CleanAIR 9769HPFS Heated In Line Filter Pump Assembly User Manual

CleanAir® EXPRESS

9769HPFS Heated In Line Filter Pump Assembly User Manual

Part # 9769HPFS
User Manual
Heated In-line Filter Pump Assembly
Questions? Contact us at 800-223-3977 or online at
http://www.cleanair.com/equipment/Express/main.html

Contents

9769HPFS Heated In Line Filter Pump Assembly

IMPORTANT!!!
BEFORE YOU BEGIN READ THIS!!!

 READ AND UNDERSTAND ALL INSTRUCTIONS BEFORE USING THIS SYSTEM!

SAVE THESE INSTRUCTIONS!!!

- **To Avoid Accidents…**
  - ✓ Keep your work area clean and well lit.
  - ✓ Keep bystanders away.
  - ✓ Exercise common sense.
- **Electrical Safety…**
  - ✓ Do not operate in combustible environments.
  - ✓ DO NOT operate these products when wet or in water.
  - ✓ ALWAYS be sure that the components of this system are running with the correct voltage (120V or 240V).
  - ✓ Never remove a grounding prong or modify a plug.
  - ✓ Do not abuse the power cord or plug.
- **Personal Safety…**
  - ✓The Heated In-line Filter and Pump Assembly will most likely be hot during and after use. Use caution when handling equipment during or after testing.
  - ✓ Stay alert and watch what you are doing.
  - ✓ Dress appropriately. Wear the appropriate personal safety devices.
- **Equipment Maintenance…**
  - ✓ Clean Air Express can not ensure that the Heated In-line Filter and Pump Assembly is compatible with any other systems. It is highly recommended that the assembly be used in conjunction with Clean Air approved analyzers and Clean Air Express heated sample lines. See **http://www.cleanair.com** or call (800) 223-3977 for more information.
  - ✓All internal maintenance and repairs should be performed by one of Clean Air Express's trained technicians.

Customer Feedback

Clean Air Engineering takes pride in our quality products and services. We strive to provide the highest quality products and services in the industry. We realize the importance of end user input in the continual improvement of our products and services. Customer feedback is of paramount importance. We encourage your feedback with any suggestions or problems that can help us improve our performance. A customer feedback form is available online at **http://www.cleanair.com/About/feedback.html**. To emphasize our commitment to quality products and complete customer satisfaction, Clean Air Engineering's manufacturing division, Clean Air Express, offers what we feel is the best and most comprehensive warranty in the environmental industry.

Safety

1.1 Weight and Bulk

The Heated In-line Filter Pump is relatively heavy (around 38 pounds). Use proper heavy lifting technique to avoid

injury.

1.2 Temperature

The filter and pump of the Heated In-line Filter and Pump are both temperature controlled, and the possibility for burns does exist. Unplug the Heated In-line Filter Pump Assembly and allow the heated head of the pump and the heated filter to cool before handling or performing any maintenance on it. One could also use insulating gloves when allowing the pump or filter to cool would be impractical. Exercise caution when moving the assembly before cooling and be sure to use the handle to avoid burns.

1.3 Electrical Shock

The Heated In-line Filter and Pump Assembly is powered by a standard 120 VAC line, meaning potentially fatal shocks are possible. The assembly is no more dangerous than many household appliances in this regard; however, care must
be taken to avoid shock. Before performing any maintenance on the assembly, turn off and unplug the apparatus from the 120 VAC line.

