

Fleetguard®



Fuel Filtration

LT36497



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Fuel Filtration Technology

The significant changes in global diesel emissions standards have driven great changes in fuel system design including much higher pressures, tighter component tolerances and the need for retention of finer particles and improved water separation. It would be unusual to find a diesel engine that does not require filtration and more likely today that sophisticated multi filter systems and water separators are found on diesel engines. At the same time, the general worldwide decline in the quality of diesel fuel itself and the significant increase in the use of biodiesel and bio-oils means that basic forms of filtration and standard on-engine filtration may not adequately protect precision components.

No matter how carefully fuel is handled, contaminants will find their way into fuel during transfer, storage, or on vehicle tanks. One of the biggest enemies of fuel system components, water, condenses directly from the air during normal operation of equipment and during storage. This water forms a layer which allows for the growth of microbes which form solid and semi-solid contaminants. Finally, particles are introduced during the storage and transfer of fuel.

In addition to contaminant challenges, paraffin wax, a natural component of diesel fuel, forms crystals when temperatures fall below the freezing point of diesel fuel. These crystals plug filters, preventing fuel from flowing to the engines.

Each of these threats to smooth engine and component performance can be addressed with a properly designed, high quality and effective diesel fuel filter/water separator. The addition of such a high quality filtration system can increase up time, reduce overall maintenance expenses and assure that your equipment performs when expected.

Water Contamination

Water is commonly found in diesel fuel, due mainly to condensation, handling and environmental conditions. While water is always present in diesel fuel, it is more pronounced in humid areas and marine applications. However, today's High Pressure Common Rail (HPCR) fuel systems cannot have even small amounts of water in the injectors.

The presence of water in diesel fuel systems may cause the following problems:

- Water causes rust and corrosion of iron components, forming loose particles of iron oxide which contribute to injector wear and component failure.
- At the interface of water and diesel fuel, microbiological growth rapidly occurs under the proper conditions. The microbes form a sludge that can plug filters and hinder injector performance. Additionally, the acid excreted by these microbes causes the corrosion of storage tanks and vehicle tanks, which leads to an increase in particles found in fuel.
- Water can overwhelm standard on-engine fuel filtration. Water that makes it past the fuel filtration system to the injector system, since it doesn't have the same lubrication as diesel fuel oil, can cause premature wear and injector failure.
- Water in the fuel can also lead to premature wear of fuel pumps and other system components that rely upon the lubricating properties of diesel fuel oil.

Bio-Based

- Biodiesel and bio-oil fuels have become increasingly popular. However, these fuels have a greater affinity to water, and when present make water separation far more difficult.
- These fuels contribute to the more aggressive growth of microbes. Both of these items require the addition of secondary filtration systems to adequately protect modern HPCR systems.
- Biofuels may experience cold temperature issues sooner or at higher relative temperatures than regular diesel.

Solid Contamination

Particles in fuel come from many sources including dust, dirt, sand, rubber and many other sources including air borne particles or particles carried in water that routinely find their way into diesel fuel. Sometimes larger identifiable objects such as pebbles, leaves, and paint chips are also present. These small particles can create substantial wear in today's tight tolerance, HPCR fuel systems.

The most common cause of plugged filters is organic sludge sometimes referred to as asphaltene but may also be from degradation or interactions of components in the fuel or additives. Additional fuel filtration decreases the likelihood of short filter life affecting equipment performance. Utilizing proprietary media, such as StrataPore™ multilayer melt-blown media and technologies such as EleMax™, fuel filtration can be designed to handle these organic materials.

Introduction

Cold Weather Operation

Diesel fuel has several components which can be significantly affected by cold weather. Two of the most impacted components are water and paraffin. Water contributes to fuel line freezing. Additionally, there are two specific points that are very important to filter life and cold weather performance. These points are Cloud Point and Cold Filter Plug Point (CFPP). Cloud Point is the point at which paraffin crystals precipitate. CFPP is the highest temperature at which a certain fuel will cause filter plugging.

Depending upon the quality of the fuel, the point at which most diesel fuels form paraffin (wax) crystals may be from 0 °F to 45 °F (-17 °C to 7.2 °C). The CFPP for fuels can vary from -10 °F to 15 °F (-23 °C to -9 °C), depending upon fuel quality. These paraffin crystals quickly coat filters and prevent fuel flow, as well as plug fuel lines. In addition, water contamination in the form of icy slush compounds the problem, slowing fuel flow even more quickly. It is therefore desirable to heat diesel fuel as close to the filter element as possible, to re-liquefy wax and ice crystals.

Specifying the Right Fuel Processor for the Job

There are several possible strategies that can be used in applying fuel/water separators and heaters. Each depends on:

- The demands on the fuel environment
- The type of OEM filtration already on the engine
- The perceived needs of the equipment operator
- The type of fuel system (mechanical, electronic, high pressure common rail, etc.)
- The engine manufacturer's requirements

Some of the more common situations encountered are listed as follows:

1. Add Water Separation Capability to an Existing Standard Filter System.

Modern fuel systems cannot handle even small amounts of water without long term damage occurring to the fuel injectors. HPCR fuel systems have pressures in excess of 30,000 lb/in² (2,068 bar), with extremely small tolerances. Therefore, even if the engine comes with a fuel/water separator as original equipment, additional water separating filtration provides additional protection for the highly sensitive fuel components.

In the absence of a water separator, standard primary elements become water-logged and ineffective. When water-logged, they are especially susceptible to waxing in cold temperatures.

Finally, an upstream water separator and filter will significantly enhance the performance and life of primary filter elements. The Fleetguard® Fuel Pro® series illustrates this type of device.

2. Add Water Separation and Filtration Capacity to an Existing System.

Frequent replacement of primary filters is required when the volume of contaminants is significant. This is especially true in emerging markets and off-highway markets. In such cases, engine damage may result because filters are not immediately available for replacement, or operators are not aware of the need to replace them. Additionally, on-engine filtration can be overwhelmed by large amounts of water or other contaminants. Therefore, adding upstream filtration capacity and water separation capability can, when properly applied, as much as triple the filtration system service life. Evidence indicates that the addition of StrataPore™ media while chaining together different micron rating filters can have this effect. For example, if the original equipment filter is 10 microns, then placing a 25 micron StrataPore media filter upstream can as much as triple the service life.

3. Add Water Separation, Higher Filtration Efficiency and Capacity to the Existing Standard Filtration Device.

Similar to the preceding example but with fine filtration to as small as 98.7% efficient, two micron media, almost all contaminant can be removed. The Fuel Pro series fuel/water separators can be fitted with such filters to remove practically all water and most solid contamination.

4. Replace On-Engine Filtration with a Remote Mount Fuel/Water Separator.

Depending upon the application, there may be opportunities to use a diverter cap to plug off the on-engine filter and replace it with a remote mount fuel/water separator. This change allows easier access to the filter and additional benefits such as heaters, finer filtration, increased capacity and/or longer life. In order to do this, one must understand:

- a. **The current on-engine filtration requirements for filter efficiency**
- b. **The current on-engine filtration water separation requirements (both free water and emulsified)**
- c. **Maximum and minimum flow rates of the fuel system**
- d. **Maximum fuel system restriction guidelines**

5. Add a Diesel Heater to the Fuel System.

There are several methods used to heat diesel fuel to maintain operation in cold weather. The following are the most common:

- a. **Electric DC Pre-Heaters: Built into the diesel fuel/water separator**
- b. **Electric AC Pre-Heaters: Built into the diesel fuel/water separator**
- c. **Coolant or Return Fuel Heaters: Built into the diesel fuel/water separator**

For most cold weather conditions, electric pre-heaters will provide sufficient localized heating to assure cold weather starting. For much colder environments or higher fuel flow systems, the addition of coolant or return fuel heaters may be necessary.

For biodiesel and bio-oil fuel applications, higher wattage DC heaters are necessary, as well as combining with coolant or return fuel heat. This heating is necessary to assure proper fuel viscosity.

These options will prevent paraffin crystals from coating the filter media and assist in providing diesel fuel flow to the injection system in the most cold weather conditions.

Details of the Application

After initial decisions are made about the type of fuel/water separator and/or heater requirements, it is important to study the details of the application more specifically to find the system most closely suited.

1. **Physical package size and location determine specifically where the fuel/water separator can be mounted and how large it can be. This space must also include enough space for service/filter removal.**
2. **Determine what environmental parameters will be required to properly install the unit. These parameters would include items like:**
 - a. **Maximum and minimum temperatures**
 - b. **Vibration**
 - c. **Hose diameter and length**
 - d. **Housing pressure**
 - e. **Restriction**
 - f. **Types of fittings**
 - g. **Free and emulsified water separation efficiency required by engine**
 - h. **Viscosity Requirements**
3. **Determine what fuel type will be used. Global fuel sources can differ greatly, so it's vital to know what type of fuel will be used. Each of the following types of fuel can have very different filtration requirements:**
 - a. **Greater than 500 ppm sulfur diesel**
 - b. **Greater than 15 ppm sulfur diesel**
 - c. **Less than 15 ppm sulfur diesel**
 - d. **Biodiesel type and blend percentage (defined as a Methyl Esther Biofuel blended with regular diesel). For example, a Rapeseed Methyl Esther (RME) blended with diesel at 20% would be known as B20 RME. There are both US ASTM and European EIN standards for these fuels.**
 - e. **Bio-oil (defined as pure vegetable oil, such as Rapeseed Oil or Soybean Oil).** Note: Bio-oil requires fuel temperatures of 158 °F (70 °C) to gain the appropriate viscosity necessary to flow properly in diesel engines. Therefore special heaters on the fuel processor and fuel system are required.

Introduction

- 4. Fuel system rated flow:** Given that one has determined the overall type of fuel/water separator, determine what the maximum flow rate will be. For example, each Fleetguard® fuel/water separator is rated for flow rates where maximum flow and minimum restriction can be achieved while maintaining maximum contaminant removal efficiency and capacity.
- 5. Determine what micron rating would be appropriate for the application.** For primary filters where increased capacity and life is desired, the filter media should be to maximize contaminant holding capacity. Usually a 98.7% efficient 25 or 50 micron filter element would be applied.

Summary

Today's modern diesel engines and fuel systems face many challenges. Ongoing governmental emissions regulations continue to drive the performance of engines and fuel systems. Due to these changes, fuel/water separators face many challenging conditions. Each filter separator system should be carefully tailored to specific equipment/contamination problems, and close attention must be devoted to system maintenance.

Factors such as filtration efficiency, emulsified water separation, free water separation, size, mounting location, and environmental parameters greatly narrow the possible filtration alternatives when choosing a system for a particular application. Specific information such as system flow rate, desired service life, anticipated housing pressure, acceptable restriction, and customer needs help further define the choice of filter separators.

As time progresses, more original equipment manufacturers are specifying fuel filter/water separators on their diesel engines. Many have added items such as Water-In-Fuel (WIF) sensors or heaters and utilize technology such as Seeing Is Believing® and EleMax™. These requests reflect the growing recognition of the need for additional fuel/water separation and additional efficiency to protect these complicated fuel systems.

Suggested Fuel Filtration Systems by Engine Size

Engine Size	Industrial Pro ^{®1}	Fuel Pro ^{®2}	Diesel Pro ^{®3,4}			Sea Pro ^{®5}
	FH239 Series	FH230 FH231 Series	FH235 Series	FH236 Series	FH241 Series	FH234 FH240 Series
2 Liter			X			
3 Liter			X			
4 Liter			X			
5 Liter			X			
6 Liter			X	X	X	
7 Liter			X	X	X	
8 Liter				X	X	
9 Liter		X		X	X	
10 Liter	X	X		X	X	
11 Liter	X	X				
12 Liter	X	X				
13 Liter	X	X				
14 Liter	X	X				
15 Liter	X	X				
16 Liter	X	X				
17 Liter	X	X				
19 Liter	Single Unit or Duplex Unit	X				Single Unit or Duplex Unit
23 Liter	Single Unit or Duplex Unit					Single Unit or Duplex Unit
30 - 45 Liter	Dual Unit or Triplex Unit					Dual Unit or Triplex Unit
46 - 50 Liter	Triple Unit or (2) Duplex Units					Triple Unit or (2) Duplex Units
61 - 80 Liter	(2) Dual Units or (2) Triplex Units					(2) Dual Units or (2) Triplex Units

This table contains suggestions only. Exact requirements should be determined by consulting engine OEM or Owner's Manual information. Engine OEMs reserve the right to make changes at any time. Some fuel system lay-outs in all engine sizes re-circulate fuel directly to the lift pump. Thus, a significantly lower flow rate (effective fuel consumption rate) circulates through the fuel processor unit.

¹ Industrial Pro[®] Fuel Flow: Single Unit – 200 gal/h (757 L/h), Dual/Duplex Unit – 400 gal/h (1515 L/h), Triple/Triplex Unit – 600 gal/h (2272 L/h)

² Fuel Pro[®] Fuel Flow: 180 gal/h (681 L/h)

³ Diesel Pro[®] Fuel Flow: 90 gal/h (341 L/h)

⁴ If the engine uses a cam-driven mechanical lift pump, no suction side filtration can be used. In this case, an additional electric or mechanical lift pump, not supplied by Cummins Filtration[®], needs to be available or installed to use a fuel processor in the fuel suction line.

⁵ Sea Pro[®] Fuel Flow: Single Unit – 200 gal/h (757 L/h), Dual/Duplex Unit – 400 gal/h (1515 L/h), Triple/Triplex Unit – 600 gal/h (2272 L/h)

Filter Elements by Engine Application

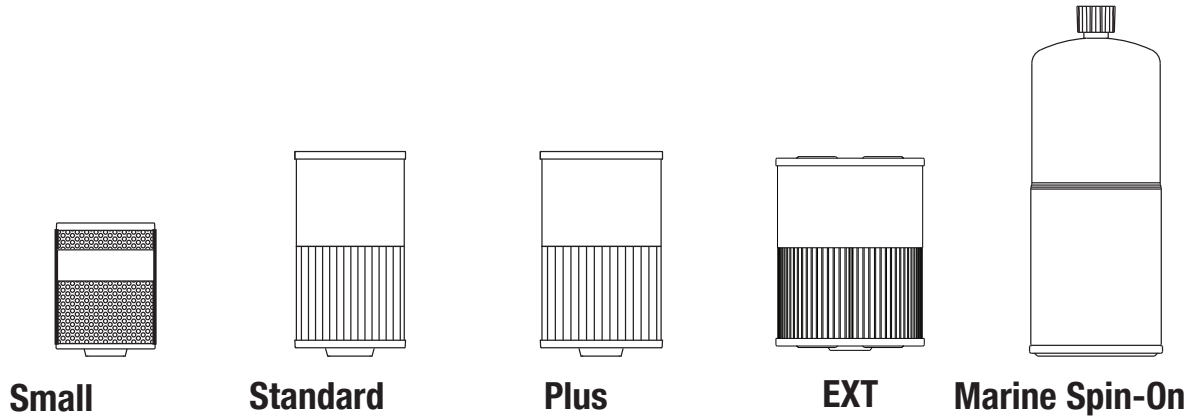
EleMax™

Application	Part Number	Description	Optimal Performance
Cummins Filtration®			
ISX Oct 2002+	FS19729	EleMax™ Cellulose 50 micron	X
ISX 1998 - 2002	FS19728	EleMax StrataPore™ 25 micron	X
	FF5369W	Cellulose 25 micron	
ISX Pre 1998	FS19727	EleMax StrataPore 10 micron	X
	FS1029W	StrataPore 10 micron	
ISM Oct 2002+	FS19727	EleMax StrataPore 10 micron	X
	FS1029W	StrataPore 10 micron	
ISM 1998 - 2002	FS19727	EleMax StrataPore 10 micron	X
	FS1029W	StrataPore 10 micron	
ISM Pre 1998	FS19727	EleMax StrataPore 10 micron	X
	FS1029W	StrataPore 10 micron	
M11 All Engines	FS19727	EleMax StrataPore 10 micron	X
	FS1029W	StrataPore 10 micron	
N14 All Engines	FS19727	EleMax StrataPore 10 micron	X
	FS1029W	StrataPore 10 micron	
Detroit Diesel®			
S60 Oct 2002+	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
S60 1998 - 2002	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
S60 Pre 1998	FS19728	EleMax StrataPore 25 micron	X
	FF5369W	Cellulose 25 micron	
S50 All Engines	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	

Application	Part Number	Description	Optimal Performance
Mercedes			
MBE 4000 All Engines	FS19624	EleMax™ StrataPore™ 7 micron	X
	FS19558	StrataPore 7 micron	
MBE 900	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
Mack®			
ASET Econodyne All Engines	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
ASET Maxidyne All Engines	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
ASET Maxicruise	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
E7	FS19728	EleMax StrataPore 25 micron	X
	FF5369W	StrataPore 25 micron	
Caterpillar®			
ACERT	FS19761	EleMax StrataPore 5 micron	X
	FS19536	Cellulose 2 micron	
Non ACERT	FS19761	EleMax StrataPore 5 micron	X
	FS19536	Cellulose 2 micron	
International®			
DT444 and DT466	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
VT365	FS19624	EleMax StrataPore 7 micron	X
	FS19558	StrataPore 7 micron	
Volvo®			
VDE	FS19728	EleMax StrataPore 25 micron	X
	FF5369W	Cellulose 25 micron	

StrataPore®





Specifications

Style	Filter Part Number	Micron Rating ¹	Media Type	Filter Type	Capacity ² g	Flow Rate ³ gal/h (L/h)	Emulsified Fuel Water Efficiency ⁴	Free Fuel Water Efficiency ⁵	Overall Height in (mm)	OD in (mm)
Small	FS19730	7	StrataPore™	Cartridge	33	60 (227.13)	95% at 60 gal/h (227 L/h)	95% at 60 gal/h (227 L/h)	4.69 (119.13)	3.50 (88.90)
	FS19731	10	StrataPore	Cartridge	46	60 (227.13)			4.69 (119.13)	3.50 (88.90)
	FS19785	25	StrataPore	Cartridge	33	60 (227.13)			4.69 (119.13)	3.50 (88.90)
Standard	FS19624	7	StrataPore	EleMax™ Cartridge	76	100 (378)	95% at 100 gal/h (378 L/h)	95% at 100 gal/h (378 L/h)	7.039 (178.79)	3.82 (97.03)
	FS19727	10	StrataPore	EleMax Cartridge	78	100 (378)			7.039 (178.79)	3.82 (97.03)
	FS19728	25	StrataPore	EleMax Cartridge	64	100 (378)			7.039 (178.79)	3.82 (97.03)
	FS19729	50	Cellulose	EleMax Cartridge	30	100 (378)	90% at 100 gal/h (378 L/h)	90% at 100 gal/h (378 L/h)	7.039 (178.79)	3.82 (97.03)
	FS19761	5	StrataPore	EleMax Cartridge	80	100 (378)	95% at 100 gal/h (378 L/h)	95% at 100 gal/h (378 L/h)	7.039 (178.79)	3.82 (97.03)
Plus	FS19763	7	StrataPore	EleMax Cartridge	82	180 (681.37)	95% at 180 gal/h (681 L/h)	95% at 180 gal/h (681 L/h)	7.039 (178.79)	4.21 (106.93)
	FS19764	10	StrataPore	EleMax Cartridge	89	180 (681.37)			7.039 (178.79)	4.21 (106.93)
	FS19765	25	StrataPore	EleMax Cartridge	71	180 (681.37)			7.039 (178.79)	4.21 (106.93)
	FS19766	5	StrataPore	EleMax Cartridge	91	180 (681.37)			7.039 (178.79)	4.21 (106.93)
	FS19905	50	Cellulose	EleMax Cartridge	87	180 (681.37)			7.039 (178.79)	4.21 (106.93)
EXT	FS19915	7	StrataPore	EleMax Cartridge	125	180 (681.37)	98% at 180 gal/hr (681 L/h)	95% at 180 gal/h (681 L/h)	7.61 (193.42)	5.83 (148.11)
Marine Spin-On	FS1013	10	StrataPore	Spin-On	100	180 (681.37)	95% at 180 gal/h (681 L/h)	95% at 180 gal/h (681 L/h)	12.323 (313.00)	4.735 (120.27)
	FS19804	25	StrataPore	Spin-On	132	180 (681.37)			12.323 (313.00)	4.736 (120.29)
	FS19841	7	StrataPore	Spin-On	135	180 (681.37)			12.323 (313.00)	4.736 (120.29)

¹ Micron rating is 98.7% efficient at rated flow per SAE J1985.

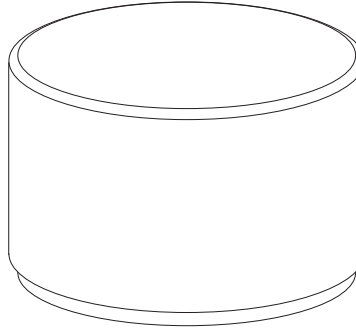
² Capacity is at rated flow per SAE J905.

