



# Operation and maintenance manual

**FILT-MASTER**  
Filtration Systems



## 1 Safety instructions

1. Read this Operation and Maintenance Manual before working the automatic filtration station.
2. Make sure the filter is not pressurized before doing any maintenance.
3. Handle with care while transporting or installing the product.
4. Avoid any direct contact of water to electrical parts during the installation.
5. Check that the operating conditions do not exceed the recommendations of the manufacturer.
6. Check before installing that the pressure in the network does not exceed the maximum working pressure (10 bar).
7. The system can activate automatically the backwash mode at any time without previous notice.
8. Use original spare parts for maintenance.
9. JIMTEN will take no responsibility for any modifications or use of non original spare parts.

### ATTENTION

Before opening a single filter for maintenance, make sure that it is not pressurized.

## 2 Filtration process

During the filtration phase, dirty water flows through the inlet HDPE manifold and goes through the backwash hydraulic valves into the Filtmaster disc filters, passing through the discs to the outlet HDPE manifold.

### Description of the backwash process

1. The controller transmits an electrical command to the solenoid of the first filter according to either differential pressure or time.
2. The solenoid actuates on a hydraulic relay mounted on the hydraulic backwash valve, changing the hydraulic valve from filtration to backwash position.
3. Filter number 1 is backwashed using clean water from the outlet HDPE manifold that has been filtered by the other filters in the automatic filtration station. Dirty water and impurities flow out through the drainage connection of the backwash valve to the HDPE drainage manifold.
4. When backwash of filter number 1 is completed, according to the program set up by the user, the filter comes to filtration position.
5. Filter number 2 comes into backwash mode and the process is repeated until all the filters in the automatic filtration station have been cleaned.
6. When all the filters have been cleaned, the automatic filtration station goes back to filtration mode until the next cleaning cycle starts.

### Hydraulic connections

#### Dirty water

No automatic hydraulic control valve should be installed at the entrance of the automatic filtration station because it could affect working pressure conditions. If needed, we recommend installing a manual control valve.



## Filtered water

We recommend the installation of a manual control valve in the outlet of the filtration station to make maintenance easier.



## Drainage

Drainage water coming out from the backwash hydraulic valves is collected in a common HDPE manifold.

The drainage must be at height 0. If installation requires a higher level, then the difference in meters translated to pressure units must be added to the minimum recommended backwash pressure (2,5 bar).



Our range has different filtration degree color-coded discs depending on the total suspended solids of raw water to be filtered and our automatic filtration stations are designed to match flow requirements of the installation. The cartridge spine has an internal piston spring for compressing or releasing the discs during the filtration and backwash cycles.

## Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves of the discs.

## Backwash Mode:

During the backwash process, the discs are released. At the same time, the multi-jet nozzles present in the three internal manifolds of the cartridge spine sprays clean water tangentially causing the discs to spin and forcing the retained solids out to the drainage outlet.

**In filtration position**

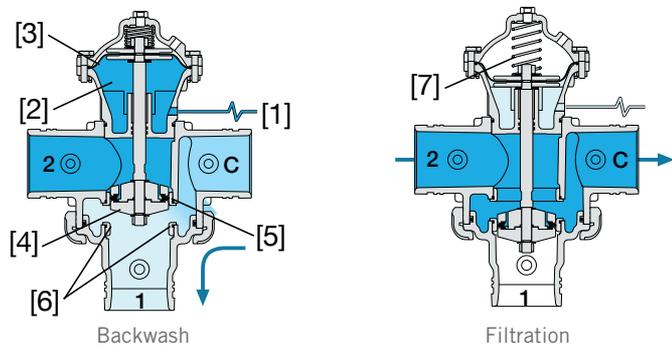
1. The piston compresses the disc cartridge.
2. The conical flexible non-return membrane remains open, allowing filtered water to go to the network.

**In cleaning position**

1. The backwash valve inverts clean water flow into the filter, closing the conical flexible non-return membrane. This forces clean water through the three spine manifolds that spray out tangentially the dirtiness from the discs.
2. At the same time, the upper piston is compressed by incoming pressure through the spine manifolds, releasing the discs that spin in a centrifugal movement at high speed.

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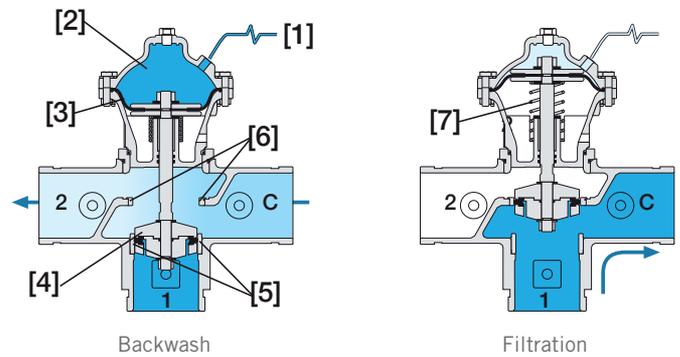
## Hydraulic operation of IN LINE backwash valves:



In backwash mode: the hydraulic command [1] pressurizes the lower control chamber [2], moving the diaphragm [3] and the metal axis [4] upwards. As a result, seal [5] closes tightly the incoming port 2. This communicates C port (dirty flow coming out from the filter) with drain port 1.

In filtration mode: we drain pressure out of the lower control chamber [2], the spring [7] moves the diaphragm [3] and metal axis [4] downwards. The seal [5] closes tightly the drain port 1 and therefore the incoming dirty water goes into the filter to be filtered from 2 port to C port.

## Hydraulic operation of IN ANGLE backwash valves:

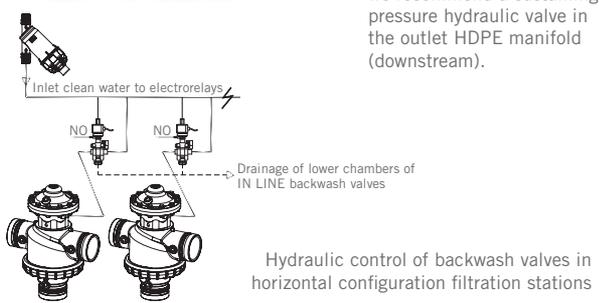


In backwash mode: the hydraulic command [1], pressurizes the upper control chamber [2], forcing the diaphragm [3] down moving downwards the metal axis [4]. As a result, the seal [5] closes tightly incoming dirty water port 1. This communicates the dirty flow coming out from the filter (C port) to the drain port 2.

In filtration mode: we drain pressure out of the upper control chamber [2], the spring [7] moves the metal axis [4] upwards. The seal [5] closes the drain port seat 2 and then the incoming dirty water goes from incoming port 1 to C port to be filtered in disc filter.

### Installation recommendations

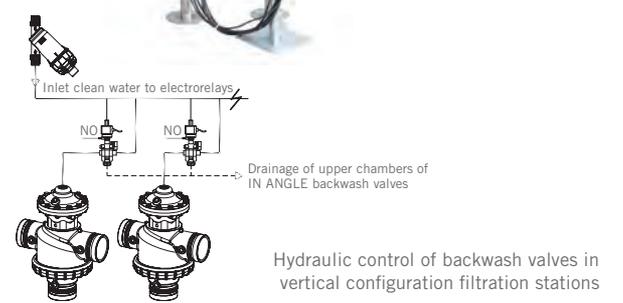
- Dirty water
- 2" triple effect air valve
- Drainage 63 mm:  
The backwash flow is between 7 and 28 cubic meters/hour.
- Clean Water:  
\* If pressure in the filtration station is lower than 2,5 bar, we recommend a sustaining pressure hydraulic valve in the outlet HDPE manifold (downstream).



Hydraulic control of backwash valves in horizontal configuration filtration stations

### Installation recommendations

- Dirty water
- 1" triple effect air valve
- Clean Water:  
\* If pressure in the filtration station is lower than 2,5 bar, we recommend a sustaining pressure hydraulic valve in the outlet HDPE manifold (downstream).
- Drainage 63 mm:  
The backwash flow is between 7 and 28 cubic meters/hour.

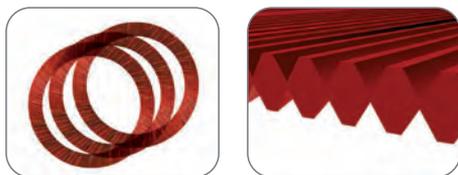


Hydraulic control of backwash valves in vertical configuration filtration stations

# 3 Description and operation

Filtmaster uses a unique disc filtration technology. The double face thin PP grooved discs are compressed together in the cartridge spine to create the filtering effective surface that retains the suspended solids in the dirty water. This disc cartridge is resistant to pressure and corrosion.

In the filtration process, the discs are tightly compressed together thanks to the spring and the differential pressure inside the filter. The filtration is done when the dirty water passes through the discs to the interior of the cartridge spin.