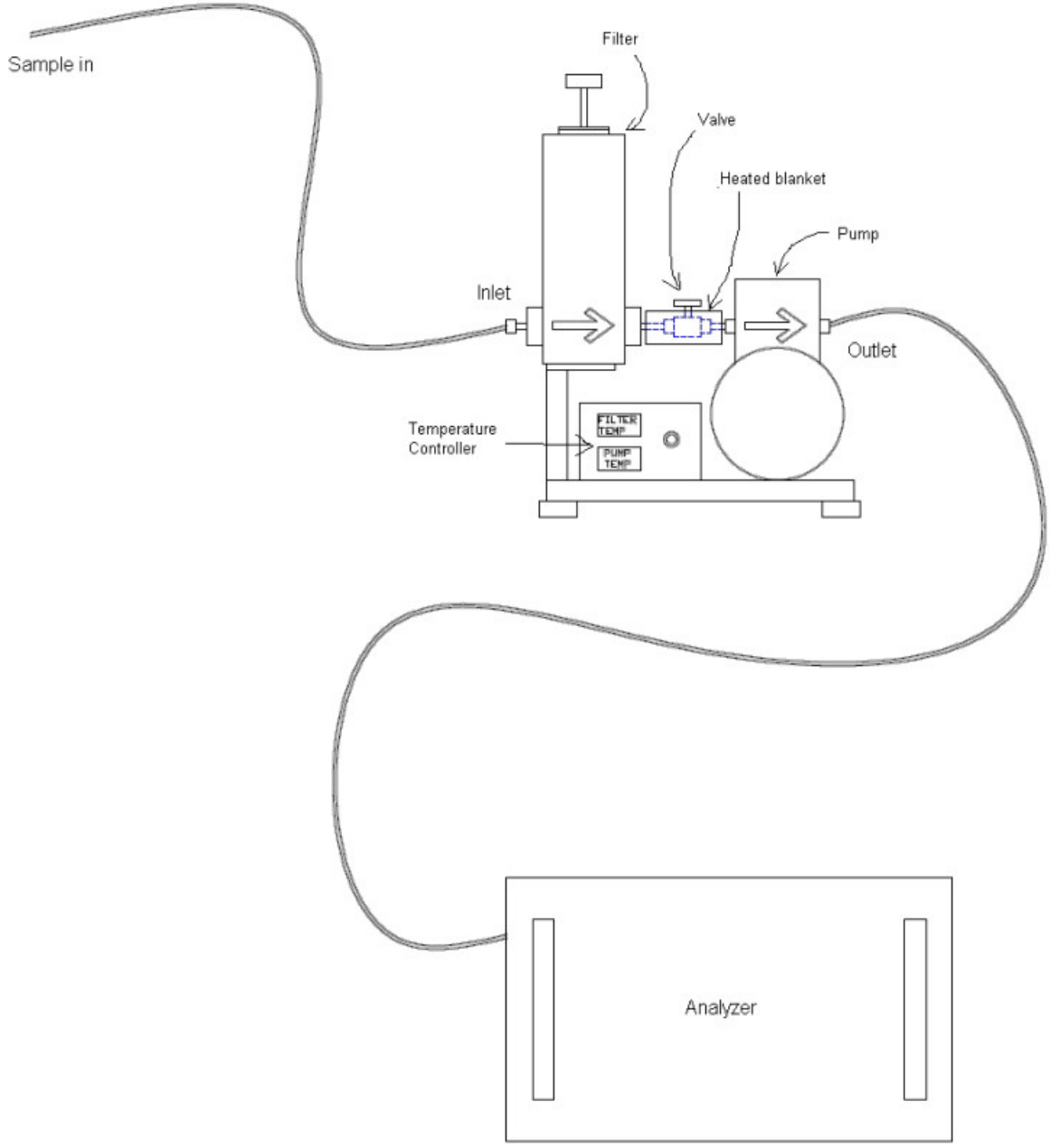
1.4 Operation in Ignition Prone Environments

Extreme caution must be taken when using the Heated In-line Filter and Pump Assembly in combustible or electrically charged environments, as the assembly is not intrinsically safe. The apparatus can potentially ignite flammable gasses, starting a fire or causing an explosion. Use extreme care and thoroughly evaluate the operating environment prior to use.

Principles of Operation

Maintaining a steady temperature around 250°F is important to ensure that moisture, acid gas, and other constituents of the gas stream do not condense before the analyzing equipment. This can result in the damage of equipment as well as the loss of important data. The Heated In-line Filter and Pump Assembly helps to ensure the accuracy of gas samples by providing a heated route for the gas before analysis.

2.1 Heated In-line Filter and Pump Assembly Schematic



2.2 System Components

Figure 1 shows the Heated In-line Filter and Pump Assembly. The assembly was designed for manual operation, requiring manual set up before use.

2.2.1 Temperature Controllers

The Heated In-line Filter and Pump Assembly utilizes two temperature controllers, shown in Figure 1. The temperature controllers are capable of maintaining the user-specified temperature of the filter and pump head. Additionally, a heated blanket maintains the temperature of the airflow path between the filter and pump at 250° F. Maintaining a steady temperature around 250°F is important so that moisture, acid gas, and other constituents of the gas stream do not condense out, introducing bias and corroding equipment.

