

FMA – 2000

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

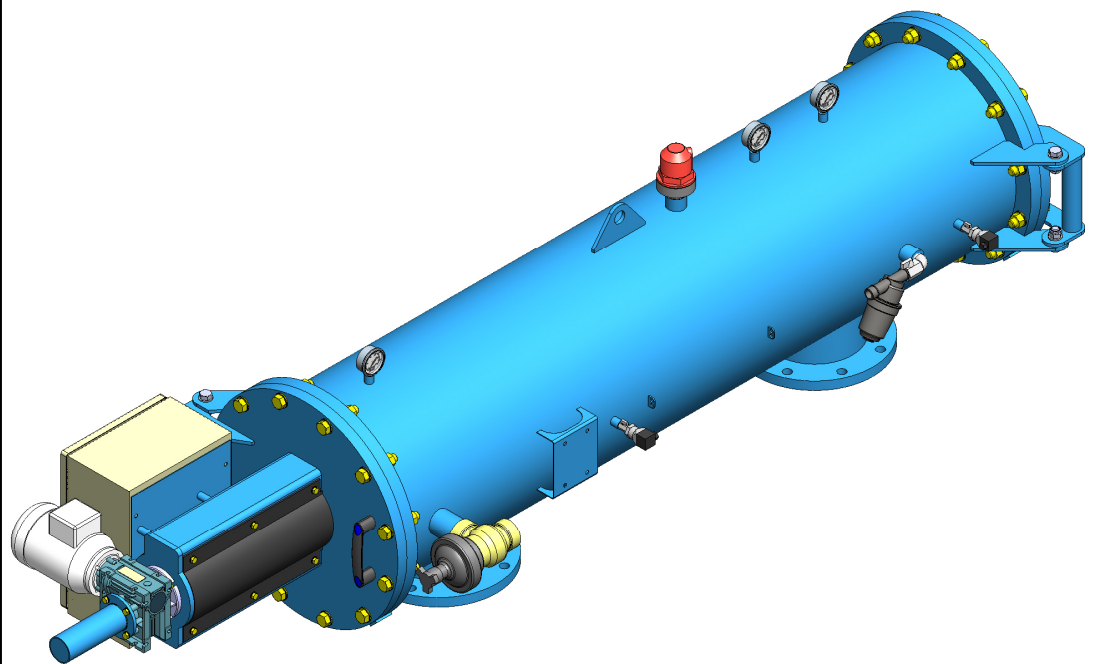


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IMPORTANT WARNINGS

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 THESE 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.

NOTE

REALLY IMPORTANT INFORMATION AND ASPECTS.

| | |
|--|--|
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| | Tel: (+34) 974 40 19 33 / Fax: (+34) 974 41 78 09 info@stf-filtros.com / www.stf-filtros.com |

Declaración de Conformidad
 (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 of the above mentioned European Directives.

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

| | |
|---|---|
| DESCRIPCIÓN DE LA MÁQUINA: <i>Machine description:</i> | FILTRO DE MALLA AUTOLIMPIANTE ELÉCTRICO <i>ELECTRIC SELF-CLEANING SCREEN FILTER</i> |
| FUNCIÓN: <i>Function:</i> | RETENCIÓN DE SÓLIDOS EN SUSPENSIÓN <i>SUSPENDED SOLID RETENTION</i> |
| MODELO / TIPO: <i>Model / Type:</i> | |
| NÚMERO DE SERIE: <i>Serial Number:</i> | |
| LA MÁQUINA SE ENCUENTRA EN ANEXO IV? <i>Is the machine included in Appendix IV?</i> | 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: <i>Equipment description:</i> | FILTRO DE MALLA AUTOLIMPIANTE <i>SELF-CLEANING SCREEN FILTER</i> |
| PRESIÓN DE DISEÑO / TEMPERATURA DISEÑO <i>Design Pressure / Design Temperature</i> | PN / °C |
| FLUIDO A CONTENER/ GRUPO S. D 67/548/CEE <i>Fluid / Fluid group S/D. 67/548/CEE :</i> | AGUA / GRUPO 2 <i>WATER / GROUP 2</i> |
| CATEGORÍA DEL EQUIPO / MÓDULO <i>S/D.9-/2-EC category / Module</i> | NO APLICA (APARTADO 3 ARTICULO 3) <i>NOT APPLICABLE (SECTION 3, ARTICLE 3)</i> |

[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 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, 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, _____ 201 _____

D. Víctor Clarimón Rami
 Dirección Industrial / General Manager

1. – INTRODUCTION

STF – FILTROS congratulates you on the acquisition of the FMA – 2000 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



SISTEMA DE FILTRADO Y TRATAMIENTO DE FLUIDOS S.A

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2. – WARRANTY



SISTEMAS DE FILTRADO Y TRATAMIENTO DE FLUIDOS S.A.U.

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 Tfno. (+34) 974 401 933 ● Fax (+34) 974 417 809
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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) Unauthorized 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

| FILTER SAFE USE INSTRUCTIONS | |
|---|--|
|  | <p>THE INCORRECT USE AND MAINTENANCE OF THE EQUIPMENT MAY CAUSE PHYSICAL INJURIES.</p> <p>IT IS STRONGLY RECOMMENDED TO RESPECT THE FOLLOWING INSTRUCTIONS IN ORDER TO AVOID RISKS.</p> <p>USE ACCIDENT PREVENTION MEASURES THAT GUARANTEE YOUR SAFETY AND THE EQUIPMENT SAFETY.</p> |

- **Do not touch parts in motion.**
Never place your hands, fingers or any other body parts near the filter parts in motion.
- **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 removal making sure that before using the new filter the protections are well fixed in its corresponding place.
- **Get protected in case of electric shocks.**
Avoid equipment electric part accidental contacts with the metallic parts.
- **Switch off the filter.**
Switch off the filter before performing any assistance, inspection, maintenance, backwashing, replacement or control of pieces.
- **Discharge filter pressure.**
Remove the equipment pressure before performing any assistance, inspection, maintenance, backwashing, change or control of pieces.
- **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.
- **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.
- **Check that screws, bolts and covers are firmly fixed.**
Check that they are adjusted from time to time.

- **Make the equipment to run at a nominal tension**

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

- **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.

- **Use only original spare pieces.**

The use of no original spare pieces invalidates the warranty.

- **Do not modify the filter.**

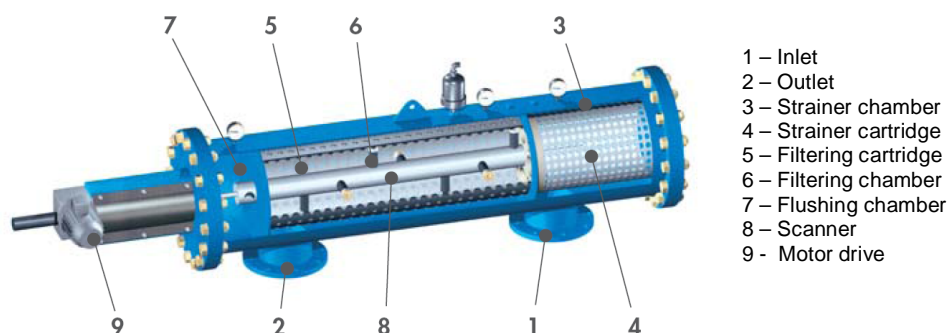
A non authorized modification can diminish the equipment performance qualities and produce harsh accidents if people have not the appropriate technical knowledge.

- **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.

4. -FMA-2000 FILTER DESCRIPTION

The filter consists of an external casing where there are three different chambers. There is a coarse screen that is used as a prefilter in the first prefiltration chamber that coincides with the water inlet.



- 1 – Inlet
- 2 – Outlet
- 3 – Strainer chamber
- 4 – Strainer cartridge
- 5 – Filtering cartridge
- 6 – Filtering chamber
- 7 – Flushing chamber
- 8 – Scanner
- 9 - Motor drive

The water goes from outside to inside the filter. Once, the water gets inside the filter, it goes into the second chamber that is called "filtration chamber". It is in this chamber where the filtering element is: FILTRATION SCREEN.

In this case water runs from the filter interior into the exterior. The solids remain in suspension (filth) held back in the filtering element, that is it, the screen. This chamber coincides with the filtered influent water inlet to the correct application: drinking water, process water, refrigeration water, etc.

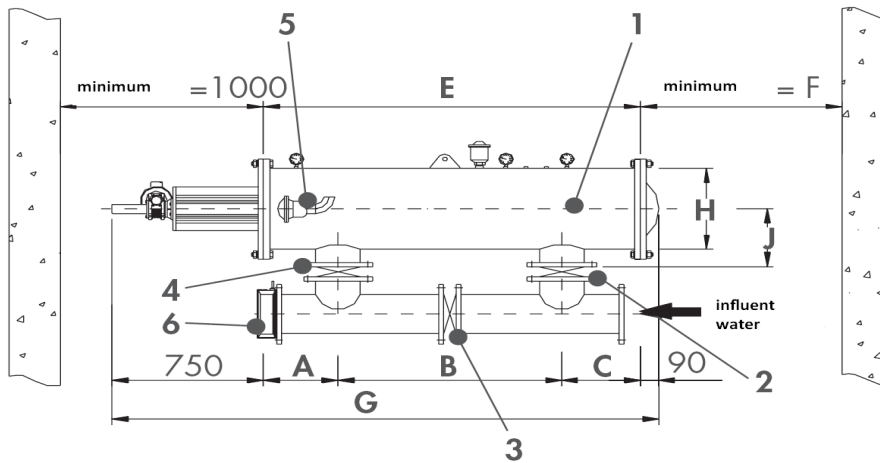
The held back dust forms a layer on the screen, that diminishes its load. The filter backwashing bases on a third chamber, the backwashing chamber whose output is connected to the drainage valve that allows water evacuation when the backwashing process starts. The backwashing chamber is separated from the filtering by a special sealing

To finish with, as a very important element of this technology is the SUCTION SCANNER. This scanner is the same place as the filtering cartridge central shaft would be, and it is hydraulically connected to the backwashing chamber. At the same time, and in the filtering chamber area where it is, the SUCTION NOZZLES are displayed perpendicularly. The nylon brushes nearly reach the screen. The situation of these nozzles in the suction scanner has been studied for getting into contact with the screen internal surface, thanks to the spiral movement that the electric engine provides to the scanner: when combining a longitudinal and rotation movement.