## Color-coded filtration degrees

Colour	Yellow	Red	Blue	Green	Sky Blue	Violet
Screen	-	130	100	-	-	-
Discs	200	130	100	50	25	20

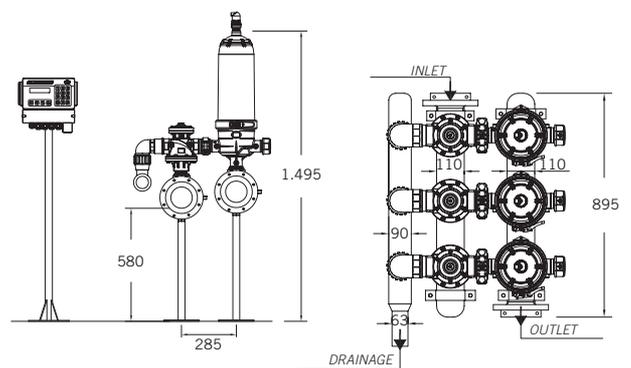
(microns)

- Operate manually several backwash cycles.
- Open slowly the downstream hydraulic valve.
- If the differential pressure remains high, check that the flow to be filtered is not excessive. This could cause a high head loss.

## Working conditions.

Maximum pressure	10 bar	140 psi
Minimum pressure	2.5 bar	35 psi
Backwash flow (per filter)	7-28 m <sup>3</sup> /h	30-123 gpm
Maximum temperature	60°C	135°F
pH	4-13	4-13

## Filtration station 3 x 2”.



# 4 How to work the automatic filtration station

- Make sure that the inlet and outlet HDPE manifolds are correctly connected.
- Check that the automatic filtration station was not damaged during the transport.
- Check that filter clamps are tightly closed.
- Power up the system.
- Pressurize the system checking that pressure does not exceeds 10 bar.
- Program the controller following the instructions in this manual.
- Check that pressure in the outlet HDPE manifold is at least 2,5 bar.

## Filter clogged during start-up.

- Close the downstream sustaining pressure hydraulic valve if exists.

# 5 Monthly Maintenance

## Check for leakages in the drainage manifold

In case that there is a leakage of water during the filtration stage, check the sealing joints of the backwash valves.

## Check inlet and outlet pressure

In case that the differential pressure is above 0,6 bar (9 psi), activate manually the backwash of the Filtmaster filtration station. In case that the differential pressure remains high check for possible failures in the internal components of the automatic disc cartridges.

## Controller performance

Check that the controller timing parameters are correctly set up. Using the controller, activate an automatic backwash cycle.

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## Clean regularly the hydraulic command filter

The ¾" filter installed in the inlet HDPE manifold provides clean water to command hydraulically the backwash valves. For regular maintenance, close the manual ball valve, get the cartridge out and clean manually.

## Winter time

To prevent damages in the filtration station by water freezing in winter time, drain the system by leaving a drainage valve open.

## 6 Seasonal Maintenance Cleaning the Discs

The disc filtration systems can be clogged by water-formed deposits. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

The most common water-formed deposits are:

1. Biological or organic (mostly mucous or oily/ beige, brown or green in color).
2. Iron oxide (rust) or other metal oxides.
3. Carbonates (white or gray).
4. Combinations of the above.

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure.

## Material and Equipment.

Chose a well ventilated working place

- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably in polypropylene.
- Plastic rope to tie up the discs.
- Sodium Hypochlorite NaOCl (commercial concentration: 10%). Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl (commercial concentration: 30%). Very corrosive liquid that dissolves and removes carbonates, iron oxide, and other deposits.

- Personal protection equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

To clean organic and biological deposits, put the discs in a 15 liter container that contains:

- 5 liters of water
- 5 liters of Sodium Hypochlorite NaOCl 10%.
- Contact time: up to 8 hours
- Agitate the discs several times with a stirring stick.
- Remove the discs carefully from the solution, put them in the second large container with clean water and rinse them very well before placing them back in the filter.

To clean carbonates and iron deposits, put the discs in a 15 liter container that contains:

- 10 liters of water
- 2 liters of Hydrochloric Acid HCl 30%.
- Contact time: from 1 to 8 hours
- Agitate the discs several times with a stirring stick.
- Remove the discs carefully from the solution, put them in the second large container with clean water and rinse them very well before placing them back in the filter.

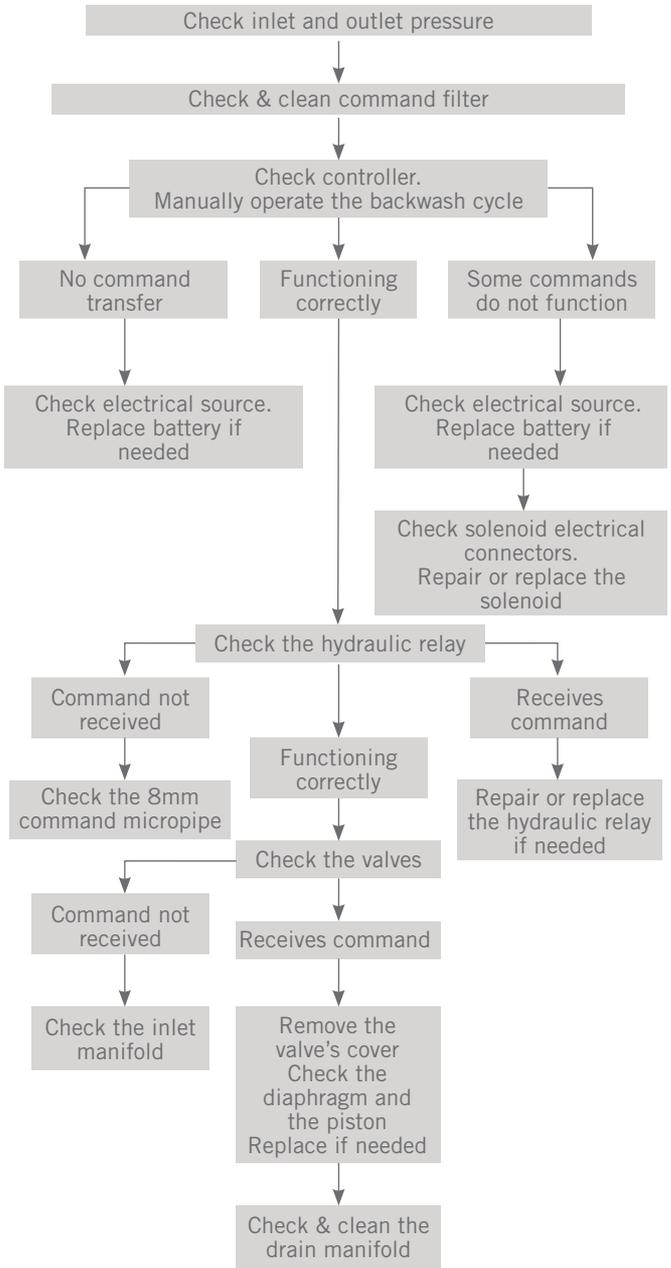
## Steps for seasonal maintenance of discs.

Make sure that the system is not under pressure! Release the clamp (1) and remove the filter cover (2). Unscrew the butterfly-nut on top of the filtration cartridge (3). Remove the tightening cap (4). Remove the discs out of the cartridge spine (5).



## 7 Troubleshooting

### NO BACKWASH OPERATION

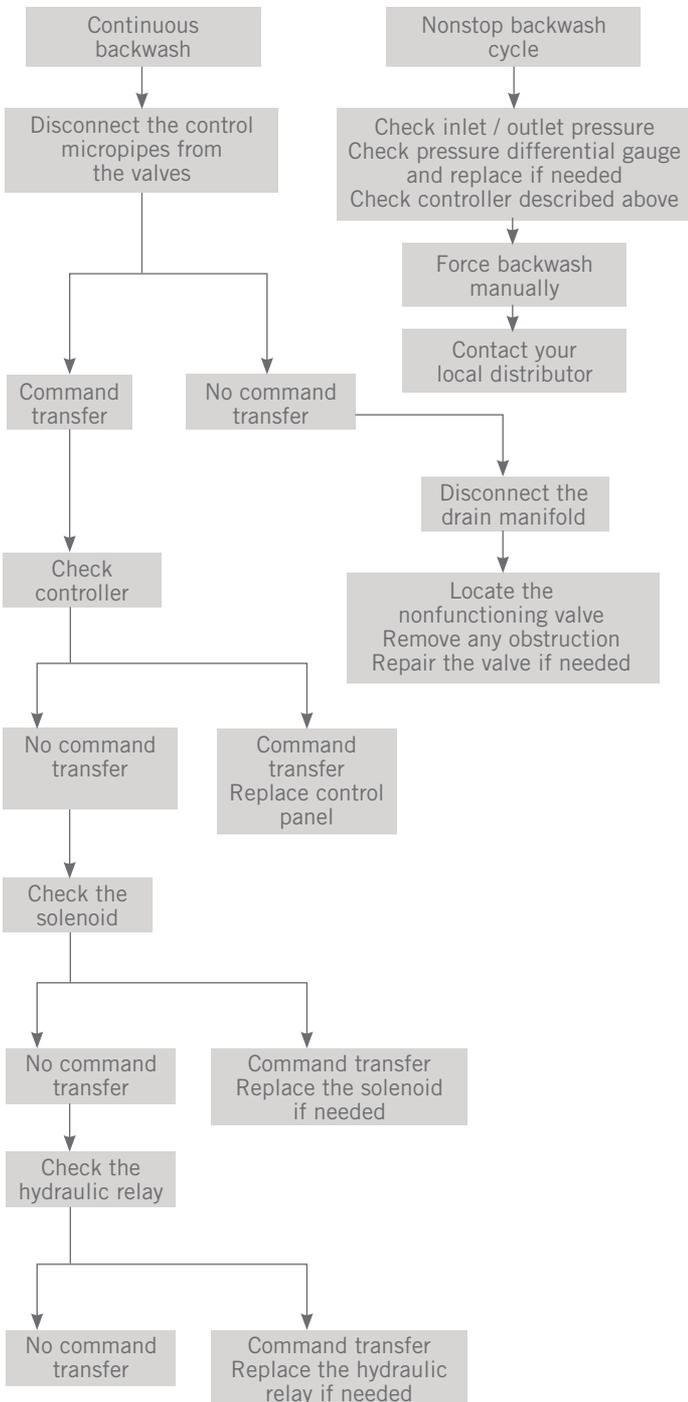


**ATTENTION**  
Carbonates react violently with hydrochloric acid (foaming, gas).

**ATTENTION**  
Contact your local distributor.

# Operation and maintenance manual

## CONTINUOUS OR NON-STOP BACKWASHING



**ATTENTION**  
Contact your local distributor.

## 8 Spare parts and accessories



1.- Filter cover

Code	Icon	Icon	Icon
97824	2" Std.	1	A-2
97345	2"	1	A-11
97346	3" / 2" L	1	A-4

1.- Transparent filter cover  
(only for demonstration purpose)

