

# **FILTERTHERM®**

## **DPF THERMAL OVEN**

**MODEL: FTM24403A**

**PART OF THE  
THERMAL  
SYSTEM**

**FILTERTHERM®**

**CAUTION  
HOT  
SURFACE**



**MADE IN  
THE USA**

# **OWNER'S MANUAL**

**Installation, Operation & Maintenance Information**

# Table of Contents

Product Record .....	2
Introduction.....	3
DPF Basics .....	4
Installation .....	5
Display .....	7
Users .....	9
Pre Cleaning Testing .....	11
Running a Cycle .....	13
Error Codes .....	17
Troubleshooting .....	19
Accessing Fuses .....	22
Warranty .....	23

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V1f – 4/2024

## Product Record

Record the information from your Filtertherm® DPF Oven'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® DPF Oven within 45 days of purchase online to activate your warranty.

### Warranty Registration

[web] [www.filtertherm.com/warranty](http://www.filtertherm.com/warranty)

[email] [warranty@filtertherm.com](mailto:warranty@filtertherm.com)

[fax] 530-241-0870

### Tech Support

[web] [www.filtertherm.com](http://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 FTM24403A

The Filtertherm® oven is used for the heating cycle of a DPF cleaning system. It uses a touchscreen interface to maintain the internal temperature at DPF manufacturer requirements. The Filtertherm® correctly heats and cools the DPFs while also protecting the user from damaging the filter.

The user selects the appropriate DPF type from the on-screen list and the system chooses the correct heating cycle. Multiple filter types can be selected during one cycle and the Filtertherm® will choose the heating cycle which will accommodate all loaded filters without voiding any of the manufacturer's warranties.

The Filtertherm® uses heating elements to bring the oven up to the temperatures required to reduce the soot trapped in DPFs into ash. These temperatures can reach 1300 °F (700 °C). The brick and fiber insulation, along with an air gap keep the outer skin at a safe temperature for the user.

A circulation fan draws a small amount of air into the Filtertherm®. The fresh air helps the process by ensuring even heating of the filters. Once the heating cycle is complete the fans stay on, and help to safely cool the DPFs.

The system uses an electronic latch to lock the oven at high temperatures. This safety feature keeps the typical user from opening the oven when the temperatures are over 200 °F (93 °C). For emergencies or loss of power situations, there is a mechanical override. To access the mechanical override a trained supervisor or lead worker must turn the lock under the controls box with a key. **This should only be used under extreme caution as the oven will be hot.**

The interior stainless steel grate keeps the DPFs off of the floor of the oven. This allows for better air circulation and protects the soft bricks from damage.

## 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.

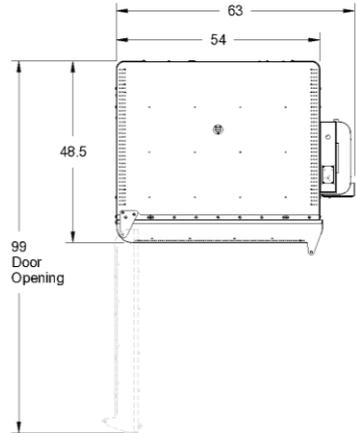
Since half of the channels are plugged at the front of the DPF and the other half are plugged at the back of the filter, only half of the filter channels accumulate soot or ash. That is, only the channels open on the inlet side are exposed to the “dirty” exhaust flow, while the channels open to the outlet 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).

## Oven Location

### Space Requirements:

- There should be at least 12" of clearance around the sides of the oven and 52" in front for the door to swing.
- There should be a minimum of 36" of overhead clearance unless a vent is installed.
- All flammable items and materials should be removed from the area of the oven.
- A Class C fire extinguisher should be located nearby.
- The area should be well ventilated.
- The Filtertherm® should be placed in a dry environment.



### Electrical Requirements:

- The Filtertherm® requires 208/240VAC, 3phase, 50/60hz and draws 11000 Watts.
- For a 208 volt supply a 40 Amp breaker is required, and for 240 volts a 45 Amp breaker is required.
- A 4 pin, 250V 60A outlet is provided with the Filtertherm®. It should be installed by a licensed electrician.
- The Filtertherm® has a 6ft cord. It should be located so that the cord can reach the outlet without stretching or creating a tripping hazard.
- A disconnect should be installed within 10ft of the Filtertherm® by a licensed electrician.

