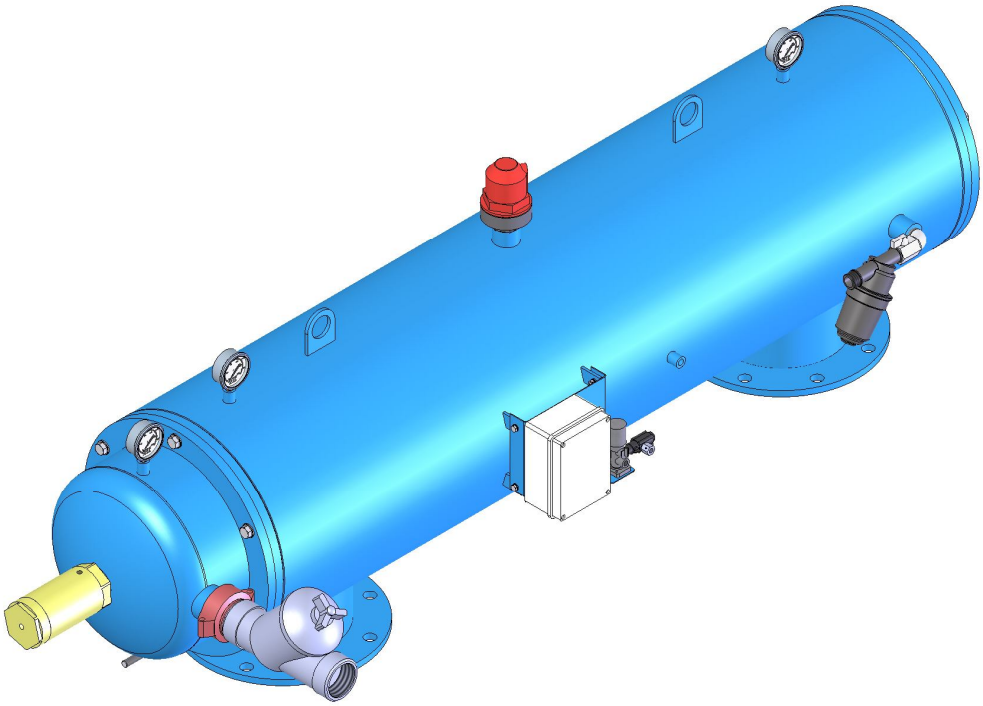
FMA – 3000

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



Ref: 3000/T/6/VH

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IMPORTANT NOTICE

READ AND FOLLOW THE INSTRUCTIONS IN THIS MANUAL BEFORE INSTALLATION OR ASSISTANCE IN THE DEVICE. THE MANUFACTURER WILL NOT BE LIABLE FOR ANY DAMAGE THAT MAY RESULT, EVEN FOR NEGLIGENCE CAUSED BY NOT READING THE MANUAL

This appliance has been designed so that it does not cause any risk during the use for which it has been designed, provided that:

Both the installation and management and maintenance are carried out in accordance with the instructions in this manual.

The conditions of the premises and the supply voltage meet those specified.

Any use other than this will be considered misuse, as will the addition of any modifications not expressly approved by the manufacturer. Only the user will be fully responsible for injuries or damages caused by misuse, which will automatically result in any warranty being void.

Remember that this device contains live electrical devices and, therefore, all service or maintenance operations shall be performed by qualified and experienced personnel, who are aware of the necessary precautions. Disable power before accessing the internal parts.

READ AND SAVE THESE INSTRUCTIONS

We want to save you time and money!
We assure you that fully reading this manual will guarantee
proper installation and safe use of the product.

WARNING!	
	RISK OF ELECTRIC SHOCK. THE OPERATIONS MARKED WITH THIS SYMBOL MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL

WARNING!	
	ESSENTIAL INFORMATION AND ISSUES. PLEASE REFER TO THE DOCUMENTATION ACCOMPANYING THE DEVICE.

NOTE	
	VERY IMPORTANT INFORMATION AND ISSUES.

SISTEMAS DE FILTRADO Y TRATAMIENTO DE FLUIDOS, S.A.
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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)

EC Declaration of Conformity

(As defined by "Machinery Directive 2006/42/EC, Appendix IIA",
"Pressure Equipment Directive (PED) 97/23/ 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 of the above mentioned European Directives.

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

DESCRIPCIÓN DE LA MÁQUINA: *Machine description:*	FILTRO DE MALLA AUTOLIMPIANTE HIDRÁULICO *HYDRAULIC SELF-CLEANING SCREEN FILTER*
FUNCIÓN: *Function:*	RETENCIÓN DE SÓLIDOS EN SUSPENSIÓN *SUSPENDED SOLID RETENTION*
MODELO / TIPO: *Model / Type:*	
NÚMERO DE SERIE: *Serial Number:*	
LA MÁQUINA SE ENCUENTRA EN ANEXO IV? *Is the machine included in Appendix IV?*	NO

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, are excluded from the scope of this Directive.

DESCRIPCIÓN DEL EQUIPO: *Equipment description:*	FILTRO DE MALLA AUTOLIMPIANTE *SELF-CLEANING SCREEN FILTER*
PRESIÓN DE DISEÑO / TEMPERATURA DISEÑO *Design Pressure Design Temperature*	PN / ºC
FLUIDO A CONTENER/ GRUPO S. D 67/548/CEE *Fluid / Fluid group S/D. 67/548/CEE :*	AGUA / GRUPO 2 *WATER / GROUP 2*
CATEGORÍA DEL EQUIPO / MÓDULO *S/D.9-/2-EC category / Module*	NO APLICA (APARTADO 3 ARTICULO 3) *NOT APPLICABLE (SECTION 3, ARTICLE 3)*

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

The Technical construction file is maintained at the 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, equipment, 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, _____201___

D. Víctor Clarimón Rami

Dirección Industrial/ General Manager

1. – INTRODUCTION

STF - FILTROS congratulates you for purchasing FMA – 3000 self-cleaning screen filter.

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

Should you have any questions about the operation after reading this manual, please contact STF-Filtros technical department.

CONTACT	
	SISTEMA DE FILTRADO Y TRATAMIENTO DE FLUIDOS S.A ☎ +34 974 401 933 🖷 +34 974 417 809 🖃 info@stf.filtros.com www.stf-filtros.com

2. – WARRANTY

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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

3. – SAFETY

INSTRUCTIONS FOR THE SAFE USE OF THE FILTER	
	MISUSE AND IMPROPER MAINTENANCE OF THIS DEVICE CAN CAUSE INJURY TO USERS. TO AVOID THESE RISKS, YOU ARE STRONGLY ADVISED TO FOLLOW THE INSTRUCTIONS BELOW. TAKE AS MANY ACCIDENT PREVENTION MEASURES AS POSSIBLE TO ENSURE PERSONAL AND EQUIPMENT SAFETY.

- **Do not touch moving parts.**

Never place your hands, fingers or other body parts near the moving parts of the filter.

- **Do not use the filter if the guards have not been fitted.**

Never use the filter if all guards have not been fitted perfectly into place (eg protective casing). If maintenance operations require removing them, make sure the guards are securely fastened back in their proper places before using the filter again.

- **Protect yourself against electric shock.**

Prevent accidental contact of electrical parts of the device with metal parts thereof.

- **Disconnect the filter.**

Disconnect the device from the power source before performing any assistance, inspection, maintenance, cleaning, replacement or part control operations.

- **Release filter pressure.**

Pressure off the device prior to any assistance, inspection, maintenance, cleaning, replacement or part control operations.

- **Work area.**

Keep work area clean and put away any potential unnecessary tools. The device can produce sparks during operation, do not use the device in situations where varnishes, gasoline or other combustible or explosive materials can be found.

- **Maintenance of the filter.**

Follow the instructions in this manual, check greasing, inspect the power cable periodically and if damaged have it repaired by qualified personnel. Check that the external appearance does not show any visual abnormalities.

- **Check that screws, bolts and the cover are firmly fastened.**

Regularly check they are tight.

- **Operate the device at nominal voltage.**

Bear in mind the voltage specified in this manual and on the filter nameplate.

- **Never use the filter if it is defective.**

If the filter makes strange noises, produces excessive vibration or appears defective, stop operation immediately and check its functionality.

- **Use genuine spare parts only.**

The use of non-genuine spare parts voids the warranty.