Code	Icon	Icon	Icon
97347	2"	1	A-2
97348	3" / 2" L	1	A-4

2.- AISI 304 stainless steel clamp

Code	Icon	Icon	Icon
97350	2"- 3"	1	A-1

3.- PAFV clamp  
(polyamide reinforced with fiberglass)

Code	Icon	Icon	Icon
97759	2"- 3"	1	A-2

4.- Filter body o-ring

Code	Icon	Icon	Icon
97351	2"- 3"	10	A-10

5.- Filter body (3 ways)

Code	Icon	Icon	Icon
97770	2"- BBB	1	A-11
97772	2"- VBV	1	A-11
97771	2"- VVB	1	A-11
97773	2"- NNN	1	A-11
97775	2"- VNV	1	A-11
97774	2"- VVN	1	A-11
97777	3"- BBB	1	A-8
97779	3"- VBV	1	A-8
97778	3"- VVB	1	A-8
97780	3"- NNN	1	A-8
97782	3"- VNV	1	A-8
97781	3"- VVN	1	A-8

6.- Filter body (2 ways)

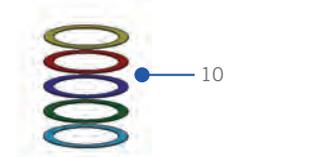
Code	Icon	Icon	Icon
97785	3"- BB	1	A-9
97784	3"- NN	1	A-9
97786	3"- VV	1	A-9
97788	4"- BB	1	A-8
97787	4"- NN	1	A-8
97789	4"- VV	1	A-9

7.- O-ring for cap

Code	Icon	Icon	Icon
97802	2"	1	4114
97803	3"	1	4114

8.- Female threaded cap

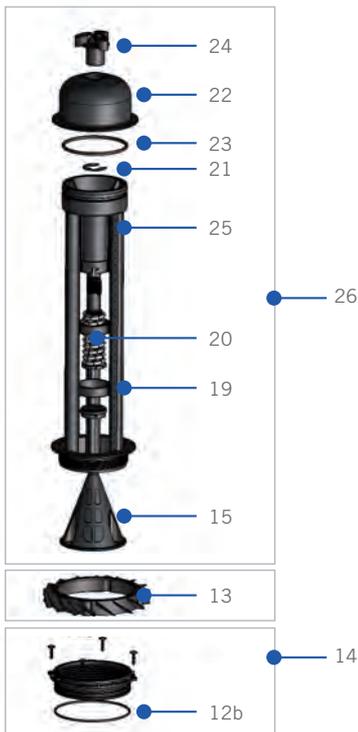
Code	Icon	Icon	Icon
51512	2" BSP	25	A-1
51535	3" BSP	15	A-2
51513	2" NPT	25	A-1
51536	3" NPT	15	A-2



10.- Discs kit (500 units)

Code	Icon	Icon	Icon
98813	20M	1	A-11
98495	25M	1	A-2
98814	50M	1	A-2
98815	100M	1	A-11
98816	130M	1	A-11
98817	200M	1	A-11

## 9 Installation manual



12b.- O-ring for automatic disc cartridge and manual before 2015

Code			
97335	2"-3"	10	A-10

13.- Deflector crown

Code			
97336	2"-3"	1	A-10

14.- Automatic filter adaptor kit

Code			
98782	-	1	4112

15.- Anti-return valve for automatic filter

Code			
98781	-	1	4109

19.- Closing cover with joint

Code			
97761	-	1	-

20.- Axis/spring with hydraulic piston

Code			
97762	-	1	-
97833	low pressure	1	-

21.- Hydraulic piston washer

Code			
97763	-	1	-

22.- Hydraulic piston cover

Code			
97765	-	1	A-10

23.- Conical joint for hydraulic pistons

Code			
97764	-	1	-

24.- Plastic screw for automatic disc cartridge

Code			
97766	-	1	-

25.- Disc support

Code			
97767	-	1	A-8

26.- Spine without discs for automatic filters

Code			
98796	-	1	A-8

The 8/16 output Filtmaster filter cleaning controller is capable of activating sequentially up to 16 valves depending on the model.

In this manual, we will cover the installation of the controller and the electrical wiring to all elements to be controlled.

This manual has been prepared by JIMTEN for the exclusive use of its customers. It is understood that the user is responsible for use.



VERY IMPORTANT

In this manual we deal with operations that in some cases may mean physical risk for the operator who carries out these operations.

Precautionary, 220Vac controllers must be operated when switched off.

All the operations must be carried out using the appropriate tools and safety protection means with the right safety protection.

### Where to install the controller.

To protect the Filtmaster filter cleaning controller from damage, it must be installed in a dry place and away from heat or electrical noise sources.

Never expose to continuous sunlight the controller screen.

For optimum vision, place the screen at the user's eye level, or keep viewpoint at 90 degrees angle.

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## How to install the controller.

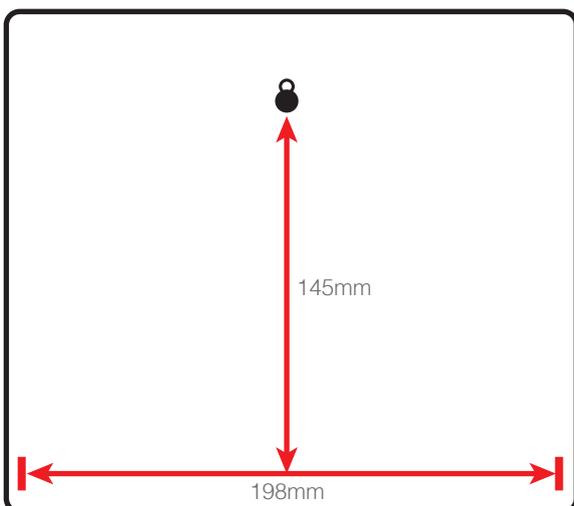
The controller is designed to be installed directly on the wall. These are the dimensions:



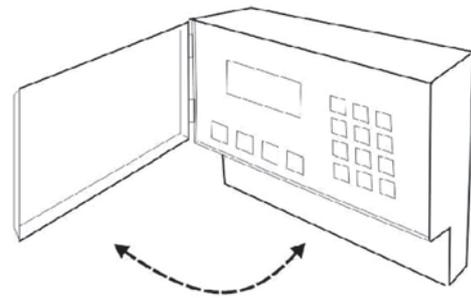
Together with the controller and inside the packaging there are 6 packing glands for the cable input and 3 Rawl plug and screw sets for correct wall mounting.

Use the mounting template (included) to mark the screw location on the wall.

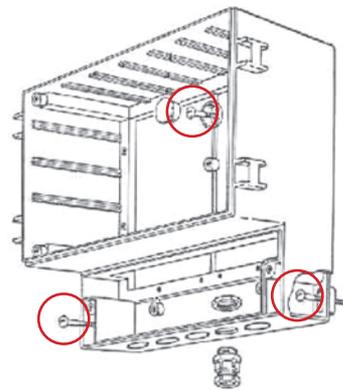
## Screw location template.



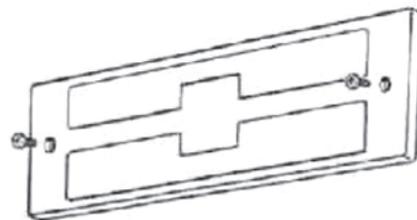
The Filtmaster filter cleaning controller has a transparent protecting cover with a hinge:



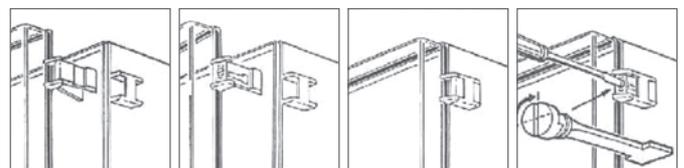
Fixing to the wall is done by placing 3 screws according to the following diagram:



To fix the lower screws, first remove the wiring cover:



The hinges and fasteners make the transparent protecting cover mobile.



## Controller setup and power supply.

Remove the lower cover of the terminal block.

At the back, there are spare fuses and a wiring connection diagram for the controller.

Once the Filtmaster filter cleaning controller is situated correctly we proceed to connect to power supply taking into account polarity.

There are several options for power supply sources:



220 Vac power supply. The controller incorporates an internal transformer to 24Vac outputs (adaptable to an external 24Vac source).