5. – FMA-2000 PERFORMANCE

- Water gets into the filter through the prefiltration chamber, where thick particles are retained, as it was a strainer.
- 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 chosen for the filtration screen which can vary from 10 microns to 2000 microns.
- 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.
- 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.
- 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.
- 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

6. - TECHNICAL CHARACTERISTICS



- 1 – Automatic filter Series 2000
- 2 – Butterfly valve inlet
- 3 – By-Pass valve
- 4 – Butterfly valve outlet
- 5 – Cleaning valve 2"
- 6 – Retaining valve (optional)

| Model Support PVC | Connect. In/Out | Dimensions (mm) | | | | | | | | | Filtration surface (cm ²) | Water consumption per cleaning (l) | Weight (kg.) |
|-------------------|-----------------|-----------------|------|-----|-----|------|------|------|-----|-----|---------------------------------------|------------------------------------|--------------|
| | | A | B | C | DN | E | F | G | H | J | | | |
| FMA-2003 | 3" | 302 | 360 | 219 | 80 | 881 | 400 | 1625 | 457 | 325 | 1.600 | 35 | 245 |
| FMA-2004 | 4" | 314 | 770 | 220 | 100 | 1305 | 690 | 2140 | 457 | 325 | 3.200 | 70 | 280 |
| FMA-2006 | 6" | 340 | 1000 | 240 | 150 | 1580 | 970 | 2415 | 457 | 325 | 4.800 | 105 | 340 |
| FMA-2008 | 8" | 367 | 1100 | 388 | 200 | 1855 | 1240 | 2690 | 457 | 325 | 6.400 | 140 | 390 |
| FMA-2010 | 10" | 419 | 1370 | 341 | 250 | 2130 | 1520 | 2965 | 457 | 325 | 8.000 | 175 | 430 |
| FMA-2012 | 12" | 430 | 1100 | 325 | 300 | 1855 | 1240 | 2690 | 660 | 450 | 10.300 | 140 | 595 |
| FMA-2014 | 14" | 433 | 1370 | 327 | 350 | 2130 | 1520 | 2965 | 660 | 450 | 12.800 | 175 | 668 |

| Model Support ST. STEEL | Connect. In/Out | Dimensions (mm) | | | | | | | | | Filtration surface (cm ²) | Water consumption per cleaning (l) | Weight (kg.) |
|-------------------------|-----------------|-----------------|------|-----|-----|------|------|------|-----|-----|---------------------------------------|------------------------------------|--------------|
| | | A | B | C | DN | E | F | G | H | J | | | |
| FMA-2003 | 3" | 302 | 360 | 219 | 80 | 881 | 400 | 1625 | 457 | 325 | 2.200 | 35 | 261 |
| FMA-2004 | 4" | 314 | 770 | 220 | 100 | 1305 | 690 | 2140 | 457 | 325 | 4.390 | 70 | 304 |
| FMA-2006 | 6" | 340 | 1000 | 240 | 150 | 1580 | 970 | 2415 | 457 | 325 | 6.900 | 105 | 382 |
| FMA-2008 | 8" | 367 | 1100 | 388 | 200 | 1855 | 1240 | 2690 | 457 | 325 | 9.400 | 140 | 439 |
| FMA-2010 | 10" | 419 | 1370 | 341 | 250 | 2130 | 1520 | 2965 | 457 | 325 | 11.900 | 175 | 495 |
| FMA-2012 | 12" | 430 | 1100 | 325 | 300 | 1855 | 1240 | 2690 | 660 | 450 | 14.700 | 140 | 675 |
| FMA-2014 | 14" | 433 | 1370 | 327 | 350 | 2130 | 1520 | 2965 | 660 | 450 | 19.150 | 175 | 753 |

| Modelo PVC | Flows (m ³ /h) | | | |
|------------|---------------------------|--------------|----------------|-------------|
| | Flow Max. | Quality High | Quality Medium | Quality Low |
| FMA-2003 | 75 | 45 | 35 | 25 |
| FMA-2004 | 150 | 80 | 65 | 50 |
| FMA-2006 | 290 | 150 | 120 | 90 |
| FMA-2008 | 380 | 250 | 200 | 150 |
| FMA-2010 | 800 | 400 | 320 | 240 |
| FMA-2012 | 920 | 500 | 400 | 300 |
| FMA-2014 | 1250 | 600 | 480 | 360 |

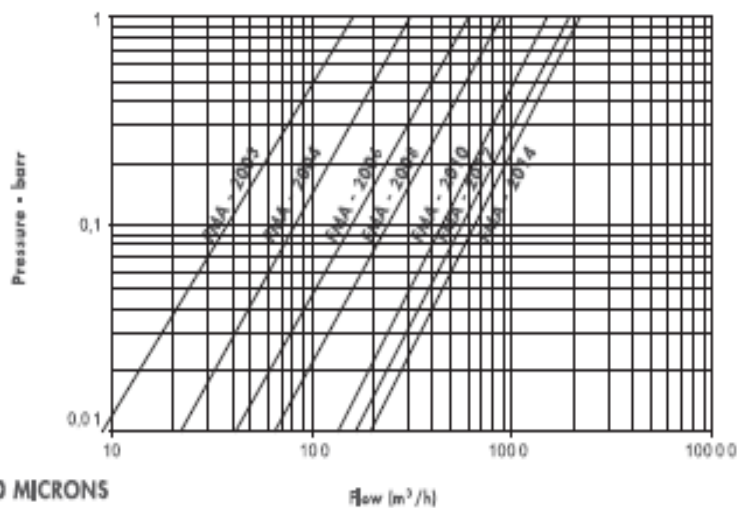
| Model ST. ST. | Flows (m ³ /h) | | | |
|---------------|---------------------------|--------------|----------------|-------------|
| | Quality High | Quality Alta | Quality Medium | Quality Low |
| FMA-2003 | 120 | 60 | 48 | 34 |
| FMA-2004 | 235 | 110 | 90 | 70 |
| FMA-2006 | 400 | 215 | 173 | 129 |
| FMA-2008 | 790 | 320 | 256 | 192 |
| FMA-2010 | 1150 | 580 | 464 | 348 |
| FMA-2012 | 1400 | 700 | 560 | 420 |
| FMA-2014 | 1800 | 900 | 720 | 540 |

The flow is calculated for a 125 micron filtration degree, please, ask for other filtration degrees.

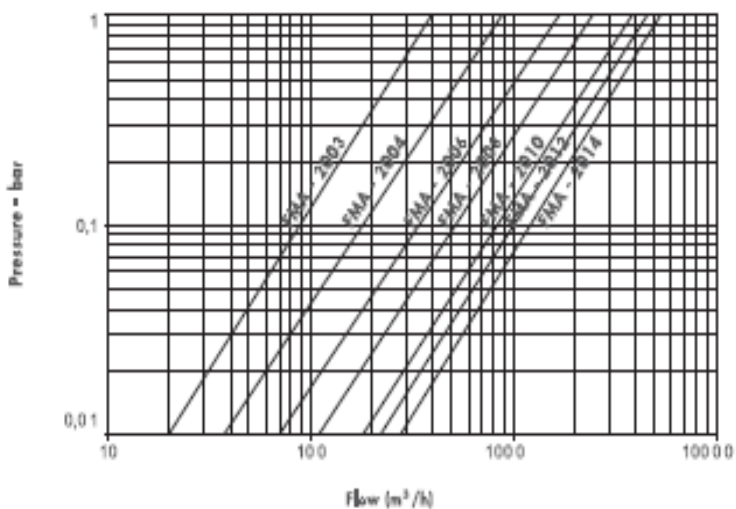
| Filter model STF - FMA | 2003 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 |
|---|---|----------------|----------------|----------------|-----------------|-----------------|-----------------|
| GENERAL CHARACTERISTICS | | | | | | | |
| Inlet diameter /Outlet ⁽¹⁾ | DN-80 (3") | DN-100 (4") | DN-150 (6") | DN-200 (8") | DN-250 (10") | DN-300 (12") | DN-350 (14") |
| Maximum/ minimum working pressure | 2 bar / 10 bar (for other working pressure, please ask us) | | | | | | |
| Fluid maximum temperature | 50 °C (u 95 °C on demand) | | | | | | |
| PVC SCREEN | | | | | | | |
| Maximum flow (m ³ /h) | 75 | 150 | 290 | 450 | 800 | 920 | 1.250 |
| Gross Filtration Surface (cm ²) | 2.450 | 4.900 | 7.350 | 9.800 | 12.250 | 16.100 | 20.100 |
| Net Filtration Surface (cm ²) | 1.600 | 3.200 | 4.800 | 6.400 | 8.000 | 10.300 | 12.800 |
| Unladen weight (kg) | 245 | 280 | 340 | 390 | 430 | 595 | 668 |
| Filtration degree | 1.000, 500, 300, 200, 125,100 micron | | | | | | |
| STAINLESS STEEL SCREEN | | | | | | | |
| Maximum flow (m ³ /h) | 120 | 235 | 500 | 700 | 1.150 | 1.400 | 1.800 |
| Filtration Surface (cm ²) | 2.650 | 5.380 | 7.990 | 10.600 | 13.210 | 16.500 | 21.300 |
| Net filtration Surface (cm ²) | 2.200 | 4.390 | 6.900 | 9.400 | 11.900 | 14.700 | 19.150 |
| Unladen weight (kg) | 261 | 304 | 382 | 439 | 495 | 675 | 753 |
| Filtration degree | 1.000, 500, 300, 200, 125,100, 80, 50, 25, 20 y 10 micron | | | | | | |
| BACKWASHING | | | | | | | |
| Backwashing valve | Thread G-2" | | | | | | |
| Backwashing time | 25 seconds | | | | | | |
| Backwashing flow (m ³ /h) | 5 | 10 | 15 | 20 | 25 | 20 | 25 |
| Water consumption (litros) | 35 | 70 | 105 | 140 | 175 | 140 | 175 |
| ELECTRICAL DATA | | | | | | | |
| Operating voltage | 220 V AC 50 Hz Single- phase(Optional 400 V AC Three-phase and 12 V DC) | | | | | | |
| Control tension | 24 V DC (12 V DC supply 12 V DC) | | | | | | |
| Electrical engine power | 0,37 kW (0,25 kW option 12 V) | | | | | | |
| Electrical engine consumption | 1,4 A | | | | | | |

| STANDARD MATERIALS | |
|-------------------------------------|---|
| Filter body and covers | S-235-JR Carbon steel |
| Finish treatment | Epoxy-polyester polymerized baked oven finish powder coating. |
| Suction scanner | AISI-304 stainless steel |
| Filtration screen | AISI-316 stainless steel |
| Suction nozzles | PVC with stainless steel AIS 316 ring and nylon fibers |
| Backwashing valves | Brass body with stainless steel spring and axis and polyamide cover. |
| Screw | Bichromated quality 5.6 and 5.8 |
| Joints | NBR – EPDM - Viton |
| SPECIAL MATERIALS (OPTIONAL) | |
| Filter body and covers | A-516 carbon steel / AISI 304 stainless steel / AISI 316 / SuperDuplex |
| Finish treatment | Internal coating adequate for sea water and external coating for marine environment |
| Suction scanner | Duplex Stainless steel or Superduplex |
| Filtration screen | 254 SMO stainless steel Avesta |
| Suction nozzles | In stainless steel, Duplex or Superduplex and nylon fibers. |
| Backwashing valves | Hydraulic, electrical or pneumatic drive. Please, ask us for other materials. |
| Screw | A2 o A4 stainless steel |
| Joints | Please, ask us |