- **Do not modify the filter.**

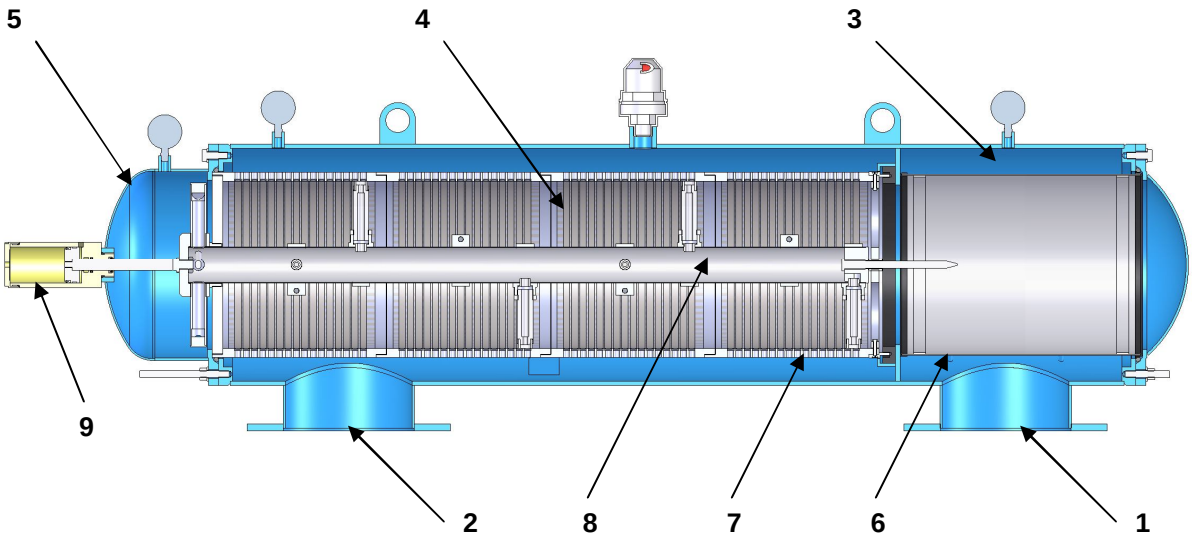
An unauthorized modification can decrease the performance of the device and cause serious accidents to people who do not have adequate technical knowledge.

- **Disconnect and drain the device.**

When the filter is not working, disconnect the device from the power and drain the filter to extend the life of the product.

4. – DESCRIPTION OF FILTER FMA-3000

The filter consists of an outer casing which houses three distinct chambers. The first one is a prefiltering chamber which coincides with the filter water inlet, and where the Coarse Mesh is located, the second one is a FILTERING CHAMBER where the fine mesh is located and where the filtering process takes place and the third one, which is a cleaning chamber.



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

In this case the water flows outwards from inside the filtering body. Suspended solids (dirt) are retained in the filtering element, ie in the mesh. This chamber coincides with the filtered water outlet to the desired application: drinking water, process water, cooling water, etc.

The dirt retained gradually forms a cake on the mesh, which generates a given pressure drop. Cleaning the filter is supported by a second chamber, the CLEANING chamber, whose outlet is connected to the DRAIN VALVE allowing evacuation of the wash water when generating the SELF-CLEANING process. The cleaning chamber is separated from the filtration chamber by means of a special seal.

Finally, the SUCTION SCANNER is a vital element of this technology. This scanner occupies the exact position that the central axis of the filtering cartridge would occupy, and is hydraulically connected to the cleaning chamber. In turn, the SUCTION NOZZLES are arranged perpendicularly in the zone that it occupies in the filtration chamber, with the nylon bristles

reaching a few microns away from the mesh. The location of these nozzles in the suction scanner has been designed to come into contact with the entire inner surface of the mesh, thanks to the spiral movement provided to the scanner by the electric motor by combining longitudinal displacement and rotation.

5. –FMA-3000 OPERATION

- Water enters the filter through the roughing chamber, which works like a stone trap where any coarse particles are retained.

- The water flows outwards through the FINE MESH, thus producing SURFACE MECHANICAL FILTRATION. High quality water is then obtained according to the degree of filtration chosen for the filter mesh, which can vary from 100 to 2,000 microns.

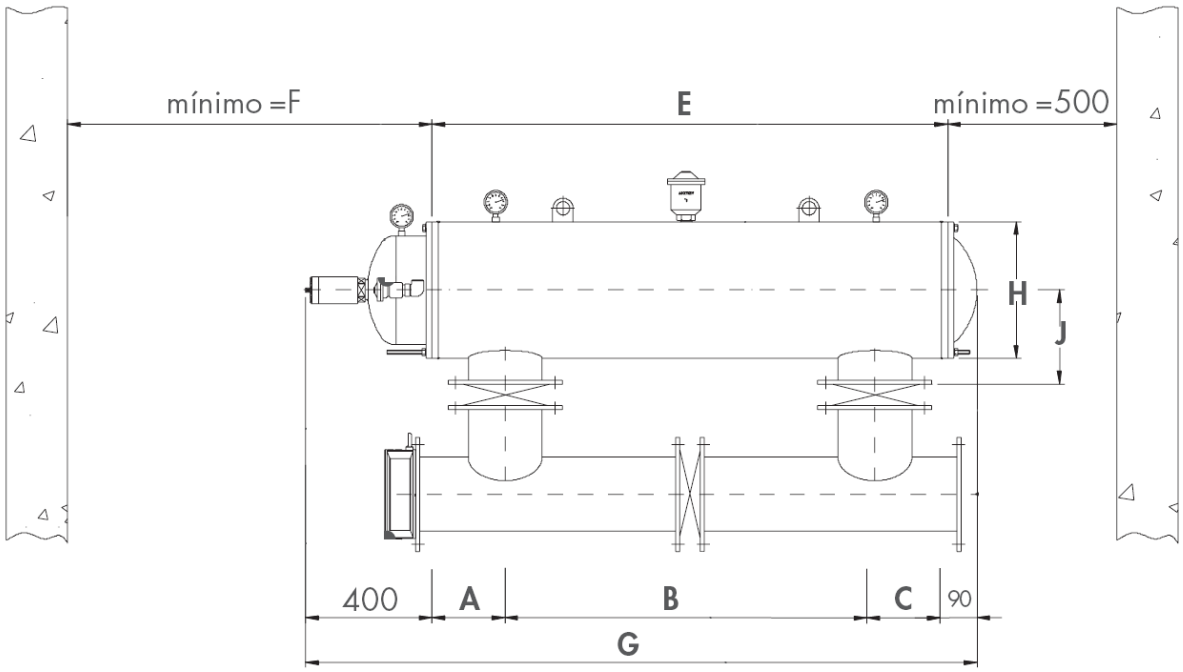
- Dirt is retained and accumulated on the inner surface of the fine mesh, while causing a gradual pressure drop between inlet and outlet of the filter. A differential pressure switch will trigger the washing sequence when a DP equal to 0.3 bar (3 m.c.a.) is reached. There are other possibilities to carry out the filter wash, namely wash by time, and manual wash option.

- When the differential pressure switch indicates 0.3 bar, the drain valve is commanded to open, thus generating a differential pressure between the outside (atmospheric pressure) and the inside of the filter (work pressure) so that a current of water at high speed is produced, which goes through the mesh and is led to the outside through the inner hole of the nozzles. The rotational motion is generated by this same flow passing through the hydraulic motor located inside the cleaning chamber, while the longitudinal motion is generated by the hydraulic piston located at the top of the filter.

- The result of these joint actions is the suction effect of the nozzles onto the dirt on the mesh, and the spiral movement of the suction scanner inside the filter.

- During the self-cleaning process, which lasts 20 seconds, water continues to be filtered and flowing into the system or application. This is due to the design of these filters, which allows the consumption of water for washing to be MINIMAL and the duty cycle to be CONTINUOUS.