³ Flow rate is established based upon emulsified water separation of 95%. Higher flow rates will reduce emulsified water separation efficiency, which may be acceptable based on application requirements.

⁴ Emulsified fuel/water separator efficiency per SAE J1488.

⁵ Free fuel/water separator efficiency per SAE J1839.

Diverter Caps



Parts List

The fuel processor **can be used as the only fuel filter in the fuel system** by removing the existing filter and heads, or by removing the filters only and replacing with special diverter caps (sold separately, see below). The diverter caps replace the existing filter and cause the fuel to flow directly through the filter head.

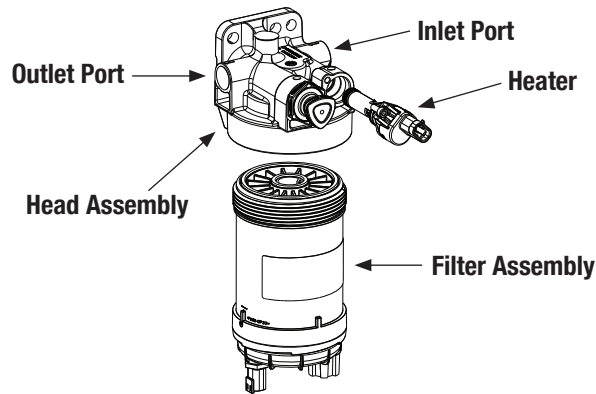
Note: If the fuel processor is used as the primary filter and a secondary filter is required, secondary filter life may be extended.

Diverter Cap Part Number	Required Filter Head Stud Size	Required Filter Head Seal ID in (mm)	Required Filter Head Seal OD in (mm)
3945182 S	1"-14	2.475 (62.865)	2.895 (73.533)
3945183 S	1"-14	3.225 (81.915)	3.435 (84.158)
3945184 S	M16 x 1.5	2.475 (62.865)	2.895 (73.533)
3945185 S	3/4" x 16	2.475 (62.865)	2.895 (73.533)
3945186 S	7/8" x 14	2.475 (62.865)	2.895 (73.533)
3945187 S	M18 x 1.5	2.475 (62.865)	2.895 (73.533)
3945188 S	13/16" x 12	3.225 (81.915)	3.235 (79.576)

Note: Diverter Caps for FS1216 and FS1006s not included.

Tier IV Fuel Modules

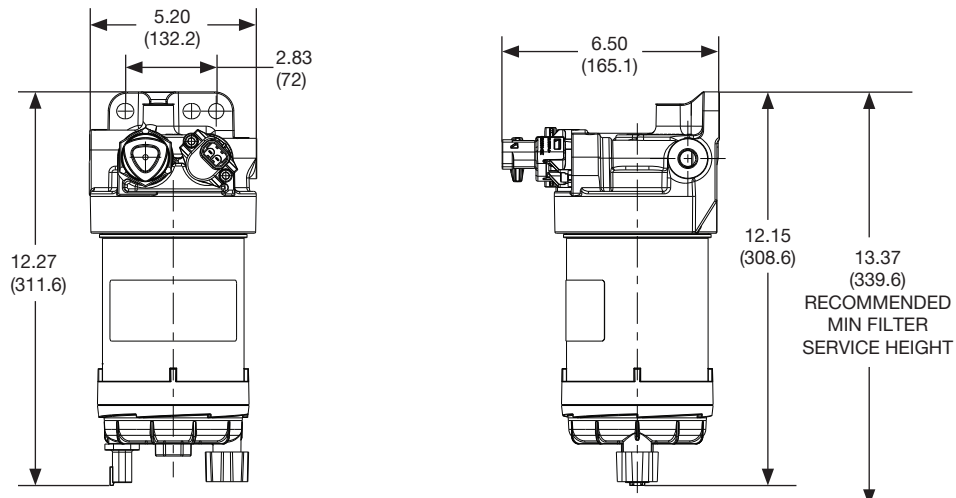




Specifications

Specification	B-Series
Height Overall	12.27" (311.56 mm)
Depth Overall	6.5" (165.1 mm)
Width, max	5.2" (132.16 mm)
Mount Bracket Centers or Rear mount Centers	2.83" (72 mm) 2.06" (52.5 mm)
Weight (Dry)	4.64 lbs (2.1 kg)
Fuel Connections (Inlet)	M14 x 1.5
Fuel Connections (Outlet)	M14 x 1.5
Fuel Capacity (w/o filter)	47 fl oz (1390 mL)
Operation Fuel Flow Rate	60 gal/h (227.1 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	5.4 fl oz (160 mL)
Filter Service Clearance	Min. 1.22" (31 mm)
Mounting Bracket	Cast in Head
Electrical Heater	24 VDC, 300 W or 12 VDC, 300 W
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Biodiesel, and JPS

Dimensions



Ordering Information

B-Series

Housing Part Number	Filter Element	Heater	WIF	Fuel In & Fuel Out Port Size	Priming Pump	Heater Service Kit
FH2146200	FS1098	N/A	Yes	M14 x 1.5	Yes	N/A
FH2146300	FS1098	12 V	Yes	M14 x 1.5	Yes	SP1166
FH2146400	FS1098	24 V	Yes	M14 x 1.5	Yes	SP1167

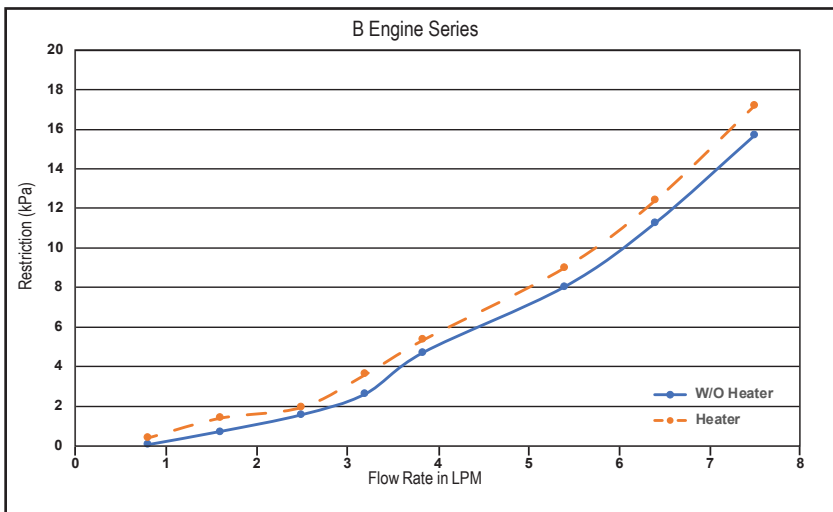
Replacement Filter

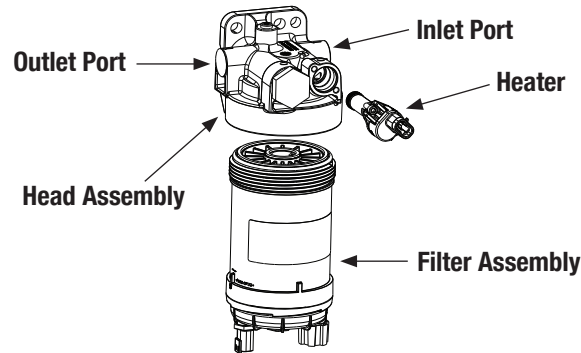
Part Number	Description
FS1098	StrataPore™ 10 micron

Filter Specifications

- Emulsified Water Separation: 93% efficiency at 46 gal/h (210 L/h) flow per SAE J1488 (modified).
- Efficiency of 98.7% at 10 micron (c) as per ISO 19438.

Performance

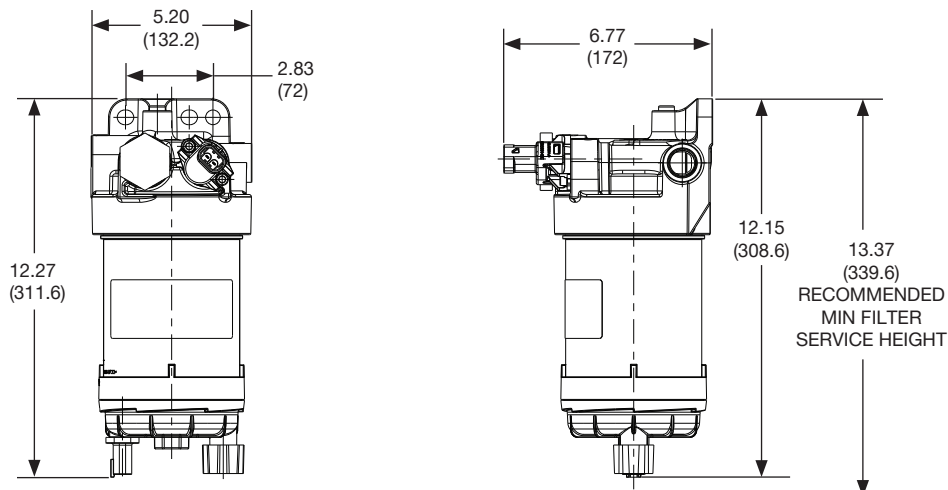




Specifications

Specification	L-Series
Height Overall	12.27" (311.56 mm)
Depth Overall	6.5" (165.1 mm)
Width, max	5.2" (132.16 mm)
Mount Bracket Centers or Rear mount Centers	2.83" (72 mm) 2.06" (52.5 mm)
Weight (Dry)	4.64 lbs (2.1 kg)
Fuel Connections (Inlet)	7/8"-14
Fuel Connections (Outlet)	7/8"-14
Fuel Capacity (w/o filter)	47 fl oz (1390 mL)
Operation Fuel Flow Rate	60 gal/h (227.1 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	5.4 fl oz (160 mL)
Filter Service Clearance	Min. 1.22" (31 mm)
Mounting Bracket	Cast in Head
Electrical Heater	24 VDC, 300 W or 12 VDC, 300 W
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Biodiesel, and JPS

Dimensions



Ordering Information

L-Series

Housing Part Number	Element Spin-On	Heater	WIF	Fuel In & Fuel Out Port Size	Priming Pump	Heater Service Kit
FH0014300	FS1098	N/A	Yes	7/8"-14	N/A	N/A
FH0014400	FS1098	12 V	Yes	7/8"-14	N/A	SP1166
FH0014500	FS1098	24 V	Yes	7/8"-14	N/A	SP1167

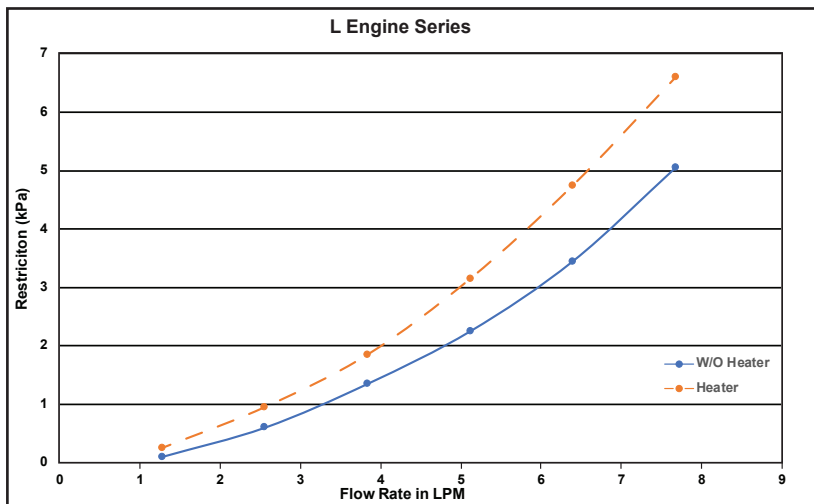
Replacement Filter

Part Number	Description
FS1098	StrataPore™ 10 micron

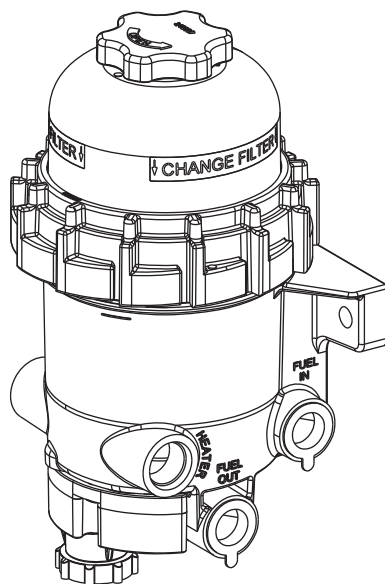
Filter Specifications

- Emulsified Water Separation: 93% efficiency at 46 gal/h (210 L/h) flow per SAE J1488 (modified).
- Efficiency of 98.7% at 10 micron (c) as per ISO 19438.

Performance



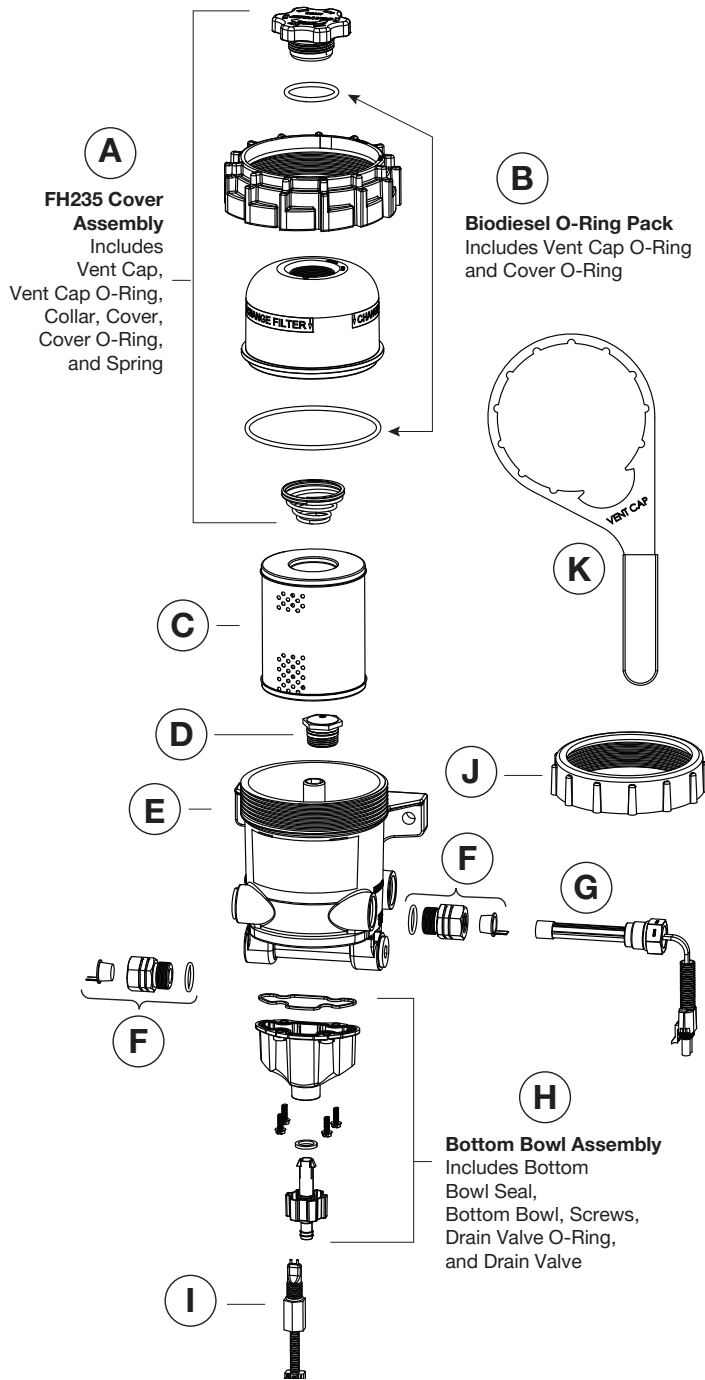
Filter/Separator/Warmer



Specifications

Specification	Diesel Pro® 235
Height Overall	10.75" (273.1 mm)
Depth Overall	5.8" (147.3 mm)
Width, max	6.22" (158.0 mm)
Mount Bracket Centers or Rear Mount Centers	5.25" (133.4 mm) 3.0" (76.2 mm)
Weight (Dry)	5 lbs (2.27 kg)
Fuel Connections (Inlet)	7/8"-14 (M16 x 1.5)
Fuel Connection (Outlet)	7/8"-14 (M16 x 1.5)
Fuel Capacity (w/o filter)	70.2 fl oz (1995 mL)
Operation Fuel Flow Rate	60 gal/h (230 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	15.2 fl oz (450 mL)
Filter Service Clearance	Min. 1.5" (38.1 mm)
Mounting Bracket	Cast in Head
Electrical Heater	12 VDC, 195 W, 8.5 A ± 0.8 A 24 VDC, 195 W, 4.5 A ± 0.5 A 120 VAC, 75 W, 0.64 A ± 0.06 A
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Kerosene, Biodiesel, and JP8

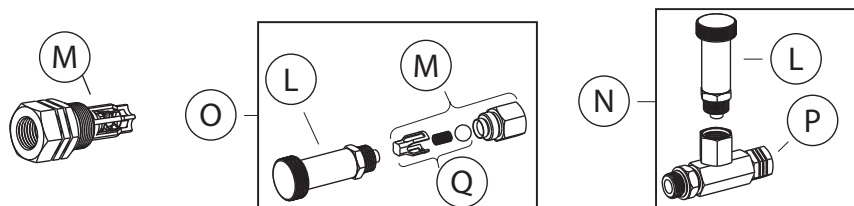
Specifications subject to change without notice.



Parts List

Part	Description	Part Number
A	FH235 Cover Assembly includes Vent Cap, Vent Cap O-Ring, Collar, Cover, Cover O-Ring, and Spring)	3973506 S
B	O-Ring Pack (Vent Cap O-Ring and Cover O-Ring)	3954449 S
C	Filter Element	See Ordering Information
D	Check Valve Assembly	SP1413
E	Diesel Pro® FH235, Unheated	See Ordering Information
F	Adapter - 7/8"-14 to M16 x 1.5 Adapter - 7/8"-14 to 3/8" NPT	3973689 S 3980209 S
G	Pre-Heater, 12V, 195 W, WP Connector Pre-Heater, 24V, 195 W, WP Connector Pre-Heater, 24V, 195 W, Tyco Connector 120 VAC, 75 W Heater	SP1312 SP1313 SP1314 3980208 S
H	Bottom Bowl Assembly (includes Bottom Bowl Seal, Bottom Bowl, Screws, Drain Valve O-Ring, and Drain Valve)	SP72263
I	Water-In-Fuel (WIF) Sensor	3957158 S
J	Collar for Reduced Clearance Applications (optional)	3945059 S
K	Collar Wrench, Metal	3944458 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
L	Manual Primer Pump Plunger Assembly	3975110 S
M	Primer Pump Check Valve (M16) Primer Pump Check Valve (M18) Primer Pump Check Valve (3/8") Primer Pump Check Valve (7/8")	3981659 S 3981660 S SP1642 3975109 S
N	Primer Pump Service Kit (M16) Primer Pump Service Kit (M18) Primer Pump Service Kit (3/8")	3979203 S 3979202 S SP1632
O	Primer Pump Service Kit	3975111 S
P	Check Valve Assembly (M18) Check Valve Assembly (M16) Check Valve Assembly (7/8") Check Valve Assembly (3/8")	SP72127 SP72128 SP72129 SP72130
Q	Check Valve Assembly Kit	SP1644

Manual Primer Pumps



Ordering Information

Housing Part Number	Filter Element	Heater	WIF	Cover	Fuel Flow	Fuel In & Fuel Out Port Size	Priming Pump
FH23500	FS19730	N/A	N/A	Short	In Right/Out Left	7/8"-14	No
FH23501	FS19730	24 VDC, 195 W	N/A	Short	In Right/Out Left	7/8"-14	No
FH23502	FS19730	12 VDC, 195 W	N/A	Short	In Right/Out Left	7/8"-14	No
FH23503 M*	FS19785	N/A	Yes	Short	In Right/Out Left	M16	No
FH23504 M*	FS19785	24 VDC, 195 W	Yes	Short	In Right/Out Left	M16	No
FH23506	FS19731	24 VDC, 195 W	Yes	Short	In Right/Out Left	7/8"-14	No
FH23508	FS19731	N/A	Yes	Short	In Right/Out Left	7/8"-14	No
FH23509 M*	FS19731	N/A	Yes	Short	In Right/Out Left	M16	No
FH23510	FS19731	12 VDC, 195 W	Yes	Short	In Right/Out Left	7/8"-14	No
FH23515 M*	FS19731	N/A (open)	Yes	Short	In Right/Out Left (all open)	M16	Yes
FH23517	FS19730	N/A	N/A	Short	In Right/Out Left	3/8" NPTF	No
FH23518 M*	FS19731	24 VDC, 195 W	Yes	Short	In Right/Out Left	M16	No

* Metric units - not available in Europe

Note: The Diesel Pro 235 can be upgraded to a Diesel Pro 236 by replacing the cover with Fleetguard part number **3973506 S** and the filter with Fleetguard part number **FS19624**. For more information, contact Fleetguard Customer Assistance.