24 Vac power supply. The controller gets power from external 24Vac transformer.



12 Vdc power supply. The controller gets power directly from a 12 Vdc battery that can be charged through solar panel.



9 Vdc power supply. The controller gets power from two 9 Vdc batteries that have to be replaced depending on use.

Once the controller is correctly mounted, we open the front cover of the wiring terminal block.

Note: this terminal block will change depending on the number of outputs and voltage of the controller model.



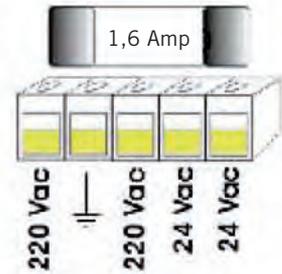
We connect here all electrical wires to external devices to be controlled or from external devices providing information to the controller.

Power supply area:

Power supply fuse



Outputs fuse



The terminal block is the same for all possible power supplies. For this reason, we detail all possibilities:

In every case, we will make the connection with stripped cable with a maximum section of 2 mm, while paying special attention to using the appropriate screwdriver, not leaving any loose filaments or too much stripped cable in sight.

It is highly recommended to mark the cables for future maintenance or to track any breakdown.

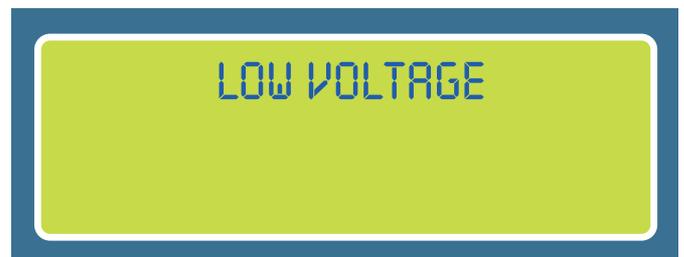
We will use an appropriate packing gland for connecting the cables into the plastic box. Maximum Ø of incoming cables is 16 mm.

Pay attention to the right fixing on packing gland to guarantee sealing of plastic box.

## Power supply. General aspects:

The Filtmaster filter cleaning controller automatically detects the power voltage, displaying a warning message if that voltage is lower than that stipulated for each use.

The screen is displayed as it follows:



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This screen is displayed in the following cases:

Power supply 220 Vac	Lower than 198 Vac
Power supply 12-9 Vdc	Lower than 8.2 Vdc

In case of 220Vac, users are warned that the quality of the power is lower than the 10% oscillation allowed by electricity companies.

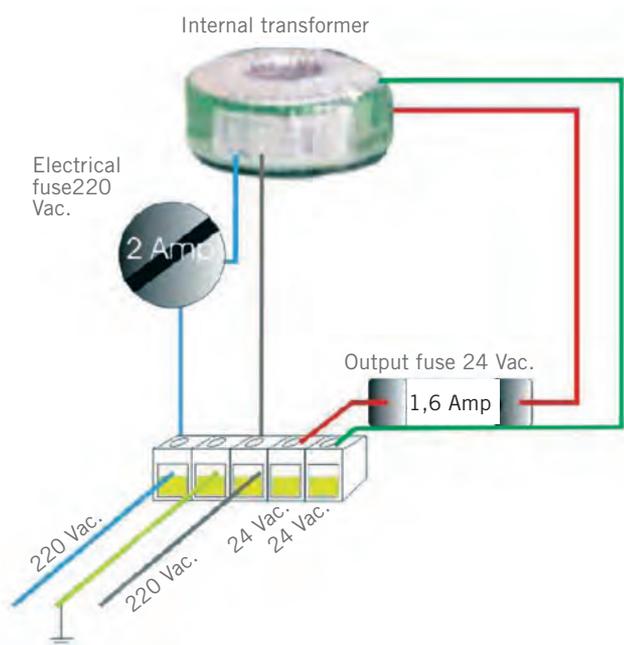
In case of battery supply, the message warns that the current voltage is lower than recommended for the good performance of the controller.

In these cases, while the warning message is displayed, the controller is paused. If the voltage level is recovered, the screen message will disappear and the controller will continue the operation that was paused.

This function is particularly interesting in those cases where latch solenoids are used, since it prevents valves from being open.

If there is a MODEM available, the controller will communicate this fact.

## 220 Vac power supply:



We supply 220 Vac to the controller at the terminals marked on the diagram.

It is of great importance that the connection to earth of the controller is properly connected so that the incorporated (varistors, static filter and fuse) act when necessary.

The 220Vac controllers have an internal transformer that generates the output voltage (24Vac).

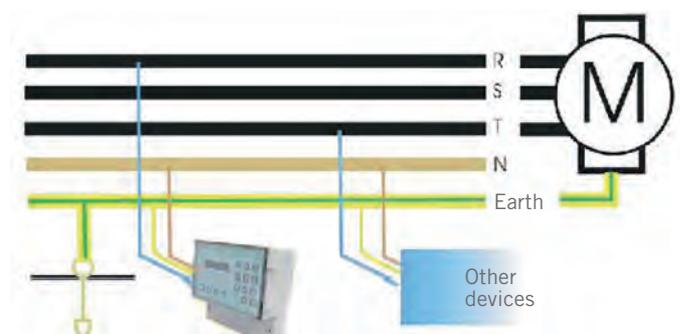
There are two 24Vac outputs that can be used for:

- Checking if the system works correctly by testing if there is 24Vac voltage in the these terminal blocks.
- In exceptional cases, conditioned by the power consumption of solenoids connected to the Filtmaster filter cleaning controller or by the number of solenoids connected to the same output, it is possible to install an external transformer to get required power.

The controller can also be used for extracting the phase to install an external switch for automatic-stop-manual operation of any external device (only for 220Vac models).

Precautionary, if we need to take the 220Vac from a three phase power source, we recommend taking it from a different device other than the following problematic ones current, we will extract the 220 Vac phase from a different one that acts on often problematic devices such as:

- Cold storage rooms.
- Frequency converters.
- Fertilizer pumps.
- Control panel contactors.



We recommend using only 2Amp fuses.

Never use fuses higher than 2Amp. In case it is fused repeatedly, you should contact JIMTEN's technical services.

The power supply is protected by a fuse, varistors and a network filter.

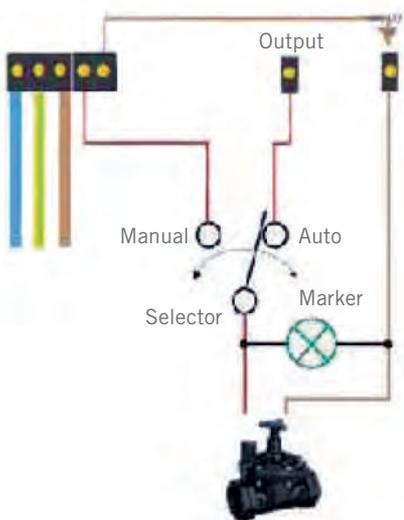
These varistors have the property of short circuiting when the voltage is higher 220Vac, causing the fuse to blow.

They are placed between phases and phase to earth. If we detect that the fuse is fused, this can be a result of varistors operating. Therefore, we must check and replace them if necessary.

Moreover, this connection can also be used for extracting the appropriate phase for the installation of a network representation or of an alternative manual control, as shown in this diagram.

The 1,6 Amp output fuse of the controller only acts on the output common.

Never use the common phase as an output common since, in this case, the protections that the controller incorporates (varistors, RC circuits and fuse) are disabled.



**NOTE**  
Once a varistor has acted, it no longer fulfills its performance specifications and must be replaced.

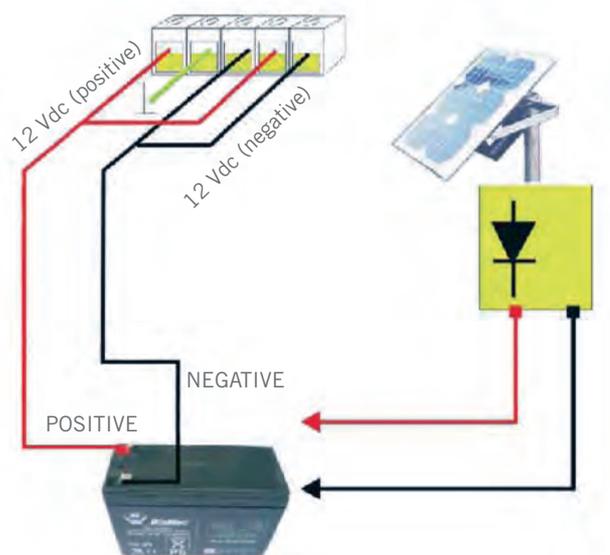
If an alternative manual control is installed, it is necessary to take the precaution of having a second protection fuse for the manual control of the system.

Originally, the output fuse is a 1,6 Amp fuse. This value must never be exceeded under any circumstances.

Furthermore, the output supply has a 39V protection varistor.

## 12 Vdc power supply (batteries)

In battery-supplied controllers, pay special attention to the quality of the connections made.



As a general rule, the following precautions must be taken:

- Terminals of the battery must be tight.
- Terminals must be clean and protected against rust.
- In case of solar panels, they must be clean, orientated and well maintained.

This controller model has only one output with polarity (pay attention to the connection), although all the protection elements and fuses meet the same quality standards.

The same power cable must be used for supplying power to the outputs of controller. (In some cases, it is possible to install two batteries).

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We recommend to connect the phase to earth to the controller.

Optionally, a solar panel with its regulator can be installed to keep the battery charged with endless autonomy.