6. – TECHNICAL CHARACTERISTICS



PVC Support Model	Inlet/outlet connection	Dimensions (mm)									Filtering surface (cm^2)	Cleaning water consumption (l)	Weight (kg)
		A	B	C	DN	E	F	G	H	J			
FMA-3004	4"	108	770	108	100	986	690	1476	406	280	3.200	49	75
FMA-3006	6"	130	1000	131	150	1261	970	1751	406	280	4.800	110	90
FMA-3008	8"	218	1100	218	200	1536	1240	2026	406	280	6.400	178	131
FMA-3010	10"	220	1370	221	250	1811	1520	2301	406	280	8.000	238	164

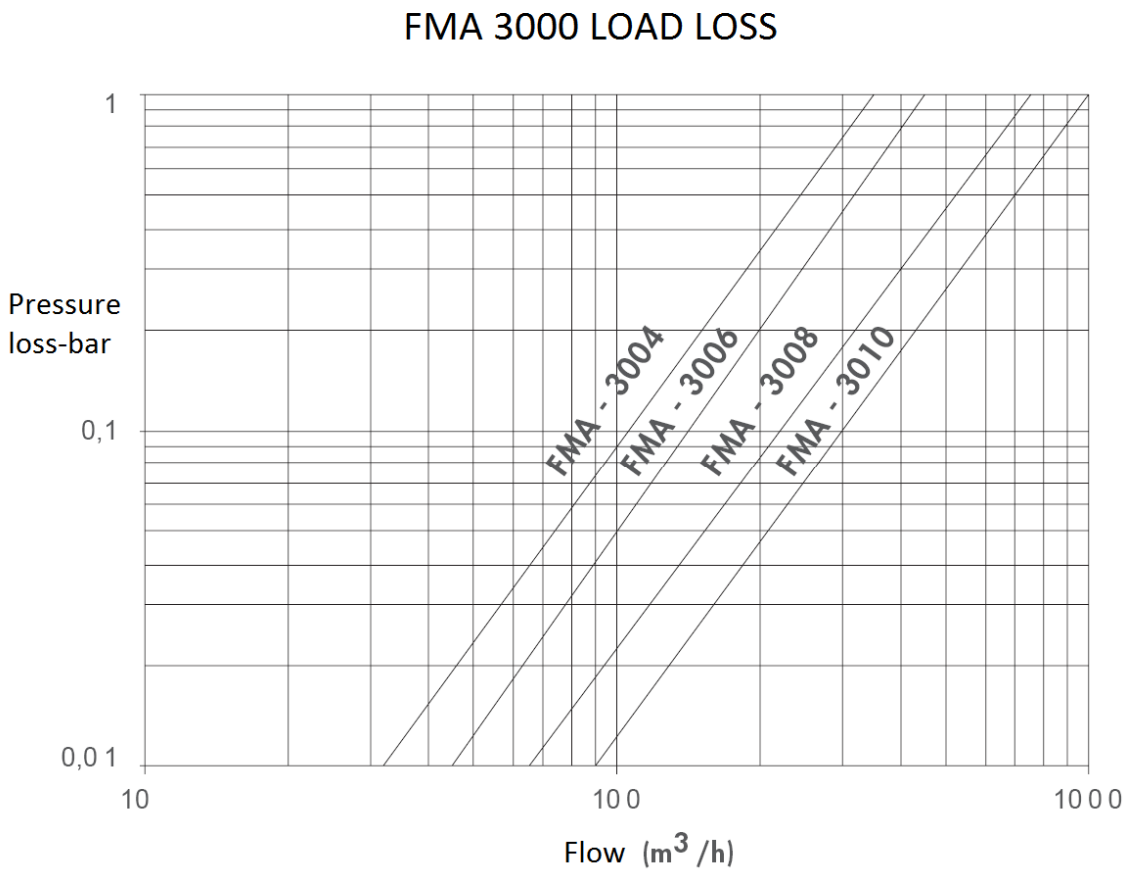
Model	Flows (m^3/h)			
	Maximum flow	High quality	Medium quality	Low quality
FMA-3004	180	80	65	50
FMA-3006	250	130	100	75
FMA-3008	350	180	130	100
FMA-3010	600	250	180	130

Flow rates are calculated for a filtration rate of 125 microns, please consult about others.

MODEL	3003	3004	3006	3008	3010
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 bar / 10 bar (please consult about others)				
Max. fluid temperature	50 ºC				
PVC MESH SUPPORT					
Maximum flow rate (m^3/h)	110	180	250	400	550
Gross filtering area (cm^2)	2,450	4,800	7,200	9,600	12,000
Net filtering area (cm^2)	1,600	3,200	4,800	6,400	8,000
Dry weight (kg)	60	75	90	131	164
Filtration sizes	1,000, 500, 300, 200, 125,100 microns				
STAINLESS STEEL MESH SUPPORT					
Maximum flow rate (m^3/h)	110	180	250	400	550
Gross filtering area (cm^2)	2,450	4,800	7,200	9,600	12,000
Net filtering area (cm^2)	1,600	3,200	4,800	6,400	8,000
Dry weight (kg)	62	80	98	142	179
Filtration sizes	1,000, 500, 300, 200, 125, 100 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 x 1.5 V LR 14-C batteries / (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	A2 Stainless steel
Gaskets	NBR – EPDM - Viton
SPECIAL MATERIALS (OPTIONAL)	
Filter body and caps	A-516 Carbon steel / AISI 304 / AISI 316 / SuperDuplex Stainless steel
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
Suction nozzle	Complete, made of Duplex or Superduplex Stainless steel and nylon bristles
Cleaning valves	“Please consult about optional materials”
Screws	A4 Stainless steel
Gaskets	Please consult

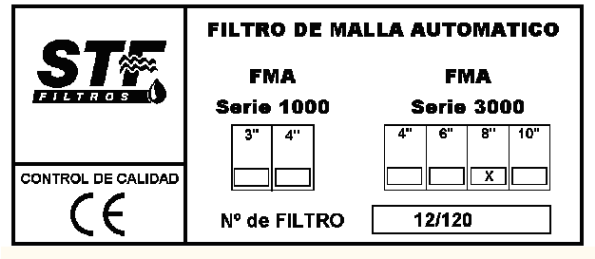
STANDARD MATERIALS	
Filter body and caps	S-235-JR Carbon steel
Finish treatment	Oven-cured epoxy polyester powder paint coating
Suction scanner	AISI-304 Stainless steel
Filtering mesh	AISI-316 Stainless steel
Suction nozzle	PVC with AIS 316 stainless steel ring and nylon bristles
Cleaning valves	Polypropylene
Spacer disc	Aluminium
Screws	A2 Stainless steel
Gaskets	NBR – EPDM - Viton
SPECIAL MATERIALS (OPTIONAL)	
Filter body and caps	A-516 Carbon steel / AISI 304 / AISI 316 / SuperDuplex Stainless steel
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
Suction nozzle	Complete, made of Duplex or Superduplex Stainless steel and nylon bristles
Cleaning valves	“Please consult about optional materials”
Spacer disc	A2 or A4 Stainless steel
Screws	A4 Stainless steel
Gaskets	Please consult



Note: Values for 125 micron cartridge

7. – NAMEPLATE

All devices are identified by means of a nameplate pasted on the filter.



It includes the following data:

- Device series.
- Model.
- Serial number of the device in question.
- EC Certificate

8. – INSTALLATION INSTRUCTIONS

- Take any necessary precautions to prevent bumping the filter. Lift the device by using the anchoring points at the top.

- Make sure the installation point has the minimum operating pressure.
  - The discharge pipe should be dimensioned to generate a minimum pressure loss at a flow rate of 30 m³/h.
  - In facilities with a working pressure above 6 bar, we recommend installing a ball valve on the discharge pipe in order to adjust the washing flow.

NOTE	
	MINIMUM OPERATING PRESSURE IS 2 BAR BETWEEN FILTER OUTPUT AND DRAIN VALVE. IN THE EVENT THAT THE DRAINAGE IS REDIRECTED, THERE MAY BE BACKPRESSURE DUE TO PRESSURE DROP AND INCREASES IN HEIGHT.

- Install filter vertically, make sure to leave enough space to allow easy access to your device for future treatments and to perform maintenance safely. See section 6.

- Orient the filter in the pipe according to the arrows indicating water flow direction.

- It is recommended to install shutoff valves at the inlet and outlet of the filter to allow insulation from the pipe. To avoid outages during maintenance, it is recommended to install a bypass.

- We recommend installing an anti-backflow valve at the outlet to prevent water hammer in the filter.

- The electrical wiring can only be carried out by a licensed electrician in accordance with section 12.1

- When installing the filter, prevent water from splashing onto the electrical components or the control panel.

CLEANING TIME

DEPENDING ON WORKING PRESSURE, YOU MUST SET A CLEANING TIME ON THE PROGRAMMING UNIT (SEE ATTACHED CHART).

	RANGE OF PRESSURES								
Kg/cm2	2	3	4	5	6	7	8	9	10
TIME	45 seconds	30 seconds			25 seconds			20 seconds	

- Diferential pressure installation (pressure switch)

The differential pressure sensor is equipped with two maneuver tubes which must be connected to the filter. The red tube shall be connected to the high pressure area (filter inlet) and the black tube shall be connected to the low pressure area (filter outlet). It is advisable to install a small 120 mesh filter before the high pressure inlet to the pressure switch.

9. – START-UP INSTRUCTIONS

- Check the items in the section above.
- Check the hydraulic circuit (see section 14) which brings water to the flush valve, making sure that:
  - The filter is clean.
- Begin with the following settings in the shut-off valves:
  - Inlet valve: OPEN.
  - Outlet valve: CLOSED.
  - By – pass (if any): CLOSED.
- Connect the filter to the power supply.
- Force a manual cleaning by pressing the manual cleaning button.
- Open the outlet valve.
  During filling from the network both a pressure drop and an increased flow rate occur, this makes it desirable to install a pressure sustaining valve at the output, thus ensuring a controlled filling from the network.

