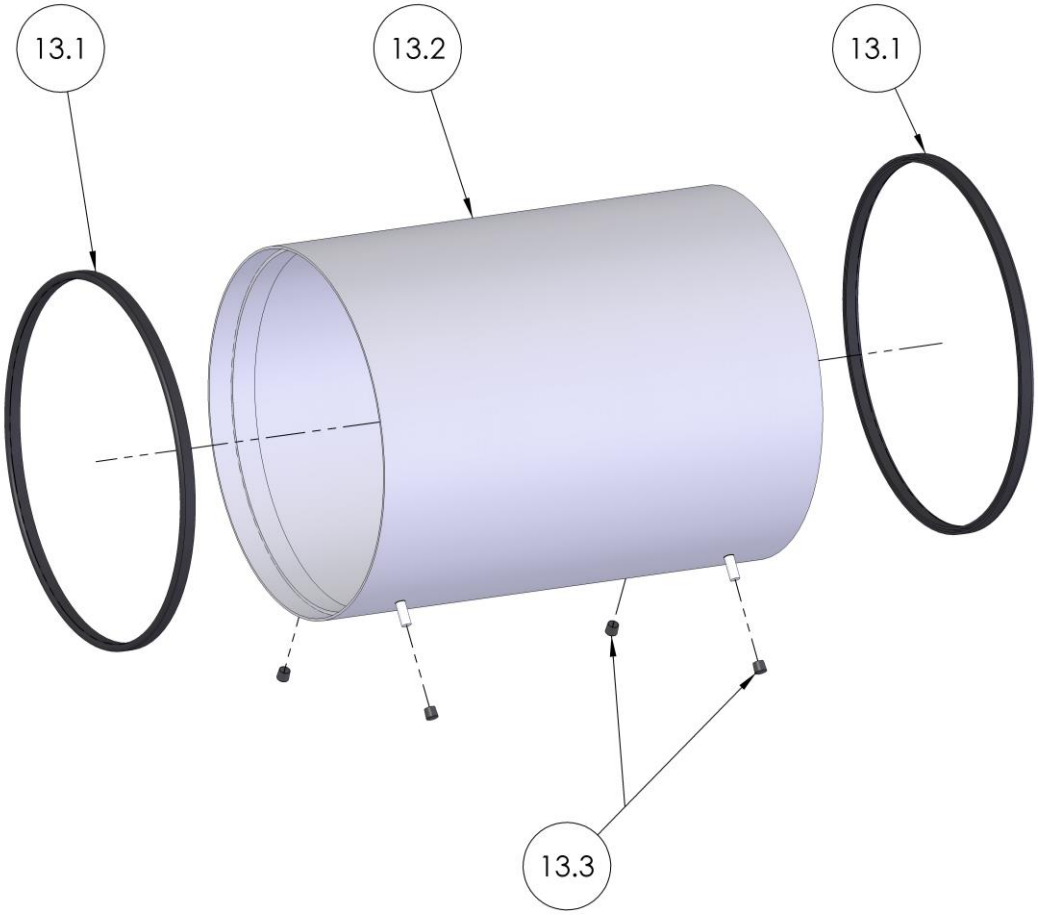
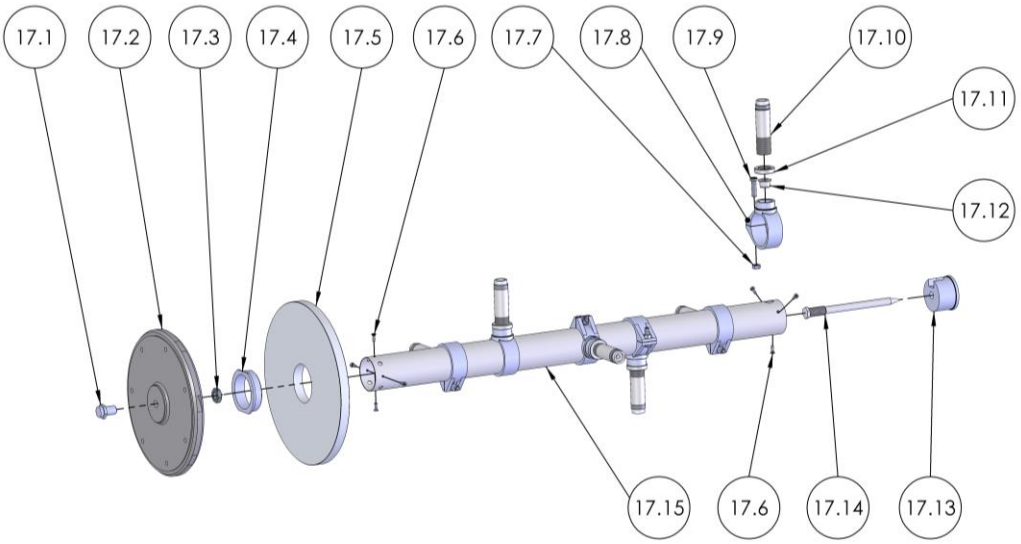