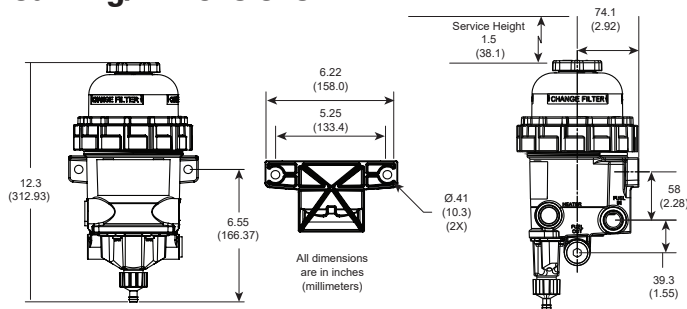
Replacement Filters

Part Number	Description
FS19730	StrataPore™ 7 micron
FS19731	StrataPore 10 micron
FS19785	StrataPore 25 micron

Filter Specifications

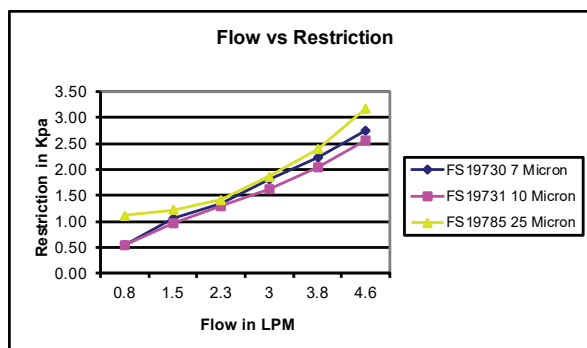
- Emulsified Water Separation: 95% efficiency at 60 gal/h (227 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 60 gal/h (227 L/h) flow per SAE J1839

Mounting/Dimensions

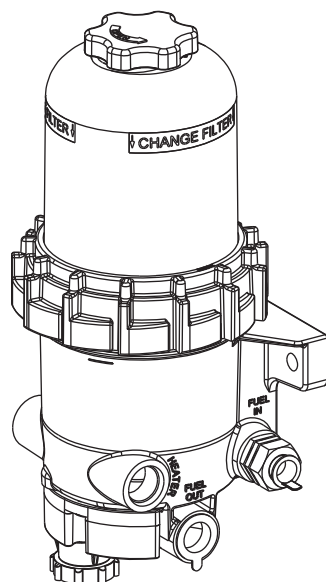


Performance

Filter Restriction vs Flow



Filter/Separator/Warmer

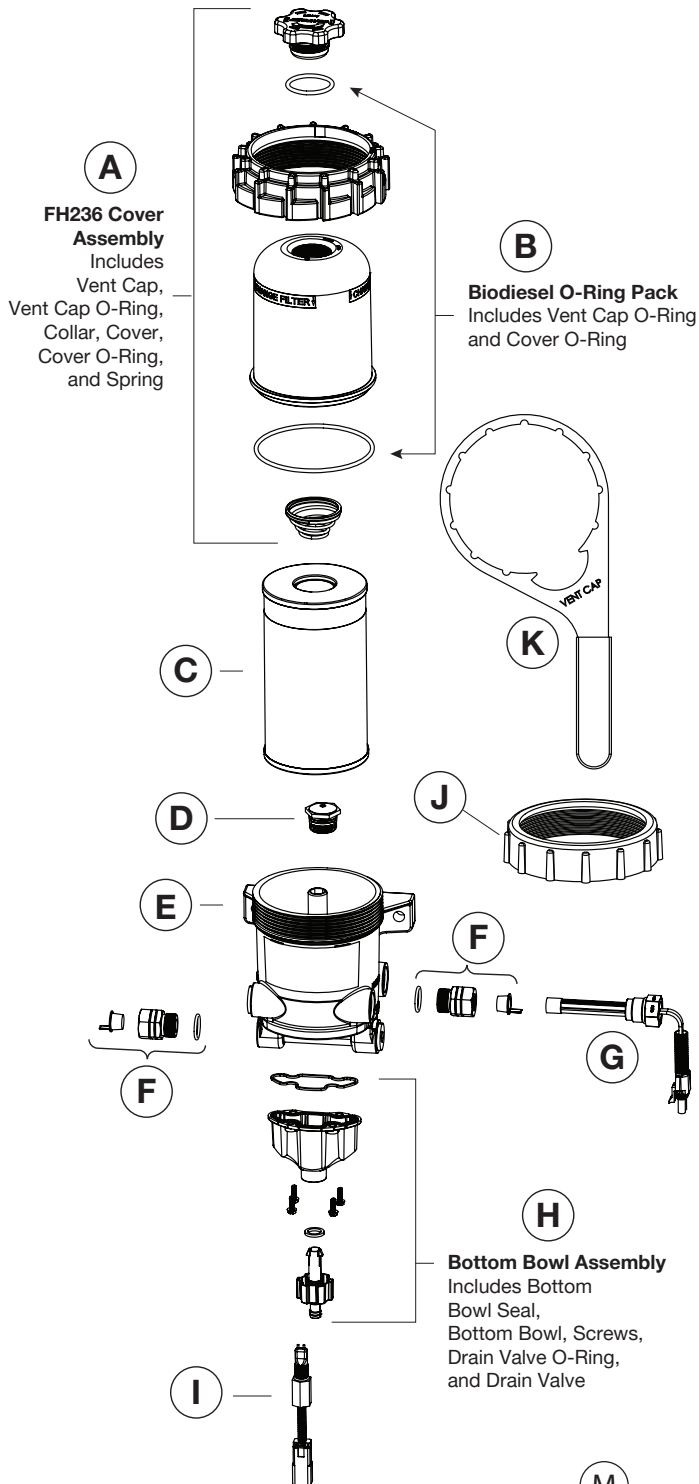


Specifications

Specification	Diesel Pro® 236
Height Overall	13.0" (330.2 mm)
Depth Overall	5.8" (147.3 mm)
Width, max	6.22" (158.0 mm)
Mount Bracket Centers or Rear Mount Centers	5.25" (133.4 mm) 3.0" (76.2 mm)
Weight (Dry)	5 lbs (2.27 kg)
Fuel Connections (Inlet)	7/8"-14 (M16 x 1.5)
Fuel Connection (Outlet)	7/8"-14 (M16 x 1.5)
Fuel Capacity (w/o filter)	70.2 fl oz (1995 mL)
Operation Fuel Flow Rate	90 gal/h (341 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	15.2 fl oz (450 mL)
Filter Service Clearance	Min. 1.5" (38.1 mm)
Mounting Bracket	Cast in Head
Electrical Heater	12 VDC, 195 W, 8.5 A ± 0.8 A 24 VDC, 195 W, 4.5 A ± 0.5 A 120 VAC, 75 W, 0.64 A ± 0.06 A
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Kerosene, Biodiesel, and JP8

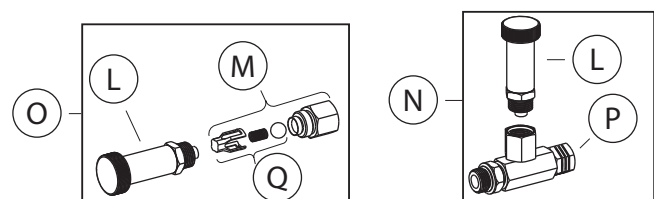
Specifications subject to change without notice.

Parts List



Part	Description	Part Number
A	FH236 Cover Assembly includes Vent Cap, Vent Cap O-Ring, Collar, Cover, Cover O-Ring, and Spring)	3974145 S
B	O-Ring Pack (Vent Cap O-Ring and Cover O-Ring)	3954449 S
C	Filter Element	See Ordering Information
D	Check Valve Assembly	SP1413
E	Diesel Pro® FH236, Unheated	See Ordering Information
F	Adapter - 7/8"-14 to M16 x 1.5 Adapter - 7/8"-14 to 3/8" NPT	3973689 S 3980209 S
G	Pre-Heater, 12 V, 195 W, WP Connector Pre-Heater, 24 V, 195 W, WP Connector Pre-Heater, 24 V, 195 W, Tyco Connector 120 VAC, 75 W Heater	SP1312 SP1313 SP1314 3980208 S
H	Bottom Bowl Assembly (includes Bottom Bowl Seal, Bottom Bowl, Screws, Drain Valve O-Ring, and Drain Valve)	SP72263
I	Water-In-Fuel (WIF) Sensor	3957158 S
J	Collar for Reduced Clearance Applications (optional)	3945059 S
K	Collar Wrench, Metal	3944458 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
L	Manual Primer Pump Plunger Assembly	3975110 S
M	Primer Pump Check Valve (M16) Primer Pump Check Valve (M18) Primer Pump Check Valve (3/8") Primer Pump Check Valve (7/8")	3981659 S 3981660 S SP1632 3975109 S
N	Manual Primer Pump (M16) Manual Primer Pump (M18) Manual Primer Pump (3/8")	3979203 S 3979202 S SP1632
O	Primer Pump Service Kit	3975111 S
P	Check Valve Assembly (M18) Check Valve Assembly (M16) Check Valve Assembly (7/8") Check Valve Assembly (3/8")	SP72127 SP72128 SP72129 SP72130
Q	Check Valve Service Kit	SP1644

Manual Primer Pumps



Ordering Information

Housing Part Number	Filter Element	Heater	WIF	Cover	Fuel Flow	Fuel In & Fuel Out Port Size	Priming Pump
FH23600	FS19624	N/A	N/A	Tall	In Right/Out Left	7/8"-14 SAE	No
FH23601	FS19624	12 VDC, 195 W	N/A	Tall	In Right/Out Left	7/8"-14 SAE	No
FH23602	FS19624	24 VDC, 195 W	N/A	Tall	In Right/Out Left	7/8"-14 SAE	No
FH23603	FS19728	N/A	Yes	Tall	In Right/Out Left	7/8"-14 SAE	No
FH23604 M*	FS19728	N/A	Yes	Tall	In Right/Out Left	M16	No
FH23605 M*	FS19728	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	No
FH23606 M*	FS19728	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	No
FH23607	FS19727	N/A	Yes	Tall	In Right/Out Left	7/8"-14 SAE	No
FH23608 M*	FS19727	N/A	Yes	Tall	In Right/Out Left	M16	No
FH23610	FS19728	N/A	N/A	Tall	In Right/Out Left	7/8"-14 SAE	No
FH23616 M**	FS19624	N/A	Yes	Tall	In Right/Out Left	M16	No
FH23617 M*	FS19728	N/A (open)	Yes	Tall	In Right/Out Left (all open)	M16	Yes
FH23618	FS19727	N/A	Yes	Tall	In Right/Out Left	7/8"-14 SAE	Yes
FH23621 M**	FS19624	12 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	No
FH23622 M**	FS19624	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	No
FH23623 M*	FS19624	N/A	Yes	Yes	In Right/Out Left	M16	Yes
FH23625 M*	FS19728	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M18	Yes
FH23627	FS19728	N/A	Yes	Tall	In Right/Out Left	3/8" NPTF	No
FH23696***	FS19624	N/A	N/A	Tall	In Right/Out Left	M16	No

* Metric units - available outside North America except Europe

** Metric units available in Europe

*** Includes drain valve with hose barb connection

Note: The Diesel Pro 235 can be upgraded to a Diesel Pro 236 by replacing the cover with Fleetguard part number **3973506 S** and the filter with Fleetguard part number **FS19624**. For more information, contact Fleetguard Customer Assistance.

Replacement Filters

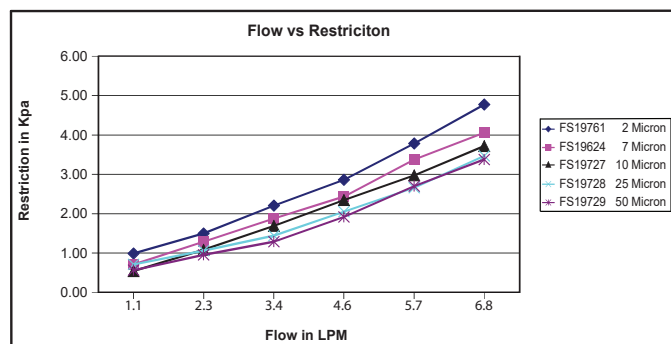
Part Number	Description
FS19761	EleMax™ StrataPore™ 5 micron
FS19624	EleMax StrataPore 7 micron
FS19729	EleMax Cellulose 50 micron
FS19728	EleMax StrataPore 25 micron
FS19727	EleMax StrataPore 10 micron

Filter Specifications

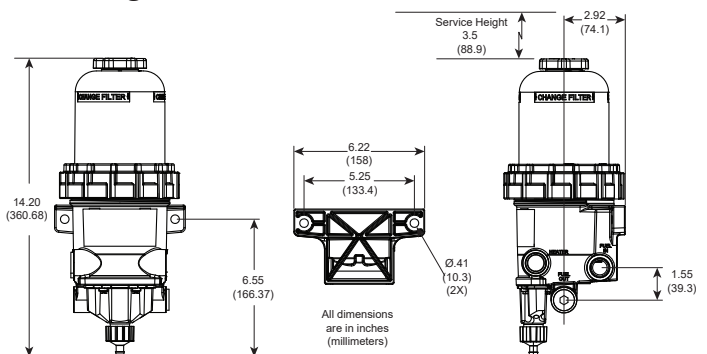
- Emulsified Water Separation: 95% efficiency at 100 gal/h (379 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 100 gal/h (379 L/h) flow per SAE J1839

Performance

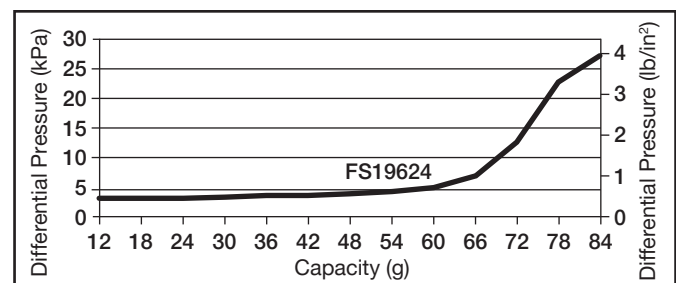
Filter Restriction vs Flow



Mounting/Dimensions

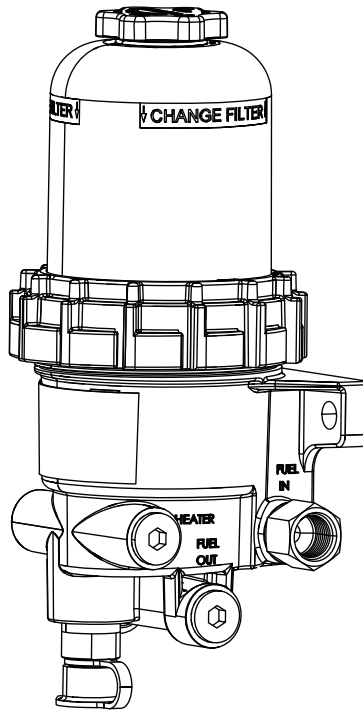


Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

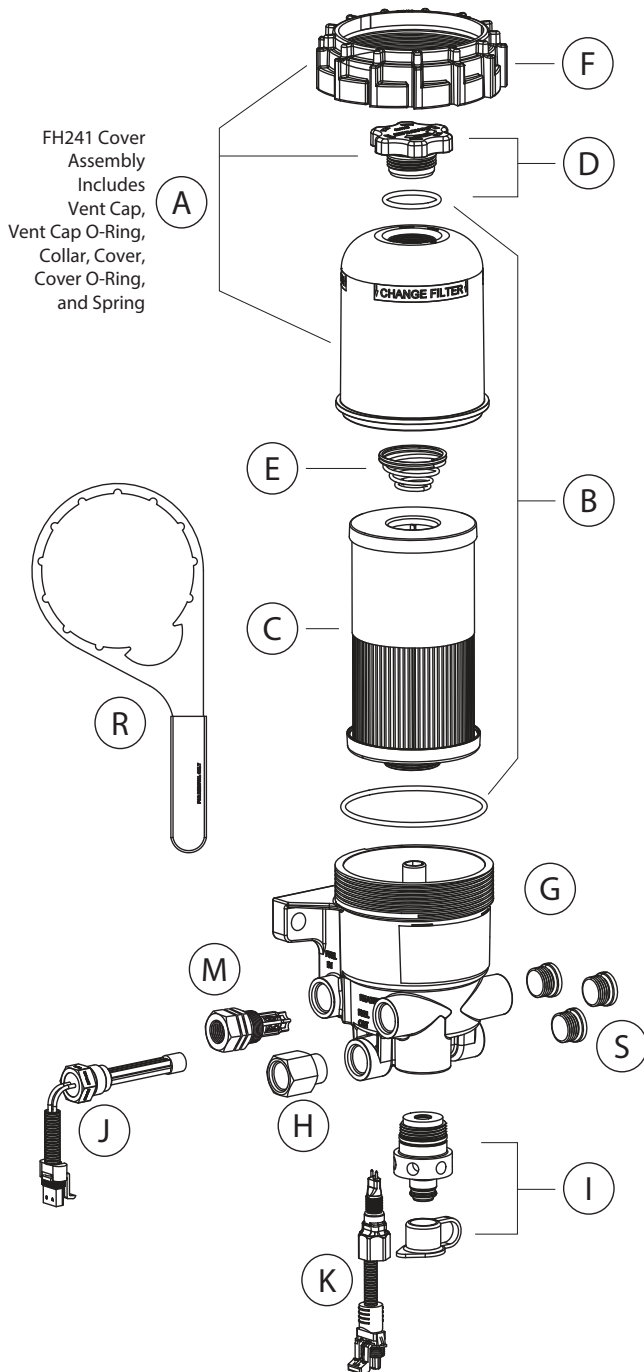
Diesel Pro® 241



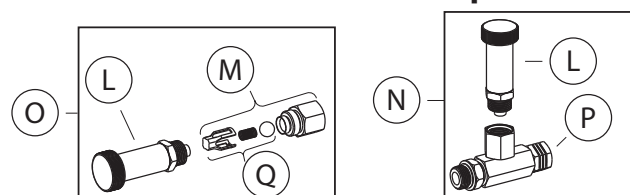
Specification	Diesel Pro 241
Height Overall	13.36" (339.5 mm)
Depth Overall	5.8" (147.3 mm)
Width, max	6.22" (158.0 mm)
Mount Bracket Centers or Rear mount Centers	5.25" (133.4 mm) 3.0" (76.2 mm)
Weight (Dry)	6-7 lbs (3.72-3.17 kg)
Fuel Connections (Inlet)	7/8"-14 (M16 x 1.5)
Fuel Connections (Outlet)	7/8"-14 (M16 x 1.5)
Fuel Capacity (w/o filter)	70.2 fl oz (1995 mL)
Operation Fuel Flow Rate	60 gal/h (227 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	15.2 fl oz (450 mL)
Filter Service Clearance	Min. 3.5" (88.9 mm)
Mounting Bracket	Cast in Head
Electrical Heater	24 VDC, 195 W Tyco Connector 24 VDC, 195 W WP Connector 120 VAC, 75 W
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Biodiesel, and JPS

Parts List

Part	Description	Part Number
A	FH241 Cover Assembly includes Vent Cap, O-Ring, Collar, Cover, Cover O-Ring, & Spring	3974145 S
B	O-Ring Pack - (Vent Cap and Collar)	3945061 S
C	Filter Element	See page 9
D	Vent Cap Service Kit	SP1053
E	Filter Spring	3944441 S
F	Reduced Clearance Collar	3945059 S
G	Diesel Pro® FH241, Unheated	See page 13
H	Adapter - 7/8" to M16 Adapter - 7/8" to M18 Adapter - 7/8" to 3/8"	3973689 S SP1643 3980209 S
I	Drain Cap	SP1647
J	Pre-Heater, 24 V, 195 W Tyco Connector Pre-Heater, 24 V, 195 W WP Connector Over Night Heater, 120 V	SP1314 SP1313 3945121 S
K	Water-In-Fuel (WIF) Sensor	3957158 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
	ESOC/Drain Valve	SP1645
	Drain Valve Service Kit	SP1646
	WIF Port Plug	SP1125
L	Manual Primer Pump Assembly	3975110 S
M	Primer Pump Check Valve (M16)	3981659 S
	Primer Pump Check Valve (M18)	3981660 S
	Primer Pump Check Valve (3/8")	SP1642
	Primer Pump Check Valve (7/8")	3975109 S
N	Primer Pump Service Kit (M16)	3979203 S
	Primer Pump Service Kit (M18)	3979202 S
	Primer Pump Service Kit (3/8")	SP1632
O	Primer Pump Service Kit	3975111 S
P	Check Valve Assembly (M18)	SP72127
	Check Valve Assembly (M16)	SP72128
	Check Valve Assembly (7/8")	SP72129
	Check Valve Assembly (3/8")	SP72130
Q	Check Valve Service Kit	SP1644
R	Collar Wrench, Metal	3944458 S
S	Drain Plug	3973690 S



Manual Primer Pumps



Ordering Information

FH241 Series

Housing Part Number	Filter Element	Heater	WIF	Cover	Fuel Flow	Fuel In & Fuel Out Port Size	Priming Pump
FH24100	FS20081	N/A	Yes	Tall	In Left/Out Left	M16	Yes
FH24101	FS20081	N/A	Yes	Tall	In Right/Out Left	7/8"-14 UNF	Yes
FH24102	FS20081	N/A	Yes	Tall	In Right/Out Left	3/8" NPTF	Yes
FH24103	FS20081	N/A	Yes	Tall	In Right/Out Left	M16	Yes
FH24104	FS20081	24 VDC, 195 W	Yes	Tall	In Left/Out Left	M16	Yes
FH24105	FS20081	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	Yes
FH24106	FS20081	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	Yes
FH24107	FS20081	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M18	Yes
FH24108	FS20081	120 VDC, 75 W	Yes	Tall	In Right/Out Left	3/8" NPTF	Yes
FH24110	FS20081	N/A	No	Tall	In Right/Out Left	7/8"-14 UNF	No
FH24111	FS20081	N/A	No	Tall	In Right/Out Left	M16	No
FH24112	FS20081	N/A	Yes	Tall	In Right/Out Left	7/8"-14 UNF	No
FH24113	FS20081	N/A	Yes	Tall	In Right/Out Left	M16	No
FH24114	FS20081	24 VDC, 195 W	Yes	Tall	In Right/Out Left	M16	No

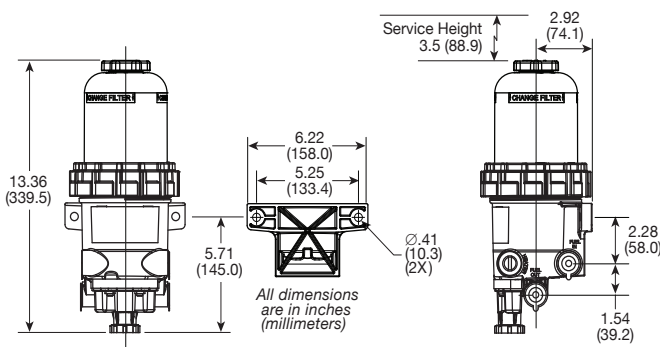
Replacement Filter

Part Number	Description
FS20081	EleMax™ StrataPore™ 10 micron

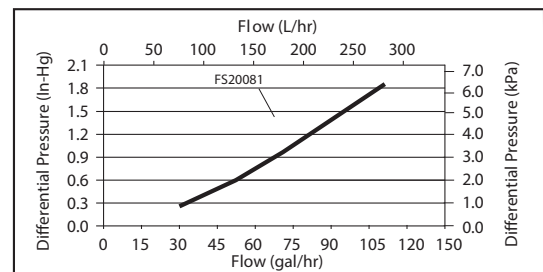
Filter Specifications

- Emulsified Water Separation: 93% efficiency at 46 gal/h (210 L/h) flow per SAE J1488 post Oct 2010
- Efficiency of 98.7% at 10 micron (c) as per ISO 19438.