NOTE	
	IF NO PRESSURE SUSTAINING VALVE IS INSTALLED, CLOSE THE OUTLET VALVE DURING FILLING FROM THE NETWORK UNTIL 2 BAR IS REACHED IN THE CLEAN WATER CHAMBER GAUGE. ONCE THE NETWORK IS PRESSURIZED, OPEN THE OUTLET VALVE OPEN FOR PROPER OPERATION.

- Make sure that the system flow rate and pressure match the maximum ones defined for the specific model in this manual. See section 6.

- Check correct operation and load loss generated by the device once the start-up has been completed.

NOTE	
	THE FILTER MAY AUTOMATICALLY START THE CLEANING CYCLE WHEN DIFFERENTIAL PRESSURE BETWEEN THE INPUT AND OUTPUT IS HIGHER THAN 0.3 BAR.

10. – MAINTENANCE INSTRUCTIONS.

- Disconnect the filter from the power supply before performing any maintenance operation.
- Make sure the filter is depressurized before loosening the screws.
- Avoid splashing and water loss, thus minimizing the risk of staff electrocution or slipping as well as the damage that moisture can cause to your device.
- After completing the treatment, reset the protective covers of the transmission mechanism.
- The manual cleaning of the filtering cartridge shall be performed by using pressurized water. Acid or other chemicals shall be used if necessary. It should be performed in accordance with the relevant instructions for the material in question without endangering the workers or those around them.
- Drain the device during prolonged periods of inactivity.

NOTE	
	ALWAYS OPEN AND CLOSE THE VALVES SLOWLY AND GRADUALLY.

11. – PREVENTIVE MAINTENANCE SCHEDULE

MAINTENANCE	FREQUENCY	ITEM	ACTION
EXTERNAL			
Check operation	6 months	Entire filter	Manual cleaning cycle. Check: • Hydraulic piston drainage. • Open valve. • Effective cleaning cycle (achieve $P_1 = P_2$)
Anticorrosion treatment	12 months	FMA housing (item 2)	Review anticorrosion treatment on required points. Apply Epoxy – Polyester treatment
Piston	6 months	Piston (item 2)	Remove hydraulic piston. Remove scale deposits from the stem.
Pressure line	1 week	Intake filter (item 20)	Clean the intake filter and microtubes which bring water to flush valve.
INTERNAL			
Anticorrosion treatment	12 months	FMA housing (item 2)	Review anticorrosion treatment on required points. Apply Epoxy – Polyester treatment
Suction nozzles	12 months	Suction nozzle (item 15.13)	Check the condition of suction nozzles, bristles, proximity to the cartridge.
Filtering cartridge	Periods of inactivity	Filtering cartridge (item 14.1)	Perform a manual cleaning using water under pressure. Use acid or other chemicals if necessary.
Gaskets	12 months	Internal gaskets • Item 6 • Item 13 • Item 20.5 • Item 20.8 • Item 20.9	Check internal gaskets, replace if damaged.

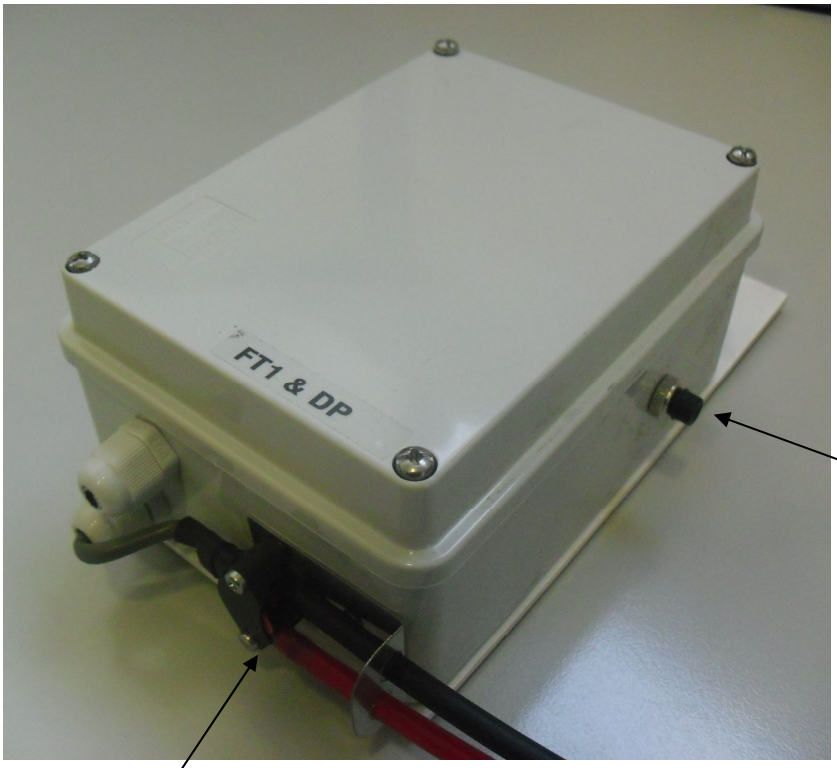
12. – CONTROL PANEL

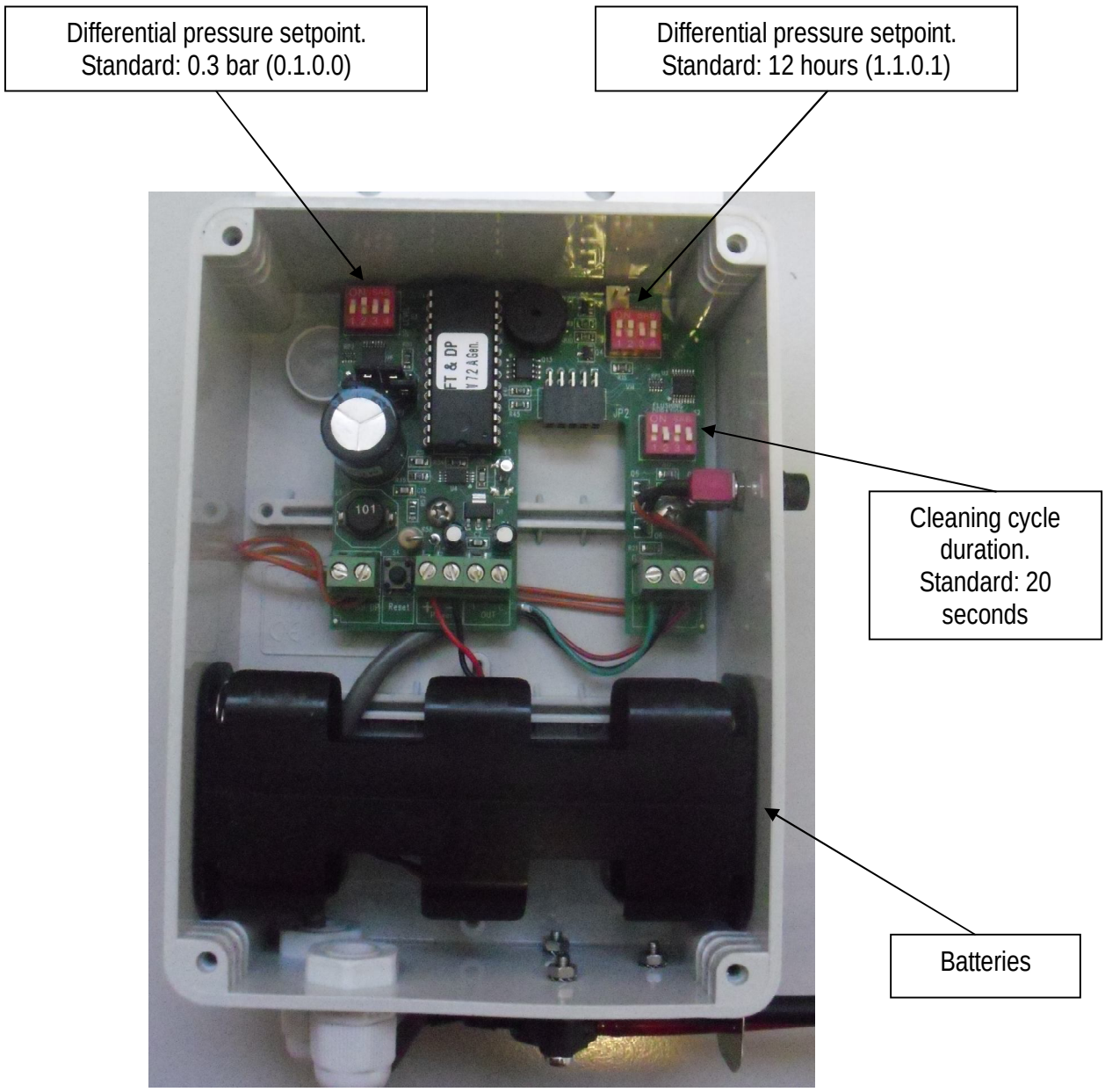
When an FMA-1000 model filter is supplied, all electrical connections between the control panel, the sensors and the actuators have already been installed and tested by the manufacturer.