13.1
13.2
13.1
13.3


17.1
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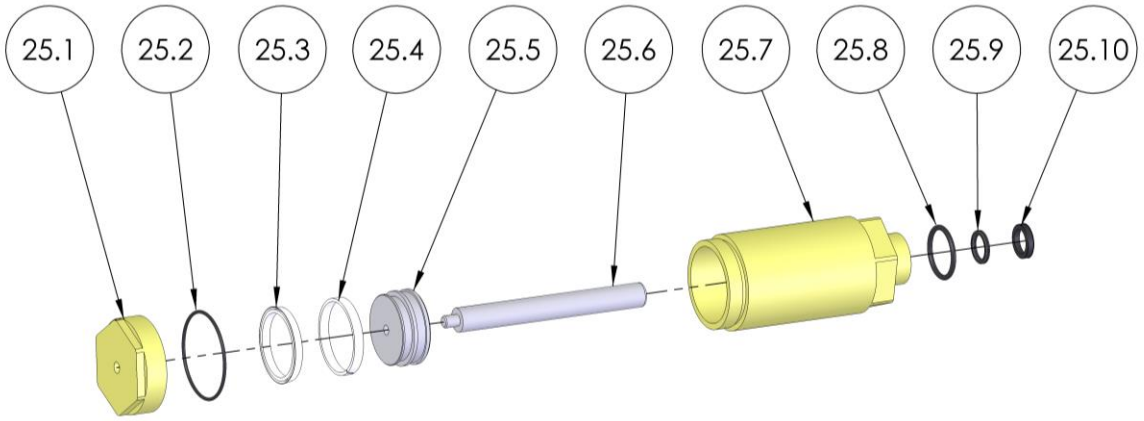
25.1
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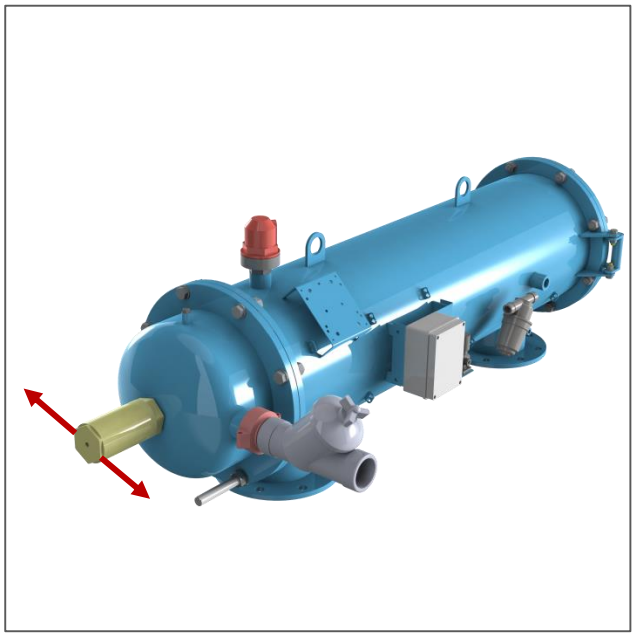
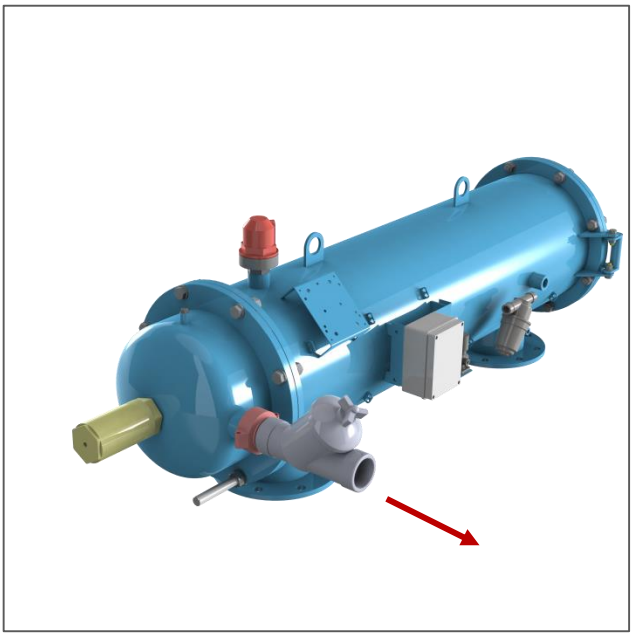
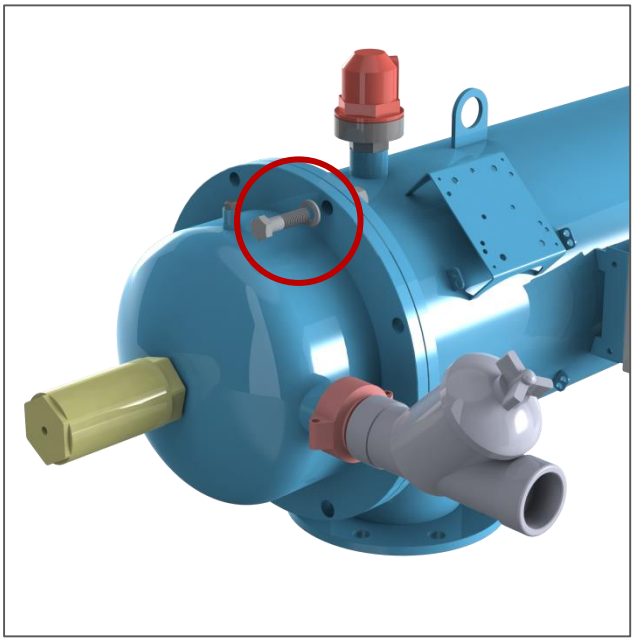
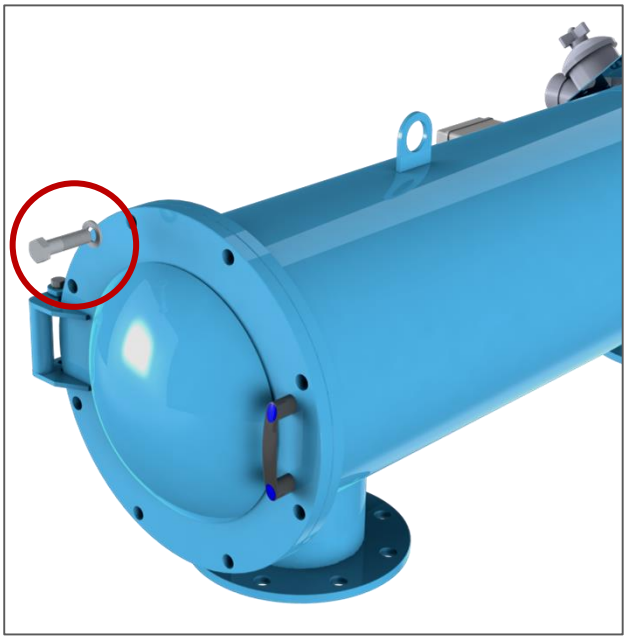


