FILTERTHERM®

AQUEOUS CLEANING MACHINE

MODEL: FTM 1100

OWNER'S MANUAL

Installation, Operation & Maintenance Information

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V2.2d – 01/2024

Product Record

Record the information from your Filtertherm® Aqueous Cleaning Machine's serial number label here for easy product reference.

Part Number: _____

Serial Number: _____

Save these instructions and your sales receipt for future reference. Use the information above to complete your Warranty Registration. You can register your Filtertherm® via online, email or fax. For email or fax, complete the registration instructions listed in the back of this manual. Register your Filtertherm® Aqueous Cleaning Machine within 45 days of purchase online to activate your warranty.

Warranty Registration

[web] www.filtertherm.com/warranty
[email] warranty@filtertherm.com
[fax] 530-241-0870

Tech Support

[web] www.filtertherm.com
[USA/Canada] 888-792-2922
[International] 00-1-530-241-3950

Manufactured by

Diesel Emissions Service
Redding, CA 96001

Introduction of the Model FTM1100

The Filtertherm Aqueous DPF Cleaning Machine offers a single stage approach for the routine cleaning of Diesel Particulate Filters. The Model FTM1100 removes accumulated ash and particulate matter using a high-velocity, low pressure liquid stream in conjunction with a proprietary surfactant. The Machine provides vehicle maintenance facilities an enclosed, semi-automated unit that quickly and efficiently cleans filters in approximately 15 minutes.

Liquid based DPF cleaning is the most effective way to clean a DPF. While pneumatic cleaning can address the soot cake on the cell walls, it is very difficult for pneumatic systems to thoroughly clean the micro pores within the cell walls. The hydraulic action of liquid cleaning can push the soot from within the cell walls. Systems that try to clean all the cells at once require a head pressure that is much higher than the filter substrate can handle and can cause irreversible damage.

Package Contents

The Aqueous DFP Cleaning unit includes the following package contents:

Item	Description
1	Model FTM1100 Liquid cleaning machine
2	Documentation package that includes links to this owner's manual and a warranty registration worksheet.
3	One gallon of Pre mixed Surfactant, 5lbs of absorbent filter material for the rear filter housing and 10 bag filters for the front filter housing.
4	Four (4) Light / Medium duty adaptors.
5	One (1) DOC plate.

Cleaning Machine Location

Consider the following when choosing a location for the Model FTM1100:

- Install Indoors only and on a hard, flat surface
- Unit Weight: 900 lbs.
- Unit rests on foot levelers
- Ensure adequate clearance around the machine

Pre-Installation

Inspection

Thoroughly inspect the Machine for damage that may have occurred during shipping. Any damage should be noted and reported to Filtertherm immediately.

Pre-installation Requirements

- Space requirement (including clearance) for proper operation: minimum 103” wide x 40” deep x 80” high
- The upper and lower cabinet doors must be able to open completely
- Power Supply: 208VAC 3 phase electrical outlet/40 amp.
- Contact your local disposal company for proper ash disposal regulations and procedure.

Installation

1. Position the Machine on a solid, level surface with recommended clearances.
    a. Allow 12” clearance on the left, back and right sides.
2. Remove shipping feet and install adjustable machine feet. Adjust the leg levelers until the cabinet is level.
3. Check tightness of all external connections.
4. Fill the Clean Water tank with water.
5. Connect the electrical supply. The FTM1100 requires 208, 3 phase, 40 amp power. Work with a qualified electrician to follow local codes.
6. Test that the pump rotation is CLOCKWISE. Open the lower cabinet doors and press the White pump momentary switch on the underside of the electrical cabinet while watching the motor rotate. If it is rotating counterclockwise have the electrician change the polarity of the incoming power. Repeat the steps above to check the Gray pump rotation.

Activate the Warranty

FTM1100 requires the installer or dealer to complete and submit the warranty for the equipment owner on our website: http://www.Filtertherm.com

Intended Use

The Aqueous machine efficiently removes and collects ash and particulate matter from filter-based components. (i.e., DPF, DOC) The unit's unique design accommodates and cleans both open and closed end filters. Coned flanges may be accommodated with the included adapters.

Safety Features

The FTM1100's key safety features include:

- Low level sensors to eliminate pump cavitation failures
- High level sensors to eliminate overflow situations
- Position sensors to keep the sprayer head within the correct areas.
- Door seals to keep water from exiting the machine cabinet

Initial Start-Up

1. Ensure the clean water tank has been filled with water.
2. Turn the front panel POWER switch to ON. The screen will turn on.
3. Wait for the spray nozzle to complete its homing operation and return to the center.
4. Make sure the sprayer head is moved to its lowest setting.
5. Close/latch door.
6. Press the WASH FILTER button.
7. Press the START button.