Standard power of the device is 6V DC. Please consult about alternatives with the manufacturer.

DESCRIPTION

The control panel includes the following components.

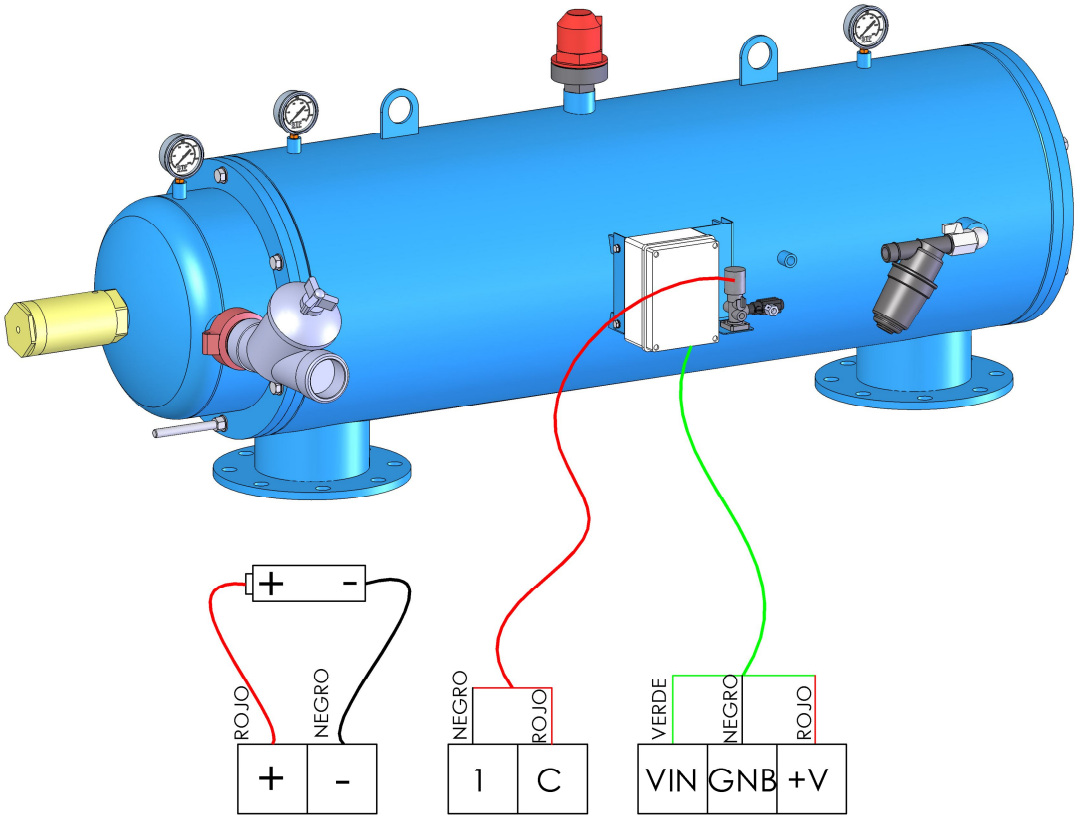



Differential pressure setpoint.
Standard: 0.3 bar (0.1.0.0)
Differential pressure setpoint.
Standard: 12 hours (1.1.0.1)
Cleaning cycle duration.
Standard: 20 seconds
Batteries

12.1. – CONNECTION

WARNING!	
	RISK OF ELECTRIC SHOCK. THE OPERATIONS MARKED WITH THIS SYMBOL MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL

The device's power supply, sensors and actuators are connected to the lower terminals according to the following specification:



- Programming unit power (Power): **+ / -**
- Solenoid power supply output (Out): **1 – C**
- Electronic differential pressure signal input (DP Sensor): **VIN+ - GNB – +V**

12.2. – OPERATION

The programming unit controls automatic cleaning of one filter. Cleaning can be started in three ways:

- Manual cleaning.

  You must hold the manual cleaning button for 5 seconds.

- Differential pressure cleaning

  Standard configuration: 0.3 bar.

- Time cleaning.

  Standard configuration: 12 hours.

In order for its use to be as reliable and simple as possible, the control panel has been equipped with an electronic differential pressure sensor. An external differential pressure can be optionally used (pressure switch).

The control unit is ready to activate 12 V two-wire latching solenoids.

As appropriate, the programming unit power can be 6 V DC or 12 V DC.

When the programming unit works by differential pressure, the system will continuously detect cleaning problems if after 7 consecutive cycles, the differential pressure sensor requires a new cycle (see list of audible warnings).

12.3. – CHANGING SETTINGS

You must access the electronic board in order to change the manufacturer's settings.

SELECTING THE INTERVAL BETWEEN CLEANING OPERATIONS

The interval between cycles is controlled by the S1 selector. The following table shows the different possibilities:

INTERVAL BETWEEN CLEANING OPERATIONS		
Position S1	**1 – ON 0 – OFF 1 2 3 4**	**TIME**
01	0 0 0 0	Only PD
02	1 0 0 0	5 min.
03	0 1 0 0	10 min.
04	1 1 0 0	15 min.
05	0 0 1 0	20 min.
06	1 0 1 0	30 min.
07	0 1 1 0	45 min.
08	1 1 1 0	1 hour
09	0 0 0 1	2 hours
10	1 0 0 1	4 hours
11	0 1 0 1	8 hours
12	1 1 0 1	12 hours
13	0 0 1 1	18 hours
14	1 0 1 1	24 hours
15	0 1 1 1	72 hours
16	1 1 1 1	120 hours

SELECTING CLEANING TIME

Filter cleaning time is controlled by the S2 selector. The following table shows the different possibilities:

CLEANING TIME		
Position S2	**1 – ON 0 – OFF 1 2 3 4**	**TIME**
01	0 0 0 0	5 seconds
02	1 0 0 0	8 seconds
03	0 1 0 0	10 seconds
04	1 1 0 0	12 seconds
05	0 0 1 0	16 seconds
06	1 0 1 0	20 seconds
07	0 1 1 0	25 seconds
08	1 1 1 0	30 seconds
09	0 0 0 1	45 seconds
10	1 0 0 1	1 min.
11	0 1 0 1	1 m 30 s
12	1 1 0 1	2 min.
13	0 0 1 1	3 min.
14	1 0 1 1	4 min.
15	0 1 1 1	5 min.
16	1 1 1 1	6 min.

ADJUSTING THE SETPOINT OF THE DIFFERENTIAL PRESSURE SENSOR

The differential pressure sensor is regulated by the S3 selector block as shown in the following table. While the differential pressure is maintained below the setpoint, no cycle start signal is generated, but when the differential pressure is greater, it works as a closed contact in the differential pressure sensor and a cleaning cycle will be initiated if this condition is maintained for at least 5 seconds.

Position S3	1 – ON 0 – OFF 1 2 3 4	Setpoint	
		Atm.	psi
00	0 0 0 0	The sensor has not been activated	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

WARNING!

CHANGING THIS VALUE IS NOT RECOMMENDED.
NEVER INCREASE THE DIFFERENTIAL, ONLY CHANGE IT TO SMALLER VALUES TO FORCE EARLIER DEVICE SELF-CLEANING.

THE ROLE OF JUMPERS JP1, JP7, JP8, JP9

JP1
Can only be used for initial calibration. During normal operation the left pin in the jumper is free.

JP7
Switch between 6 V or 12 V power supply. When the left pin in the jumper is free, 12 V power has been selected. If instead the free pin is the right one, 6 V supply is working. When power is set to 6 V, a low battery level is detected when the voltage drops to 3.5 V. When power is set to 12 V, the programming unit works correctly up to the 9.5 V, where it begins to emit a low battery signal, but the programming unit continues to operate until the voltage drops to 8 V. The low battery signal consists of 3 beeps every 15 seconds.

JP8
When the left side of the jumper is free, it will continuously detect cleaning after 7 cycles. The problem is indicated by two beeps every 15 seconds. When the right pin of the jumper is free, the continuous cleaning alarm signal will not be activated.

JP9
When the left pin of the jumper is free, after the end of a cleaning cycle, the signal to start the next cycle by the differential pressure switch will be delayed 5 seconds, if the pin is not free it will be immediate.