The solar panel charge requirements or the autonomy of battery will be more defined by the power consumption of solenoids and working hours per day of these solenoids than the power consumption of controller itself.

**NOTE**  
12 Vdc controllers, for obvious energy-saving reasons, do not have light screen.

The autonomy of a battery greatly depends on temperature and humidity conditions.

In case of automotive batteries, we recommend maintaining the acid level.

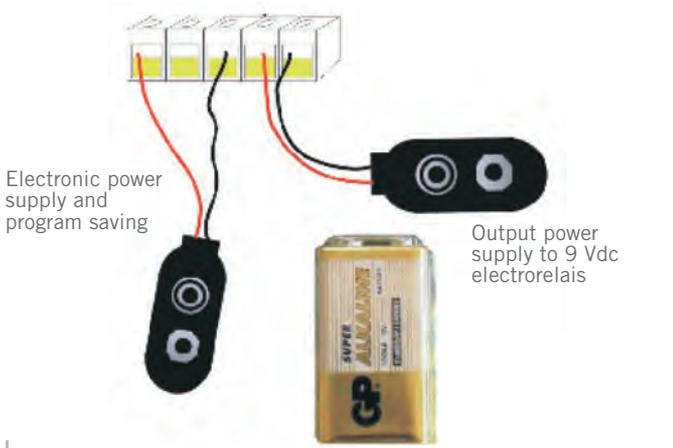
During inactive periods, we recommend taking out the battery and keeping it under ideal conditions

If the battery is recharged by solar panels, they must be suitably maintained, by keeping them clean and well oriented to assure that the battery is fully charged.

## 9 Vdc power supply (batteries)

There is a model of Filtmaster filter cleaning controller that works with 9 Vdc batteries.

Unlike the previous controller models, it can only work with two-wire latch solenoids (with invertible polarity).



The main characteristic of this latch solenoid is that it consumes only during opening and closing operations. Therefore, it does not consume power while the valves are actuated (for practical purposes, there is no difference between operating for 1 hour or 20 hours).

The SLEEP function is a distinguishing feature of this model. The controller becomes disconnected in order to save energy. It is automatically activated for milliseconds every minute to check if it has to do any operation.

As the 12 Vdc model, it does not have light screen and turns into SLEEP mode for energy-saving reasons.

The 9 Vdc controller has quick connectors for the power supply batteries and also for the 9 Vdc outputs.

Number of batteries is doubled to guarantee 3 months of autonomy in normal working conditions.

### Wiring:

+9 Vdc electronic (RED)	(WITHOUT CONNECTION)	-9 Vdc electronic (BLACK)	+9 Vdc outputs (RED)	-9 Vdc outputs (BLACK)
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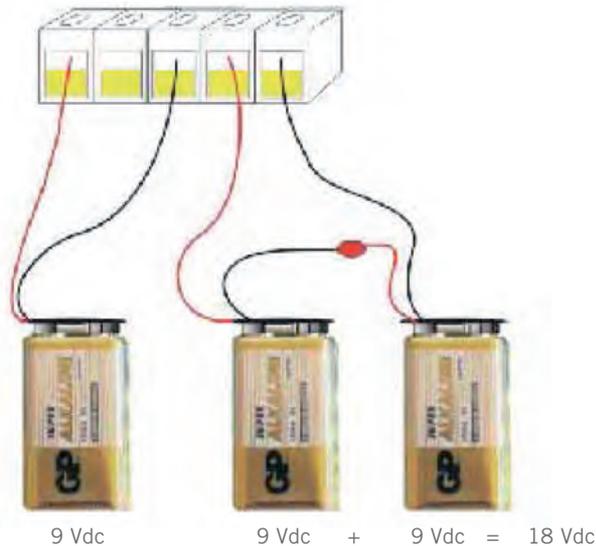
This model is produced with standard 9 Vdc battery quick connectors, but can also work with 12 Vdc batteries in order to extend its autonomy.

The battery recommended by JIMTEN for this function has a 550mAh charge.

**NOTE**  
We recommend using longlife well known brand Ni-Cad batteries.

**NOTE**  
Never program pauses lower than 4 seconds between latch solenoid activation times since the electronic condenser requires that minimum time to accumulate the necessary power for activation/deactivation.

Most solenoids work from 9 to 12 Vdc, but there are some cases when solenoids must be powered with a higher voltage. In these cases, we can do as follows:



Once this operation is carried out, the screen shows the controller status.

Another characteristic of this controller is that it disconnects its screen in order to save energy. If we want to program it again, we must press any key for a few seconds until it activates again.

To turn it off again, we will key in at the "STATUS SCREEN":



Sleep controller? will be shown



When validating, the screen will turn off, but the controller will be fully operational.

#### NOTE

The specific operation of this kind of controller and the fact that the low power consumption of all its functions is a priority, make inadvisable installations that require an active input since this means multiplying the power consumption and therefore reducing its autonomy.



#### VERY IMPORTANT

Battery controllers switch the screen off to save power consumption when no key has been touched for a minute.

To switch on the screen again... Keep a key pressed for a few seconds.

#### NOTE

Due to the fact that the highest power consumption occurs when the screen is on, after learning how to operate the controller during the first programming, we recommend to swap the two batteries so that the battery in best condition is available for the electronics.

## Electric connection to backwash valves

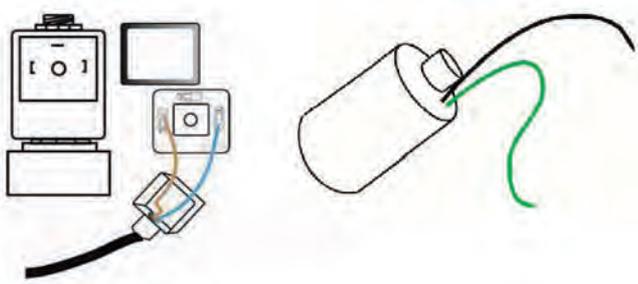
The connection to backwash valves is done through solenoids. Current intensity must not exceed 1,6 Amp for the total of solenoids connected simultaneously to the output ports.

We must bear in mind that the internal transformer gives a maximum intensity of 40VA, so we will take into consideration the maximum power consumption, depending on the number of solenoids and relays working simultaneously in the worst case scenario.

The Filtmaster filter cleaning controller can be connected either to continuous consumption solenoids or to latch solenoids.

The connection is the same for 12 Vdc controllers, taking into account the power supply polarity and the polarity of solenoids.

# Operation and maintenance manual



Invertible polarity latch solenoids vary their performance, interchanging the order of the cables (consult manufacturer). That is to say, they change from normally open (N.O.) to normally closed (N.C.).

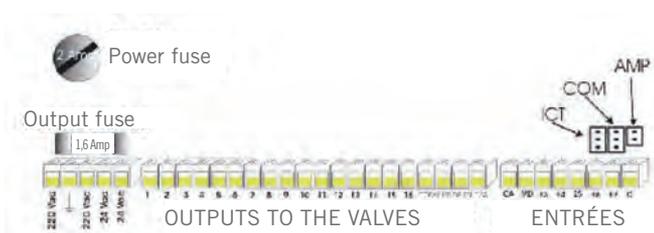
Some manufacturers make specific solenoids for each operation.

The Filtmaster filter cleaning controller, can work with different brands of latch solenoids.

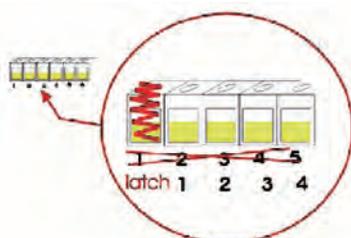
JIMTEN recommends a solenoid that, for connections to normally-open valves, the common is the black cable while the green cable is the common for connections to normally-closed valves.

For these solenoids the output common must be the black cable (check for other models), while for 24Vac and 12 Vdc solenoids the connection polarity is not important, although it is recommended to use the same colour for the output common in order to make future maintenance work easier.

## Output connection terminal block

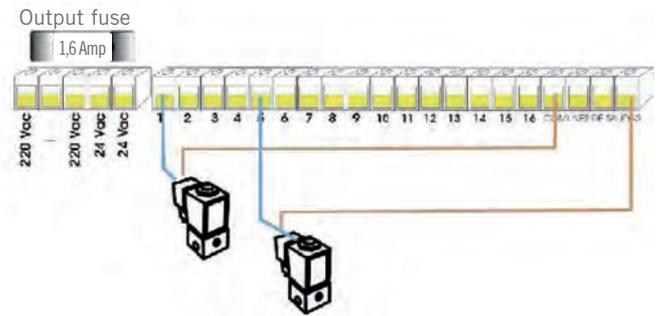


Nous pouvons apprécier qu'il existe une différence de nombre de sorties s'il s'agit d'un programmateur latch.



In this case the internal relay no.1 is responsible for inverting the polarity of latch solenoids.

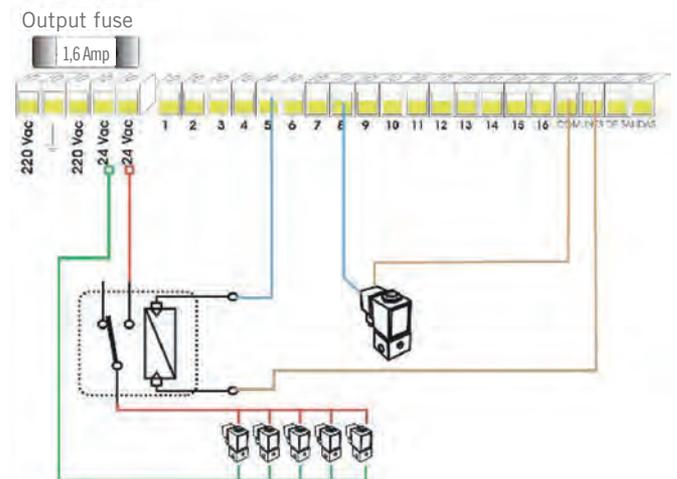
We will connect the solenoids of the backwash valves according to the following diagram:



There are 4 common terminals (internally bridged).