Head Loss FMA-2000-PVC-125 MICRONS

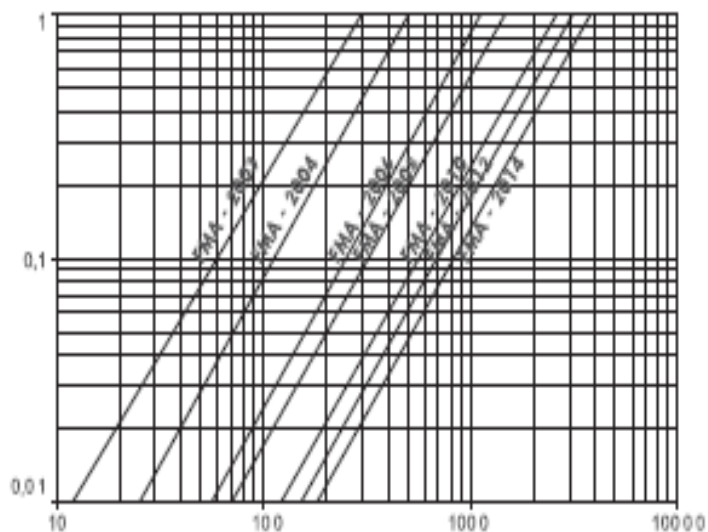


Head Loss FMA-2000-PVC-1500 MICRONS

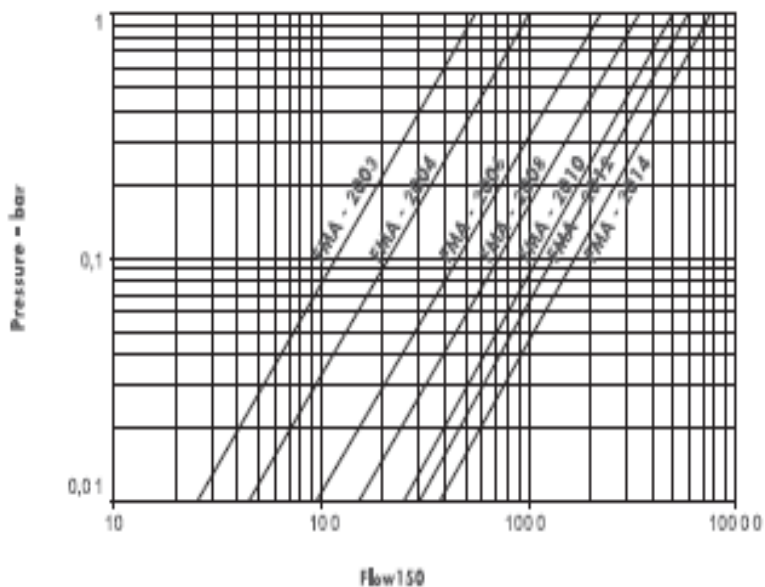


Flow (m³/h)

Head Loss FMA-2000-INOX-125 MICRONS





Head Loss FMA-2000-INOX-1500 MICRONS



7. – IDENTIFICATION PLATE

All the equipments are identified by means of an identification plate stuck to the filter.

| | | | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
|  | FILTRO DE MALLA AUTOMATICO FMA - Serie 2000 | | | | | | | |
| | DN | 3" | 4" | 6" | 8" | 10" | 12" | 14" |
| <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| CONTROL DE CALIDAD  | N° de FILTRO <input type="text" value="11/xxx"/> | | | | | | | |

The following information is included in the identification plate:

- Equipment serial
- Model
- Equipment serial number
- CE certificate

8. – INSTALLATION INSTRUCTIONS

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

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

- 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 section 6.
- Position the filter in the driving obeying the arrows indicating the water running direction.
- 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.
- It is recommended to install an outlet backflow in order to avoid water hammer on the filter.
- According to section 12.1 the electrical wiring can only be installed by a skilled electrician.
- In the filter installation it has to be avoided that water splashes over the electrical components or the control panel.

9. – STARTING INSTRUCTIONS.

- Check previous section instructions.
- Check the hydraulic circuit (see section 15) that provides the backwashing valve with water, making sure that:
 - ¾" filter is clean.
 - The ball valve is open.
 - The 3 way valve value is in AUTO position.
 - Start with the following shut-off valves configuration:
 - Inlet valve: OPEN
 - Outlet valve: CLOSE.
 - By – pass (If it exists): CLOSE
- Switch on the filter, put the circuit breaker ON
- Make sure that the programmable relay is on the selected option RUN
- Manual backwash by pressing the limp button.
- The backwashing cycle evolution is detailed in section 12.2.
- Open outlet valve.
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.
ONCE THE WATER MAINS IS PRESSURIZED, OPEN THE OUTLET VALVE TO GET A CORRECT OPERATION.

- Make sure that water flow and pressure installation correspond with the maximum values defined for this manual model. See section 6
- Check the equipment operation and the head loss when the starting up is finished.

NOTE

THE FILTER CAN START THE BACKWASHING CYCLE AUTOMATICALLY WHEN THE 0.3 PRESSURE DIFFERENCE BETWEEN THE INLET AND THE OUTLET RISES OVER 0.3 BAR.

NOTE

IN CASE OF HAVING SEVERAL FILTERS WORKING IN PARALEL WITH COMMON CONTROL PANEL, PLEASE NOTE THAN THE FILTER WHICH MANAGES THE CLEANING IS THE ONE WITH THE PRESSURE TRANSMITTERS / PRESSURE SWITH INSTALLED IN ITS BODY. PLEASE TAKE THIS INTO ACCOUNT IN CASE OF MAINTENANCE.

10. – MAINTENANCE INSTRUCTIONS.

- Switch off the energy supply filter before any maintenance operation.
- Make sure that the filter is unpressurized before loosening the screws.
- Avoid splashes and water leaks by minimizing the personnel risk sliding or being electrocuted and the damage that humidity can cause to the equipment.
- After completing the treatment rearm the transmission mechanism protecting covers.
- Make the manual backwashing of the filtering cartridge by using pressurized. If necessary 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.
- Drain the equipment when it is not used for long time.

NOTE



OPEN AND CLOSE THE VALVES SLOWLY AND GRADUALLY.

11. – PREVENTIVE MAINTENANCE SCHEDULE

| MAINTENANCE | TIME | ELEMENT | ACTION |
|-------------------------|-------------------------|--|--|
| EXTERNAL | | | |
| Working revision | 1000 backwashing cycles | Complete filter | Filter on + manual backwashing button. Control: <ul style="list-style-type: none"> • Engine starting • Valve opening • Efective backwashing cycle (P₁ = P₂) |
| Anticorrosion treatment | 12 months | FMA casing (element 9) | Review anticorrosion treatment in the necessary points. Apply Epoxi - Polyester treatment |
| Turret | 6 months | Spindle (element 1.23) | Desmantle the spindle protection (1.32) and lateral rolling press Clean and grease spindle both sides. Use the grease supplied by STF-Filtros. |
| Rim watertightness | 6 months | Rim watertightness (element 1.10) | Revise the watertightness of the element 1.10. Replace the inside joints: <ul style="list-style-type: none"> • Ø45x4 o-ring seal (element 1.9) • NI joint- 150 20x28x5,5 (element 1.14) • EQ-16 quadric joint (element 1.15) • Scraper 20X28X4,8/7 (element 1.16) |
| Pressure line | 1 week | Intake filter (element 18) | Intake filter backwashing and microtubes for supplying water to the backwashing valve. |
| INTERNAL | | | |
| Anticorrosion treatment | 12 months | FMA casing (element 9) | Review anticorrosion treatment in the necessary points Apply Epoxi - Polyester treatment |
| Suction nozzle | 12 months | Suction nozzle (element 24.1) | Suction nozzles condition revision, nylon fibers condition, cartridge proximity. |
| Smoothing cartridge | 12 months | Smoothing cartridge (element 28) | Smoothing cartridge backwashing |
| Filtering cartridge | Inactivity period | Filtering cartridge (element 29) | Backwash manually by using water under pressure, if necessary, acid or any other chemicals products will be used |
| Joints | 12 months | Inside joints <ul style="list-style-type: none"> • Element 11 • Element 27.6 • Element 27.8 • Element 30 | Revise inside joints. In case they are deteriorated, they will be replaced. |

12. – CONTROL PANEL

When a FMA-2000 filter model is supplied, all the electrical connections between the control panel and the actuators have already been installed and checked by the manufacturer.

The equipment supply is 230V CA, 50Hz in a standard way. In case of variants, this should be checked with the manufacturer

BEWARE!



DURING THE STARTING, IT SHOULD BE CHECKED THAT THE ENGINE TURNING CORRESPONDS WITH THE FILTER PROGRAMMING IN PANELS WHICH ARE SUPPLIED BY TRIPHASE CURRENT.

DESCRIPTION

The different monitoring and control components can be found in the control panel :

- Pilot lights:
 - Green: It turns on when there is energy.
 - Yellow: It turns on when a backwashing cycle is produced.
 - Red: It turns on when there is an alarm.

- The push button has two functions:
 - To generate a manual backwashing cycle.
 - To rearm the equipment when it fails.

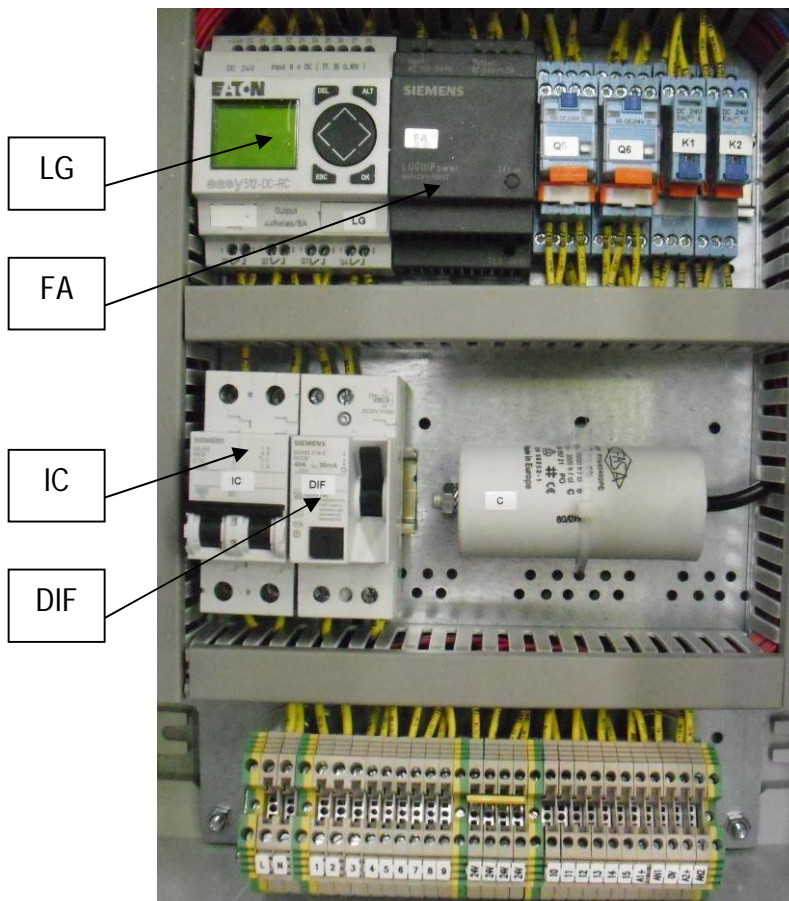
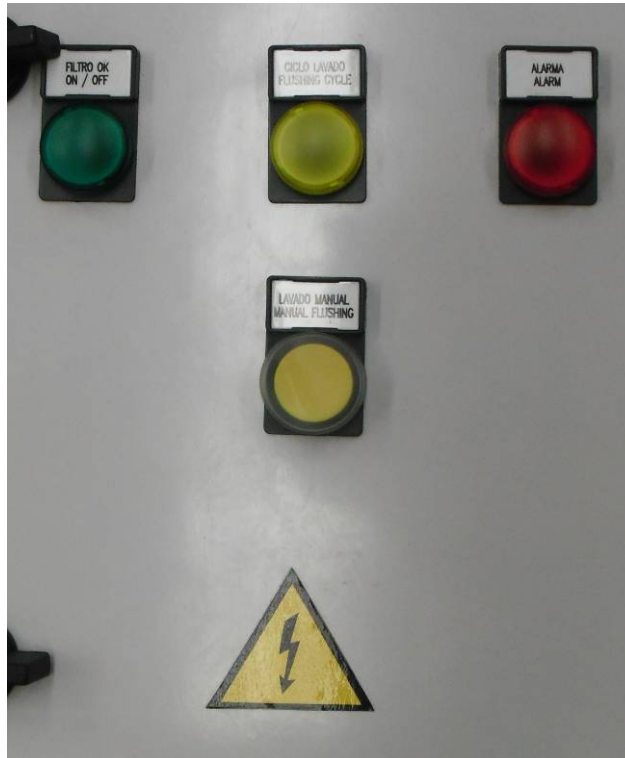
- Thermic magnet (**IC**).
 - 1 + N, 10A C

- Differential (**DIF**).
 - 1 + N, 40A 30 mA.