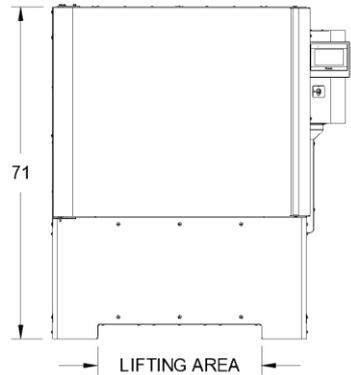
# Pre-Installation

## Inspection

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

## Installation

1. The door must be closed and latched before any moving or lifting is attempted.
2. The Filtertherm® can be moved with a forklift or pallet jack.
3. Remove shipping feet and install adjustable machine feet.
4. Adjust the leg levelers until the oven is level front-to-back and side-to-side for the door to operate correctly.



## Before First use:

- Vacuum out the interior to remove any dust from shipping.
- Remove the packaging from the grate and install the grate inside the Filtertherm®. (See pg. 3 for the mechanical door override if there is no power.)

## 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.

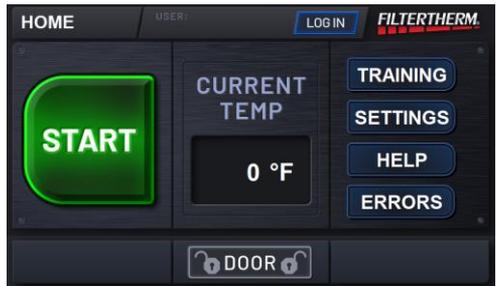
**DOOR:** Releases the latch and opens the door. The door release has a temperature limit of 200°F (93°C) on it and will not open above safe temperatures. The lock symbols indicate current door status.

**NEXT:** To the next screen.

### Home Screen

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

**TRAINING** will walk you through how to use the Filtertherm® DPF Oven and important safety information.



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

**ERRORS** will show you the list of current errors and allow you to reset any active errors. You can also view the error log to see when an error occurred.

### Screensaver

When the user interface is not in use for twenty minutes a screen saver will appear. Touch the screen to return to the previous screen.

# Display Setup

The first time the Filtertherm® is turned on the user will be asked to setup the system. Follow the onscreen instructions.

## DATE AND TIME

Enter the 2 digit year, month and day. The hour and minutes are entered using the 24 hr. format.

## USERS

This page includes the default usernames and passwords that are enabled by default on the Filtertherm® see the Users section on the next page for more information.

## TEMPERATURE UNITS

The temperature can be displayed in degrees Fahrenheit or Celsius. When the internal temperature is displayed on screen, the units (degrees F or C) can be changed by touching the temperature readout. The current units can also be changed in the settings menu after setup.

## Users

The Filtertherm® requires a user ID to run heating cycles. The user ID is displayed during the cycle to let others know who started the cycle. The ID requirement also makes sure that trained users are running the cycles. For this reason users should not share their passwords with other users.

From the settings menu you can add new users, delete users, or change the password of an existing user. There are three levels of access users can be assigned:

- A. **Operator:** can start a cycle
- B. **Technician:** Access to the oven's function tests in settings
- C. **Super:** can modify users

The following are the usernames and passwords that are enabled by default. It is recommended that you change the default passwords if you decide to keep these usernames.

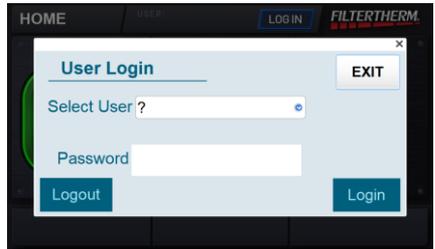
- User1 (pw: user1)
- User2 (pw: user2)
- Tech1 (pw: tech1)
- Super1 (pw: super1)

## Logging In

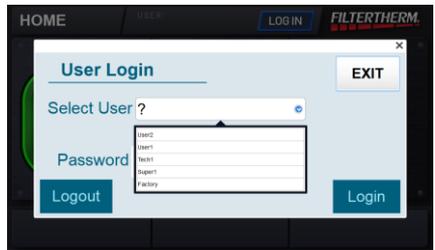
Press the LOG IN button located in the top right of most screens.



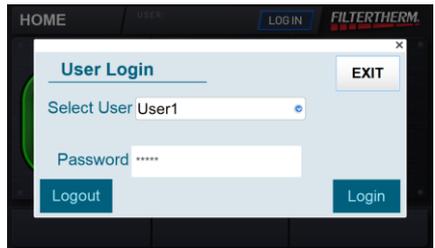
This will open the User Login window



Tap on the Select User dropdown and select your username from the list available.



Tap in the password field to open the on screen keyboard. Type the password for the selected user. When done press enter on the center right of the keyboard.



*If you press the close keyboard button in the bottom right it will delete what you typed.*

Then tap Login. You should see a login confirmation at the bottom of the screen. You can then tap exit.

If it says Password Error repeat the steps above to attempt to login again.