Mounting/Dimensions



Performance

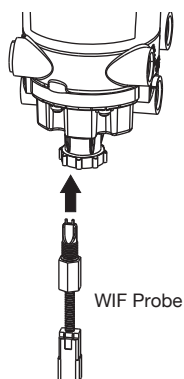


Ordering Information

Part Number	Description
3957158 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation



Specifications

Specification	WIF
Resistance Across Pins	82 kΩ ±2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC
Signal Type	Analog
Thread	1/2" 20 UNF-2B
Output Deutsch Connector	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT06-2S
Height to Water Sensing (Switch is in ON Position)	0.58" (14.73 mm)
Overall Length	2.328" (59.12 mm)
Length – Top of Probe to Bottom of Knuckle	1.201" (30.50 mm)
Length – Bottom of Knuckle to Top of Pin	0.79" (20.0 mm)
Distance Between Pins (Center to Center)	0.215" (5.46 mm)

Specifications subject to change without notice.

Ordering Information

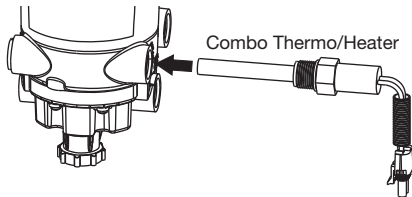
Part Number	Description
SP1312	Pre-Heater, 12 V, 195 W, WP Connector
SP1313	Pre-Heater, 24 V, 195 W, WP Connector
SP1314	Pre-Heater, 24 V, 195 W, Tyco Connector
3980208 S	120 VAC, 75 W Heater

Specifications

Specification	SP1312	SP1313	SP1314	3980208 S
Volts	12 VDC	24 VDC	24 VDC	120 VAC
Watts	195 W	195 W	195 W	75 W
Amps	8.5 ± 0.8 A	4.5 ± 0.5 A	4.5 ± 0.5 A	0.64 A ± 0.06 A
Cold Resistance	0.86 - 1.02 Ω	3.5 - 4.1 Ω	2.45 - 2.55 Ω	175-199 Ω
N/A Switch Open Temp.	≥ 62 °F (17 °C)	≥ 62 °F (17 °C)	≥ 62 °F (17 °C)	N/A
Switch Closed Temp.	≤ 40 °F (4 °C)	≤ 40 °F (4 °C)	≤ 40 °F (4 °C)	N/A

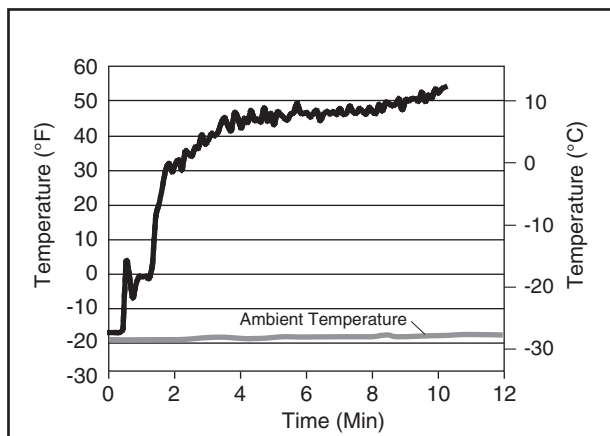
Specifications subject to change without notice.

Installation

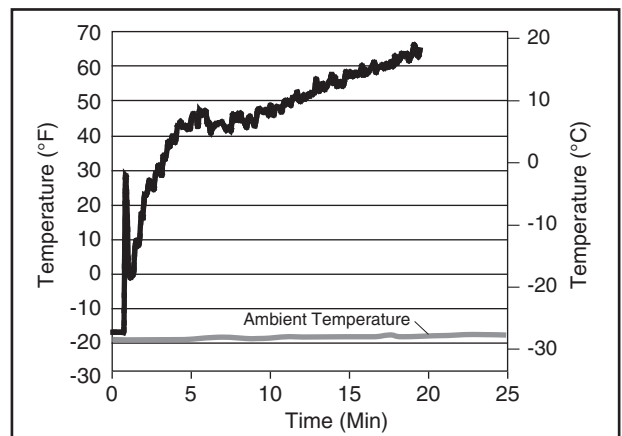


Performance

Temperature vs Time - #2 Diesel Fuel



Temperature vs Time - SME Biodiesel Fuel



Note: Typical temperature rise from the heater is 5°. Large increases in temperature over time can be attributed to the hot fuel returned back from the tank.

Ordering Information

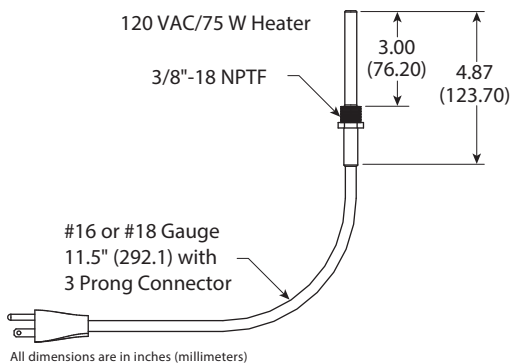
Part Number	Description
3945121 S	120 VAC, 75 W Heater

Specifications

Specification	3945121 S
Volts	120 VAC
Watts	75 W
Amps	0.63 A
Cold Resistance	187 ± 12 Ω
Plug	Molded 120 V Male Wall Plug
Temp. Rating	221 °F (105 °C)
Cordset Length	11.5" (29.2 cm)

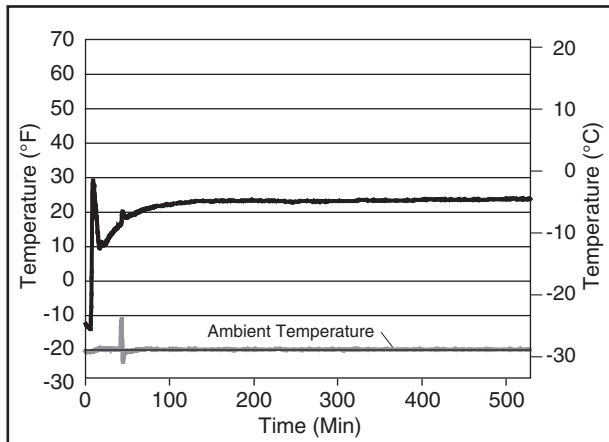
Specifications subject to change without notice.

Installation

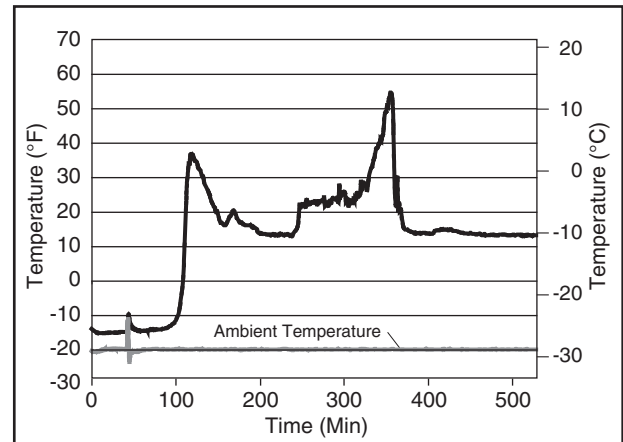


Performance

Temperature vs Time - #2 Diesel Fuel

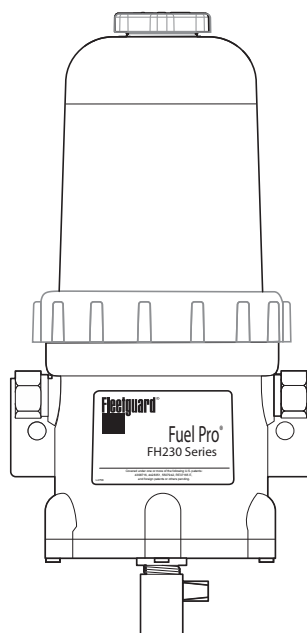


Temperature vs Time - SME Biodiesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975. Tests for SME (Soybean Methyl Esther) Biodiesel Fuel run per ASTM D-975 and ASTM D6751.

Filter/Separator/Warmer

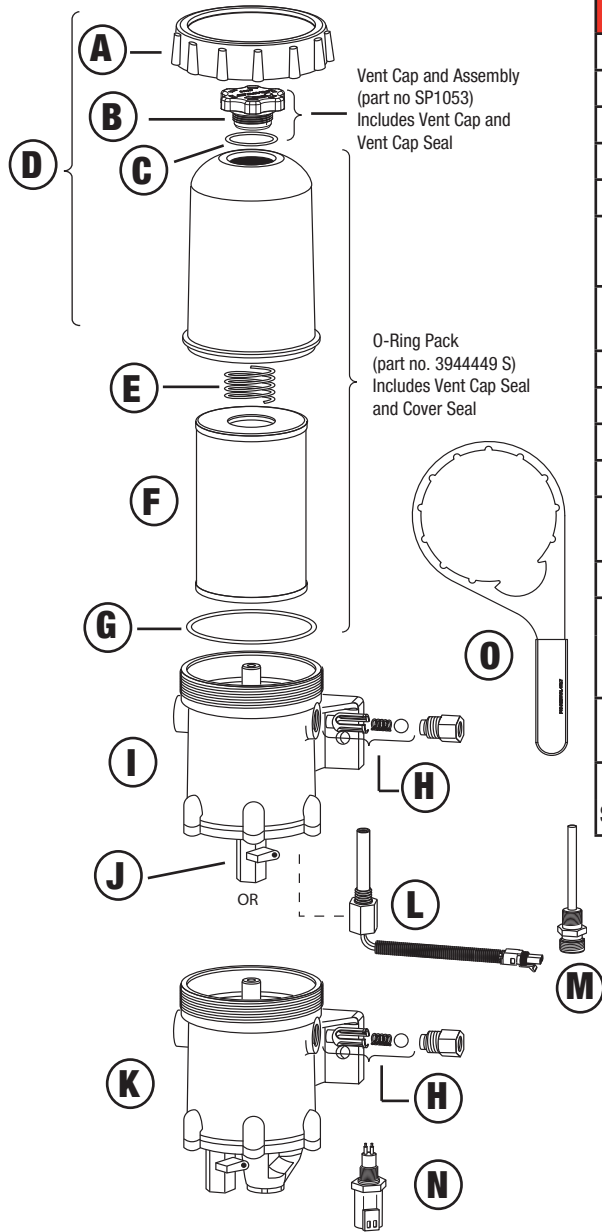


Specifications

Specification	Fuel Pro® Standard & Plus Series	Fuel Pro® EXT Series
Height Overall	16.13" (409.7 mm)	14.28" (362.7 mm)
Depth Overall	7.25" (184.15 mm)	6.58" (167.13 mm)
Width, max	6.89" (175 mm)	8.34" (211.8)
Mount Bracket Centers	5.91" (150.11 mm)	3.94" (100.0 mm)
Weight (Dry)	7.25 - 9.75 lbs (3.9 - 4.42 kg)	10.35 lbs (262.89)
Fuel Connection (Inlet)	1/2"-14 NPTF (M22 x 1.5)	1/2"-14 NPTF (M22 x 1.5)
Fuel Connection (Outlet)	1/2"-14 NPTF (M22 x 1.5)	1/2"-14 NPTF (M22 x 1.5)
Fluid Heat Connection (Inlet)	3/8" -18 NPTF (M14 x 1.5)	1/2"-14 NPTF (M22 x 1.5)
Fluid Heat Connection (Outlet)	3/8" -18 NPTF (M14 x 1.5)	1/2"-14 NPTF (M22 x 1.5)
Fuel Capacity (w/ filter)	64.2 fl oz (1.9 L)	110.2 fl oz (3.26 L)
Operation Fuel Flow Rate	180 gal/hr (681 L/hr)	180 gal/hr (681 L/hr)
Recommended Applications	Heavy Duty Engines	Heavy Duty Engines
Water Trap Capacity	33.8 fl oz (1.0 L)	20.3 fl oz (0.6 L)
Filter Service Clearance	Min. 1.5" (38.1 mm)	Min. 3.50" (88.9 mm)
Electrical Heater	12 VDC, 195 W, 8.5 A +/-0.8 24 VDC, 195 W, 4.5 A +/-0.4 A 120 VAC, 75 W, 0.63 A ± 0.1 A	12 VDC, 195 W, 8.5 A +/-0.8 A 24 VDC, 195 W, 4.5 A +/-0.4 A 120 VAC, 75W, 0.63 +/-0.1 A
Fuel Types	Compatible for use with #1 Diesel, #2 Diesel, Kerosene, Biodiesel, and JP8	

Specifications subject to change without notice.

Standard and Plus Series



Parts List

Part	Description	Part Number
A	Collar	3946706 S
B	Vent Cap	Vent Cap and O-Ring SP1503
C	O-Ring	
D	Cover Assembly	SP1244
E	Holddown Spring	3944441 S
F	Filter Element (Includes Grommet and O-Rings)	See Ordering Information
G	O-Ring Pack - included with each replacement element	3944449 S
H	Check Valve Service Kit	3944447 S
I	Fuel Pro®, Unheated	See Ordering Information
J	Drain Valve	3944453 S
K	Fuel Pro, Heated	See Ordering Information
L	Pre-Heater, 12 VDC, 195 W, WP Connector Pre-Heater, 24 VDC, 195 W, WP Connector	SP1321 SP1319
M	120 VAC Electric Heater	See AC Heater Unit page
N	Water-In-Fuel (WIF) Sensor	3911940 S
	Water-In-Fuel (WIF) Sensor for Units with Fluid Heat	3957158 S
O	Collar Wrench, Plastic	3944451 S
	Collar Wrench, Metal	3944448 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S

Note: The WIF sensor is not included, but can be purchased separately.

Ordering Information

Housing Part No.	Filter Element**	Size	Pre-Heater 1	Pre-Heater 2	Fluid Heat	WIF	Fuel Flow
FH23027	FS19763	Plus	12 VDC	120 VAC	Yes	N/A	In Rt./Out Lt.
FH23028	FS19763	Plus	24 VDC	120 VAC	Yes	N/A	In Rt./Out Lt.
FH23029	FS19763	Plus	N/A	N/A	N/A	N/A	In Rt./Out Lt.
FH23030	FS19905G	Plus	N/A	N/A	N/A	N/A	In Rt./Out Lt.
FH23031	FS19763	Plus	12 VDC	N/A	N/A	N/A	In Rt./Out Lt.
FH23032	FS19763	Plus	24 VDC	N/A	N/A	N/A	In Rt./Out Lt.
FH23038	FS19763	Plus	N/A	N/A	Yes	N/A	In Rt./Out Lt.
FH23039	FS19763	Plus	N/A	N/A	Yes	Yes	In Rt./Out Lt.
FH23040	FS19763	Plus	12 VDC	N/A	Yes	N/A	In Rt./Out Lt.
FH23041	FS19763	Plus	12 VDC	N/A	Yes	Yes	In Rt./Out Lt.
FH23042	FS19763	Plus	24 VDC	N/A	Yes	N/A	In Rt./Out Lt.
FH23045	FS19763	Plus	120 VAC	N/A	Yes	N/A	In Rt./Out Lt.
FH23048	FS19728	Plus	24 VDC	120 VAC	N/A	Yes	In Rt./Out Lt.
FH23049	FS19763	Plus	12 VDC	N/A	N/A	Yes	In Rt./Out Lt.
FH23050	FS19763	Plus	24 VDC	N/A	N/A	Yes	In Rt./Out Lt.
FH23054	FS19763	Plus	12 VDC	120 VAC	N/A	N/A	In Rt./Out Lt.

Housing Part No.	Filter Element**	Size	Pre-Heater 1	Pre-Heater 2	Fluid Heat	WIF	Fuel Flow
FH23060	FS19765	Plus	N/A	N/A	N/A	Yes	In Rt./Out Lt.
FH23061	FS19763	Plus	N/A	N/A	N/A	Yes	In Rt./Out Lt.
FH23067M*	FS19765	Plus	24 VDC	N/A	N/A	Yes	In Rt./Out Lt.
FH23068M*	FS19765	Plus	Ports Available	N/A	N/A	Yes	In Rt./Out Lt.
FH23069M*	FS19765	Plus	24 VDC	N/A	Yes	Yes	In Rt./Out Lt.
FH23076	FS19765	Plus	N/A	N/A	N/A	N/A	In Rt./Out Lt.
FH23127	FS19764	Plus	12 VDC	N/A	N/A	Yes	In Rt./Out Lt.
FH23128	FS19765	Plus	12 VDC	N/A	N/A	Yes	In Rt./Out Lt.
FH23129	FS19905G	Plus	N/A	N/A	N/A	Yes	In Rt./Out Lt.
FH23130	FS19764	Plus	N/A	N/A	N/A	Yes	In Rt./Out Lt.
FH23131M	FS19764	Plus	Ports Available	N/A	N/A	Yes	In Rt./Out Lt.

* M designates metric connections of M22 x 1.5.

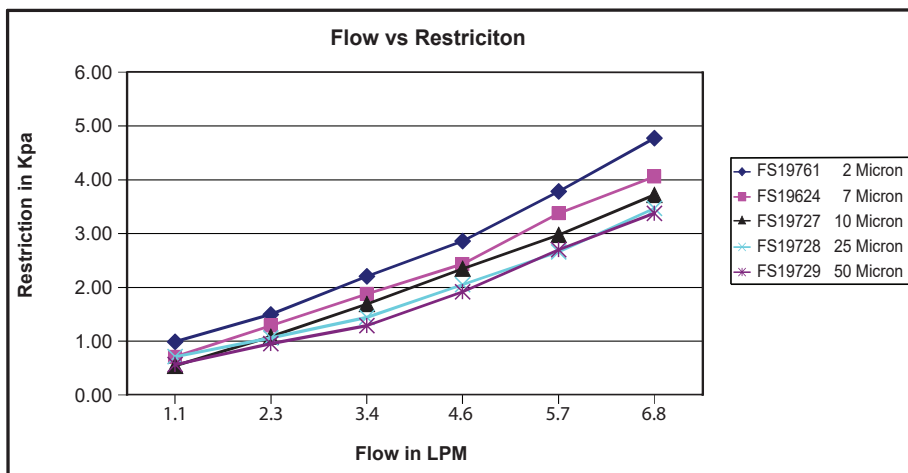
** Bio Oil Fuel Pro. Accepts only Plus Size replacement filters.