If there are many cables to be connected to these terminals, we will install an external terminal block for an appropriate connection to the controller.

If power consumption is higher than 4Amp per output, resulting from solenoids with greater power consumption or from the simultaneous connection of a number of solenoids, an external relay should be installed.



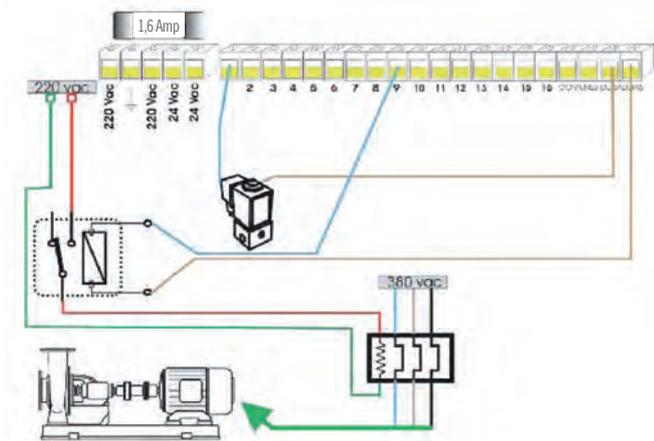
As a precautionary measure, mainly for controllers that make many operations daily, this relay should be installed to increase the working lifetime.

Furthermore, the installation of an external relay is good because this increases the galvanic separation between the solenoid and the controller. Another advantage is that the relay can be quickly changed in case of breakdown.

## Electric connection to pumps

In addition to the controller, backwash valves and filters, there are other devices (pumps, mixers, fertilizer pumps, etc.).

These elements are based on electric motors, and so their installation and control follow common guidelines.



The previous diagram is valid both for the automation of pump motors, mixers and electric fertilizer injection pumps.

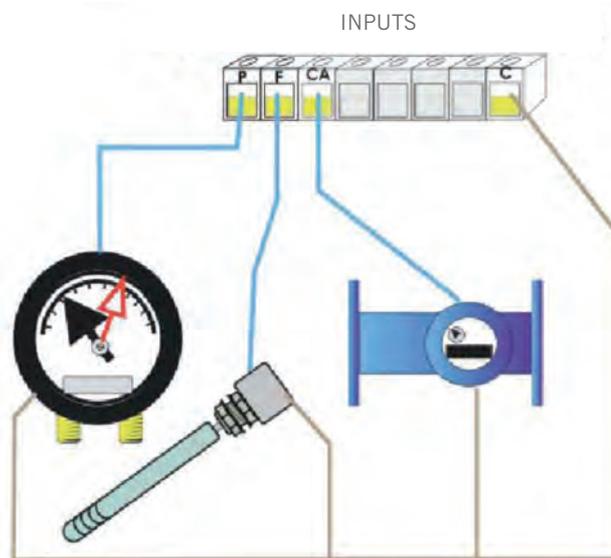
## Input connection terminal block

The controller has 7 contact voltage-free inputs, that is to say, the controller recognises them when there is a short circuit between the common input and the corresponding input.

The function of these inputs is the following:

Symbol	Function
P	MECHANICAL DIFFERENTIAL PRESSURE SWITCH
F	NETWORK WATER SENSOR/ACTIVE PUMPING
WM / CA	WATER METER
E4	----without use----
E5	----without use----
E6	----without use----
E7	----without use----

The devices shown on the previous table are those in the following diagram:



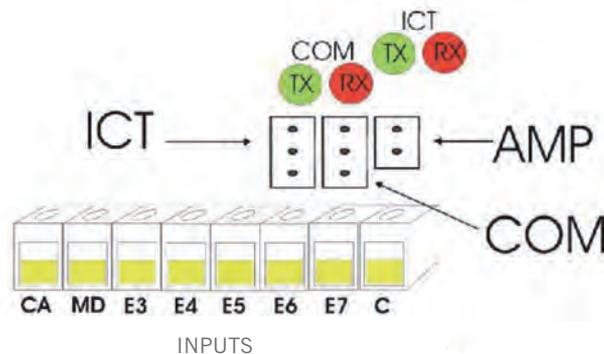
In the previous diagram, we see the connections to the water meter and the differential pressure gauge. These inputs are fixed for these devices.

## Communication connections

The controller can communicate with different devices:

There are 3 connector types located immediately above the connection terminal block of the digital inputs.

There are 4 warning lights that inform us whether the controller is sending or receiving information (from modem or ICT), useful information for setup and assistance operations.



# Operation and maintenance manual

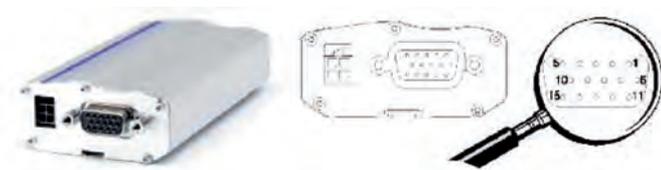
## RS232 connection

By using this connector, the controller can communicate with a PC through modem or by cable for programming or downloading data.

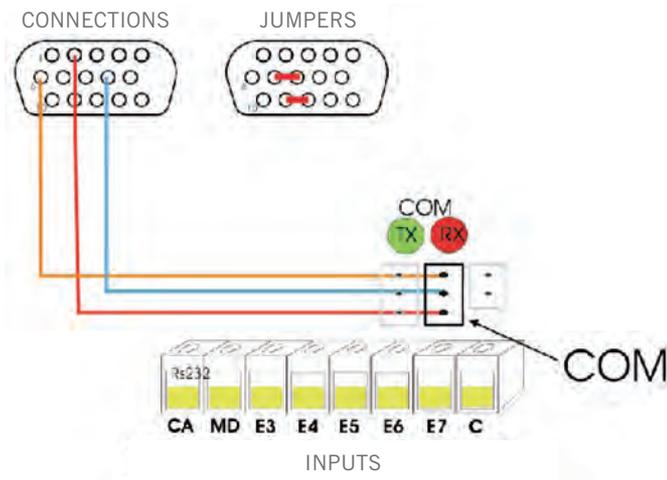
There are a large number of modems in the market. JIMTEN has officially approved different GSM modem models for the Filtmaster filter cleaning controller.

If you have a different modem model, please contact JIMTEN's technical department to verify its compatibility.

Modem connection:



The modem connection is easily done by using the appropriate cable supplied by JIMTEN.



In the male socket plug that must be connected to the MODEM there are two works to be done.

## Wiring

PIN 2 MODEM CONNECTOR	PIN 1 CONTROLLER
PIN 6 MODEM CONNECTOR	PIN 2 CONTROLLER
PIN 9 MODEM CONNECTOR	PIN 3 CONTROLLER

## Jumpers

PIN 7 WITH 8
PIN 11 WITH 12

## NOTE

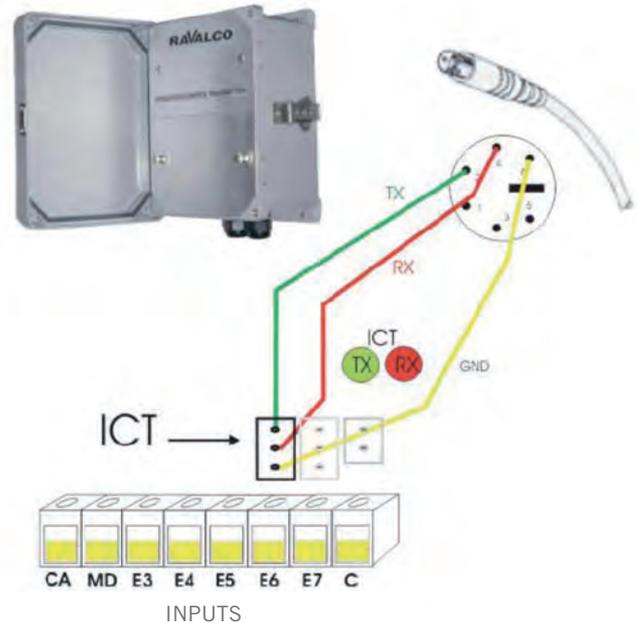
For the correct performance of the MODEM, the PIN number request must be deactivated.

## ICT connection (via radio)

Through a radio connectivity module, this Filtmaster filter cleaning controller model can command an ICT transmitter that will open/close valves at long distances (see ICT specifications).

In this case, this module can control 96 more valves by simply connecting both devices.

This module includes the necessary cable.



## NOTE

The connection between both devices must be as close as possible and the cable connecting them must be outside the area of influence of any device that may generate interference (power cables, motors, etc.).

This model requires the RADIO CONNECTIVITY MODULE.

The compatibility between the Filtmaster filter cleaning controller and the ICT transmitter is guaranteed by the ICT Transmitter version 6.

**NOTE**

Never make any connection between controllers while ON.

Never do testing without connecting the aerial to the transmitter.