# 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. If you have the Filtertherm® FTM8003 DPF Inspection Table this process is made easier by having all of these tests at one station.

## 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 bake Oil soaked filters.

## Flow Testing

Air flow testing measures 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.

## Running a Cycle

1. Press DOOR button to open the Filtertherm®.
2. Inspect the interior of the oven. It should be dry and clean. Remove any dust, soot or ash.
3. Press LOGIN at the top of the screen and enter a user and password.
4. From the home screen choose START.
5. The cycle selection screen reminds the user:



**There should be no excess oil in the filter.**



**The filter should be blown out before heating.**



**The filter should be placed with the flow arrow facing down.  
The dirty inlet should be facing up.**

6. The Cycle screen offers the option of a general cleaning or a dry out cycle.



The GENERAL CLEANING CYCLE will heat to the temperature requirements set by the DPF manufactures.

If a filter is heavily loaded with soot or needs a low temperature cycle to remove dampness from oil, fuel or coolant then run the DRY OUT CYCLE. If a filter is damp and you are unsure, do not heat it. Ask a supervisor, who is trained on the Filtertherm®, for instructions.

Make your selection and then press NEXT.

7. If you selected general cleaning, next is the Filter type screen.

As you load in each filter, choose the substrate of the filter. Retrofit and Aftermarket DPFs often have a tag on them indicating the Make and Model of the filter. Filters for OEM systems (Cummins, CAT, Detroit, etc.) commonly do not have a tag. Multiple materials and manufactures can be selected.



- a. For filters that do not have a tag on them the type of filter is identified by the material, or substrate, used for the filter.

- SILICON CARBIDE is identified by segments of substrate cemented together. It can be heated to a higher temperatures.



- CORDIERITE is identified by a single brick with a waffle or honey comb pattern. It must be heated to lower temperatures.



- METAL MESH and unidentified substrate type should not be heated in the Filtertherm
- b. The retrofit manufacturers will have a tag that identifies the Make and Model. You can choose the model of the filter from the RETROFITS button.

## Running a Cycle cont.

8. Once all of the filters are loaded press NEXT. (This button is not shown if there are no filters selected.)
9. If multiple filters types are selected, the system will indicate that the safest temperature will be chosen and may not meet the cleaning requirements of all of the filter which are loaded.
10. When stacking filters, make sure there is at least a  $\frac{3}{4}$ " air gap between the top and bottom filters. (Use material that will handle temperatures of 700C or 1300F. i.e. stainless steel).
11. The Start Cycle screen will show the cycle name, bake and cooling times. If satisfied with your selection close the door and press START CYCLE to begin the heating. If the door is not closed the cycle will not start and the user will be warned.



12. The Filtertherm® will run the heating cycle. Followed by the cooling cycle.



### Heating and Cooling:

**TIME LEFT:** The total remaining time of the current cycle. A progress bar will also show percentage time remaining.

**TEMP:** The internal temperature of the Filtertherm®.

**USER:** The user ID which started the cycle.

**STOP:** Stops the cycle and returns to the main menu.

### Heating Only:

**CYCLE TYPE:** The name of the currently running cycle.

**STEPS:** Current step and total number of heating steps in the cycle.

**CURRENT STATUS:** Current action the oven is performing.

13. CYCLE COMPLETE will be displayed when the cycle is finished. Touching OK will return to the Main Menu. The circulation fans will continue to run until the door is opened.



## Error Codes

### Cycle Errors

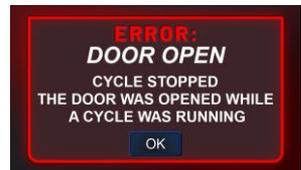
#### CYCLE ERROR OVER HEATING

More than 50°C (122°F) over the cycle temperature. The system will stop the cycle, including the fans. Let the internal temperatures cool naturally. This may be due to a DPF which is having an exothermic reaction.



#### DOOR OPENED DURING CYCLE

If the door is opened while the heating cycle is running the system will stop the cycle. This will usually occur when the manual door override is used while the cycle is running. The Filtertherm® will require the cycle to be restarted from the beginning.



### System Errors

#### NO TEMPERATURE READING

The system is not getting a reading from the thermocouple. The Filtertherm® cannot be used until this is fixed. Contact your dealer.



#### NO DOOR SIGNAL

The system is not getting an indication from the latch that the door is either open or closed. The Filtertherm® cannot be used until this is fixed. Contact your dealer.



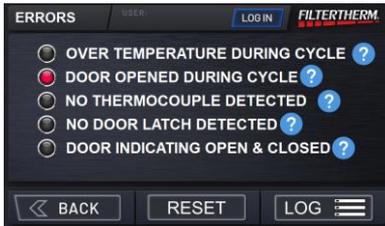
## BAD DOOR SWITCH

The system is getting an indication from the latch that the door is both open and closed. The Filtertherm® cannot be used until this is fixed. Contact your dealer.