2.2.2 Sample Filters and Heated Filter Holder

The filter holder and a glass/PTFE fluorocarbon microfiber filter scrub the sample before it enters the pump. These type of filters have a 99.9% efficiency and are effective up to 500° F. The large size of the filter (1" diameter, 7" long) ensures that the heated in-line filter and pump assembly can be used in many different applications, over long periods of time. However, the filter should be periodically changed to ensure accurate and consistent sampling.

2.2.3 Heated Head Pump

The heated head pump drives the fluid flow of the sample from the extraction point to the analyzer. The pump is functional in ambient temperatures of up to 140°F and the heated head is able to heat the sample contained up to 400° F.

2.2.4 Needle Valve

The needle valve controls the flow of sample air through the filter and the supply flow rate to your analyzer. It is

recommended that the user sets the flow rate of the sample air through the assembly before sampling begins. This can be done by connecting a flow meter to the inlet of the filter and adjusting to the desired flow rate using the needle valve. Be sure to disconnect the flow meter after setting your sample flow rate and before sampling, as most flow meters cannot withstand temperatures above 250° F.

2.2.5 Power Requirements

The Heated In-line Filter and Pump Assembly requires a 120 VAC line capable of supplying at least 10 Amps. The whole assembly is protected by a 15 Amp breaker.

Figure 1

2.3 System Operation

2.3.1 Pre-sampling

Unscrew the filter handle and visually inspect the filter element. If particulate has built up on the filter element, extract it and install a new clean filter. Connect the outlet of a flow meter to the inlet of the heated filter. Plug in the assembly and adjust the needle valve so that the pump is pulling at the desired flow rate. This flow rate will probably be determined by the analyzer being used and can be found in the analyzer's manual. When the desired flow rate is reached, turn off the pump and disconnect the flow meter.

2.3.2 Assembly Setup

Connect the inlet of the heated filter to the sample line. Connect the outlet of the pump to the sample analyzer. Ensure that your sample collector is not currently in the sample stream and run a system leak check. Turn on the heater controller displays and set your target temperatures for the heated filter and the heated head of the pump. A video that shows this process can be found here: http://express.cleanair.com/HeatedSampleLine/temperaturecontroller.html.

When temperatures of the heated filter and heated head have reached your target temperatures, you are ready to sample, and can locate your probe in the gas sample stream.

2.3.3 Sampling
Locate your sampler in the gas stream and begin sampling. The flow rate should stay relatively constant unless you are sampling from a gas stream extremely high in particulate.
2.3.4 High Particulate Applications
If you are sampling in an extremely high particulate application, you must plan to routinely pause sampling to replace the filter if necessary so that your flow rate does not deteriorate.

Routine Maintenance and Inspection

The Heated In-line Filter and Pump Assembly has a relatively maintenance-free design, requiring minimum upkeep throughout its lifespan.

CAUTION!! – Do NOT disassemble this product beyond the scope of the manual! For internal maintenance contact Clean Air Express.

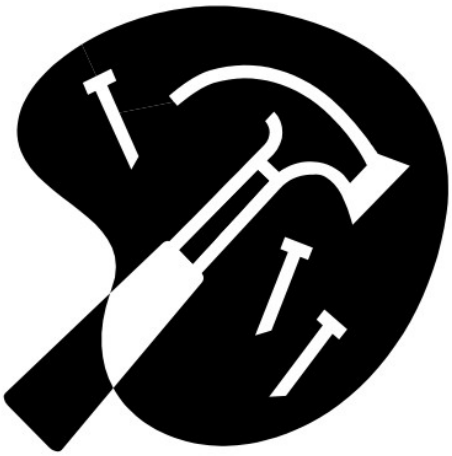
3.1 Check-Out Procedure

Before considering your assembly fit for service after a job, check out a few simple things to ensure its good status.

- Always pull clean air through the assembly after completed testing to cleanse the sample gas path
- Check the electrical connections for bent, frayed, or damaged wires
- Leak-check the assembly from inlet of the filter to the outlet of the pump, ensuring that it holds both positive and negative pressure
- Inspect the filter housing gaskets for cracks or tears, and replace if necessary
- Verify that the filter and pump head can heat to approximately 250 °F or desired temperature up to 275 °F
- Lastly, general cleanliness promotes good equipment health as well as accurate test results

3.2 Other Maintenance Issues

For any other maintenance issues, concerns, or questions, please contact Clean Air Express at (800)-223-3977. Clean Air Express can also be reached by mail at 212 N. Woodwork Lane Palatine, IL 60067; by fax at (847)-991-8924 or on the web at **http://www.cleanair.com/equipment/Express/main.html**



Troubleshooting

The Heated In-line Filter and Pump Assembly is very reliable. When something is not working, these points often can provide a solution.