Replacement Filters

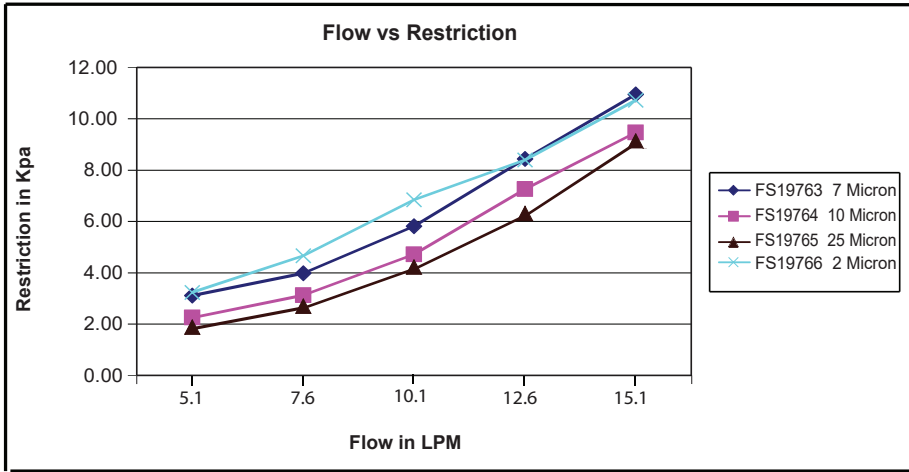
Part Number	Description
FS19761	EleMax™ StrataPore™ 5 micron
FS19624	EleMax StrataPore 7 micron
FS19727	EleMax StrataPore 10 micron
FS19728	EleMax StrataPore 25 micron
FS19729	EleMax Cellulose 50 micron

Part Number	Description
FS19763	EleMax™ StrataPore™ 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19766	EleMax StrataPore 5 micron (plus size)
FS19905G	EleMax StrataPore 50 micron (plus size)

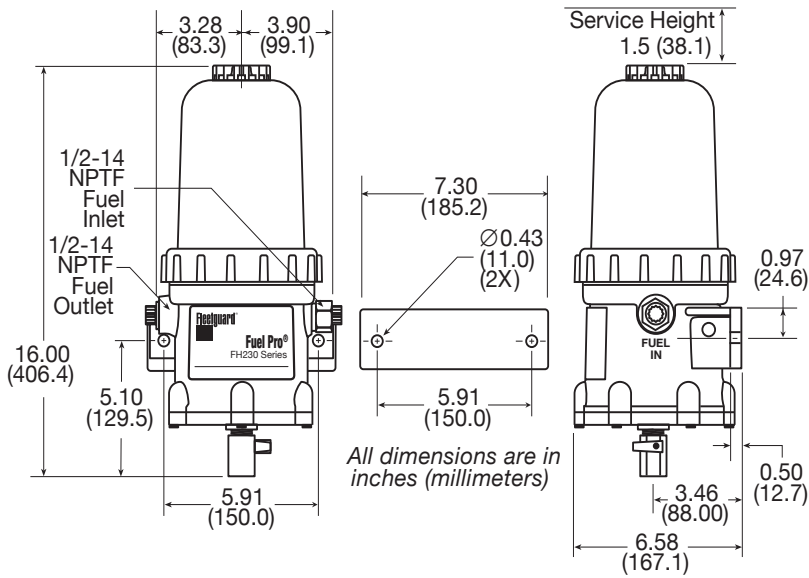
Performance



Performance



Mounting/Dimensions



Filter Specifications

Standard Size Filter

- Emulsified Water Separation: 95% efficiency at 100 gal/h (379 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 100 gal/h (379 L/h) flow per SAE J1839

Plus Size Filter

- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Note: Performance information included on the following page.

Water-In-Fuel (WIF) Sensor

Ordering Information

Part Number	Description
3911940 S	Water-In-Fuel (WIF) Sensor
3977418 S	Water-In-Fuel (WIF) Sensor for Units with Fluid Heat
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

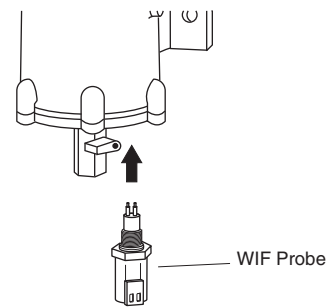
Note: The WIF sensor is not included, but can be purchased separately.

Specifications

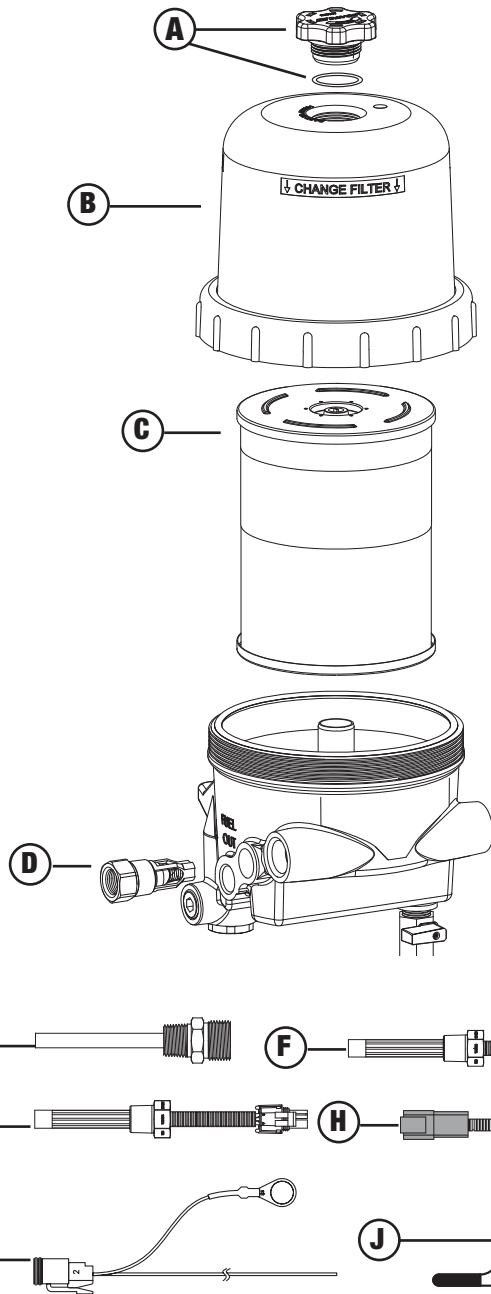
Specification	WIF
Resistance Across Pins	82 kΩ ±2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC
Signal Type	Analog
Thread	1/2" 20UNF-2B
Output Deutsch Connector	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT06-2S
Height to Water Sensing (Switch is in ON Position)	0.58" (14.73 mm)
Overall Length	2.328" (59.12 mm)
Length – Top of Probe to Bottom of Knuckle	1.201" (30.50 mm)
Length – Bottom of Knuckle to Top of Pin	0.79" (20.0 mm)
Distance Between Pins (Center to Center)	0.215" (5.46 mm)

Specifications subject to change without notice.

Installation



EXT Series



Parts List

Part	Description	Part Number
A	Vent Cap & Seal	SP1053
B	Cover Assembly	SP1127
C	Filter Element	FS19915
D	Check Valve Assembly	3944454 S
E	120VAC Overnight Heater	3945121 S
F	12VDC Pre-Heater (Metri-Pack)	SP1320
G	12VDC Pre-Heater (Weather-Pack)	SP1322
H	WIF (Deutsch Connector)	3957158 S
I	WIF Wiring Harness	3950729 S
J	Metal Collar Wrench	SP1076

Note: The WIF sensor is not included, but can be purchased separately.

Ordering Information

Housing Part No.	Filter Element**	Pre-Heater 1	Pre-Heater 2	Fluid Heat	WIF	Fuel Flow
FH23100	FS19915	N/A	N/A	N/A	No	In Lt./Out Lt.
FH23166	FS19915	24 VDC	N/A	N/A	Yes	In Rt./Out Lt.

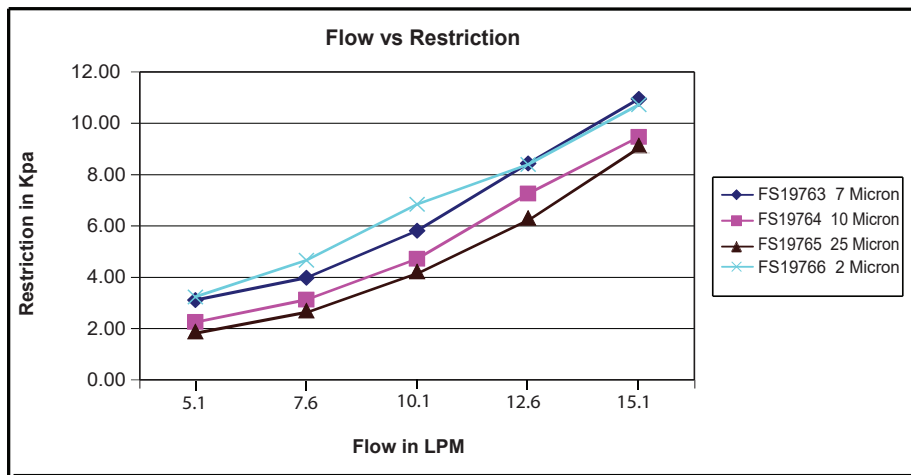
Replacement Filters

Part Number	Description
FS19915	EleMax™ StrataPore™ 7 micron
FS20139	EleMax StrataPore 10 micron (Not for use in Detroit Diesel engines)
FS20140	EleMax StrataPore 25 micron (Not for use in Detroit Diesel engines)

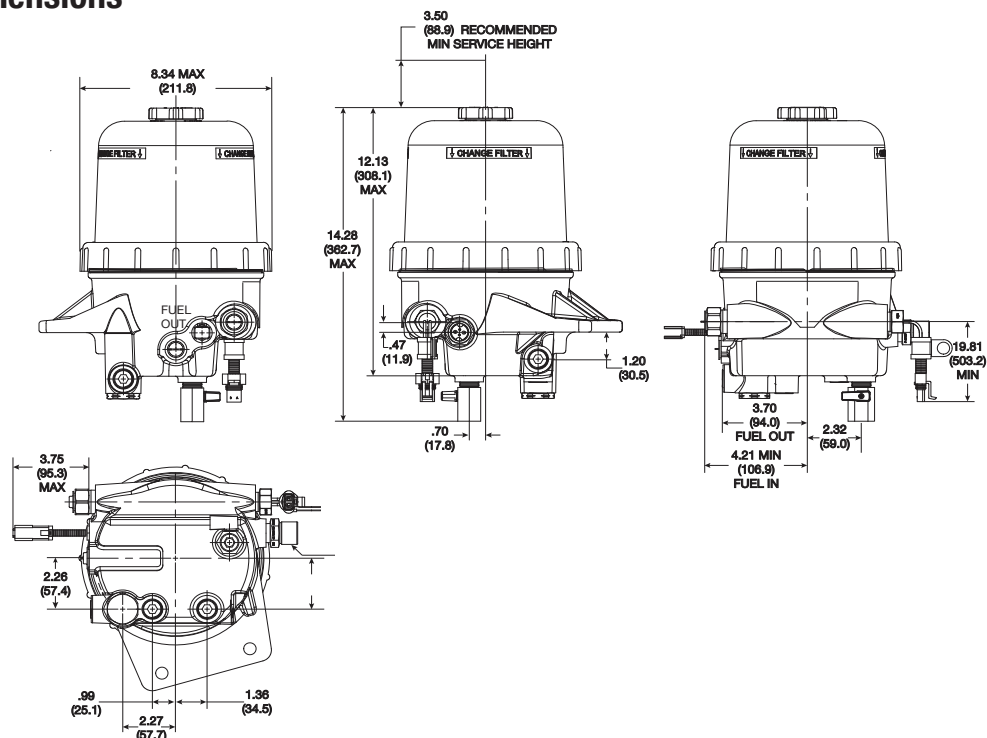
Filter Specifications

- Emulsified Water Separation: 95% efficiency at 7 L/min (110 GPH) flow per SAE J1488
- Free Water Separation: 95% efficiency at 7 L/min (110 GPH) flow per SAE J1839

Performance



Mounting/Dimensions



Ordering Information

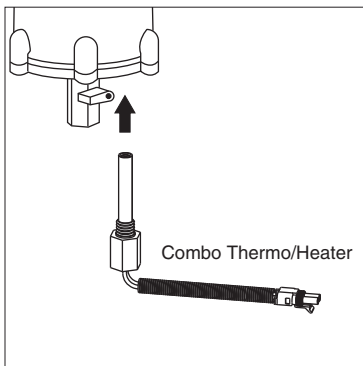
Part Number	Description
SP1319	Pre-Heater, 24 VDC, 195 W, Weather Pack Connector
SP1320	Pre-Heater, 12 VDC, 195 W, Metric Pack Connector
SP1321	Pre-Heater, 12 VDC, 195 W, Weather Pack Connector
SP1322	Pre-Heater, 12 VDC, 195 W, Weather Pack Connector
3945121 S	120 VAC, 75 Overnight Heater

Specifications

Specification	SP1319	SP13120	SP1321	SP1322	3945121 S
Volts	24 VDC	12 VDC	12 VDC	12 VDC	120 VAC
Watts	195 W	195 W	195 W	195 W	75 W
Amps	4.5 A ± 0.4 A	8.5 A ± 0.8 A	8.5 A ± 0.8 A	8.5 A ± 0.8 A	0.63 A ± 0.1 A

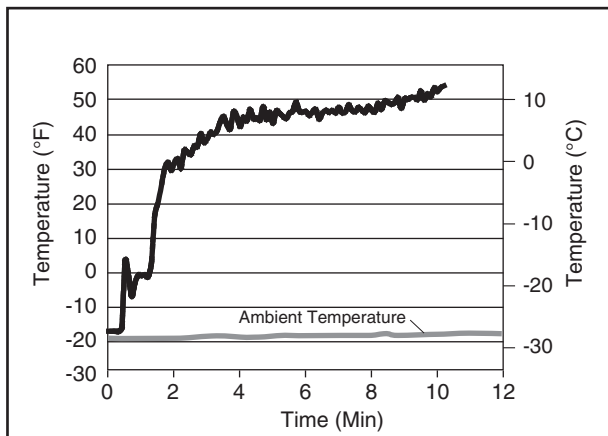
Specifications subject to change without notice.

Installation

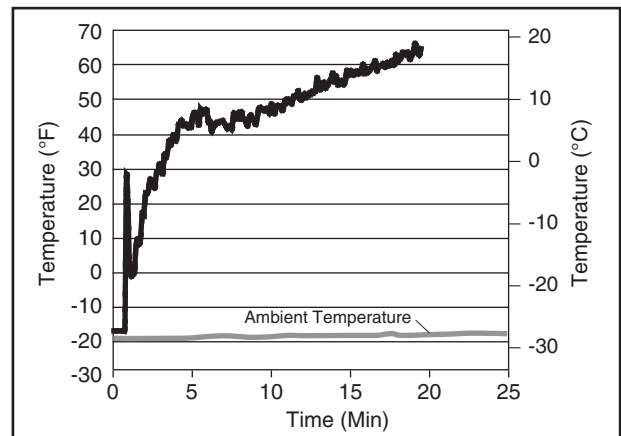


Performance

Temperature vs Time - #2 Diesel Fuel



Temperature vs Time - SME Biodiesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975. Tests for SME (Soybean Methyl Esther) Biodiesel Fuel run per ASTM D-975 and ASTM D6751.

Ordering Information

Part Number	Description
3945121 S	120 VAC, 75 W Overnight Heater
3945126 S	Single Cordset
3946716 S	Y Cordset (Y cord to processor and block heater w/ locking ring)

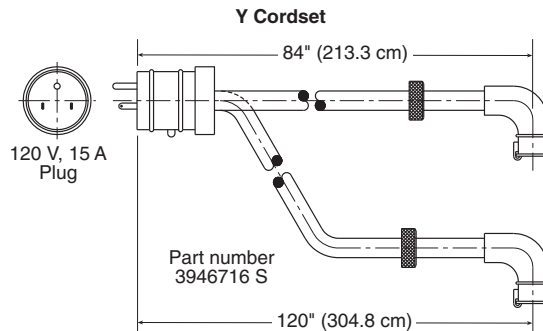
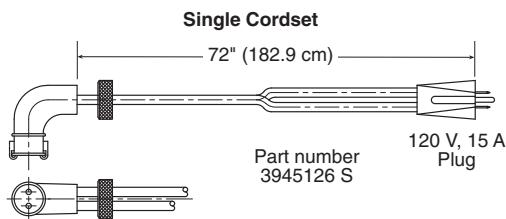
Specifications

Heater	
Specification	3945121 S
Volts	120 VAC
Watts	75 W
Amps	0.63 ± 0.1 A
Cold Resistance	187 ± 12 Ω

Cordsets		
Specification	3945126 S	3946716 S
Plug	120 V Male Wall Plug	120 V Male Wall Plug
Temp. Rating	221 °F (105 °C)	221 °F (105 °C)
Cordset Length	72" (182.9 cm)	Straight Leg – 84" (213.3 cm) Long Leg – 120" (304.8 cm)

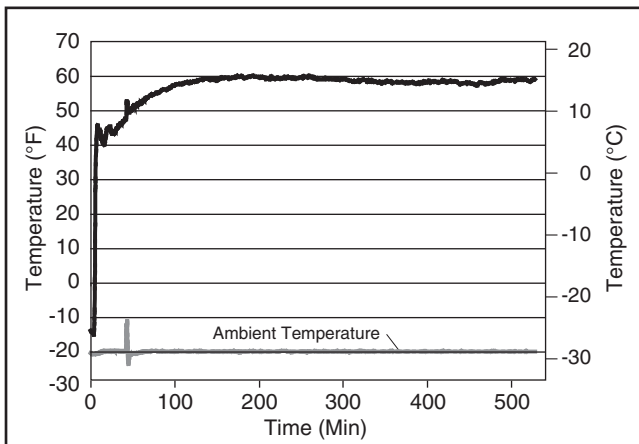
Specifications subject to change without notice.

Installation

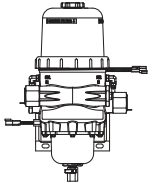
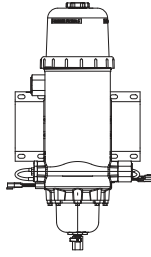
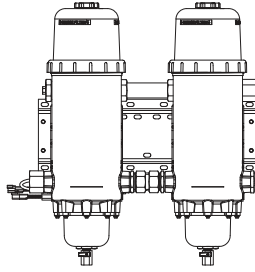
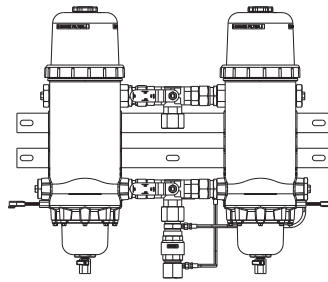
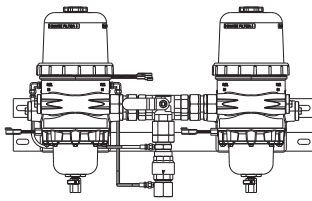
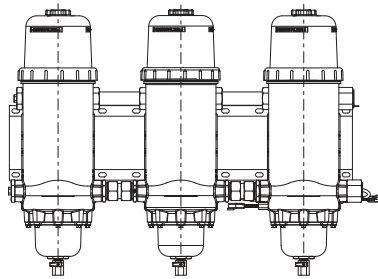


Performance

Temperature vs Time - #2 Diesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975.