**Setup**

**Special screens**

The controller has some special advanced configuration screens for adjusting the controller to the installation on exceptional occasions.

One of these screens allows the installer to check that the connections are correctly made and, at the same time, to test the devices connected to the Filtmaster filter cleaning controller.

**Testing the outputs**

By pressing , the controller version is shown in the screen status.

 back to the controller main screen.

With this combination, we have quickly activated program number 20 with a 5 second operation time for all 16 outputs.

Now, the only thing to be done is to activate manually program number 20 so the outputs operate sequentially.



**VERY IMPORTANT**

Before doing this operation, the person who is going to carry out the activation must be aware that this operation will activate outputs connected to pumps or fertilizer pumps that can damage seriously the network.

That is why we recommend that these test operations always are done after opening a valve and, if possible, disconnecting the three-phase startup of the motors startup.

Precautionary, we recommend deleting this program before definitively programming the filter cleaning controller.

**Testing the inputs**

In the status screen, pressing  we will access the reports provided by the Filtmaster filter cleaning controller.

The following will appear immediately:



They are voltage-free inputs and they can only be detected when the specific input is connected to the input common through the controller.

**Technical characteristics**

Dimensions	250 x 190 x 120 mm
Pin 6 connector modem	PIN 2 CONTROLLER
Weight	2 Kg
Material	ABS
Dust/water protection	IP-56

# Operation and maintenance manual

Voltage (10%)	220 Vac 12 Vdc 9 Vdc
Power consumption 220 Vac / 12 Vdc/ 9 Vdc	75mA / 15mA / 400µA.
Power consumption per output	20 mA.
Power consumption per input	8 mA.
Internal battery	NI-CAD 3.6V 110mA/H
Duration of battery off	1 year
Working temperature	0°C to 60°C
Working humidity	0 to 95% non condensing
Power fuse	2 Amp
Outputs	RELAY
Output fuse	1,6 Amp
Output isolation	8 Amp 4mm
Inputs	Optocouplers
Input isolation	Optical
Overvoltage protection	Varistors

## Troubleshooting

Next, we offer users the best steps to follow when facing an anomaly in the performance of our controller:

Problem	Action to be taken
The screen is off	- Check connection to power - Check power is on - Check fuses
A valve does not work	- Check that valve is active - Measure the output voltage
No valve works	- Check output fuse - Check possible short circuit in cables
Loses data	- Check the battery - Change battery

If the problem is not solved, please contact your local dealer or our aftersales department.

# 10 Users manual

The Filtmaster filter cleaning controller is an easily programmable powerful device designed to process automatically all the functions of a modern filtration station.

This version is able to control the automatic cleaning of 8 to 16 filters, depending on the model.

The high number of parameters that can be controlled by the Filtmaster filter cleaning makes it adaptable to any filtration system: from the most complex to the simplest.

The programming by the user (data input) through the display allows an easy communication that makes the use of this controller really simple and easy to understand by users.

## Components

### Digital display

The display allows us to program the cleaning process, to set up the system adapting it to the needs of the installation and to check all its operating parameters.

On the "STATUS SCREEN", the controller shows in real time what is happening in the filtration station.



This information will be very important to set up the controller, trying to achieve a balance between the correct cleaning of the filters, water saving and the power consumption saving (extremely important in battery operated facilities).

The display has 2 lines with 20 characters each one.

### Top line

Information regarding the model, status of the inputs and current time.

Filters	CONTROLLER MODEL (program version)
P	PRESSURE GAUGE ACTIVATED Displayed when there is a need for cleaning through this device.
C	WATER METER DETECTED Displayed when it detects a meter pulse (if this device exists).
F	CLEANING PERMISSION ACTIVATED Displayed when it detects water in the network (through minimum pressure switch, flow sensor, auxiliary water pump or another controller). If water is detected, then cleaning is allowed.

## Bottom line

Information on the current status of the cleaning and remaining volume and time.

### Out of schedule

...The Filtmaster filter cleaning controller is out of the time interval when it is authorised to clean filters (displayed only if a cleaning interval time has been entered).

### No permission

...The Filtmaster filter cleaning controller may be out of the time interval (if it is programmed) but the cleaning permission input may not be activated (if it is programmed). Therefore, no operation is done. This message is displayed if the user answered YES to the question of enabling inputs. In this case, any automatic cleaning is conditioned to the activation of this input.

### 05-minute lag

...The Filtmaster filter cleaning controller already has permission to clean filters, but it is in a lag mode (programmed by the user or 5 minutes pre-program), so pressure in the facility is stabilised to prevent mistaken cleaning. This process takes place every time it is programmed at the beginning of the cleaning permission and after each cleaning carried out.

Remaining v:0847 t:01:30

...The Filtmaster filter cleaning controller is already in the process between cleanings once the lag is over (if this was programmed) and it is now counting down time and volume to reach the next cleaning. The Filtmaster filter cleaning controller has a cleaning interval that can be programmed by time, volume or both, depending on the devices of the facility or on the user's preference.

On top of that, the cleaning on demand of the differential pressure switch (if this is connected) is always active. If the differential pressure switch gives the signal, the cleaning will start and then the interval countdown (time/volume) will go back to their initial programmed position.

The REMAINING data are saved when finishing the PERMISSION period or entering the OUT OF SCHEDULE period, these are kept so that, when back to the CLEANING status, not a single second of the interval set by the user for the correct cleaning of the filtering station is lost.

F:01 00:28 cleaning

...Once the cleaning interval set by the user is up, or when the pressure gauge gives the signal, the Filtmaster filter cleaning controller starts cleaning the first programmed filter. It displays on the countdown counter what still remains before passing on to the following step.

F:02 06 pause

PAUSE (if this is programmed) before proceeding to clean the second filter. This process will be repeated with every filter that is programmed by the user until the last one is cleaned.

F:08 00:01 cleaning

Once the cleaning is completed, the controller will go back to the LAG status.

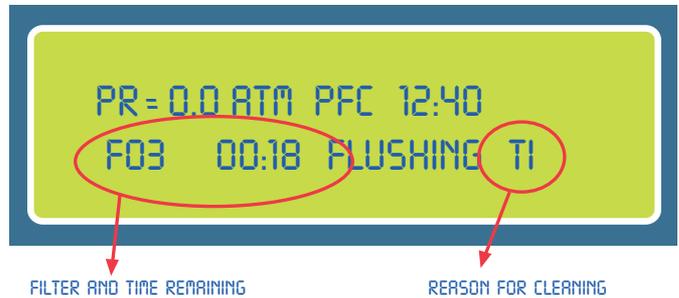
### 05-minute lag

Once this is finished, the INTERVAL period will be displayed again.

Remaining v:0847 t:01:30

Until it goes to NO PERMISSION or OUT OF SCHEDULE

No request  
OUT OF SCHEDULE



In this example, filter 3 is being cleaned, with 18 seconds remaining before cleaning the next filter. It is also indicating that this cleaning process has been started by time counter (TI).

## Reasons for cleaning

TI	Cleaning activated because time countdown reached 0.
VO	Cleaning activated because volume countdown reached 0.
MD	Cleaning activated by the differential pressure switch.
MA	Cleaning manually activated through keypad of controller.

### NOTE

Every time a cleaning is carried out for whatever reason, both time and volume countdown counters start again with the information programmed by the user.

## Keypad



At any time we can see in the screen what the controller is doing and what devices are connected.

# Operation and maintenance manual

The Filtmaster filter cleaning controller keypad has been designed for an easy and intuitive use.

The keys have assigned functions for an easy and clear use. This, together with the information given on the screen, makes the Filtmaster filter cleaning controller very easy to program.

Programming is initiated using the correct key for each purpose. Later on, the digits can be modified with the cursor keys.

The validation of the information entered with  is necessary to save it in the memory.

 and  access to activation/deactivation menu of manual cleaning.

 access to the MAIN PROGRAMING MENU.

 changes answers (YES/NO).

 moves lines within the MAIN PROGRAMING MENU.

 goes back to previous screen in case of mistake. Also resets initial values if pressed while in the STATUS SCREEN.

## First contact with the Filtmaster filter cleaning controller

Once the Filtmaster filter cleaning controller is connected, the first message displayed on the screen is the one set by the default program.

By default the controller has a program in its memory and shows default values and current time.

At this stage, we can activate a manual cleaning to check setup program and also to check if connected devices work properly.

We press 



NO is shown as default answer.

By pressing  we change answer to YES

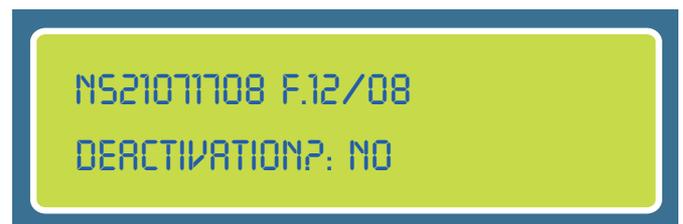
And finally we validate this by pressing 

It will immediately begin a cleaning with the programmed default values. That is cleaning all outputs for 5 seconds with a 4 seconds pause between them.

Once changed the program, every time we do a manual cleaning, it will be done according to what is programmed.

To stop the cleaning, whether started manually or automatically:

We press 



By pressing  we change answer to YES.

And again we press  to confirm the stop.

This deactivation affects the cleaning in process. The program continues the countdown for a new cleaning process.

The Filtmaster filter cleaning controller has prefixed values for cleaning times and pauses between cleaning processes.