Basics of the Diesel Particulate Filter (DPF)

The most common diesel particulate filters in widespread use are cellular ceramic honeycomb filters. The ends of the filter, plugged in a checkerboard pattern, force the soot-containing exhaust to flow through the porous filter walls. The soot particles are trapped along the inlet channel, which is open at the front end but plugged at the back end. DPFs contain several hundred channels or cells per square inch (cpsi), with the most common being 200 cpsi.

Since half of the channels are plugged at the front of the DPF and the other half are plugged at the back of the filter, only half of the filter channels accumulate soot or ash. That is, only the channels open on the inlet side are exposed to the "dirty" exhaust flow, while the channels open to the outlet side remain clean. Given the small pore size and design of the honeycomb filters, DPFs can achieve a particle trapping efficiency of 99% or greater. Due to the high trapping efficiency and DPF cell design, no visible soot or ash should pass through the filter walls. Black streaks or visible soot in the outlet channels are a sure sign of filter failure.

Soot particles are captured and retained in the DPF through a combination of depth filtration inside the filter pores and surface filtration along the channel walls. The soot fills the depth of the cells and it then forced through the filter walls and trapped within the walls. As the soot load in the filter increases, so too does the filter's trapping efficiency, as the accumulated soot provides an additional layer to trap incoming particles. The specific soot filtration mechanisms, whether in the pores or on the surface of the walls, plays an important role in determining the overall increase in exhaust back pressure (or pressure drop across the filter).

The Display Screen

Toolbar

The tool bar will display at the bottom of the screen with buttons that are appropriate for the screen.

Common Buttons

BACK: Goes to the previous screen.
HELP: Provides information for the screen being displayed.
NEXT: To the next screen.

Home Screen

This is the main screen from which you can access all of the features of the Aqueous Machine.

Training will walk you through how to use the Aqueous Cleaning Machine and important safety information.

Settings will take you to the system test pages and machine setup.

Help and support will take you to the support page with links and a phone support number.

Screensaver

When the user interface is not in use for half an hour a screen saver will appear. Touch the screen to return to the previous screen.

The Process of Testing and Cleaning a Filter

Pre-Cleaning Testing

Testing the filter prior to cleaning is a crucial part of the cleaning process. These tests can determine if the filter is fit for cleaning or has some issue that excludes it from the cleaning process.

Filtertherm recommends flow testing and light testing each filter prior to cleaning.

Inspection

Clean any gasket debris from the mating surfaces of the filter ends.

Inspect both faces of the substrate for damage or oil residue that may exclude the filter from the cleaning process.

WARNING: Do not wash Oil soaked filters.

WARNING: Do not wash retrofit filters.

Flow Testing

Air flow testing quantifies the resistance of the filter to air passing through it. The dirtier the filter the less ability the filter has to pass the required amount of air through the cell walls. This causes high back pressure which is a common reason the filter was removed for cleaning. Air flow testing of the filter right off the vehicle is a great reference point for how effective the cleaning process is. Minimum back pressure standards can tell you if the filter is clean enough to return to service. Pressures below the minimum can show that the filter has a crack that couldn't be detected by other testing methods.

Light testing

Light testing is a simple and effective way for an operator to detect cracks within the substrate that were not detected by other means of testing. Light testing should be done during the pre-cleaning test and the post-cleaning test. Sometimes soot can plug a crack enough that it is not detectable during the pre-cleaning test.

Pin Testing

Pin testing is another tool to use for checking on the blockage in the filter. With our Filtertherm Inspection Table you will receive pins to use. Filtertherm does suggest that an operator be very careful putting any foreign object into the cells of a filter. The filters are very fragile internally and inserting pins can scrape the walls of the substrate causing small gouging of the cell. These gouges can create small cracks as the integrity of the filter wall has been compromised.

Start the Filter Cleaning Process

Effective cleaning results are achieved by carefully determining the initial condition of the filter and tailoring the cleaning process to match. Thorough filter inspection during the initial pre-cleaning process is essential. Without an inspection, it is difficult to quantify the results achieved during the cleaning process. Record the pre-cleaning numbers on the cleaning log.

After the pre-cleaning inspection has been finished and the results show that a filter can be cleaned, the operator marks the filter to keep track of each customer's filter module. Paint stick, grease marker or engraving are the best options.