- Power supply (**FA**).
 - 230 V / 24 VCC (1^a)

- A relay that can be programmed(**LG**).
 - EASY 24V DC 8entries / 4LCD outputs.

The messages that appear in the relay that can be programmed are specified in section 12.2 and 13.



12.1. – CONNECTION

BEWARE!

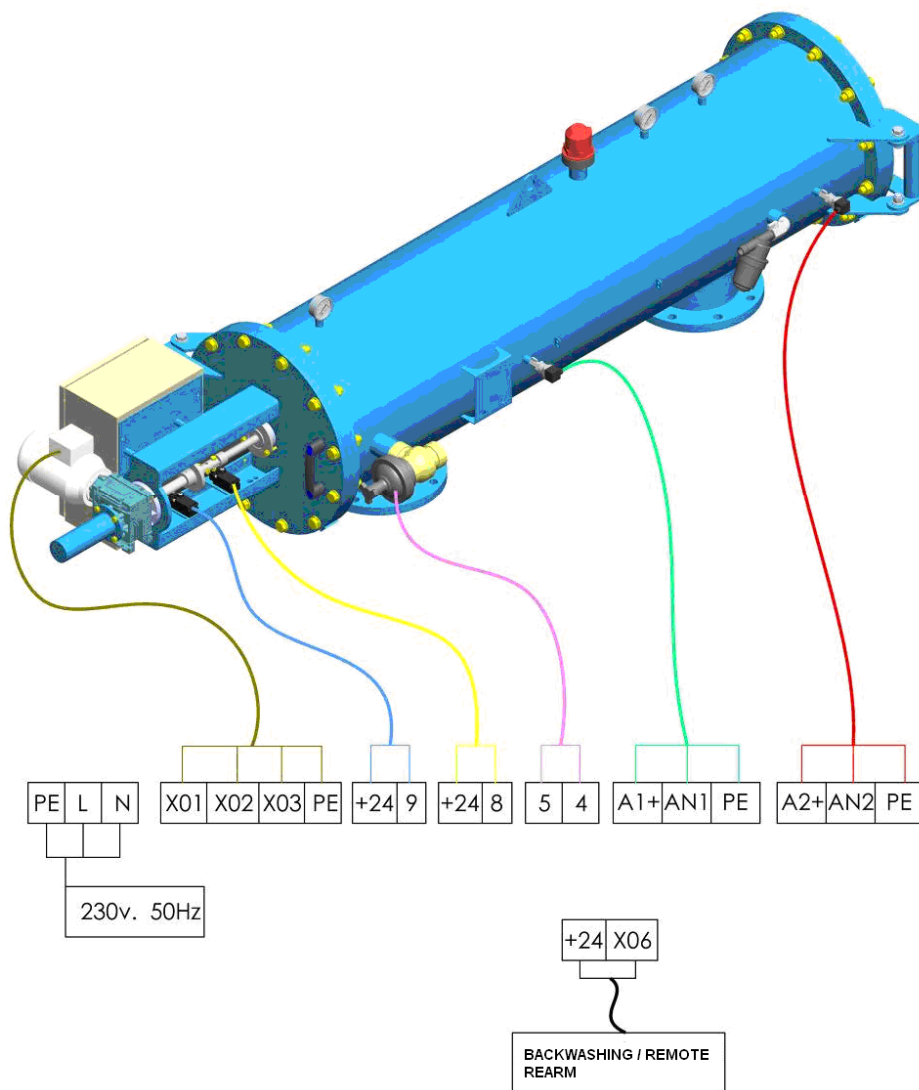


ELECTRICAL DISCHARGE RISK. THE OPERATIONS INDICATED WITH THIS SYMBOL SHOULD BE CARRIED OUT ONLY BY SKILLED TECHNICAL STAFF.

The supply, sensor and equipment actuators connection is carried out in the lower terminal block according to the following specifications:

CONNECTIONS

CPF-01 (for one filter 230v. ca)



- Panel supply: **PE – L – N**
- Engine supply input: **PE – 1 – 2 – 3**
- Electrovalve supply output: **4 – 5**
- Backwashing inlet/ external rearm: **+24 – 6**
- Front limit switch inlet: **+24 – 8**
- Back limit switch inlet: **+24 – 9**
- Clean water pressure transducer entry signal: **A1+ - AN1 – PE**
- Wastewater pressure transducer entry signal: **A2+ - AN2 – PE**
- Alarm (tension-free contact)
 - Common: **10**
 - N.C: **11**
 - N.O: **12**
- Backwashing cycle (tension-free contact)
 - Common: **13**
 - N.C: **14**
 - N.O: **15**

COMMUNICATION STANDARD SIGNALS



ENTRY:

- MANUAL BACKWASHING / REARM: +24 – 6

OUTPUT:

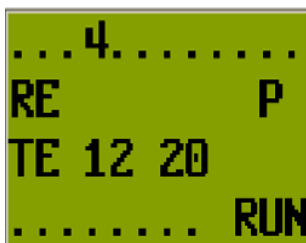
- ALARM (TENSION-FREE CONTACT): 10 – 11 – 12
- BACKWASHING CYCLE (TENSION-FREE CONTACT): 13 – 14 – 15

12.2. – PERFORMANCE

The start screen shows the following information, the upper parameters...3.4... indicate the entry signals into the programmer.

- Parameter 1 – Manual backwashing pushbutton
- Parameter 2 – Pressure switch.(Pressure transducers are used by default)
- Parameter 3 – Front limit switch. Filter 1
- Parameter 4 – Back limit switch. Filter 1

Besides this, the date and time appear on the display, (RUN) if the programmer is on or (STOP) if it is stopped. In the event of the equipment is stopped it will not make backwashing cycles. P indicates the push-button



Start screen image

When a backwashing cycle starts a screen that monitors the time in seconds and milliseconds appear. When the cycle finishes the start screen appears again.



Filter backwashing screen image

Pulse to check the time that has passed from the last backwashing (it appears in hours and minutes) and the total equipment backwashings number by pressing the key ◀ or ▶ while the start screen is on.

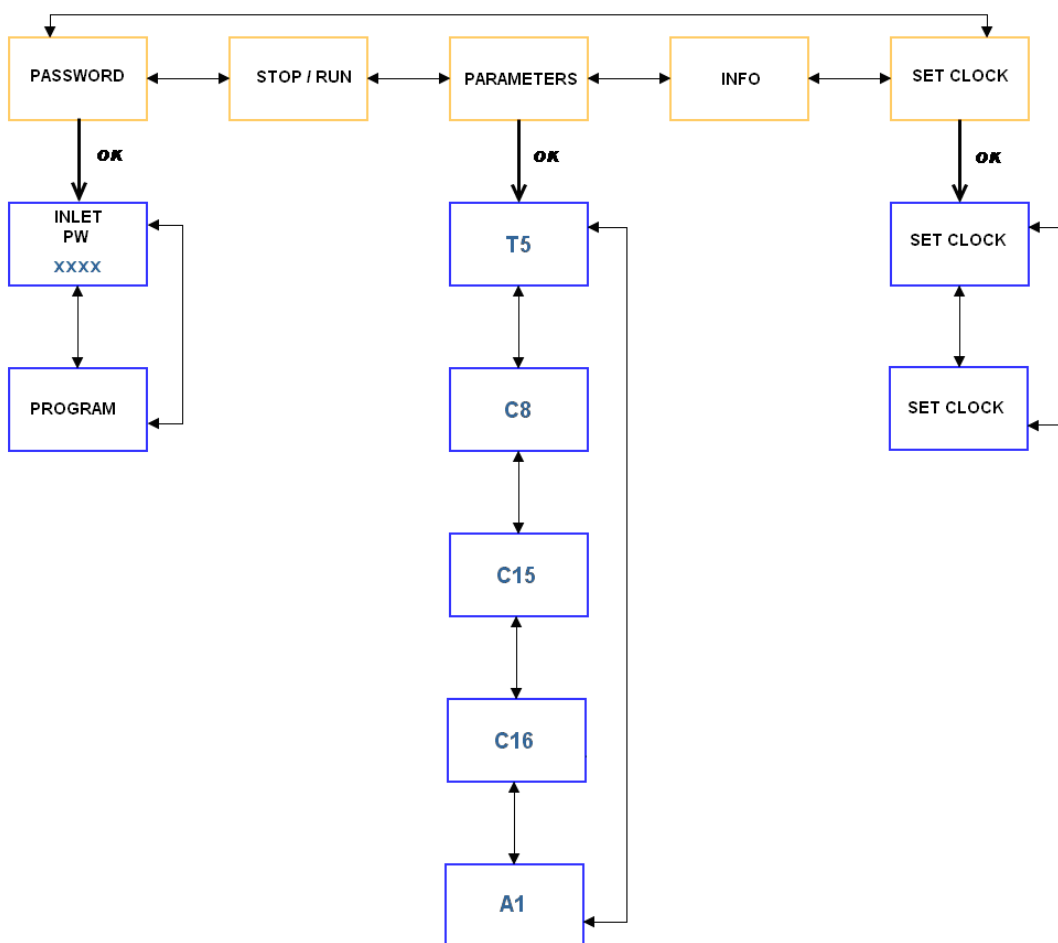


Last backwashing & total backwashings screen image

12.3. –MODIFYING PARAMETERS

It is useful to observe the diagram that is shown in order to have access to the different program functions. In the same diagram the main menu and several submenus appear. Pulse OK in order to have access to the main menu functions.

Press keys ▼▲ in order to change the menu selection. Press OK key in order to have access and ESC to turn back.



- **PASSWORD:** It allows you to have access to the program, it is protected to avoid non-authorized modifications by the manufacturer.
- **RUN / STOP:** It allows you to stop the running cycle when the STOP key is pressed.