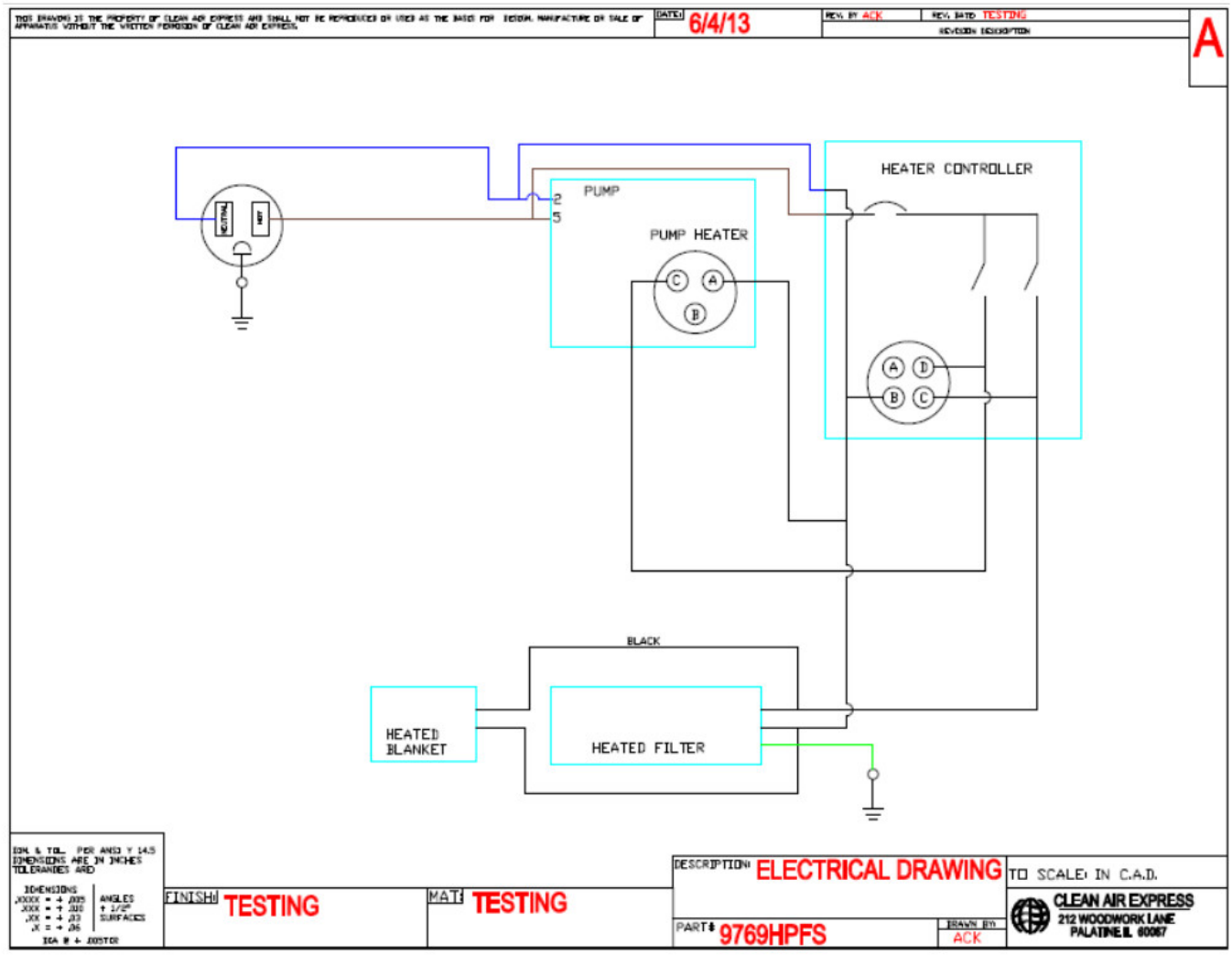
- **Unable to pull sufficient sample flow rate**