1 Remove the piston tubes 25.

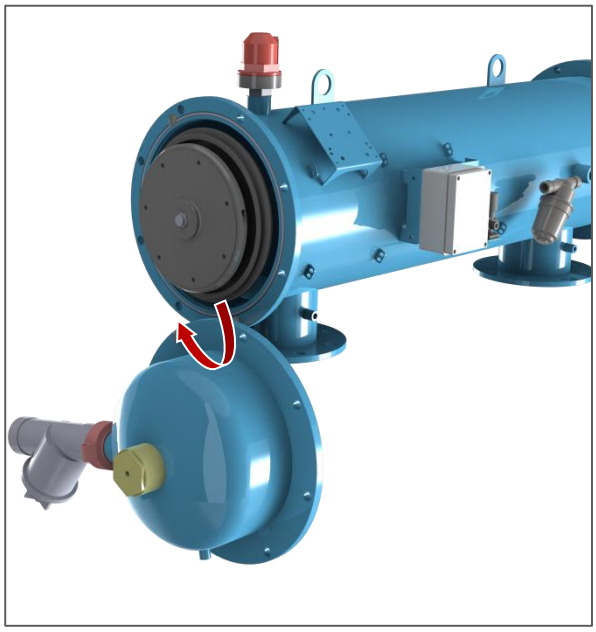


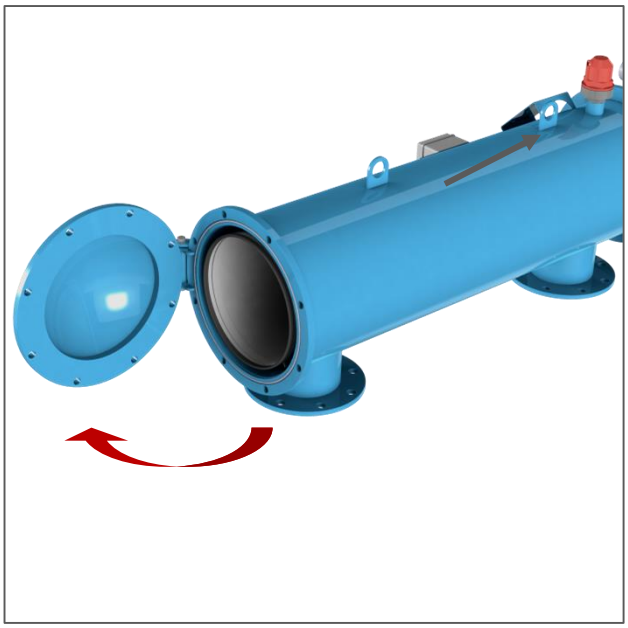
2 Remove the drain pipeline 19.