The symbol ✓ appears next to the present condition on the LCD screen. Use keys ▼▲ in order to change it and select STOP RUN (a flickering appears) and press OK.

- **PARAMETERS:** It allows you to have access to the installation modifiable parameters

Press keys ▼▲ in order to select the PARAMETERS (a flickering appears) and press OK. The parameters are the following:

T5– Time between backwashings

It shows the backwashing time in hours and minutes. These figures turn back to zero every time a manual or automatic backwashing is carried out. This valor can be modified according to installation needs.

- I1 – Backwashing time value in hours and minutes (H:M)
- T – Time in hours and minutes (H:M) since last backwashing

Press keys ▼▲ to move over I1. Press OK to modify values by using keys ▼▲ and ◀▶ . When finished, press OK in order to accept the new value.

Press ESC to quit.

C8 – Language selection meter.

It allows you to select the language of the messages monitorized by the programmer. It can be done in Spanish and English.

- 1 – Spanish (standard)
- 2 – English

Press keys ▼▲ to move over I1, press OK to modify values by using keys ▼▲ and ◀▶ . When finished, press OK again to accept the new value.

Press ESC to quit

C15-Consecutive backwashing meter

It shows the consecutive automatic backwashings number during which the pressure switch keeps sending a continuous signal. In this case the value is 20. At the moment when the consecutive automatic backwashings get this value, the filter will go into alarm. (Consult ALARM section)

- S – Setpoint value
- C – Meter real value

Press keys ▼▲ to move over S. Press OK to modify values by using keys ▼▲ and ◀▶ . When finished, press OK again to accept the new value.

Press ESC to quit


C16– Switch pressure & pressure transducers selection.

It allows to control the filter pressure differential. It is possible to do it by means of the pressure transducers or pressure switches.

- S – Setpoint value:
 - 1 – Work with pressure switch
 - 2 – Work with pressure transducers (standard)

Press keys ▼▲ to move over I1. Press OK to modify values by using keys ▼▲ and ◀▶ . When finished, press OK again in order to accept the new value.

Press ESC to quit.

| BEWARE! | |
|---|---|
|  | <p>IT IS NOT ADVISABLE TO MODIFY THIS VALUE. IF WATER QUALITY WORSENS IN A SPECIFIC MOMENT, THIS VALUE WILL BE MODIFIED TO A HIGHER ONE SO THAT THE FILTER CAN RECOVER AUTOMATICALLY.</p> |

A1 – Pressure difference set value when working with pressure transducers.

It shows the pressure difference of the automatic backwashing cycle start when using pressure transducers:

- I1 – Effluent water pressure reading
- I2 – Influent water pressure reading
- OS – Set value

Press keys ▼▲ to move over OS. Press OK to modify values by using keys ▼▲ and ◀▶ . When finished, press OK again in order to accept the new value.

Press ESC to quit.

BEWARE!

IT IS NOT ADVISABLE TO MODIFY THIS VALUE.
THE DIFFERENTIAL SHOULD NEVER BE INCREASED, IT CAN ONLY BE
MODIFIED TO LOWER VALUES IN ORDER TO BACKWASH.

13. – WARNINGS AND ALARMS

1. When the programmer makes the number of backwashings consecutively indicated in parameter C2 (the setpoint is 20) there is no possibility to go on filtering, the safety device that will stop the filter backwashing will activate.

The panel alarm light will turn on and the inscription **ALARM 20 CONSECUTIVE BACKWASHINGS** will appear on the programmer screen.

This alarm indicates that the pressure differential gets to the electrical panel, this can be due to a measure sensor failure, dust in the filters or dust in the water to be filtered.

Unblock the pressure switch or press the START, REARM, ALARM button in order to delete the alarm.

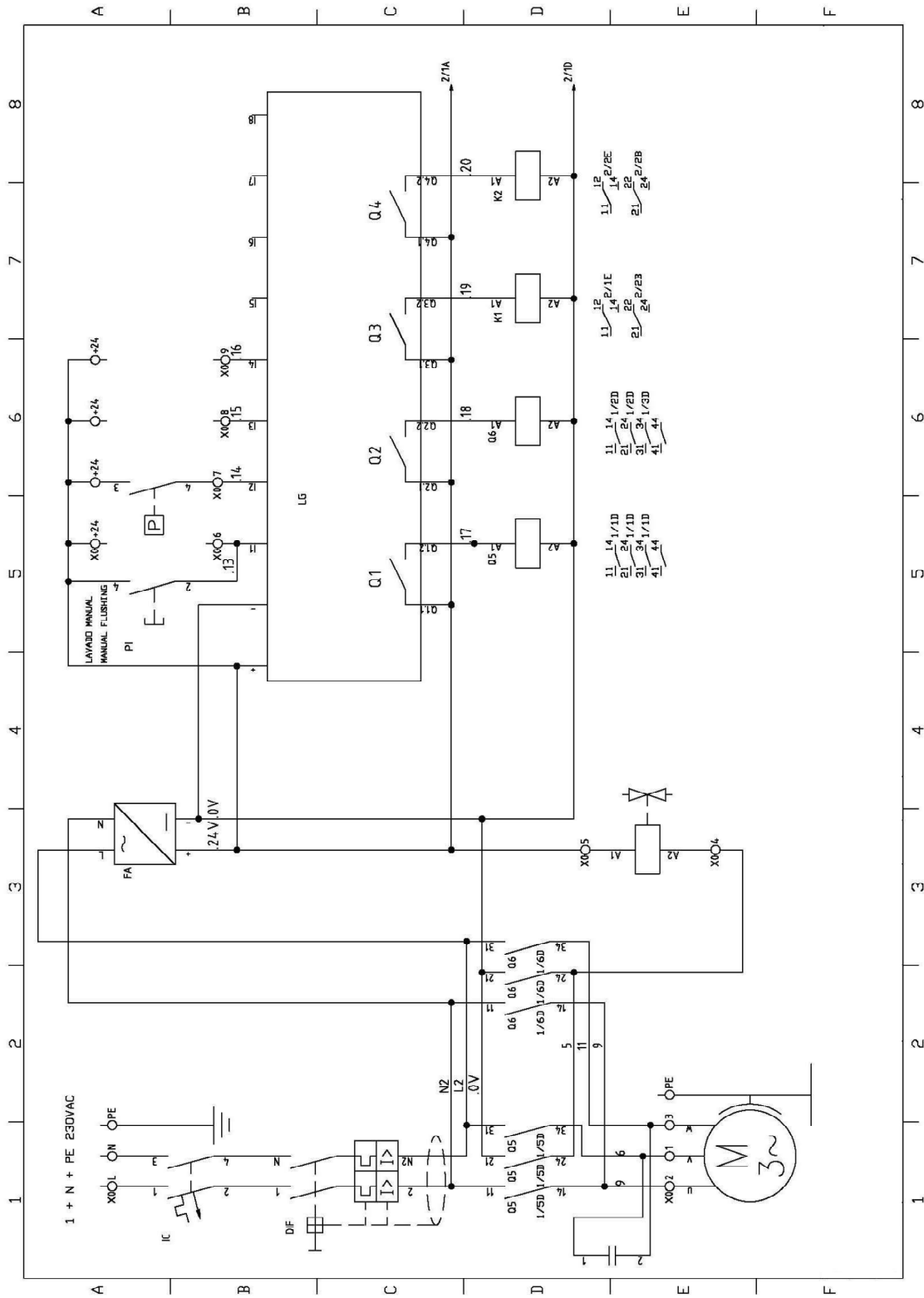
2. If during the backwashing any of the engines running is stopped, the message LIMIT SWITCH ALARM will appear on the screen.

This alarm does not need to be rearmed, it is necessary to check that the limit switch signal gets correctly to the panel, then backwash twice.

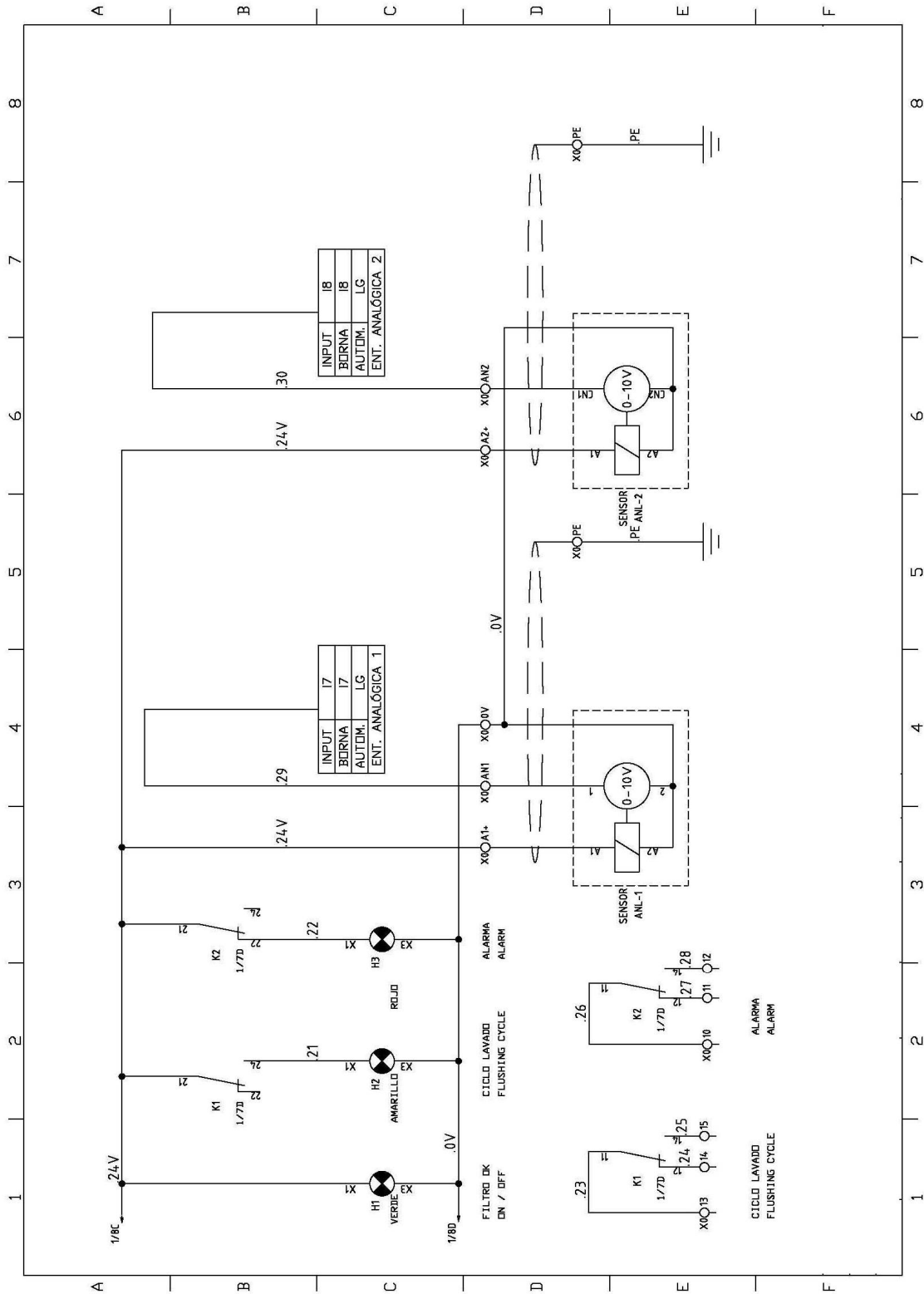
If this is not corrected, please contact the manufacturer.