Washing Process

A Video version of these instructions can be found by scanning here: *If viewing as a pdf* click here

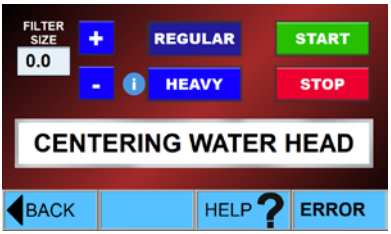
Auto Wash

1. Turn the POWER Switch to ON
2. Open the upper cabinet doors
3. Place a filter with the smooth side down on to the rubber mat. (Smooth side is reference to the stainless housing to keep a seal with the rubber)
4. Pour 4oz of Surfactant into the filter. The Surfactant is located behind the bottom right door. (1 pump = 1oz) Then, using the supplied water hose fill the filter with water until the substrate is submerged.
5. Allow the filter to soak for a minimum of 15 minutes.
6. Move the filter from the Soak mat to the wash grate. Let the water drain completely.
7. Position the filter dirty side down and using the laser crosshairs to center the filter in the machine.
8. Loosen the knobs and lower the nozzle to within 1/2 inch of the filter face. Tighten the knobs to secure the nozzle location.
9. Measure across the top to get the diameter of the filter cells.
10. Close and latch the upper doors.
11. Press the WASH FILTER button on the home screen.

Auto Wash Cont.

12. Then press the AUTO WASH button on the next screen

13. Using the + and - buttons, adjust the size shown under filter size to match the dimension of the filter core to within 0.5 inches.



14. Choose between regular or heavy wash cycles. If the filter is extremely clogged select the heavy cycle.
15. Press the START button to begin the cleaning cycle. The machine will inform the user that the cycle is complete with a light and an audible alarm.
16. When the cycle is complete, open the upper doors, loosen the knobs and move the nozzle out of the way. Lean the filter onto its side and rinse the unit with clean water through the filter to determine cleanliness. Spin the filter around and rinse the other side.
17. The filter can now be placed in the dryer.

Drying Cabinet

Put the filter into the Filtertherm Drying Cabinet for a cycle and operate per the manual for the cabinet. This is a simple procedure that usually dries a filter within 20 minutes.

Final Test

Place the unit on the Inspection Table and record the post cleaning flow. Inspect the filter with the light table to check if cracks were made visible during the cleaning cycle. Record the Post-cleaning numbers on the cleaning log.

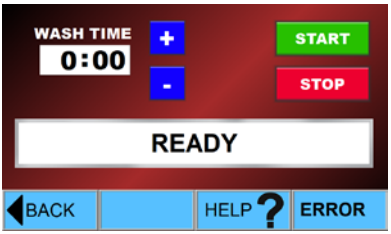
Optional

If you want to check the filter during a cycle you can go to Settings > Machine Setup and toggle the wash cycle selection to cycle with pause. Then, the next time you load a filter into the machine it will run a short test pass so you can ensure nothing on the filter is going to collide. It will beep to alert you when it is done with this preliminary wash pass. When you are satisfied with the setup, hit start to resume and do the full wash cycle.

Auxiliary Wash

For filters with pipe or flanged ends

1. Turn the POWER Switch to ON.
2. Open the upper cabinet doors.
3. Place the filter onto the soak mat. If it is irregularly sized or shaped lay it on its side.
4. Pour 4oz of Surfactant onto the dirty side of the filter. The Surfactant is located behind the bottom right door. (1 pump = 1oz) Then, using the supplied water hose completely wet the filter with water.
5. Allow the filter to soak for a minimum of 15 minutes. If you cannot get it to hold water periodically spray it down so it remains wet.
6. Move the filter from the Soak mat to the wash grate.
7. Insert appropriately sized adapter into the outlet pipe of the filter and tighten the cam-lock fitting until the adapter is firmly held in place.
8. Open the cam-lock connector at the top of the nozzle.
9. Connect the hose to the adapter making sure the cam-lock is closed and secure.
10. Loosen the knobs and raise the nozzle out of the way. Tighten knobs to secure the nozzle location.
11. Close and latch the upper doors.
12. Press the WASH FILTER button on the screen home, and then the AUXILIARY WASH button from the next screen.



13. Using the + and - buttons, adjust the time shown under wash time. We recommend 10 minutes for most DPFs.
14. Press the START button to begin the cleaning cycle.
15. For best results, rotate the DPF every few minutes to ensure all parts of the filter get washed.
16. The machine will inform the user that the cycle is complete with a light and an audible alarm.
17. If the water draining from the filter is still visible dirty, close the upper doors and press the START button to run another cycle.
18. Open the cam-lock and unscrew the adapter until it can be removed from the filter.
19. The filter can now be moved to the dryer.
20. Loosen the knobs and lower the nozzle until you can reach the top. Tighten to knobs to secure the nozzle location.
21. Secure the hose cam-lock to the top of the nozzle and your Aqueous machine is now ready for another filter.