13. – NOTICES AND ALARMS

- **1 beep every 15 seconds** – Normal operation.
- **2 beeps every 15 seconds** – Continuous cleaning problem alarm.
- **3 beeps every 15 seconds** – Low battery.
- **6 beeps after ON or after RESET** – It indicates that the programming unit is in calibration mode. It should not normally occur but if it is the case, then the JP1 jumper has been placed in calibration mode (free right pin), the process should be completed as follows: to ensure that the differential pressure indicated by the sensor is zero (disconnect the red and black pipes from the sensor if necessary), and press the RESET button. Change the position of JP1 jumper to normal with the left pin of the jumper free and press the RESET button again.

When the program indicates a continuous cleaning problem through 2 beeps every 15 seconds, it means there is a continuous differential signal in the differential pressure switch. In the event that this occurs, the system starts cleaning at time intervals to be defined in S1 selector for intervals between cleaning operations. The cause of the problem should be detected and removed and, once the problem has been fixed, press the RESET button to send a signal to the programming unit that the problem has been solved.

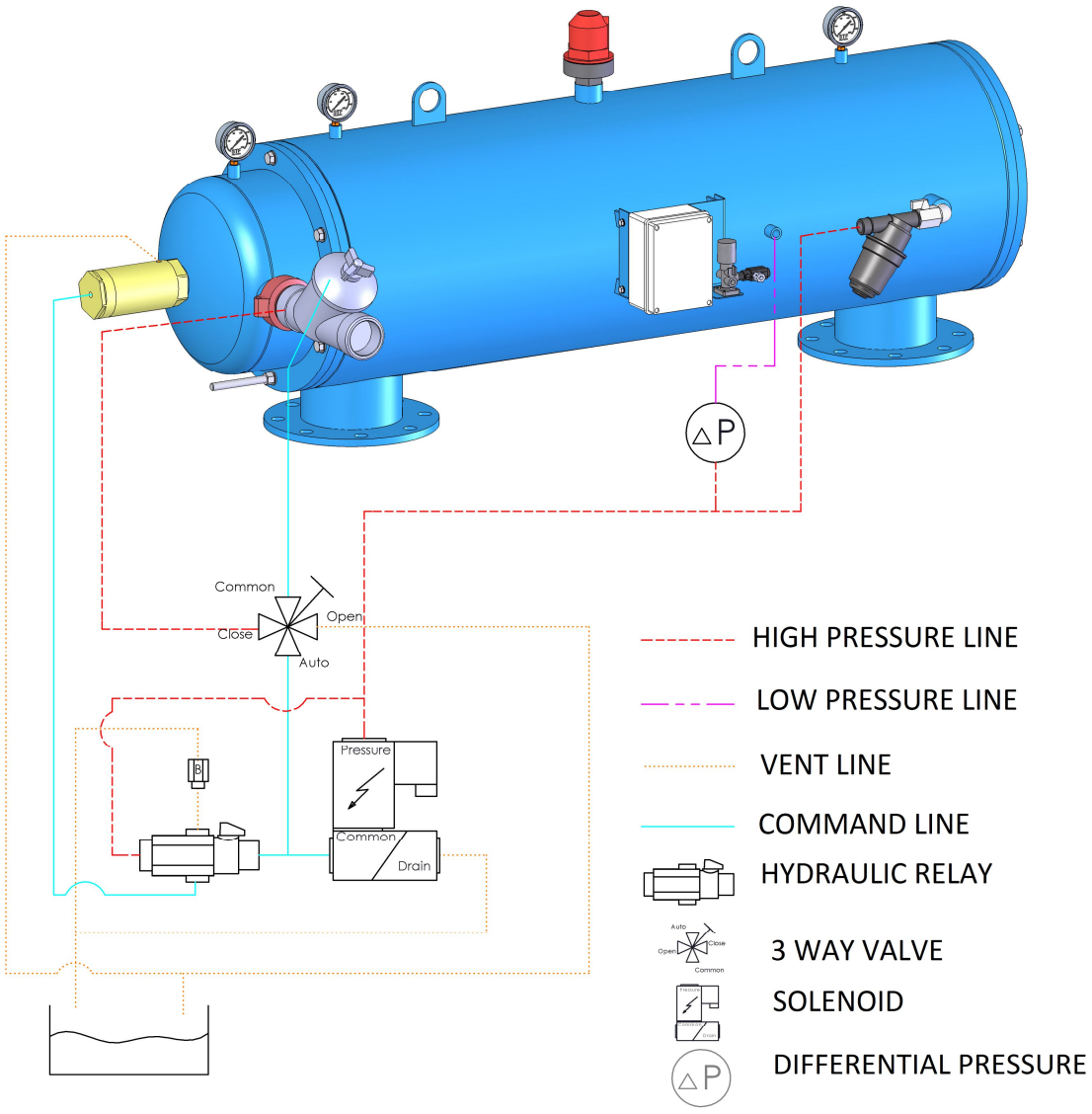
14. – HYDRAULIC CIRCUIT

The filter has a hydraulic valve which is resposnible for evacuating the cleaning flow. The valve remains closed by action of an internal spring and the water pressure in the valve chamber, it opens when the water in the chamber is drained, and closes when it is filled.

While the drainage or filling of the hydraulic valve chamber is taking place, the same operation is performed in the hydraulic cylinder which manages the longitudinal movement of the cleaning scanner.

The valve can be mechanically adjusted, thus allowing to adjust the cleaning flow in facilities with pressures greater than 6 bar.

The opening and closing processes are automated by using a 12V DC latching solenoid as specified in the attached diagram.



Ref:

WARNING!	
	MAINTENANCE OF FILTER THAT PROTECTS THE CIRCUIT, BY PERFORMING REGULAR CLEANING. LONG DISTANCE DRAINAGE MAY RESULT IN OPERATION PROBLEMS.

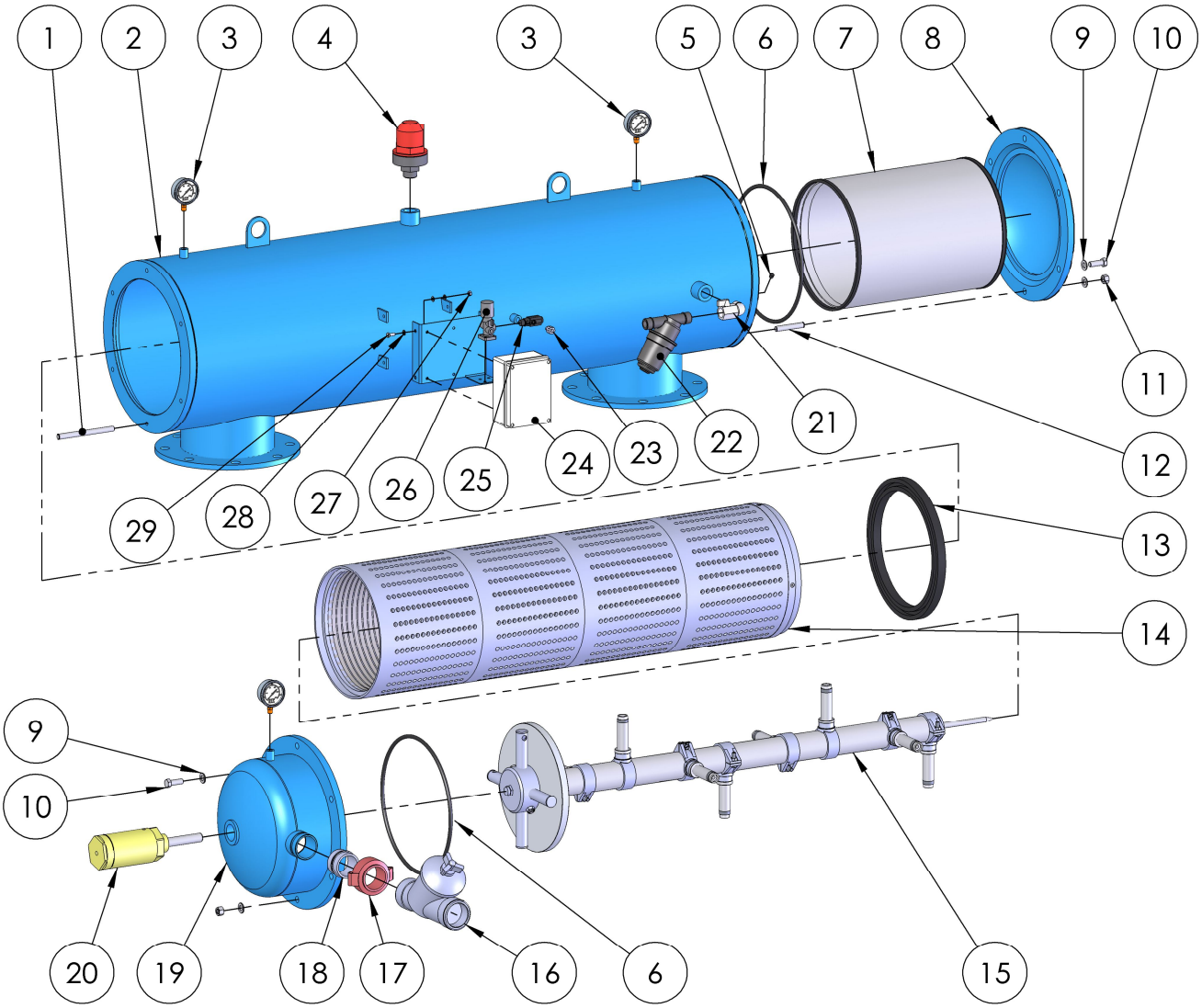
NOTE	
	THE DIAGRAM ABOVE IS VALID FOR STANDARD DEVICES WITH MAXIMUM PRESSURE OF 10 BAR. PLEASE CONSULT THE MANUFACTURER ABOUT OTHER PRESSURES.