14. – ELECTRIC DIAGRAM

Layout 1 of 2



Layout 2 of 2



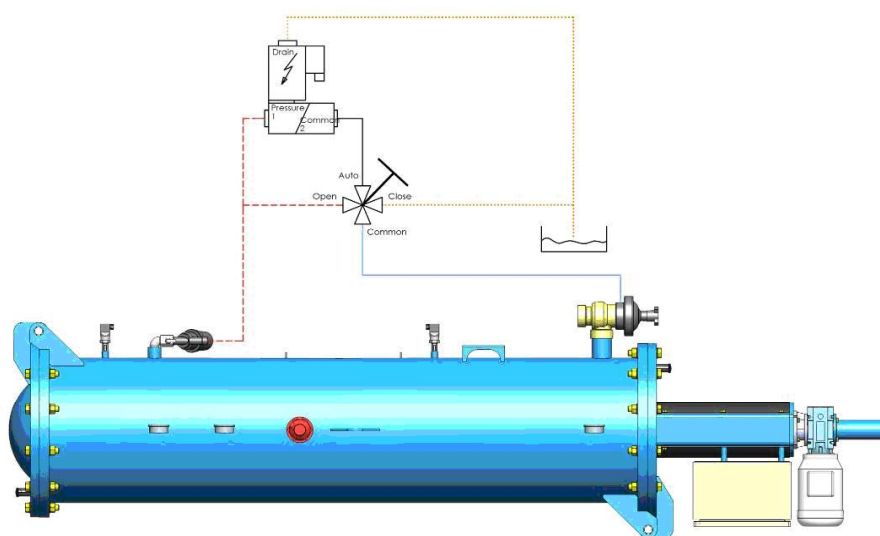
15. – HYDRAULIC CIRCUIT.

The filter has a hydraulic valve for draining the backwashing flow. The valve remains closed because of the internal spring, and it opens when introducing water in the lower chamber and it closes when the drain is in process.

The valve has a mechanic regulation that allows to adjust the backwashing flow in installations with a pressure superior to 6 bar.

The opening and closing process is automated by means of a 24V DC NC solenoid (normally closed). It is specified in the drawing below.

The 3-way valve has to remain in AUTO position, allowing the possibility to operate manually with the OPEN and CLOSE positions.



Solenoid 24v. Dc NC



3 WAY VALVE

--- PRESSURE LINE

... VENT LINE

— COMMAND LINE

BEWARE!

FILTER THAT PROTECTS THE CIRCUIT MAINTENANCE BY MEANS OF USUAL BACKWASHINGS.

LONG DISTANCE DRAINAGE CONDUCTION CAN RESULT IN OPERATION PROBLEMS.

NOTE

THE PREVIOUS DIAGRAM IS VALID ONLY FOR STANDARD EQUIPMENTS WITH MAXIMUM 10 BAR PRESSURE

ASK THE MANUFACTURER IN CASE OF DIFFERENT PRESSURES.

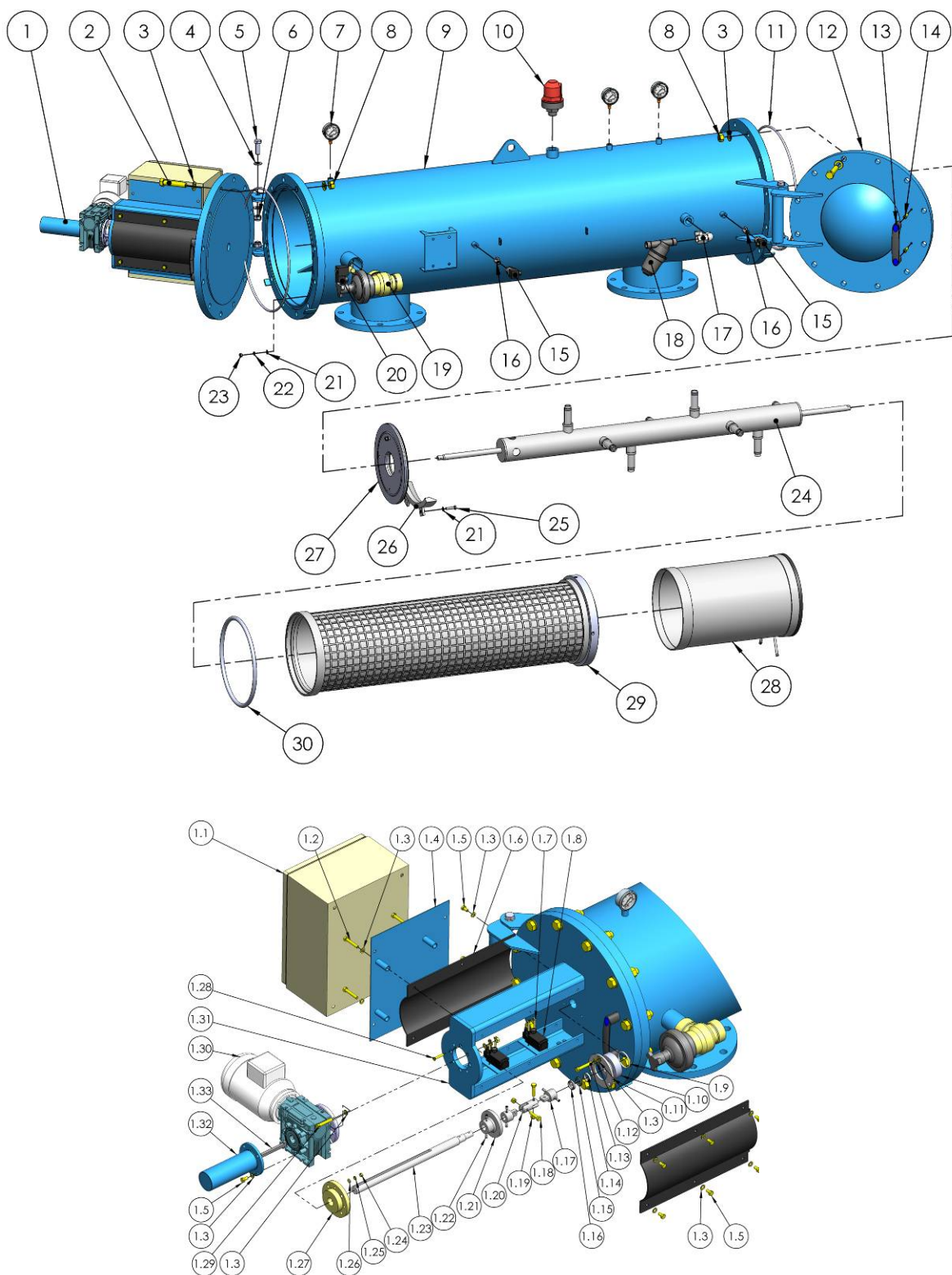
16. – EXPLOSION DRAWING

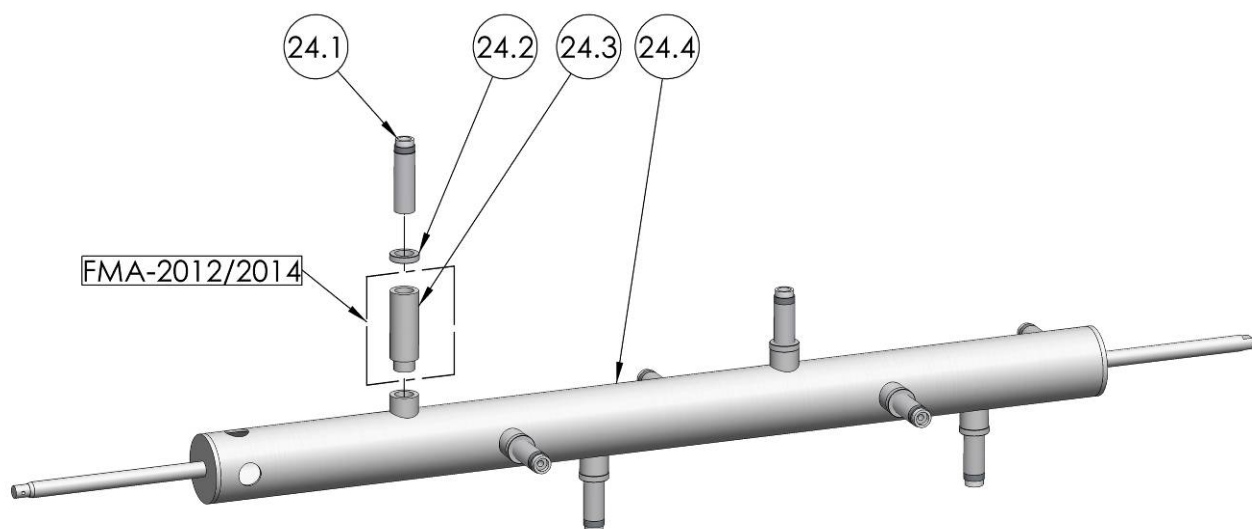
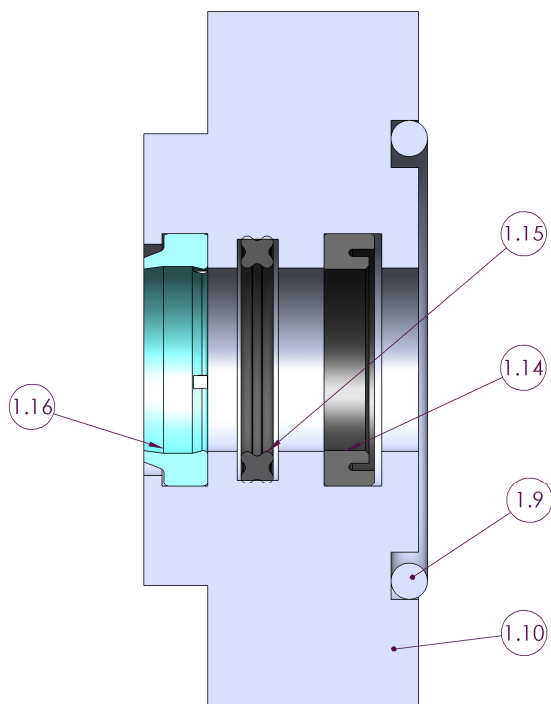
| Order | Equipment model | Description | Number of units |
|-------|-----------------|---|-----------------|
| 1 | | TURRET | |
| 1.1 | FMA-2003 - 2014 | Electric panel CPF-01 (for 1 filter, 230v. ca panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-04 (for 4 filters 230v. ca panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-10 (for 10 filters 230v. ca panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-01-400 (for 1 filter 400v. ca panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-04-400 (for 4 filters 400v. ca panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-10-400 (for 10 filters 400v. ca panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-01-12 (for 1 filter 12v. cc panel) | 1 |
| | FMA-2003 - 2014 | Electric panel CPF-03-12 (for 3 filters 12v. cc panel) | 1 |
| 1.2 | FMA-2003 - 2014 | M8x80 screw | 4 |
| 1.3 | FMA-2003 - 2014 | M8 washer | 15 |
| 1.4 | FMA-2003 - 2014 | Electric panel support plate | 1 |
| 1.5 | FMA-2003 - 2014 | M8x20 screw | 12 |
| 1.6 | FMA-2003 - 2014 | Protection cover | 2 |
| 1.7 | FMA-2003 - 2014 | M5x30 screw | 4 |
| 1.8 | FMA-2003 - 2014 | Omron limit switch | 2 |
| 1.9 | FMA-2003 - 2015 | ø45x4 O-ring | 1 |
| 1.10 | FMA-2003 - 2014 | Rim watertightness | 1 |
| 1.11 | FMA-2003 - 2014 | Rim watertightness washer | 1 |
| 1.12 | FMA-2003 - 2014 | M8 washer | 3 |
| 1.13 | FMA-2003 - 2014 | M8x45 screw | 3 |
| 1.14 | FMA-2003 - 2014 | NI-150 20x28x5,5 Joint | 1 |
| 1.15 | FMA-2003 - 2014 | Quadric joint EQ-16 | 1 |
| 1.16 | FMA-2003 - 2014 | AUASOB 20x28x4,8/7 scraper | 1 |
| 1.17 | FMA-2003 - 2014 | Male crosshead | 2 |
| 1.18 | FMA-2003 - 2014 | M8x35 screw | 2 |
| 1.19 | FMA-2003 - 2014 | M8 nut | 2 |
| 1.20 | FMA-2003 - 2014 | Female crosshead | 1 |
| 1.21 | FMA-2003 - 2014 | Limit switch | 1 |
| 1.22 | FMA-2003 - 2014 | M6x12 screw | 8 |
| 1.23 | FMA-2003 - 2014 | Shaft | 1 |
| 1.24 | FMA-2003 - 2014 | M6 nut | 4 |
| 1.25 | FMA-2003 - 2014 | M6 washer | 4 |
| 1.26 | FMA-2003 - 2014 | M6 washer | 4 |
| 1.27 | FMA-2003 - 2014 | Bronze nut | 1 |
| 1.28 | FMA-2003 - 2014 | M6x35 screw | 4 |
| 1.29 | FMA-2003 - 2014 | M8x50 screw | 4 |
| 1.30 | FMA-2003 - 2014 | Gear engine Ca 0,37Kw 27rpm Fs-1,5 with an outlet flange | 1 |
| | FMA-2003 - 2014 | Gear engineCc 12v 27rpm with an outlet flange | 1 |
| 1.31 | FMA-2003 - 2010 | Engine cover side | 1 |
| | FMA-2012 / 2014 | Engine cover side | 1 |
| 1.32 | FMA-2003 - 2014 | Spindle protection | 1 |
| 1.33 | FMA-2003 - 2014 | Shaft key | 1 |
| 2 | FMA-2003 - 2010 | M18x90 screw | 24 |
| | FMA-2012 / 2014 | M24x110 screw | 40 |