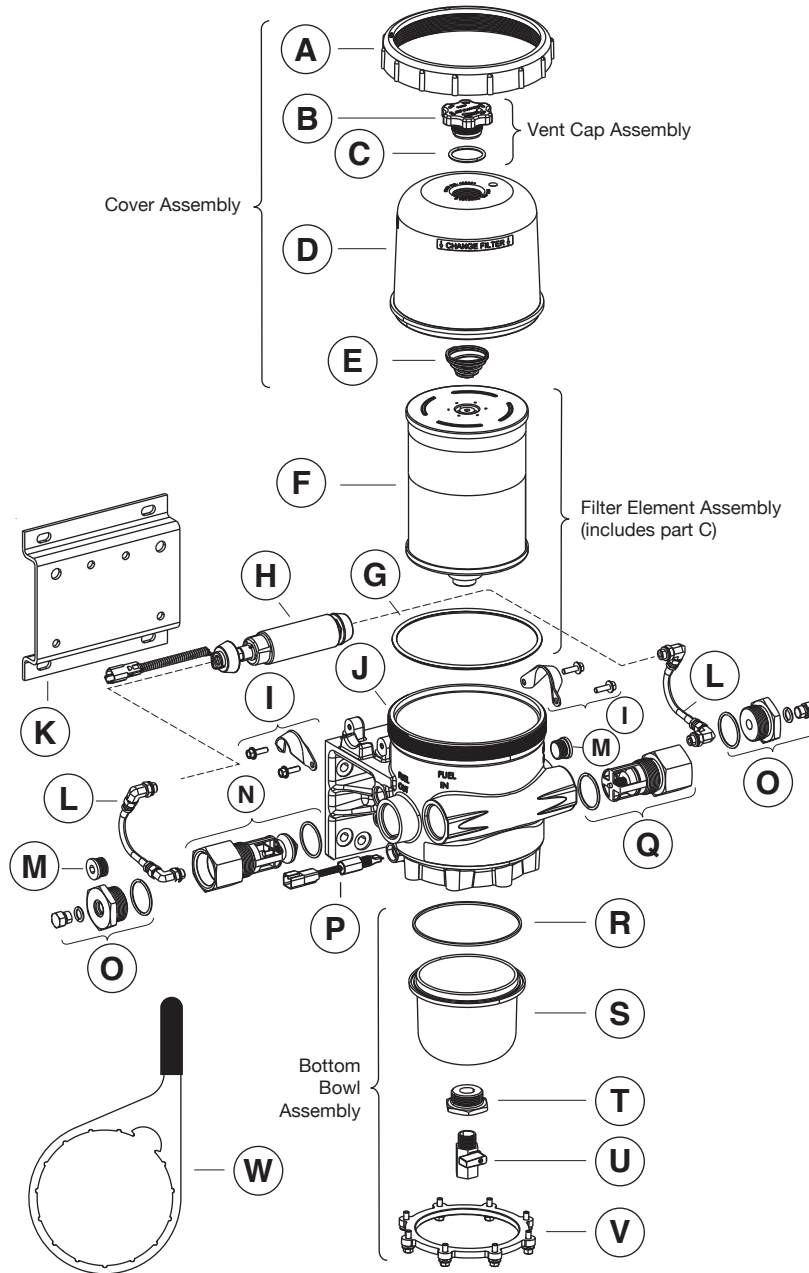
Single Short**Single Tall****Dual Tall****Duplex Tall****Duplex Short****Triple Tall**

239 Series

Industrial Pro[®]

Specification	Single Short	Single Tall	Dual Tall	Triple Tall	Duplex Short	Duplex Tall
Height Overall	20" (508 mm)	28" (711 mm)	28" (711 mm)	28" (711 mm)	20" (508 mm)	28" (711 mm)
Depth Overall	12" (305 mm)	12" (305 mm)	12" (305 mm)	12" (305 mm)	12.4" (314 mm)	12" (305 mm)
Width, max	11.2" (284 mm)	13.9" (352 mm)	23.8" (604 mm)	35.5" (902 mm)	32" (813 mm)	32" (813 mm)
Weight (Dry)	29 lbs (13.2 kg)	39 lbs (17.7 kg)	75 lbs (34.0 kg)	151 lbs (68.5 kg)	71 lbs (32.2 kg) w/ check valve 66 lbs (29.9 kg) w/o check valve	91 lbs (41.3 kg) w/ check valve 86 lbs (39.0 kg) w/o check valve
Weight (Wet)	37 lbs (16.8 kg)	57 lbs (25.6 kg)	112 lbs (50.8 kg)	213 lbs (96.6 kg)	87 lbs (39.5 kg) w/ check valve 82 lbs (37.2 kg) w/o check valve	127 lbs (57.6 kg) w/ check valve 122 lbs (55.3 kg) w/o check valve
Fuel Capacity (w/o filter)	1.1 gal (4.3 L)	2.5 gal (9.5 L)	5.0 gal (19 L)	7.5 gal (28.5 L)	2.2 gal (8 L)	5.0 gal (19 L)
Fuel Connections	1-1/4" NPT	1-1/4" NPT	1-1/4" NPT	1-1/4" NPT	1-1/4" NPT	1-1/4" NPT
Fuel Flow Rate	300 gal/hr (18.9 L/min)	600 gal/hr (37.9 L/min)	1200 gal/hr (75.7 L/min)	1200 gal/hr (75.7 L/min)	300 gal/hr Duplex mode (18.9 L/min) 600 gal/hr Dual mode (37.9 L/min)	600 gal/hr Duplex mode (37.9 L/min) 1200 gal/hr Dual mode (75.7 L/min)
Bottom Bowl Water Holding Capacity	29 fl oz (857 ml)	29 fl oz (857 ml)	58 fl oz (1715 ml)	87 fl oz (2573 ml)	29 fl oz (857 ml) Single mode 58 fl oz (1715 ml) Dual mode	29 fl oz (857 ml) Single mode 58 fl oz (1715 ml) Dual mode
Filter Service Clearance	Min. 3.5" (89 mm)	Min. 6.0" (152 mm)	Min. 6.0" (152 mm)	Min. 6.0" (152 mm)	Min. 3.5" (89 mm)	Min. 6.0" (152 mm)
Electrical Heater Options	12 VDC or 24 VDC					
Primer Pump	Supply Voltage: 24 VDC, 6 A					
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Kerosene, Biodiesel B20, and JP8					

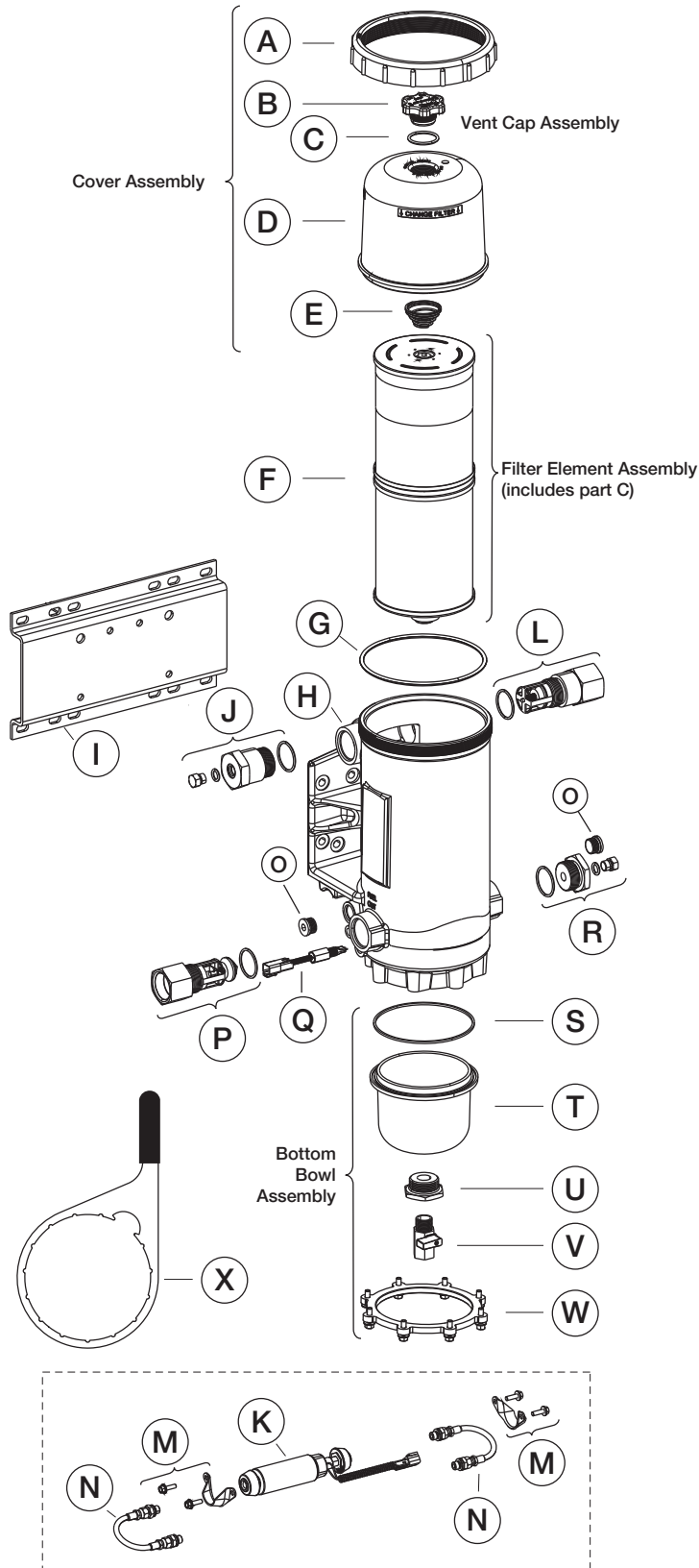
Industrial Pro® Single Short



Parts List

Part	Description	Part Number
A	Collar	Cover Assembly SP1127
B	Vent Cap	
C	O-Ring	
D	Cover	
E	Filter Spring	
F	Filter Element (includes Part C)	FS53015
G	O-Ring	(includes Part C)
H	Priming Pump (includes Isolators)	SP1124
I	(2) Priming Pump Clamp and (4) Screws	SP1133
J	Industrial Pro®	See Ordering Information
K	Bracket with Fasteners	SP1131
L	(2) Priming Pump Hoses and (4) Fittings	SP1128
M	Plug 1/2" STOR	SP1125
N	Bypass Check Valve	SP1121
O	Diagnostic Plug Fitting	SP1130
P	Water-In-Fuel (WIF) Sensor	SP1123
Q	Check Valve	SP1120
R	O-Ring	3945125 S
S	Bottom Bowl	Bottom Bowl Assembly (Includes Part R) SP1134
T	Drain Flange	
U	Drain Valve	
V	Bottom Bracket and Bolts (8)	
W	Wrench	SP1076
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
	Electric Heater	See Heater Page
	Adapter Fitting, 3/4" to 1-1/4"	SP1135
	Adapter Fitting, 1-1/4" NPT to M42 x 1.5	3956561 S

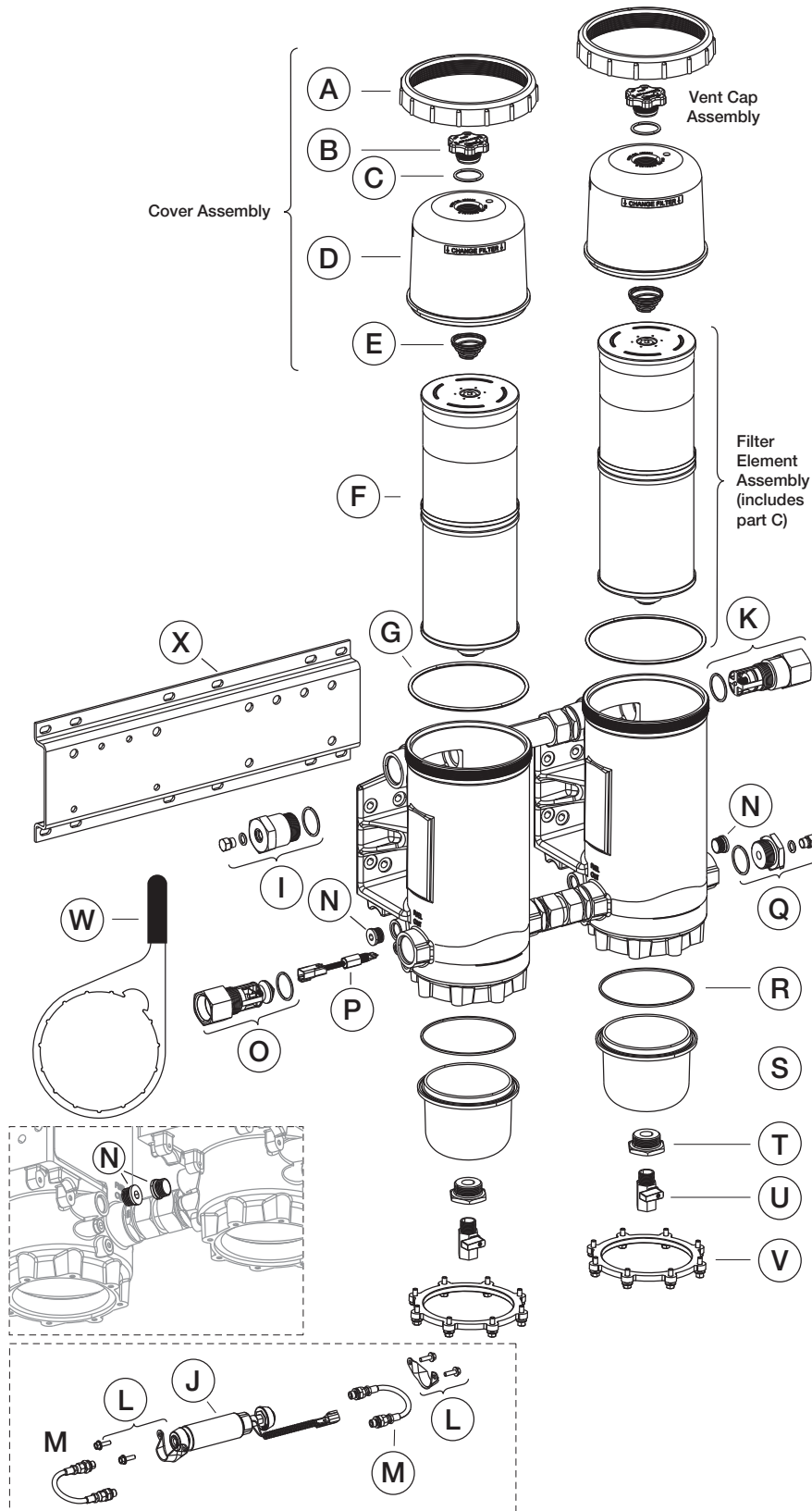
Industrial Pro® Single Tall



Parts List

Part	Description	Part Number
A	Collar	Cover Assembly SP1127
B	Vent Cap	
C	O-Ring	
D	Cover	
E	Filter Spring	FS53014 (includes Part C)
F	Filter Element (includes Part C)	
G	O-Ring	See page 14
H	Industrial Pro®	
I	Bracket with Fasteners	SP1132
J	Diagnostic Plug Fitting - Extended	SP1205
K	Priming Pump (includes Isolators)	SP1124
L	Check Valve - Extended	SP1206
M	(2) Priming Pump Clamps and (4) Screws	SP1133
N	(2) Priming Pump Hoses and (4) Fittings	SP1129
O	Plug 1/2" STOR	SP1125
P	Bypass Check Valve	SP1121
Q	Water-In-Fuel (WIF) Sensor	SP1123
R	Diagnostic Plug Fitting	SP1130
S	O-Ring	3945125 S
T	Bottom Bowl	Bottom Bowl Assembly (Includes Part S) SP1134
U	Drain Flange	
V	Drain Valve	
W	Bottom Bracket and Bolts (8)	SP1076
X	Wrench	SP1076
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
	Electric Heater	See Heater page
	Adapter Fitting, 3/4" to 1-1/4"	SP1135
	Adapter Fitting, 1-1/4" NPT to M42 x 1.5	3956561 S

Industrial Pro® Dual Tall



Parts List

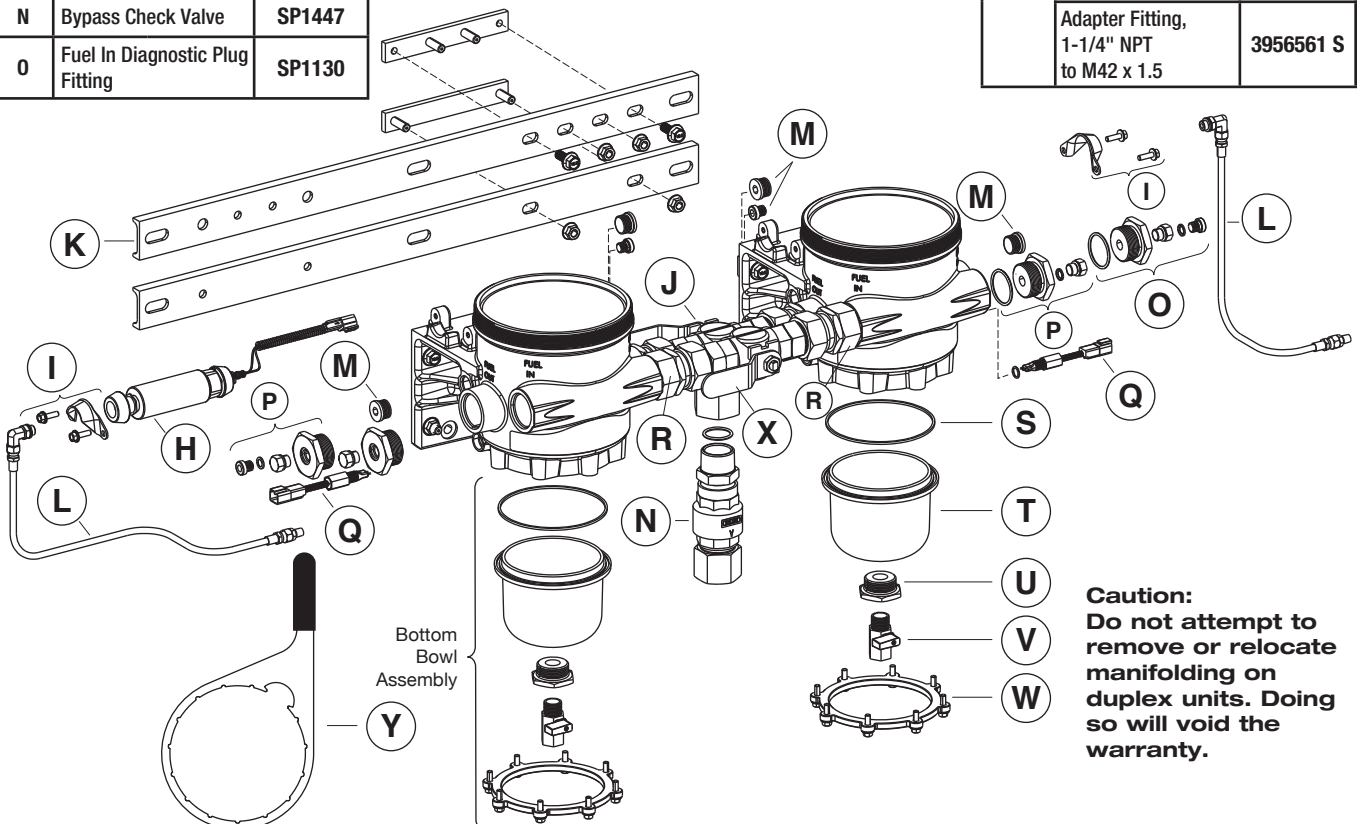
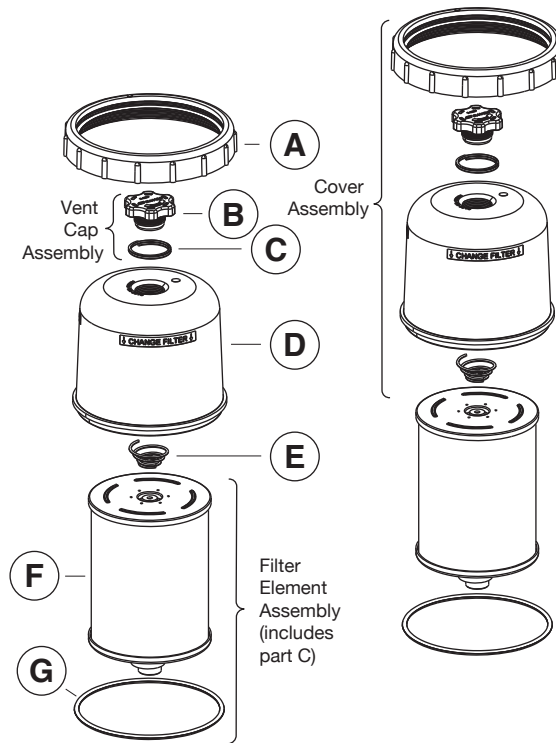
Part	Description	Part Number
A	Collar	Cover Assembly SP1127
B	Vent Cap	
C	O-Ring	
D	Cover	
E	Filter Spring	
F	Filter Element (includes Part C)	FS53014 (includes Part C)
G	O-Ring	
H	Industrial Pro®	See Ordering Information
I	Diagnostic Plug Fitting - Extended	SP1205
J	Priming Pump (includes Isolators)	SP1124
K	Check Valve - Extended	SP1206
L	(2) Priming Pump Clamps and (4) Screws	SP1133
M	(2) Priming Pump Hoses and (4) Fittings	SP1129
N	Plug 1/2" STOR	SP1125
O	Bypass Check Valve	SP1121
P	Water-In-Fuel (WIF) Sensor	SP1123
Q	Diagnostic Plug Fitting	SP1130
R	O-Ring	3945125 S
S	Bottom Bowl	Bottom Bowl Assembly (Includes Part R) SP1134
T	Drain Flange	
U	Drain Valve	
V	Bottom Bracket and Bolts (8)	
W	Wrench	SP1076
X	Bracket	SP1329
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
	Electric Heater	See Heater page
	Adapter Fitting, 3/4" to 1-1/4"	SP1135
	Adapter Fitting, 1-1/4" NPT to M42 x 1.5	3956561 S