Drying Cabinet

Install the FTM2250 Dry out Light Duty adapter into the Filtertherm drying cabinet and then operate per the manual. This will allow you to quickly dry a wide array irregularly shaped light duty DPFs.

Final Test

If possible place the unit on the Inspection Table and record the post cleaning flow. Inspect the filter with the light table to check if cracks were made visible during the cleaning cycle. Record the Post-cleaning numbers on the cleaning log.

Routine Maintenance

Check the Water

Depending on the number of filters the machine cleans during an average month, the clean water tank may need to be refilled. There are water level indicators on both the clean and dirty water tanks.

Changing the water

1. Connect a garden hose to the bottom of the Clean Water tank and route the hose to a drain location.
2. Open the valve and let the tank drain.
3. When finished, close the valve and refill the tank with clean water.

Filter Replacement

There are 2 filter vessels on the FTM1100. In the front is the filter bag, and the in rear is absorbent material.

The machine will indicate when the bag filter (in the Front housing) needs replacement. If you have changed the bag filter and still getting an error try changing the absorbent material as well.

In the rear housing the absorbent filter material should be replaced when it is completely black or after anywhere from one to fifty filter cleanings depending on how dirty the filters are.

Consumables

Consumables for the aqueous machine can be ordered here:

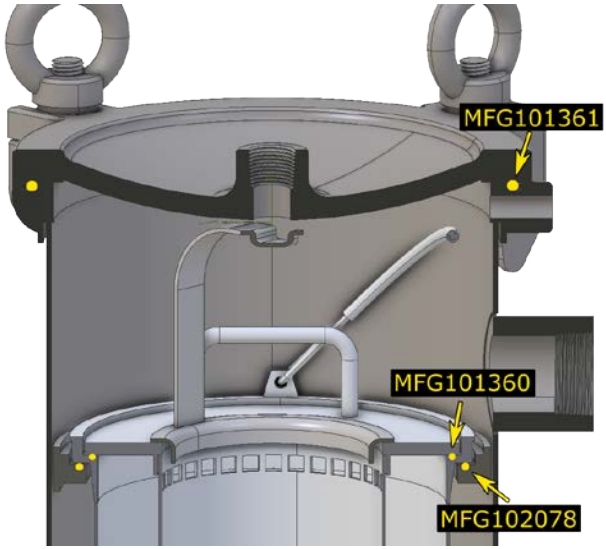
DPF Cleaning Machines & Systems - Filtertherm for Fleets

Filter Replacement cont.

CAUTION: Be careful not to damage or misplace O-rings when removing or installing the filters.

Front Housing

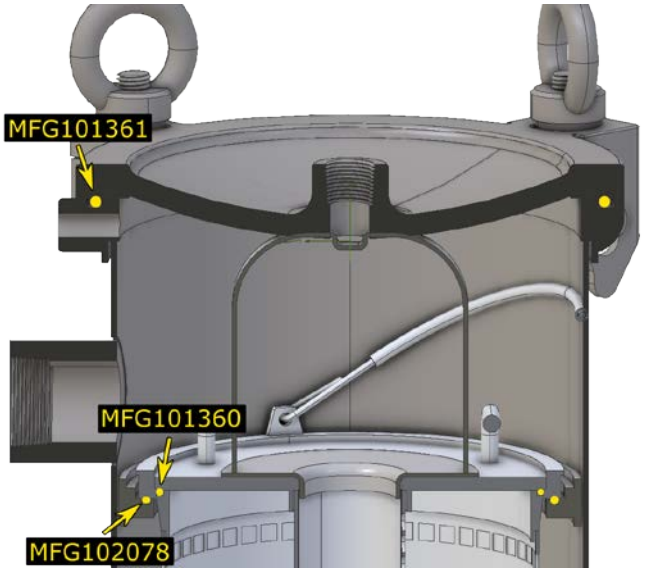
1. Loosen the 4 turnbuckles holding the top of the filter canister in place and swing open the lid to expose the filter basket.
2. Remove the inner filter basket and separate the filter from the basket. Rinse the inner basket mesh screen.
3. Properly dispose of the filters in accordance with your local laws and regulations.
4. Install a new bag onto the filter basket and place it into the filter housing. Check that O-rings are properly seated.
5. Close the lid and tighten the 4 nuts securely. If leakage occurs, tighten the nuts further until leakage stops.