  If you cannot achieve your desired flow rate, ensure that the needle valve is in the fully open position. Then check to ensure that the filter is not clogged. If it is not, check the sample line; make sure the line is not crimped or clogged.
- **System cannot pass a leak check**

  First ensure that all of your connections to and from the assembly are tight, and connected correctly (not cross-threaded). If one of these connections is not the source of the leak, check the filter gasket to ensure that it is not cracked or broken. If no other source of leakage is found, the diaphragm to the pump may be ripped or cracked and if so, should be replaced.
- **Temperature controller is heating filter and pump head above temperature set points**

  If this is happening, check all wires and ensure that they are connected properly and not damaged. If they are connected properly and are not damaged, the relay inside of the temperature controller may be faulty, and must be replaced.

Wiring Diagram



Parts List

HEATED IN-LINE FILTER AND PUMP ASSEMBLY
Parent Part #: 9769HPFS
Type: F

Component	Description	Qty Required	UM	T
0035C	CEM CATECO TEMP. CONTROLLER TFE COATED THERMOCOUPLE	1	EA	F
0315T	WIRE	4	FT	R
0316M	STD MALE THERMOCOUPLE PLUG	2	EA	R
0419SNV	NEEDLE VALVE 3/8″T S.S. HOT POCKET-MET 80 JUNCTION	1	EA	R
1233	BOX	1	EA	R
1233F	HEATED FILTER 1″X 7″,TYP K TCS	1	EA	R
8701	FOAM GRIP 1″X1″ 5″ LENGTH	1	EA	R
9332	SHRINK TUBING 1/4″	4	FT	R
9334	SHRINK TUBING 1/2″ BLACK MATTE	6	EA	R
9334C	SHRINK TUBING 1/2 CLEAR	3	FT	R
940310A	3 PIN CONNECTOR ASSY 3 PIN BOX MOUNT FLANGED	1	EA	R
940310FL	RECEP.	1	EA	R
9409	4 PIN CABLE CLAMP	1	EA	R
9410	4 PIN CABLE RECEPTACLE	1	EA	R
94110	CABLE CLAMP SIZE 10	1	EA	R
9417	4 PIN MALE INSERT BRACKET FOR HEATED FILTER	1	EA	R
9769HFB	FOR	1	EA	F
9769S2015	END CAP BLACK 80/20 MATERIAL	4	EA	R
9769S3059	BUTTON HEAD SOCKET CAP SCREW BUTTON HEAD SOCKET CAP	4	EA	R
9769S3061	SCREW	14	EA	R

9769S3280	1/4-20 DOUBLE NUT SLIDE IN	23	EA	R
9769S3287	1/4-20 TRIPLE NUT	1	EA	R
9769S3342	1/4-20 FLANGED SCREW	59	EA	R
9769S3382	FASTENER T NUT	21	EA	R
9769S4107	2 HOLE JOINING INSERT 80/20	1	EA	R
9769S4112	7 HOLE TEE JOINING PLATE	1	EA	R
9769S4118	3 HOLE JOINING STRIP	1	EA	R
9769S4132	JOINING CONNECTOR 2 HOLE	1	EA	R
9769S4150	JOINING PLATE 4 HOLE 90 DEGREE	1	EA	R
9769S4155	8 HOLE TEE JOINING PLATE	1	EA	R
9769S4509	2 HOLE TRANSITION INSIDE CORNR	1	EA	R
9769SBAR	1″ X 1″ SLOTTED 80/20 BAR RAIL	107	FT	R
9769T2	PUMP ADI SS HEATED HEAD	1	EA	R
99511	BUMBER 1-1/2″ OD X 1/4″ SCREW	4	EA	R

Our Guarantee

Clean Air Engineering warrants products to be free from defects and workmanship for a period of one year after delivery date. The sole and exclusive remedy for defective goods shall be repair or replacement of defective parts or payment price of the goods for which damages are claimed, at Clean Air Engineering’s option.

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Documents / Resources

	CleanAIR 9769HPFS Heated In Line Filter Pump Assembly [pdf] User Manual 9769HPFS, 9769HPFS Heated In Line Filter Pump Assembly, 9769HPFS Filter Pump Assembly , Heated In Line Filter Pump Assembly, Heated In Line Pump Assembly, Filter Pump Assembly, Pump Assembly

References

- CleanAir - Universal Temperature Controller
- CleanAir Engineering - Environmental Testing, Consulting & Equipment