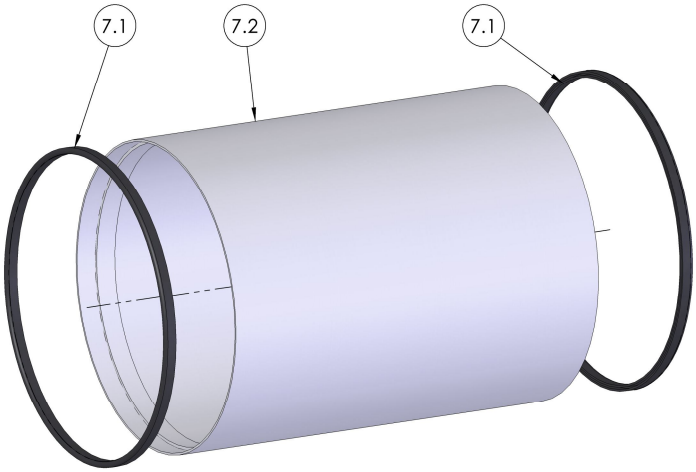
15. – PARTS

Position	Device Model	Description
1	FMA-3004 - FMA-3010	M12 L=150 Rod
2	FMA-3004	FMA-3004 Housing
	FMA-3006	FMA-3006 Housing
	FMA-3008	FMA-3008 Housing
	FMA-3010	FMA-3010 Housing
3	FMA-3004 - FMA-3010	Gas 1/4" Plug Glycerine Gauge
4	FMA-3004 - FMA-3010	Gas 1" Male Suction Pad
5	FMA-3004 - FMA-3010	GPN-280-ER8 Plug
6	FMA-3004 - FMA-3010	ø312x8 Ring
7		ROUGHING CARTRIDGE
7.1	FMA-3004 - FMA-3010	U 60VA80 Profile
7.2	FMA-3004 - FMA-3010	Roughing Cartridge
8	FMA-3004 - FMA-3010	Bottom Side Cover
9	FMA-3004 - FMA-3010	M12 Washer
10	FMA-3004 - FMA-3010	M12x35 Screw
11	FMA-3004 - FMA-3010	M12 Nut
12	FMA-3004 - FMA-3010	M12 L=75 Rod
13	FMA-3004 - FMA-3010	U-type Cartridge Gasket
14		FILTERING CARTRIDGE
14.1	FMA-3004	PVC cartrdige mesh ….. Microns
	FMA-3006	PVC cartrdige mesh ….. Microns
	FMA-3008	PVC cartrdige mesh ….. Microns
	FMA-3010	PVC cartrdige mesh ….. Microns
14.2	FMA-3004 - FMA-3010	M5x35 Screw
14.3	FMA-3004 - FMA-3010	Centering Disc
14.4	FMA-3004 - FMA-3010	M5 Nut
14.5	FMA-3004 - FMA-3010	Centering Bushing
15		SCANNER
15.1	FMA-3004 - FMA-3010	M10x120 Screw
15.2	FMA-3004 - FMA-3010	Motor Arm Cap
15.3	FMA-3004	FMA-3004 Motor Arm
	FMA-3006	FMA-3006 Motor Arm
	FMA-3008	FMA-3008 Motor Arm
	FMA-3010	FMA-3010 Motor Arm
14.4	FMA-3004 - FMA-3010	M16 Nut
15.5	FMA-3004 - FMA-3010	Guide Bushing
15.6	FMA-3004 - FMA-3010	Cleaning Chamber Disc
15.7	FMA-3004	FMA-2004 Nozzle-holding Tube
	FMA-3006	FMA-2006 Nozzle-holding Tube
	FMA-3008	FMA-2008 Nozzle-holding Tube
	FMA-3010	FMA-2010 Nozzle-holding Tube
15.8	FMA-3004 - FMA-3010	A4x12 Chipboard Screw
15.9	FMA-3004 - FMA-3010	Centering Shaft
15.10	FMA-3004 - FMA-3010	Centering side Flap

Position	Device Model	Description
15.11	FMA-3004	M8 Nut
	FMA-3006	M8 Nut
	FMA-3008	M8 Nut
	FMA-3010	M8 Nut
15.12	FMA-3004	M8x30 Screw
	FMA-3006	M8x30 Screw
	FMA-3008	M8x30 Screw
	FMA-3010	M8x30 Screw
15.13	FMA-3004	Hair-filtering Nozzle
	FMA-3006	Hair-filtering Nozzle
	FMA-3008	Hair-filtering Nozzle
	FMA-3010	Hair-filtering Nozzle
15.14	FMA-3004	3/4" Nozzle Nut
	FMA-3006	3/4" Nozzle Nut
	FMA-3008	3/4" Nozzle Nut
	FMA-3010	3/4" Nozzle Nut
15.15	FMA-3004	Nozzle Support Bushing
	FMA-3006	Nozzle Support Bushing
	FMA-3008	Nozzle Support Bushing
	FMA-3010	Nozzle Support Bushing
15.16	FMA-3004	63 - 3/4" Full Collar
	FMA-3006	63 - 3/4" Full Collar
	FMA-3008	63 - 3/4" Full Collar
	FMA-3010	63 - 3/4" Full Collar
15.17	FMA-3004 - FMA-3010	M10 Nut
15.18	FMA-3004 - FMA-3010	Motor Arm Support
15.19	FMA-3004 - FMA-3010	Rotation Screw
16	FMA-3004 - FMA-3010	S-100 Gas 2" in line Valve
17	FMA-3004 - FMA-3010	2" Vitaulic Joint
18	FMA-3004 - FMA-3010	Gas 2"Thread Vitaulic Connection
19	FMA-3004 - FMA-3010	Cylinder Side Cap
20		PISTON
20.1	FMA-3004 - FMA-3010	Cylinder Cap
20.2	FMA-3004 - FMA-3010	ø69x2.5 Ring
20.3	FMA-3004 - FMA-3010	NAP-300 63x53x7 Gasket
20.4	FMA-3004 - FMA-3010	Stem
20.5	FMA-3004 - FMA-3010	8x2.5 Guide Band
20.6	FMA-3004 - FMA-3010	Stem
20.7	FMA-3004 - FMA-3010	Casing
20.8	FMA-3004 - FMA-3010	EQ-16 Square Gasket
20.9	FMA-3004 - FMA-3010	NI-150 20x28x5.5 Gasket
20.10	FMA-3004 - FMA-3010	ø37x4 Ring
21	FMA-3004 - FMA-3010	M/F Gas-3/4" Angle Ball Valve
22	FMA-3004 - FMA-3010	120 mesh M/M Gas-3/4" Water Intake Filter
23	FMA-3004 - FMA-3010	Calibrated Orifice B
24	FMA-3004 - FMA-3010	BATTERY box with differential pressure switch
	FMA-3004 - FMA-3010	220v Electrical box with differential pressure switch
25	FMA-3004 - FMA-3010	Hydraulic Relay

Position	Device Model	Description
26	FMA-3004 - FMA-3010	NO Latching Solenoid (battery box)
	FMA-3004 - FMA-3010	NO 24v 50Hz Solenoid (220v box)
27	FMA-3004 - FMA-3010	M6 Nut
28	FMA-3004 - FMA-3010	M6 Washer
29	FMA-3004 - FMA-3010	M6x15 Screw