## Resetting Errors

Once an error has occurred, the error needs to be reset from the ERROR menu shown in the main screen. The ERROR button will turn red to indicate that there are errors to be reset.



Press RESET to reset errors. If the problem has been resolved, the indicator by the error will go out. If the error has not been resolved, the indicator by the error will remain lit, even if the reset button is pressed.

The LOG button will display a detailed log of errors.

Date	Time	Error Message	Count
01/12/2024	15:06	DOOR OPEN DURING CYCLE	1

## Troubleshooting

### BRICKS ARE CRACKING

Hair line cracks in the bricks are a normal occurrence caused by heating and cooling cycles. The cracks are cosmetic and do not affect the insulation properties of the bricks or oven.

### ELEMENT IS COMING OUT OF THE GROOVE

Elements will expand and contract with the heating and cooling cycles. An element can be used normally if it not in danger of contacting a DPF. The elements are held into a groove by pins. The elements become brittle the more they are used. Under no circumstance should the Filtertherm® be turned on with an element touching a DPF or the grate. Contact your dealer or tech support about questionable elements.

### ELEMENT IS BROKEN

Any broken element will need to be replaced. The elements in the Filtertherm® are designed to last many cycles but all elements have a usable life and are consumable components. The time between replacements is effected by many variables. Elements that break from no obvious impact or contamination are most often at end of life.

Contact your dealer for replacement elements and instructions. Never use non-OEM elements as incorrect parts may cause system failures.

## DOOR DOES NOT LATCH

If the mechanical override for the door latch is left on, it will not allow the latch to catch in the closed position. Make sure the manual override key is not holding the latch open. Look under the control box and turn the override key back to the locked position and remove it from the override.

## OVEN DOES NOT HEAT

Check each element to confirm they are heating. This can be easily accomplished by putting a small strip of paper on each element and turning the elements on to see if it creates a burn mark on the paper. To turn on the elements, log into a Technician or administrative user account and go to the SETTINGS menu. Select FUNCTION TEST. On the Function test screen press the heater button to turn on the heaters. Check the paper to see if the element created a burn mark. If it did, the element is working. If it did not burn the paper check the internal fuse.

Checking the internal fuses for the heating elements. The fuses are located in the electrical control box, on the side of the Filtertherm®. See *page 20*. Unplug the Filtertherm® from the wall to remove power. Remove the two screws from the front of the controls box. Open the electronic control box and check the fuses. If fuses are bad, replace them and repeat the element testing above. If the fuses are good, replace the elements. Contact your dealer for parts and procedure to replace broken elements.

## LONGER THAN NORMAL HEATING CYCLE

See the troubleshooting steps for OVEN DOES NOT HEAT.

## Troubleshooting Cont.

### DPF OIL SPLATTER

If a DPF is not properly cleaned out before it is heated excess oil can splatter on the elements and burn them out. Contact your dealer for parts and procedure to replace broken elements.

### DOOR DOESN'T OPEN

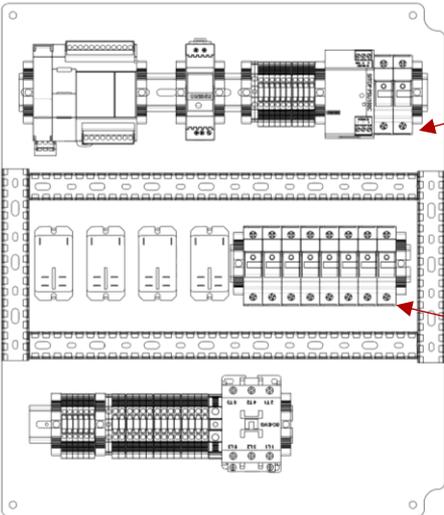
The system uses an electronic latch to lock the oven at high temperatures. This safety feature keeps the user from opening the oven when the temperatures are dangerous. To access the mechanical override a trained supervisor or lead worker must turn the lock under the controls box with a key. **This should only be used under extreme caution as the oven will be hot.**

### OTHER

For further troubleshooting call: 888-792-2922 or Email: [TechSupport@Filtertherm.com](mailto:TechSupport@Filtertherm.com)

# Accessing the Fuses

To open the controls box remove the two screw on the front of the box and pull it open.



Touch-screen Fuses

Heating Element Fuses

## Warranty Information

Diesel Emissions Service (“Seller”) warrants to the original purchaser of the Filtertherm® Thermal Regeneration 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® Thermal Regeneration System 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](http://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