Parts List

Industrial Pro® Duplex Short

Part	Description	Part Number
A	Collar	Cover Assembly SP1127
B	Vent Cap	
C	O-Ring	
D	Cover	
E	Filter Spring	
F	Filter Element (includes Part C)	FS53015 (includes Part C)
G	O-Ring	Bottom Bowl Assembly (Includes Part S) SP1134
H	Priming Pump (includes Isolators)	
I	(2) Priming Pump Clamp and (4) Screws	SP1133
J	Industrial Pro®	See Ordering Information
K	Bracket with Fasteners	SP1429
L	(2) Priming Pump Hoses and (4) Fittings	SP1430
M	Plug 1/2" STOR	SP1125
N	Bypass Check Valve	SP1447
O	Fuel In Diagnostic Plug Fitting	SP1130

Part	Description	Part Number
P	Fuel Out Diagnostic Plug Fitting	SP1444
Q	Water-In-Fuel (WIF) Sensor	SP72026
R	Check Valve	SP1446
	Fuel In Fitting (no check valve)	SP1486
S	O-Ring	3945125 S
T	Bottom Bowl	Bottom Bowl Assembly (Includes Part S) SP1134
U	Drain Flange	
V	Drain Valve	
W	Bottom Bracket and Bolts (8)	SP1134
X	Three-way Valve	SP1431
Y	Wrench	SP1076
Not Shown	WIF Wiring Harness	SP72028
	WIF LED	3946670 S
	Electric Heater	See Heater Page
	Adapter Fitting, 3/4" to 1-1/4"	SP1135
	Adapter Fitting, 1-1/4" NPT to M42 x 1.5	3956561 S

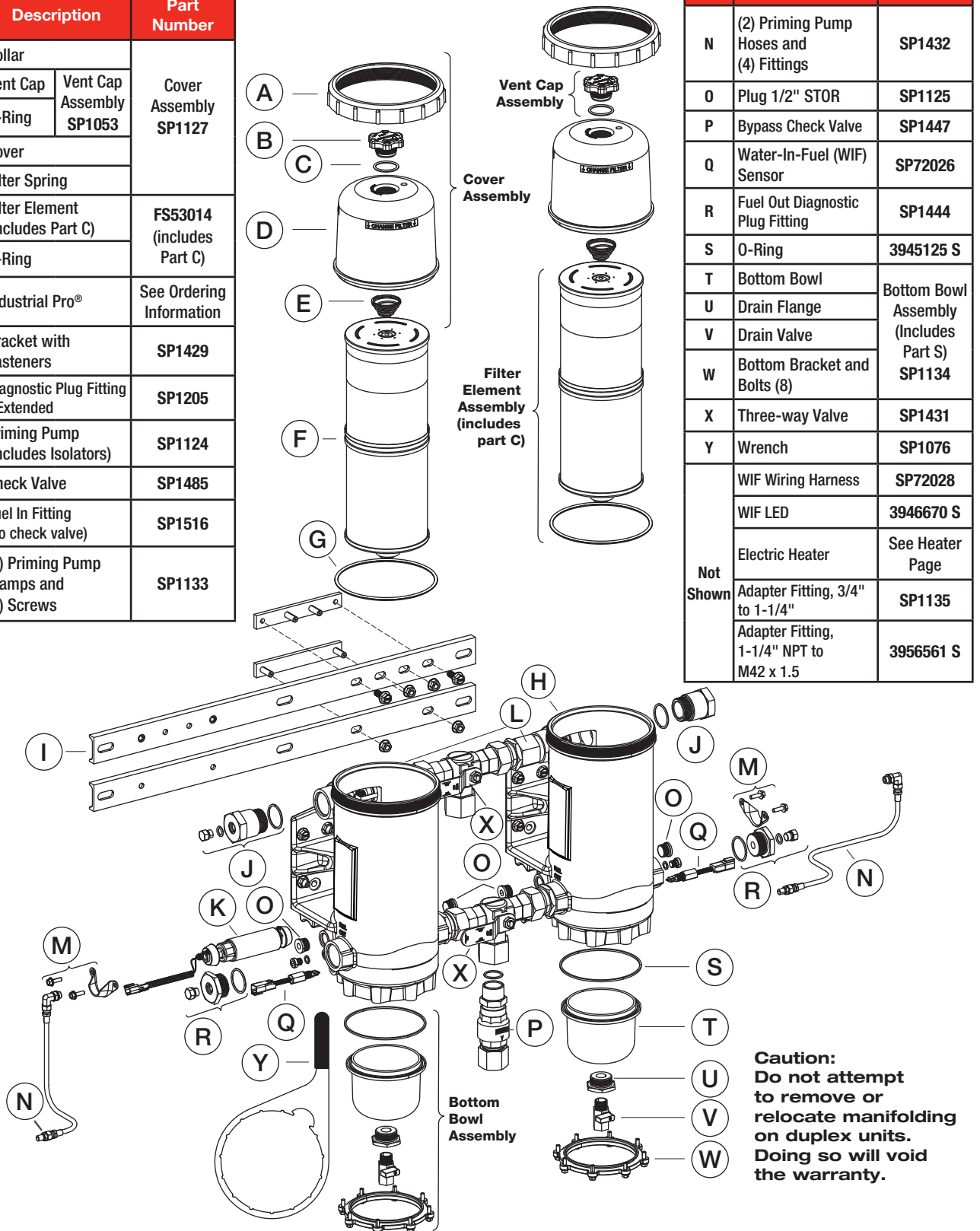


Caution:
Do not attempt to remove or relocate manifolding on duplex units. Doing so will void the warranty.

Parts List

Part	Description	Part Number
A	Collar	Cover Assembly SP1127
B	Vent Cap	
C	O-Ring	
D	Cover	
E	Filter Spring	
F	Filter Element (includes Part C)	FS53014 (includes Part C)
G	O-Ring	
H	Industrial Pro®	See Ordering Information
I	Bracket with Fasteners	SP1429
J	Diagnostic Plug Fitting - Extended	SP1205
K	Priming Pump (includes Isolators)	SP1124
L	Check Valve	SP1485
	Fuel In Fitting (no check valve)	SP1516
M	(2) Priming Pump Clamps and (4) Screws	SP1133

Industrial Pro® Duplex Tall

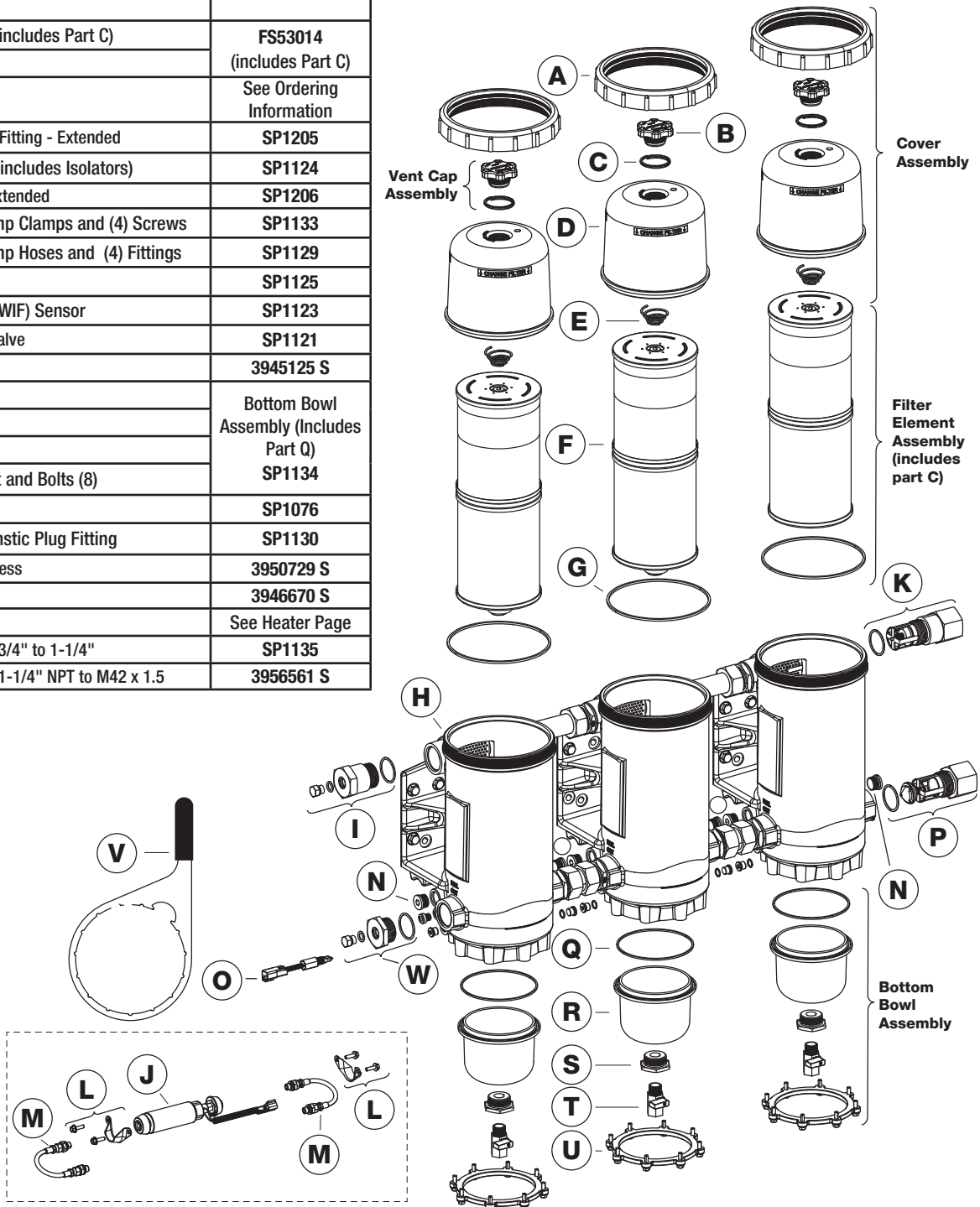


Part	Description	Part Number
N	(2) Priming Pump Hoses and (4) Fittings	SP1432
O	Plug 1/2" STOR	SP1125
P	Bypass Check Valve	SP1447
Q	Water-In-Fuel (WIF) Sensor	SP72026
R	Fuel Out Diagnostic Plug Fitting	SP1444
S	O-Ring	3945125 S
T	Bottom Bowl	Bottom Bowl Assembly (Includes Part S)
U	Drain Flange	
V	Drain Valve	
W	Bottom Bracket and Bolts (8)	SP1134
X	Three-way Valve	SP1431
Y	Wrench	SP1076

Parts List

Part	Description	Part Number
A	Collar	Cover Assembly SP1127
B	Vent Cap	
C	O-Ring	
D	Cover	
E	Filter Spring	FS53014 (includes Part C)
F	Filter Element (includes Part C)	
G	O-Ring	See Ordering Information
H	Industrial Pro®	
I	Diagnostic Plug Fitting - Extended	SP1205
J	Priming Pump (includes Isolators)	SP1124
K	Check Valve - Extended	SP1206
L	(2) Priming Pump Clamps and (4) Screws	SP1133
M	(2) Priming Pump Hoses and (4) Fittings	SP1129
N	Plug 1/2" STOR	SP1125
O	Water-In-Fuel (WIF) Sensor	SP1123
P	Bypass Check Valve	SP1121
Q	O-Ring	3945125 S
R	Bottom Bowl	Bottom Bowl Assembly (Includes Part Q)
S	Drain Flange	
T	Drain Valve	
U	Bottom Bracket and Bolts (8)	
V	Wrench	SP1076
W	Fuel Out Diagnostic Plug Fitting	SP1130
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
	Electric Heater	See Heater Page
	Adapter Fitting, 3/4" to 1-1/4"	SP1135
	Adapter Fitting, 1-1/4" NPT to M42 x 1.5	3956561 S

Industrial Pro® Triple Tall



Ordering Information

Housing Part Number	Filter Element	Primer Pump	WIF	Clear Bowl	Bracket Included	Heater	Check Valve	Bypass Valve	Fuel Flow	Fuel In & Fuel Out Port Size
FH23900	FS53015	Yes	Yes	Yes	Yes	No	Yes	Yes	In Right/Out Left	1-1/4" NPTF
FH23904	FS53015	Yes	Yes	Yes	Yes	No	Yes	Yes	In Left/Out Right	1-1/4" NPTF
FH23916	FS53015	No	Yes	Yes	Yes	No	Yes	No	In Right/Out Left	1-1/4" NPTF
FH23917	FS53015	No	Yes	Yes	Yes	No	Yes	No	In Left/Out Right	1-1/4" NPTF

Replacement Filters

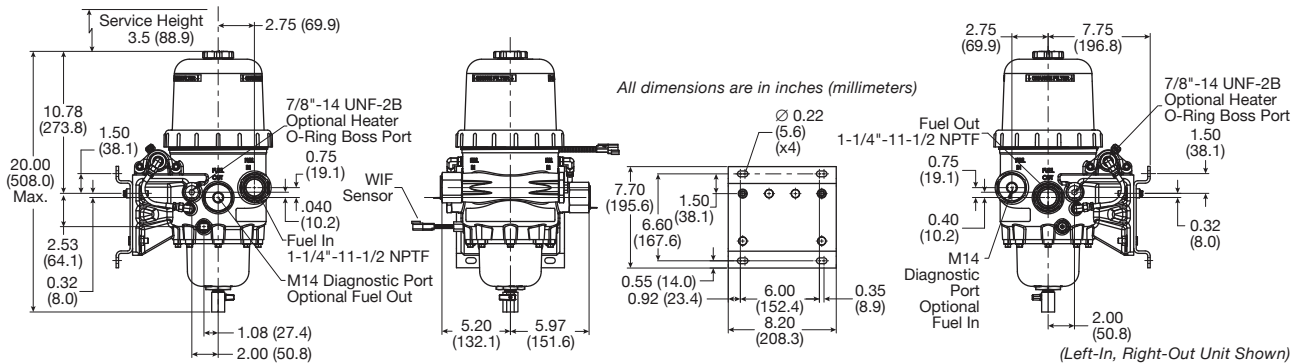
Part Number	Description
FS53015	EleMax NanoNet 5 micron (short)

Filter Specifications

Elemax[™] NanoNet[™] Filter

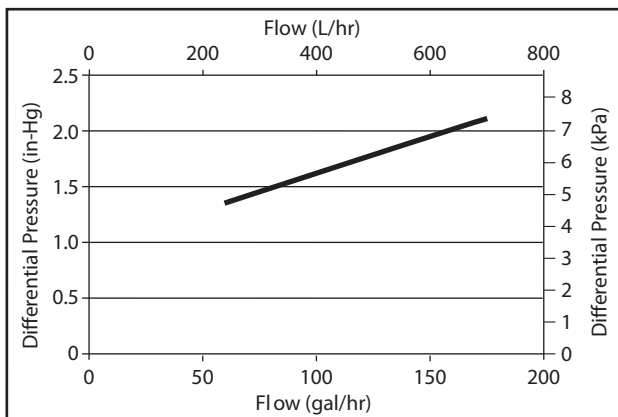
- Emulsified Water Separation: 95% efficiency at 300 gal/h (1135 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 300 gal/h (1135 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Ordering Information

Housing Part Number	Filter Element	Primer Pump	WIF	Clear Bowl	Bracket Included	Heater	Check Valve	Bypass Valve	Fuel Flow	Fuel In & Fuel Out Port Size
FH23901	FS53014	Yes	Yes	Yes	Yes	No	Yes	Yes	In Left/Out Right	1-1/4" NPTF
FH23903	FS53014	Yes	Yes	Yes	Yes	No	Yes	Yes	In Right/Out Left	1-1/4" NPTF
FH23905	FS53014	Yes	Yes	Yes	Yes	No	Yes	Yes	In Left/Out Left	1-1/4" NPTF
FH23906	FS53014	Yes	Yes	Yes	Yes	No	Yes	Yes	In Right/Out Left	1-1/4" NPTF
FH23912	FS53014	No	Yes	Yes	Yes	No	Yes	No	In Right/Out Left	1-1/4" NPTF
FH23913	FS53014	No	Yes	Yes	Yes	No	Yes	No	In Left/Out Right	1-1/4" NPTF
FH23914	FS53014	No	Yes	Yes	Yes	No	Yes	No	In Left/Out Left	1-1/4" NPTF
FH23915	FS53014	No	Yes	Yes	Yes	No	Yes	No	In Right/Out Right	1-1/4" NPTF

Replacement Filters

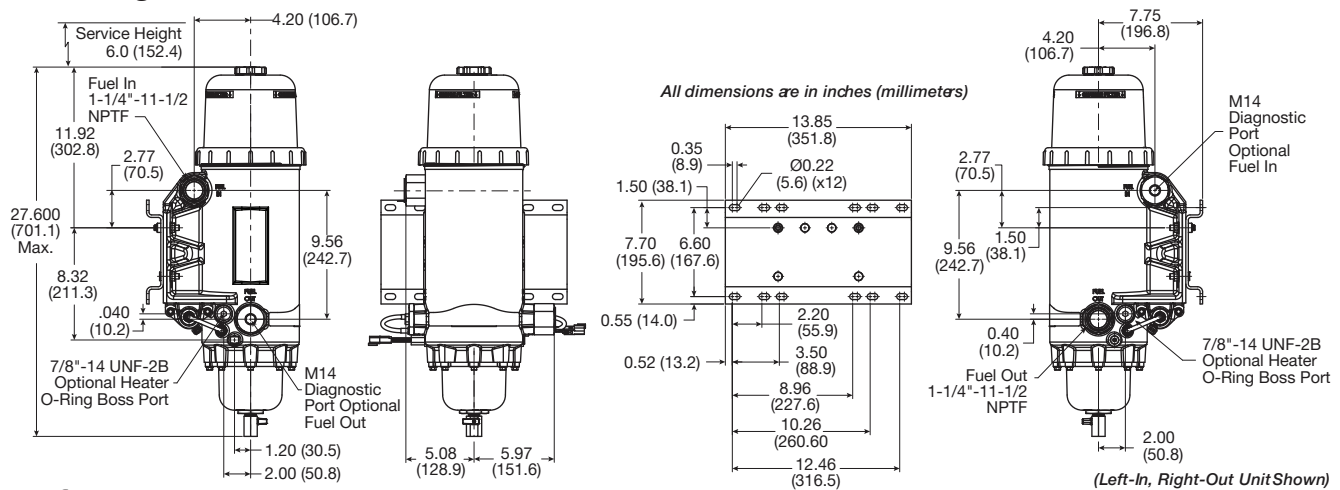
Part Number	Description
FS53014	EleMax™ NanoNet™ 5 micron (tall)

Filter Specifications

Elemax™ NanoNet™ Filter

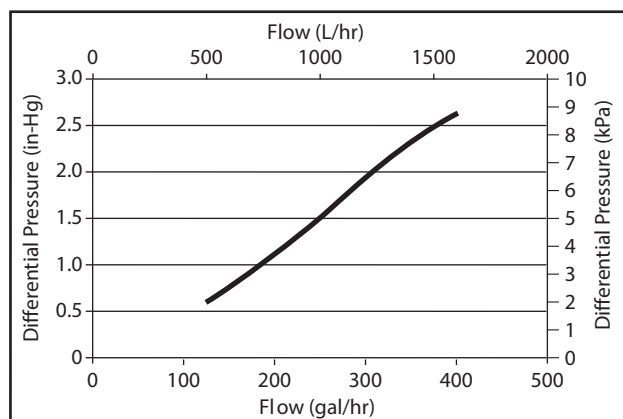
- Emulsified Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Ordering Information

Housing Part Number	Filter Element	Primer Pump	WIF	Clear Bowl	Bracket Included	Heater	Check Valve	Bypass Valve	Fuel Flow	Fuel In & Fuel Out Port Size
FH23907	FS53014*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Right/Out Right	1-1/4" NPTF
FH23908	FS53014*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Right/Out Left	1-1/4" NPTF
FH23910	FS53014*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Left/Out Right	1-1/4" NPTF
FH23911	FS53014*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Left/Out Left	1-1/4" NPTF
FH23918	FS53014*	No	Yes	Yes	Yes	No	Yes	No	In Right/Out Left	1-1/4" NPTF
FH23919	FS53014*	No	Yes	Yes	Yes	No	Yes	No	In Left/Out Right	1-1/4" NPTF
FH23920	FS53014*	No	Yes	Yes	Yes	No	Yes	No	In Left/Out Left	1-1/4" NPTF
FH23921	FS53014*	No	Yes	Yes	Yes	No	Yes	No	In Right/Out Right	1-1/4" NPTF