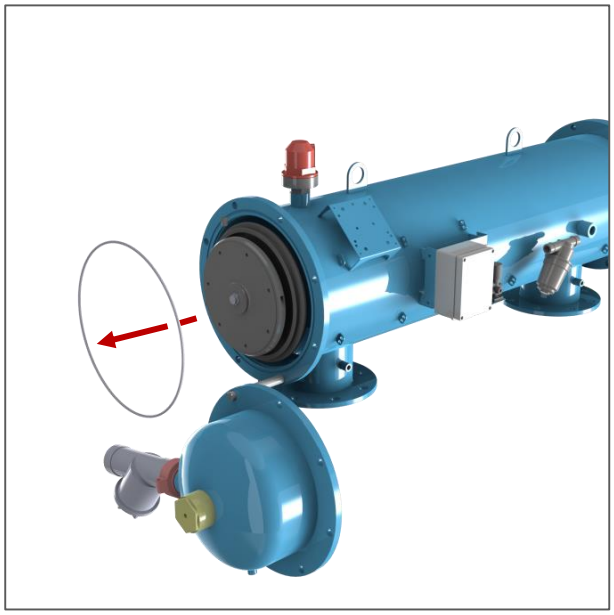


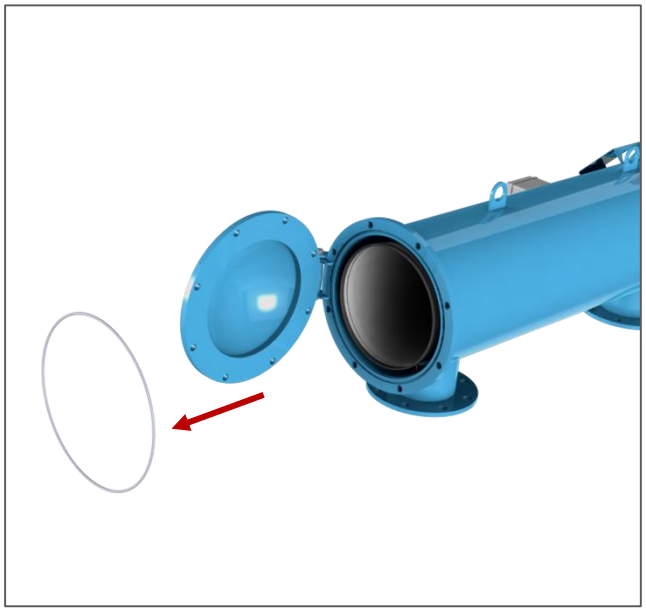
3 Remove screws 10 from the covers



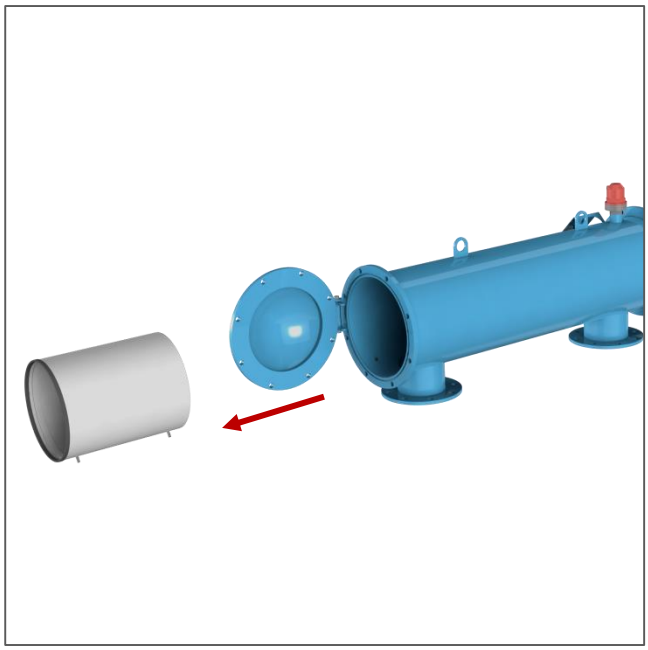


4 Open the covers 11 y 22.

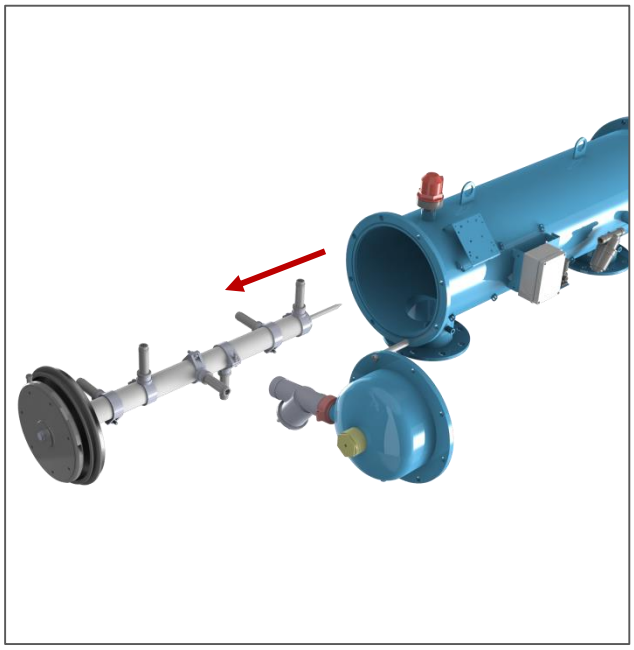