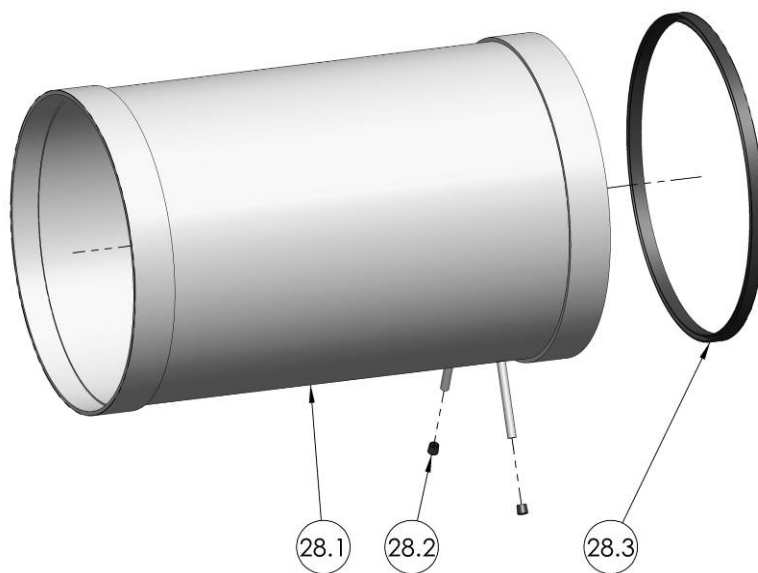
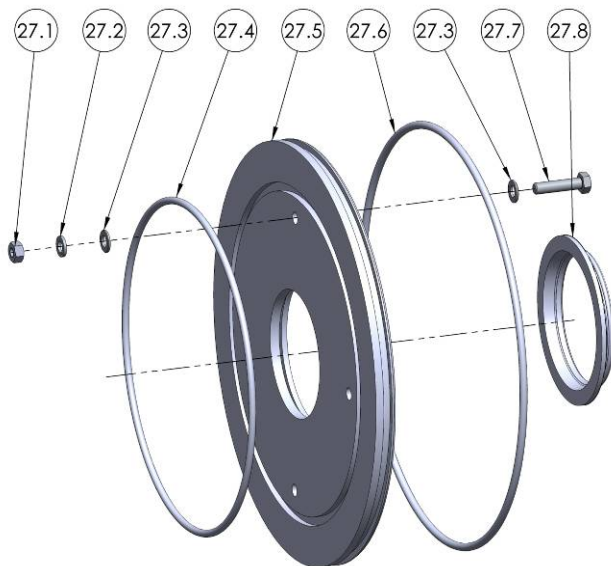
| Order | Equipment model | Description | Number of units |
|-------|-----------------|--|-----------------|
| 3 | FMA-2003 - 2010 | M18 washer | 48 |
| | FMA-2012 / 2014 | M24 washer | 80 |
| 4 | FMA-2003 - 2014 | M16 washer | 12 |
| 5 | FMA-2003 - 2014 | M16x50 screw | 4 |
| 6 | FMA-2003 - 2014 | M16 nut | 4 |
| 7 | FMA-2003 - 2014 | Glycerin pressure gauge Macho Gas-1/4" | 3 |
| 8 | FMA-2003 - 2010 | M18 nut | 24 |
| | FMA-2012 / 2014 | M24 nut | 40 |
| 9 | FMA-2003 | Casing FMA-2003 | 1 |
| | FMA-2004 | Casing FMA-2004 | 1 |
| | FMA-2006 | Casing FMA-2006 | 1 |
| | FMA-2008 | Casing FMA-2008 | 1 |
| | FMA-2010 | Casing FMA-2010 | 1 |
| | FMA-2012 | Casing FMA-2012 | 1 |
| | FMA-2014 | Casing FMA-2014 | 1 |
| 10 | FMA-2003 - 2014 | Macho Gas-1" air release | 1 |
| 11 | FMA-2003 - 2010 | ø456x6,99 O-ring joint | 2 |
| | FMA-2012 / 2014 | ø633.48x6,99 O-ring joint | 2 |
| | | ø660x8 O-ring joint | 2 |
| 12 | FMA-2003 - 2010 | Prefiltration cover side | 1 |
| | FMA-2012 / 2014 | Prefiltration cover side | 1 |
| 13 | FMA-2003 - 2014 | Handle | 2 |
| 14 | FMA-2003 - 2014 | M8x35 screw | 4 |
| 15 | FMA-2003 - 2014 | Pressure transducer Macho Gas-1/4" | 2 |
| 16 | FMA-2003 - 2014 | Ball valve M/H Gas-1/4" | 2 |
| 17 | FMA-2003 - 2014 | Ball valve in angle M/H Gas-3/4" | 1 |
| 18 | FMA-2003 - 2014 | Filter inlet 120mesh M/M Gas-3/4" | 1 |
| 19 | FMA-2003 - 2014 | Valve S-300 Gas-2" Reversible angle (Bermad) | 1 |
| 20 | FMA-2003 - 2014 | NC 24v Dc solenoid | 1 |
| 21 | FMA-2006 - 2014 | M8 washer | 4 |
| 22 | FMA-2006 - 2014 | M8 washer | 2 |
| 23 | FMA-2006 - 2014 | M8 nut | 2 |