Filter Bag O-Ring locations

Rear Housing

1. Loosen the 4 turnbuckles holding the top of the filter canister in place and swing open the lid to expose the filter basket.
2. Remove the outer and the inner filter baskets. Remove and rinse the inner basket to remove debris from the screen.
3. Dump out the material. This should be disposed of according to your local regulations.
4. Install new material and place it in the filter housing. Check that O-rings are properly seated.
5. Close the lid and tighten the 4 nuts securely. If leakage occurs, tighten the nuts further until leakage stops.



Absorbent Material O-Ring locations

Troubleshooting

Most of the problems you may encounter with the Aqueous Machine will have instructions automatically appear on the screen with instructions to solve them.

Drain Tank Full

The drain tank is not emptying because water cannot be pumped through the cleaning filters. Please change the filter bags, wash down the filter screens and change the absorbent filter material, if necessary.

Supply Tank Full

There is too much water in the supply tank. The cleaning cycle cannot run because of the risk of the water tank overflowing. Please drain the supply tank until the water level is about 2/3 full.

Water level is low

The wash cycle is running slowly because there is not enough water in the supply tank. Please fill the supply tank with RO filtered water until the tank level is 2/3 full.

Too much water in system

Both the supply and the drain tanks are full. Please drain the supply tank until the water level is about 2/3 full.

Water from nozzle is dirty or smells bad.

The filter O-rings may be damaged or misaligned allowing contaminants into the clean water tank, or machine has not been operated in a while allowing microbe growth in the water. Please check filter O-rings and then drain the clean tank and refill to 2/3 full.

Other

For further troubleshooting call: 888-792-2922 or Email: TechSupport@Filtertherm.com

Warranty Information

Diesel Emissions Service (“Seller”) warrants to the original purchaser of the Filtertherm® Aqueous Cleaning System (“product”), subject to all of the terms and conditions hereof, that the Product and all components thereof will be free from defects in materials and workmanship for the following period(s) of time, measured from the date of purchase:

Diesel Emissions Service warrants the Filtertherm® Aqueous Cleaning System for a period of ONE (1) YEAR.

Seller’s obligation under this warranty is specifically limited to repairing or replacing, at its option, the product or any part thereof which is determined by Seller to be defective during the applicable warranty period. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty is made to the original purchaser of the Product only, and is not transferable or assignable. This warranty applies only to components of the Filtertherm® system. This warranty does not apply to any unauthorized or improper installation, alteration or repair of the Product, or to any Product or component which has been damaged or deteriorated due to misuse, neglect, accident, failure to provide necessary maintenance, normal wear and tear, or acts of God or any other cause beyond the reasonable control of Seller, missing or damaged parts due to clearance, repairs, and maintenance to components.

ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN TIME TO THE APPLICABLE WARRANTY PERIOD REFLECTED

ABOVE. NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THE LIMITED WARRANTY PERIOD HAS EXPIRED.

Some states do not allow limitations on how long an implied warranty lasts. IN NO EVENT SHALL DIESEL EMISSIONS SERVICE OR ITS AFFILIATES BE RESPONSIBLE FOR, OR LIABLE TO ANYONE FOR, SPECIAL, INDIRECT, COLLATERAL, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL DAMAGES, even if Seller has been advised of the possibility of such damages. Such excluded damages include, but are not limited to, loss of use, cost of any substitute product, or other similar indirect financial loss. Some states do not allow the exclusion or limitation of incidental or consequential damages. Claims under this warranty must be made promptly after discovery and within the applicable warranty period.

To obtain warranty service, you must contact DIESEL EMISSIONS SERVICE customer service and provide proof of the date and location of purchase and identification as the original purchaser. Call (DES) Customer Service toll free at 1-888-792-2922 to speak with a trained representative.

Purchaser must allow the seller a reasonable opportunity to inspect Product claimed to be defective prior to removal or alteration of its condition. Upon determination by Seller that the Product or any part thereof is defective during the applicable warranty period (which may require purchaser to return the Product to Seller at purchaser's expense), Seller will supply the purchaser with replacement parts or, at its option, a replacement Product. Seller may use new or reconditioned parts, or a new or reconditioned Product of the same or similar design.

Purchaser's warranty responsibility

- Warranty form submitted within 45 days of purchase - submit online, fax or email
- Detailed description of failure
- Pictures of failure
- Contact Diesel Emissions Service within 24 hours of failure

Warranty Form

Complete registration and return via email, fax, mail or online (at www.filtertherm.com/warranty) within 45 days of purchase to register your Machine and activate the warranty.

Name	Email Address
Company Name	Phone Number
Address	Model Name
Address 2	Serial Number
City	Date of Purchase
State	Dealer Purchased From
Zip	Date of Installation