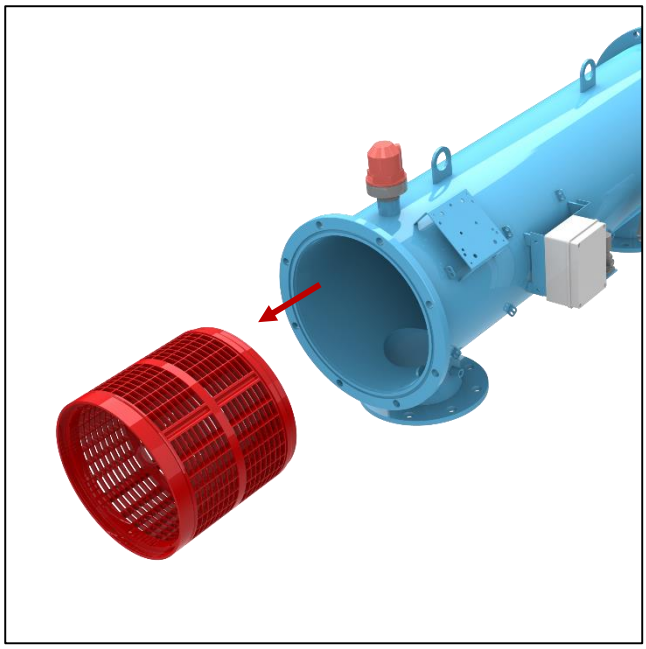
5 Remove the O-rings 2.



6 Remove the coarse screen 13.



7 Remove the scanner 17.



8 Remove the filtering 16.

Sistemas de Filtrado y Tratamientos de Fluidos S.A.

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