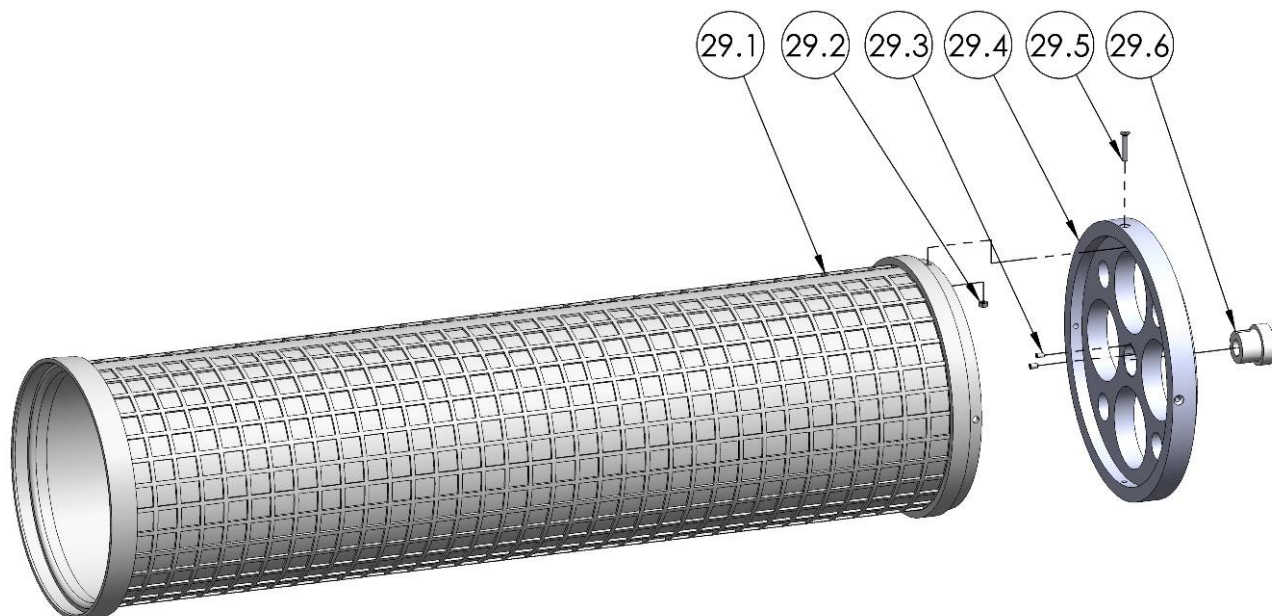
| Order | Equipment model | Description | Number of units |
|---------------------------|----------------------------|------------------------------------|-----------------|
| 24 | | SCANNER | |
| 24.1 | FMA-2003 | Nylon brushes nozzle | 2 |
| | FMA-2004 | Nylon brushes nozzle | 4 |
| | FMA-2006 | Nylon brushes nozzle | 6 |
| | FMA-2008 / 2012 | Nylon brushes nozzle | 8 |
| | FMA-2010 / 2014 | Nylon brushes nozzle | 10 |
| 24.2 | FMA-2003 | 3/4" nozzle nut | 2 |
| | FMA-2004 | 3/4" nozzle nut | 4 |
| | FMA-2006 | 3/4" nozzle nut | 6 |
| | FMA-2008 / 2012 | 3/4" nozzle nut | 8 |
| | FMA-2010 / 2014 | 3/4" nozzle nut | 10 |
| 24.3 | FMA-2012 | Nozzle extension | 8 |
| | FMA-2014 | Nozzle extension | 10 |
| 24.4 | FMA-2003 | Scanner for cartridge INOX and PVC | 1 |
| | FMA-2004 | Scanner for Cartridge INOX | 1 |
| | | Scanner for Cartridge PVC | 1 |
| | FMA-2006 | Scanner for Cartridge INOX | 1 |
| | | Scanner for Cartridge PVC | 1 |
| | FMA-2008 | Scanner for Cartridge INOX | 1 |
| | | Scanner for Cartridge PVC | 1 |
| | FMA-2010 | Scanner for Cartridge INOX | 1 |
| | | Scanner for Cartridge PVC | 1 |
| | FMA-2012 | Scanner for Cartridge INOX | 1 |
| Scanner for Cartridge PVC | | 1 | |
| FMA-2014 | Scanner for Cartridge INOX | 1 | |
| | Scanner for Cartridge PVC | 1 | |
| 25 | FMA-2006 - 2014 | M8x40 screw | 2 |
| 26 | FMA-2006 - 2010 | Cartridge stainless centering ring | 1 |
| | FMA-2012 / 2014 | Cartridge stainless centering ring | 1 |
| 27 | | RIM WATERTIGHTNESS | |
| 27.1 | FMA-2003 - 2014 | M8 nut | 4 |
| 27.2 | FMA-2003 - 2014 | M8 washer | 4 |
| 27.3 | FMA-2003 - 2014 | M8 washer | 8 |
| 27.4 | FMA-2003 - 2014 | ø230x5 O-ring | 1 |
| 27.5 | FMA-2003 - 2010 | Rim watertightness | 1 |
| | FMA-2012 / 2014 | Rim watertightness | 1 |
| 27.6 | FMA-2003 - 2010 | ø291,47x5,33 O-ring | 1 |
| | FMA-2012 / 2014 | ø468.76x6,99 O-ring | 1 |
| 27.7 | FMA-2003 - 2014 | M8x40 screw | 4 |
| 27.8 | FMA-2003 - 2014 | H joint | 1 |
| 28 | | WATERTIGHTNESS DISK | |
| 28.1 | FMA-2003 | Prefiltration cartridge | 1 |
| | FMA-2004 - 2010 | Prefiltration cartridge | 1 |
| | FMA-2012 / 2014 | Prefiltration cartridge | 1 |
| 28.2 | FMA-2003 - 2014 | Cap GPN-280-ER8 | 2 |
| 28.3 | FMA-2003 - 2010 | 62VA82 joint | |
| | FMA-2012 / 2014 | 62VA82 joint | |

| Order | Equipment model | Description | Number of units | |
|-------|-----------------|-----------------------------------|-----------------|---|
| 29 | | FILTRATION CARTRIDGE | | |
| 29.1 | FMA-2003 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | FMA-2004 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | FMA-2006 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | FMA-2008 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | FMA-2010 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | FMA-2012 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | FMA-2014 | PVC screen cartridge Micron | 1 | |
| | | INOX screen cartridge Micron | 1 | |
| | 29.2 | FMA-2003 - 2014 | M6 nut | 4 |
| | 29.3 | FMA-2003 - 2014 | M6x12 screw | 2 |
| 29.4 | FMA-2003 - 2010 | Disc | 1 | |
| | FMA-2012 / 2014 | Disc | 1 | |
| 29.5 | FMA-2003 - 2014 | M 6x35 screw | 4 | |
| 29.6 | FMA-2003 - 2014 | Housing guide | 1 | |
| 30 | FMA-2003 - 2010 | ø314x14 O-ring joint | 1 | |
| | FMA-2012 / 2014 | ø498x14 O-ring joint | 1 | |

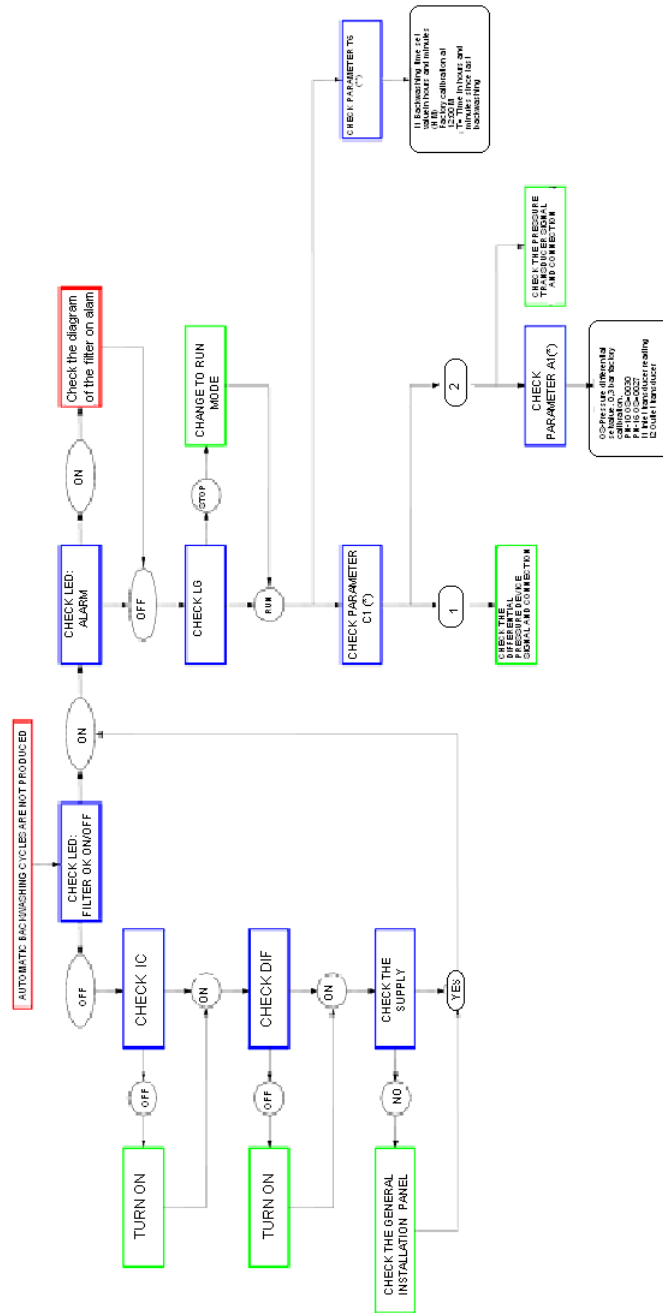






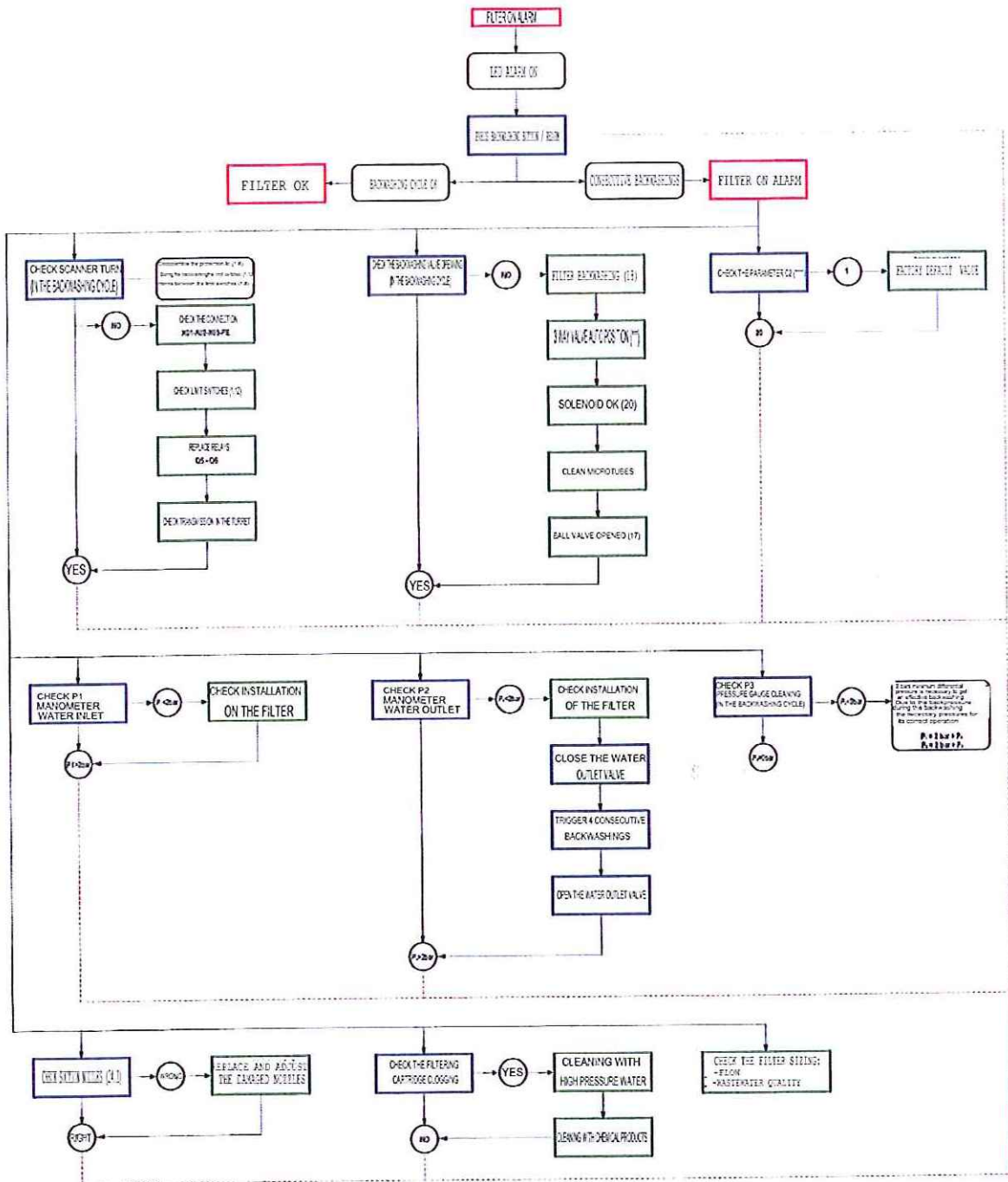


17. – ERROR DETECTION



(*) C1 – Pressure switch selection differential & pressure transducers.
See programmer panel / Modify parameters.

(**) T8 – Time between backwashings.
See programmer panel / Modify parameters.



(***) – See hydraulic circuit section.

(****) C2 – Consecutive pieces counter.
See programmer panel section / Modify parameters

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