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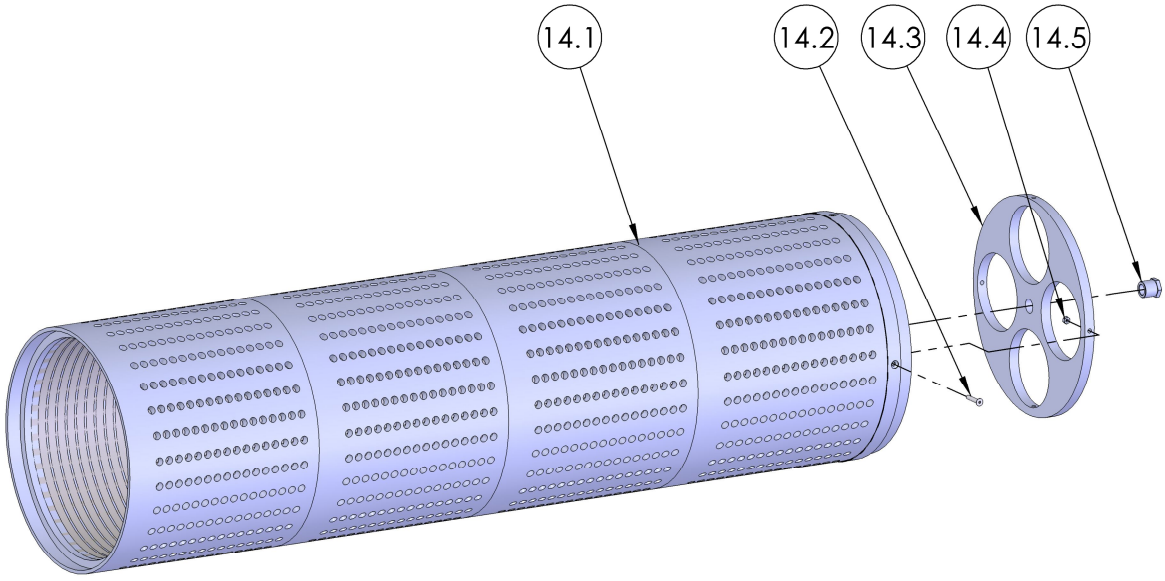
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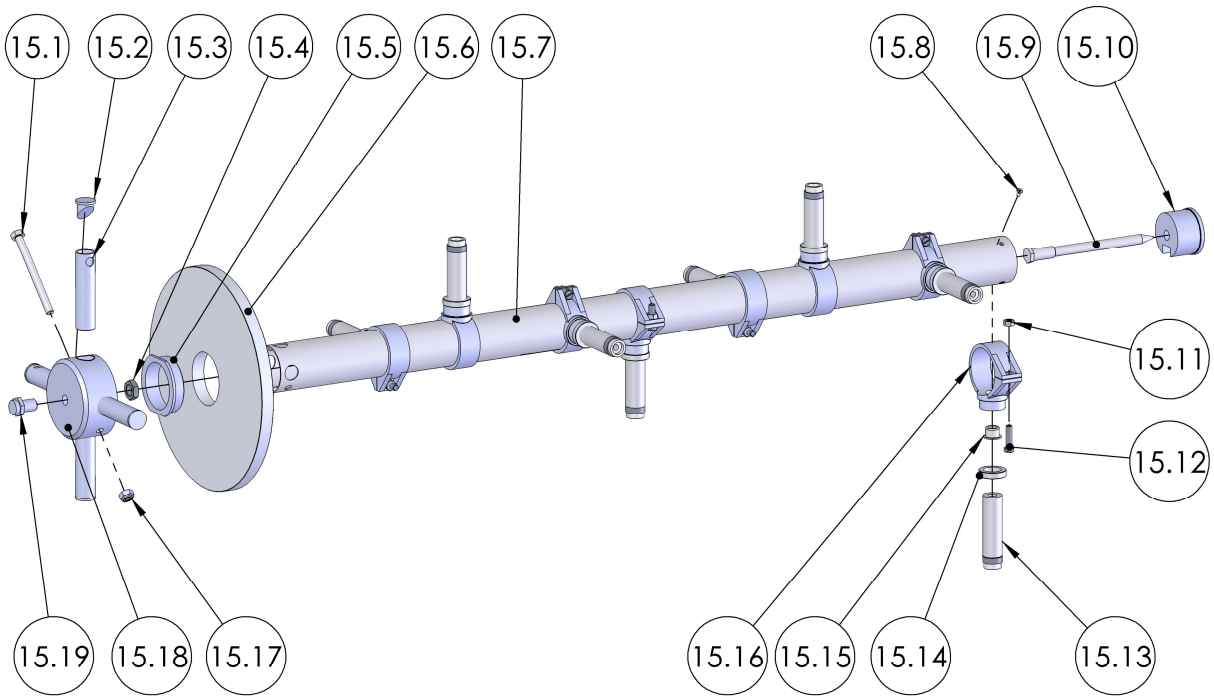
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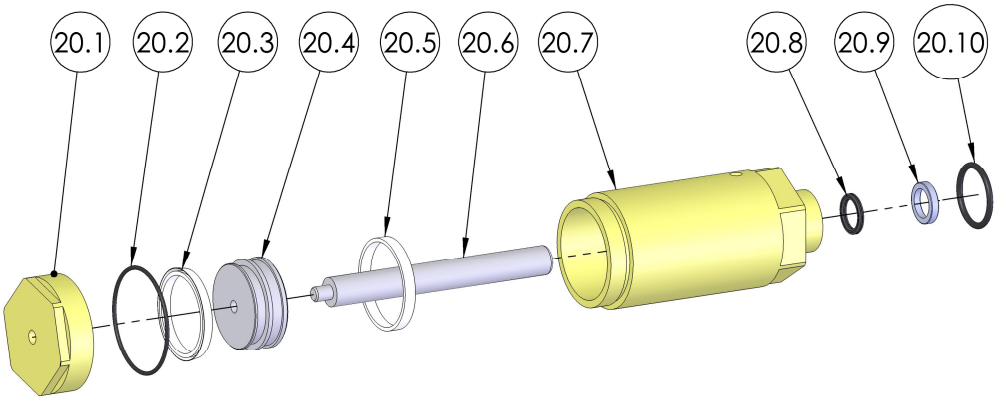
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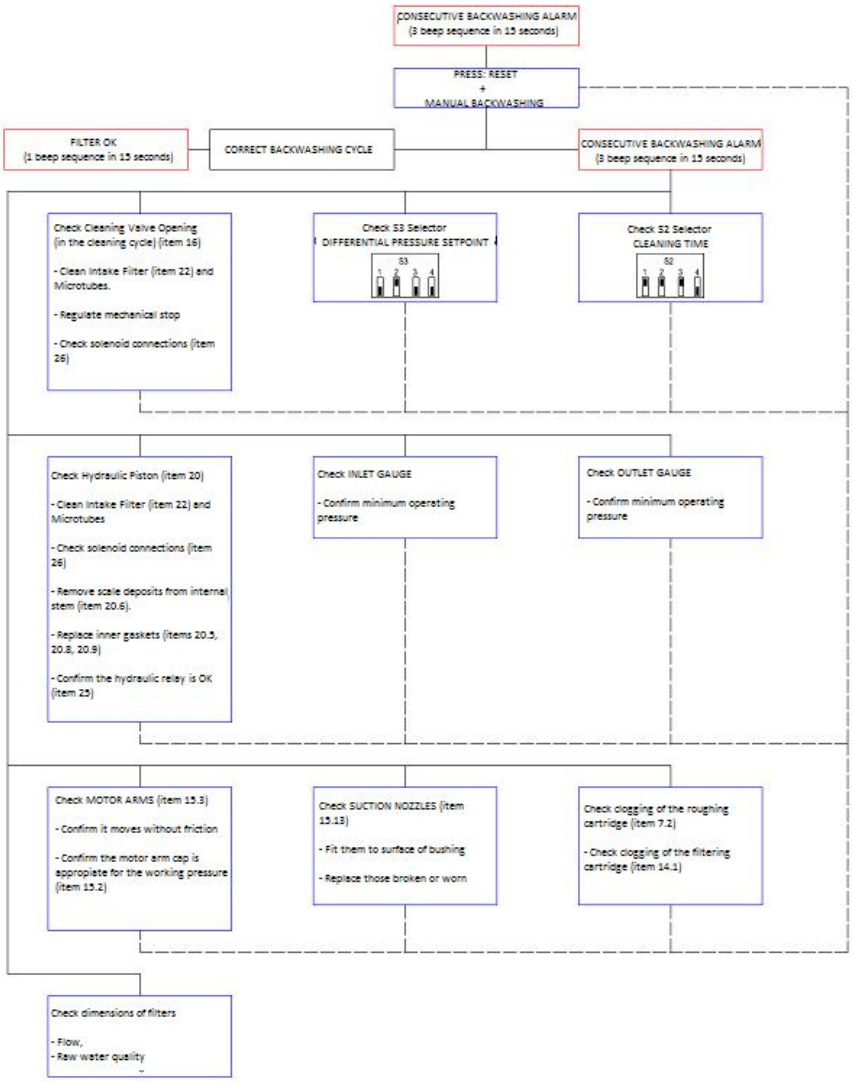
16. – ERROR DETECTION AND TROUBLESHOOTING



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