The first thing to be done is to enter the parameters that we wish the controller to fulfill, that is the needs of the filtration station.

To do this, we first should be informed about the filter characteristics and the necessary pressure and time for a successful cleaning process.

We press 

A cursor indicates which option will be selected by pressing , then we will be able to select the option by pressing 

Language + 

In order to change the language, we press  to enter the MAIN PROGRAMING MENU.

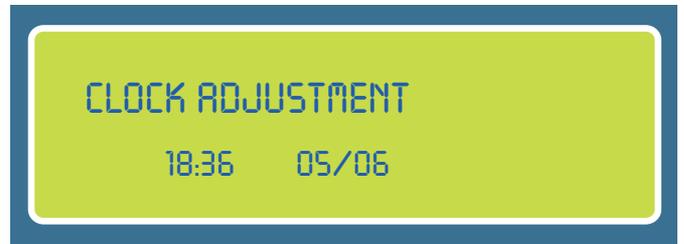


By pressing , we go down to LANGUAGE and then we press .

Using the arrows, we select the programing language and then we press  for saving the selection.

Next, we set up time and date.

Clock + 



Allows us to set up time and date of the Filtmaster filter cleaning controller.

We insert the current time by pressing the numerical keypad    . We validate by pressing .

Programing + 



In this programing option we will answer consecutive questions in order to set up the configuration of the automatic filter cleaning.

Now all questions will be displayed as follows.



# Operation and maintenance manual

Asks if we want one of the outputs of the controller to be permanently connected while the cleaning process of filters is done or while it is paused.

This output is generally used to close a hydraulic valve downstream the filtration station so that incoming pressure is used for cleaning the filters. It can also be used to connect to an auxiliary pressure pump in external backwash source installations.

By pressing  we change answer to YES.

 We validate ...

 ignores the function and goes on to the next question.

Next, we set up the pause between sequential cleaning of filters so the pressure in the automatic filtration station stabilizes.



Next, we set up the maximum number of consecutive cleaning.



Then, we state if any permission input is needed to activate the controller.



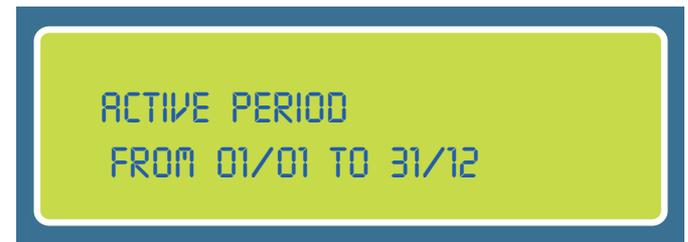
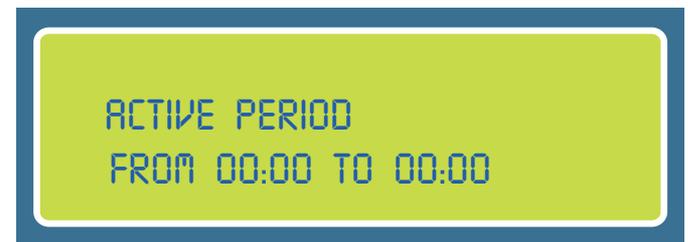
If we IGNORE, the controller is ready to clean filters depending on the next question.

The Filtmaster filter cleaning controller can get into PAUSE mode if there is no need for cleaning the filters because of the lack of water in the filtration station.

The Filtmaster filter cleaning controller has a digital input able to detect the presence of water through any device as: minimum pressure switch, flow sensor, etc.

When the controller gets into PAUSE mode, all the REMAINING data are kept for the next active period.

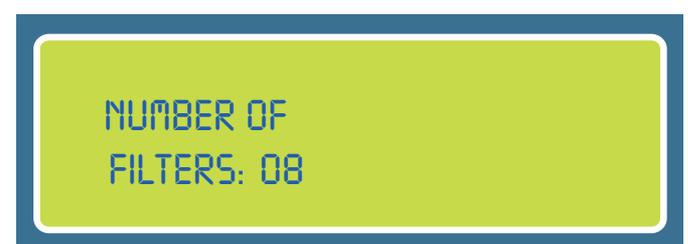
By pressing  we validate or by pressing  we ignore and move to the next question.



With this function we achieve the same effect as with the last question. The two can be programmed simultaneously with the same features.

Note: it will only be considered to be programmed when there is a difference between the initial and final times.

We indicate the value with the numeric keypad, we validate by pressing  or ignore  and we move on to the next question.



We set up the number of automatic cleaning filters in the filtration station.

We set up the correct number, we validate  or ignore  and we move on to the next question.



We set time (in minutes) that the cleaning process is in standby after beginning of the active period (either by time interval or by permission input) and after every cleaning process.

In case that there is a differential pressure gauge, this function is to prevent unnecessary filter cleanings caused by pressure destabilisation during the initial phase of filtration or during the cleaning process.

We set up the correct value, we validate by pressing  or ignore  and we move on to the next question.



We set up how often a cleaning must be carried out. There are 4 programming options:

Volume	Water volume in m3 that must pass through the filtration station to do the cleaning.
Time	Hours and minutes that must elapsed before cleaning.
Volume + Time	The first value that reaches 0 activates the cleaning.
Data to 0	Will only clean manually or after pressure gauge demand.

Regarding Volume, each digit corresponds to a pulse from water meter pulse emitter so end user has to calculate the number of pulses to reach the desired m3 depending on the water meter type (10-100-1000 liters/pulse).

Next, we set up the differential pressure that we want the cleaning to be activated in the automatic filtration station.



**NOTE**  
In any case, if there is a differential pressure gauge, that input immediately affects the controller, activating a cleaning process and therefore changing the volume and time counters to the initial programmed value.

The interruption caused by OUT OF SCHEDULE or by NO CLEANING PERMISSION, implies the freezing of the REMAINING values until the next time that it is within the cleaning parameters.

We set up the correct value, we  validate or ignore  and we move on to the next question.

By default the Filtmaster filter cleaning controller sets identical CLEANING and PAUSE times for all filters.



If we press  the controller will ask for a single CLEANING and PAUSE time, while if we press , the controller will ask for the value for each filter and pause.

This function is for the correct distribution of the filtration times in filtration stations composed by different types of filters, and must respect the recommended cleaning times for every filter model.

# Operation and maintenance manual



In the selected option we set up the correct value and we  validate...



In the selected option we set up the correct value and we  validate...

Once the last question is answered, the Filtmaster filter cleaning controller is ready to work according to the set-up program.

## Deleting

At any moment the initial values can be re-established by pressing  in the STATUS SCREEN.



By pressing  we change answer to YES. We press  to validate and  to exit this option.

## Special situations

If there is an electric voltage drop, the Filtmaster filter cleaning controller keeps all the data in its memory until the electrical voltage recovers. Then, the controller continues working from the last status (after waiting programmed DELAY AFTER FLUSHING time).

If a cleaning is being done in the TIME / VOLUME mode and the filtration system stops, when it restarts, a DELAY AFTER FLUSHING time passes and then it continues with the same cleaning process.

# 11

## Limit of responsibility

### Warranty

JIMTEN, S.A., warrants this controller against any defect in materials for a period of two (2) years from the date of purchase.

We will replace, free of charge, the defective part or parts found to be defective under normal use.

We reserve the right to inspect the defective part prior to replacement.

JIMTEN, S.A., grants this warranty if the filtering installation and due maintenance are done according to our technical recommendations.

### Limit of responsibility

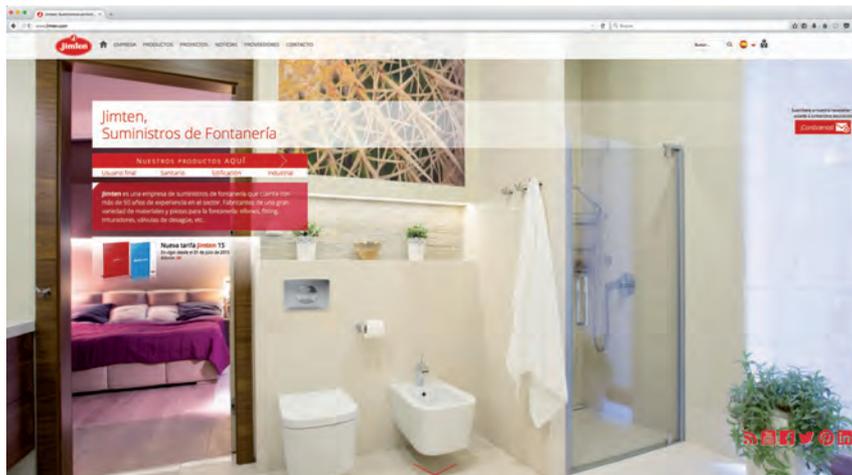
JIMTEN, S.A., does not cover as warranty (unless agreed otherwise) the following:

- Civil works.
- Hydraulic or electrical connections.
- Additional technical visits to be done for reasons not attributable to JIMTEN SA (no water, no power, absence of the customer, etc).
- Anything not specified in the Warranty Section.

**NOTICE:** Data provided in this Operation and Installation manual, as a result of permanent improvement and evolution of our products, may change without prior notice. This manual does not have a contractual value and all information is given in good faith. We do not assume any liability for the use of this manual.

You will find the most updated version of this manual in our website

[jimten.com](http://jimten.com)





**FILT-MASTER**

Filtration Systems

Operation and maintenance manual



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