* Requires two filter elements

Replacement Filters

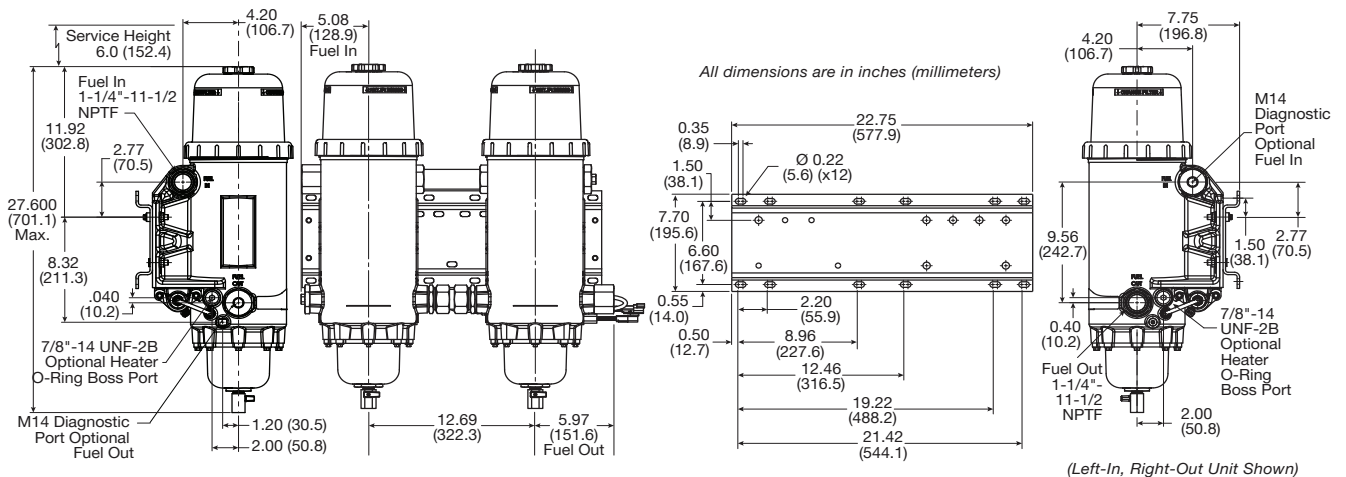
Part Number	Description
FS53014	EleMax™ NanoNet™ 5 micron (tall)

Filter Specifications

Elemax™ NanoNet™ Filter

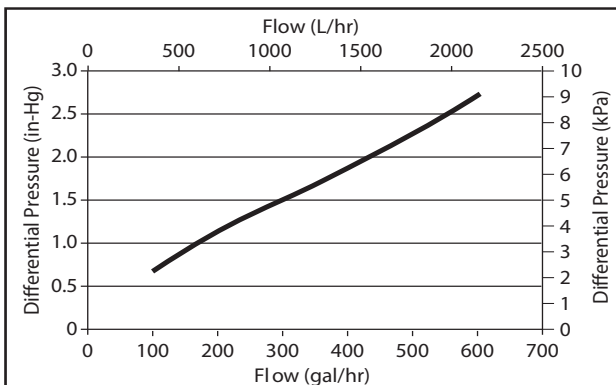
- Emulsified Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Ordering Information

Housing Part Number	Filter Element	Primer Pump	WIF	Clear Bowl	Bracket Included	Heater	Check Valve	Bypass Valve	Fuel Flow	Fuel In & Fuel Out Port Size
FH23926	FS53015*	No	Yes	Yes	Yes	No	No	No	In Center/Out Center	1-1/4" NPTF
FH23927	FS53015*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Center/Out Center	1-1/4" NPTF

* Requires two filter elements

Replacement Filters

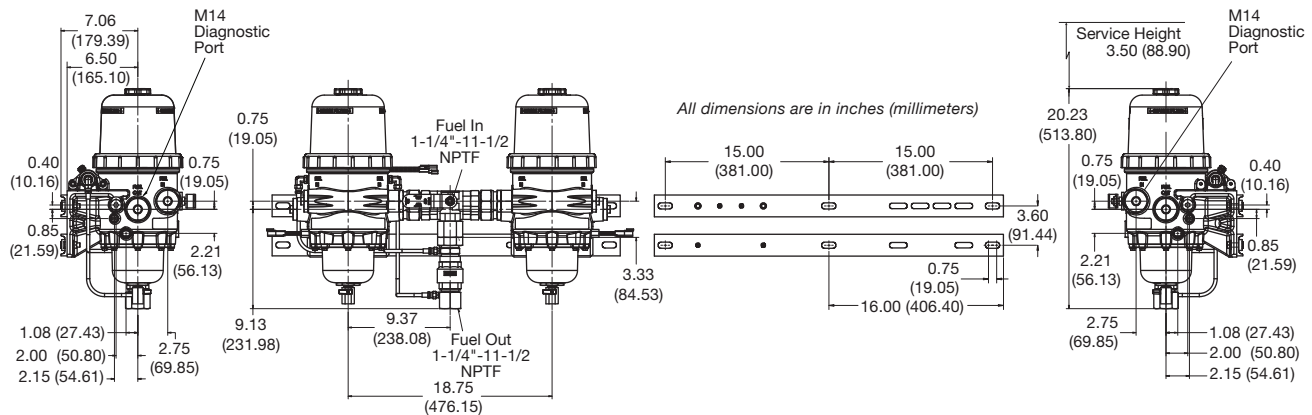
Part Number	Description
FS53015	EleMax NanoNet 5 micron (short)

Filter Specifications

Elemax[™] NanoNet[™] Filter

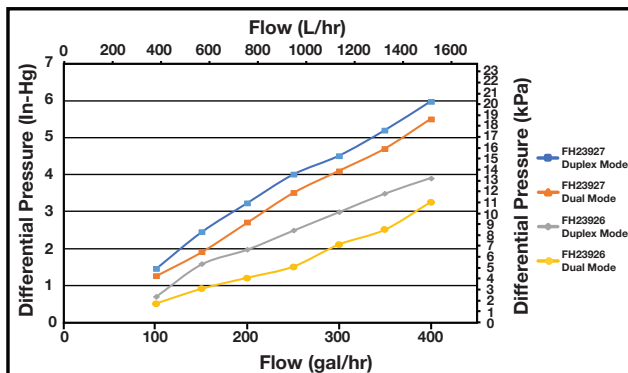
- Emulsified Water Separation: 95% efficiency at 300 gal/h (1135 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 300 gal/h (1135 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Ordering Information

Housing Part Number	Filter Element	Primer Pump	WIF	Clear Bowl	Bracket Included	Heater	Check Valve	Bypass Valve	Fuel Flow	Fuel In & Fuel Out Port Size
FH23922	FS53014*	No	Yes	Yes	Yes	No	No	No	In Center/Out Center	1-1/4" NPTF
FH23923	FS53014*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Center/Out Center	1-1/4" NPTF

* Requires two filter elements

Replacement Filters

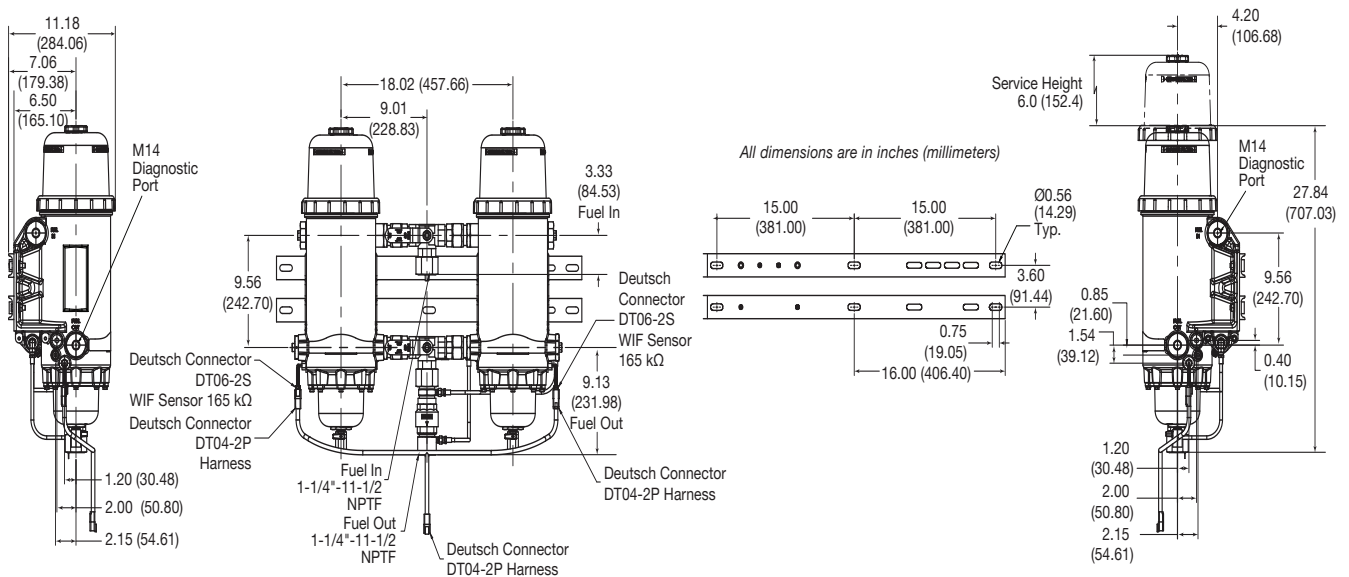
Part Number	Description
FS53014	EleMax™ NanoNet™ 5 micron (tall)

Filter Specifications

Elemax™ NanoNet™ Filter

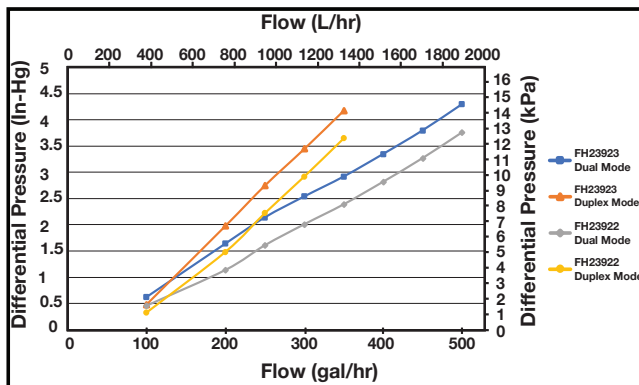
- Emulsified Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Ordering Information

Housing Part Number	Filter Element	Primer Pump	WIF	Clear Bowl	Bracket Included	Heater	Check Valve	Bypass Valve	Fuel Flow	Fuel In & Fuel Out Port Size
FH23930	FS53014*	Yes	Yes	Yes	Yes	No	Yes	Yes	In Right/Out Right	1-1/4" NPTF

* Requires three filter elements

Replacement Filters

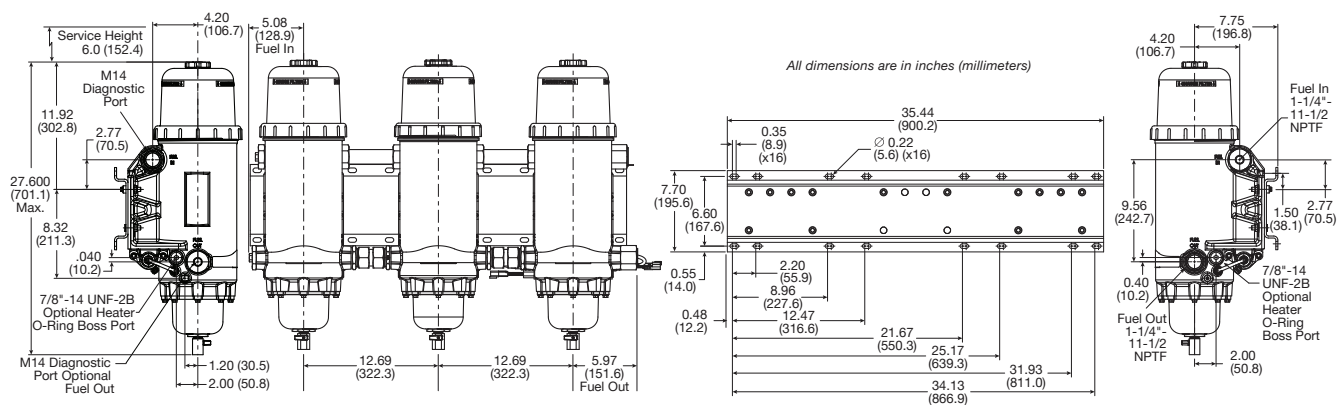
Part Number	Description
FS53014	EleMax™ NanoNet™ 5 micron (tall)

Filter Specifications

Elemax™ NanoNet™ Filter

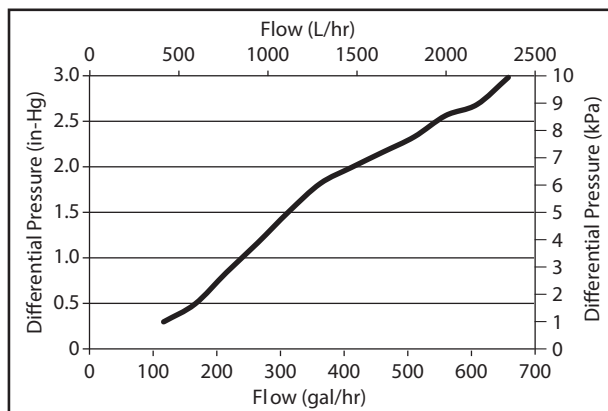
- Emulsified Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 600 gal/h (2271 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Ordering Information

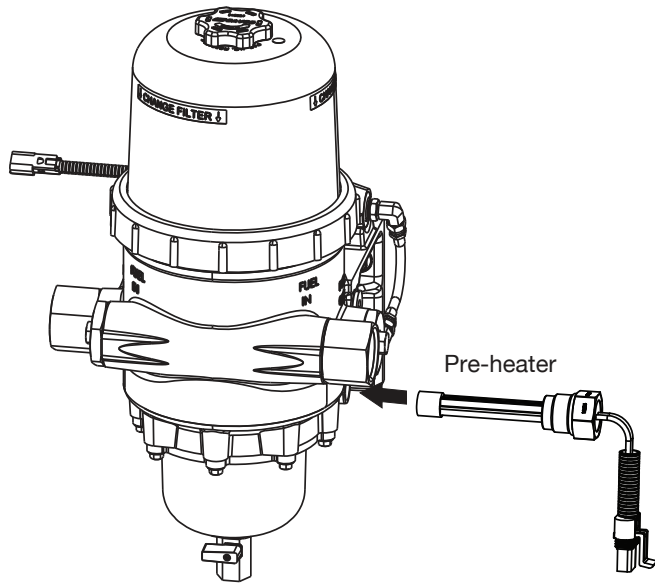
Part Number	Description
SP1312	12 VDC Pre-heater
SP1313	24 VDC Pre-heater

Specifications

Specification	SP1312	SP1313
Volts	12 VDC	24 VDC
Watts	195 W	195 W
Inrush Current	≤ 28 A	14 A
Average Current	< 12 A	< 7 A
Cold Resistance	0.425 - 0.575 Ω	2.0 - 3.0 Ω
Switch Open Temp.	N/A	N/A
Switch Closed Temp.	N/A	N/A

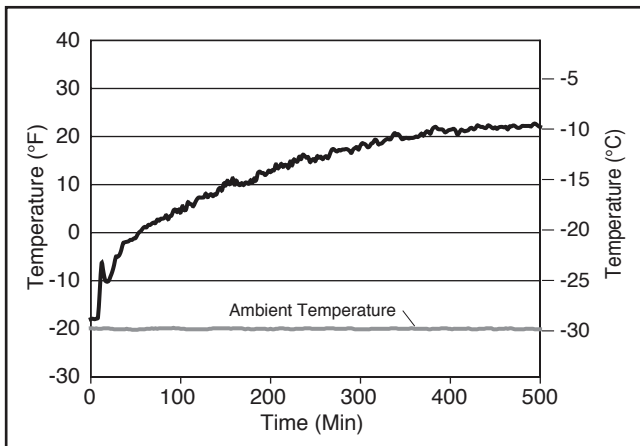
Specifications subject to change without notice.

Installation

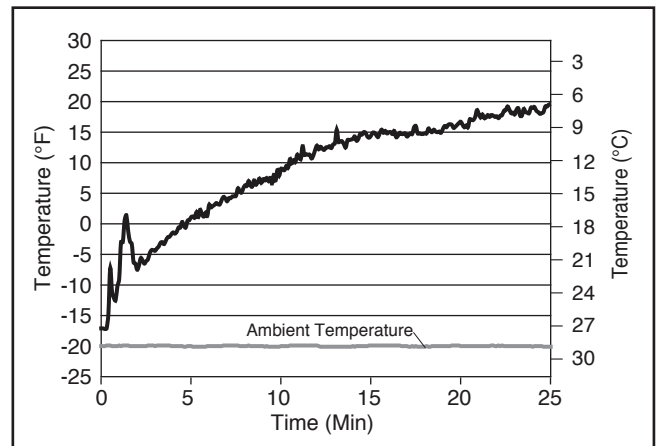


Performance

Temperature vs Time - #2 Diesel Fuel



Temperature vs Time - SME Biodiesel Fuel



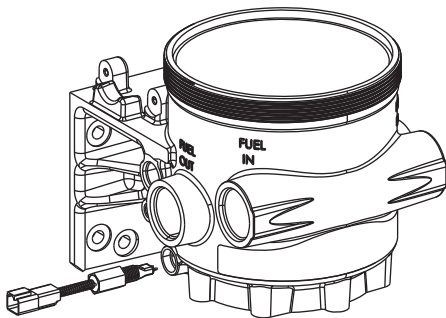
Note: Tests for #2 Diesel Fuel run per ASTM D-975. Tests for SME (Soybean Methyl Ester) Biodiesel Fuel run per ASTM D-975 and ASTM D6751.

Ordering Information

Part Number	Description
SP1123 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation

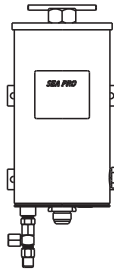


Specifications

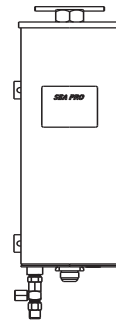
Specification	WIF SP1123 S
Resistance Across Pins	82 k Ω \pm 2%
Voltage Rating	5 – 50 VDC
Signal Type	Analog
Thread	1/2" 20 UNF-2A
WIF Harness Connector	Deutsch DT04-2P
WIF Harness Length	12.09" (307 mm)

Specifications subject to change without notice.

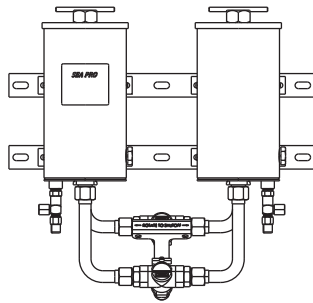
Single Short



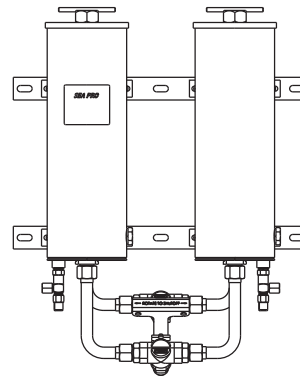
Single Tall



Duplex Short



Duplex Tall



Specifications

Specification	Single Short	Single Tall	Duplex Short	Duplex Tall
Height Overall	19.2" (448 mm)	26.70" (678 mm)	24.70" (627 mm)	32.20" (818 mm)
Depth Overall	8.75" (222 mm)	8.75" (222 mm)	11.1" (282 mm)	11.1" (282 mm)
Width, max	8.2" (208 mm)	8.2" (208 mm)	26.00" (660 mm)	26.00" (660 mm)
Weight (Dry)	31 lbs (14.1 kg)	43 lbs (19.5 kg)	80 lbs (36.3 kg)	103 lbs (46.7 kg)
Fuel Capacity (w/o filter)	1.2 gal (4.6 L)	2.5 gal (9.3 L)	2.4 gal (9.2 L)	4.9 gal (18.6 L)
Fuel Connections	1-5/16"-12 UN/UNF-2A	1-5/16"-12 UN/UNF-2A	1-5/16"-12 UN/UNF-2A	1-5/16"-12 UN/UNF-2A
Fuel Flow Rate	360 gal/hr (22.7 L/min)	540 gal/hr (34 L/min)	720 gal/hr (45.4 L/min)	1080 gal/hr (68 L/min)
Water Holding Capacity	66 fl oz (1970 ml)	66 fl oz (1970 ml)	132 fl oz (3940 ml)	132 fl oz (3940 ml)
Filter Service Clearance	Min. 10.6" (270 mm)	Min. 18.3" (465 mm)	Min. 10.6" (270 mm)	Min. 18.3" (465 mm)
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Kerosene, Biodiesel B20, and JP8			

Specifications subject to change without notice.

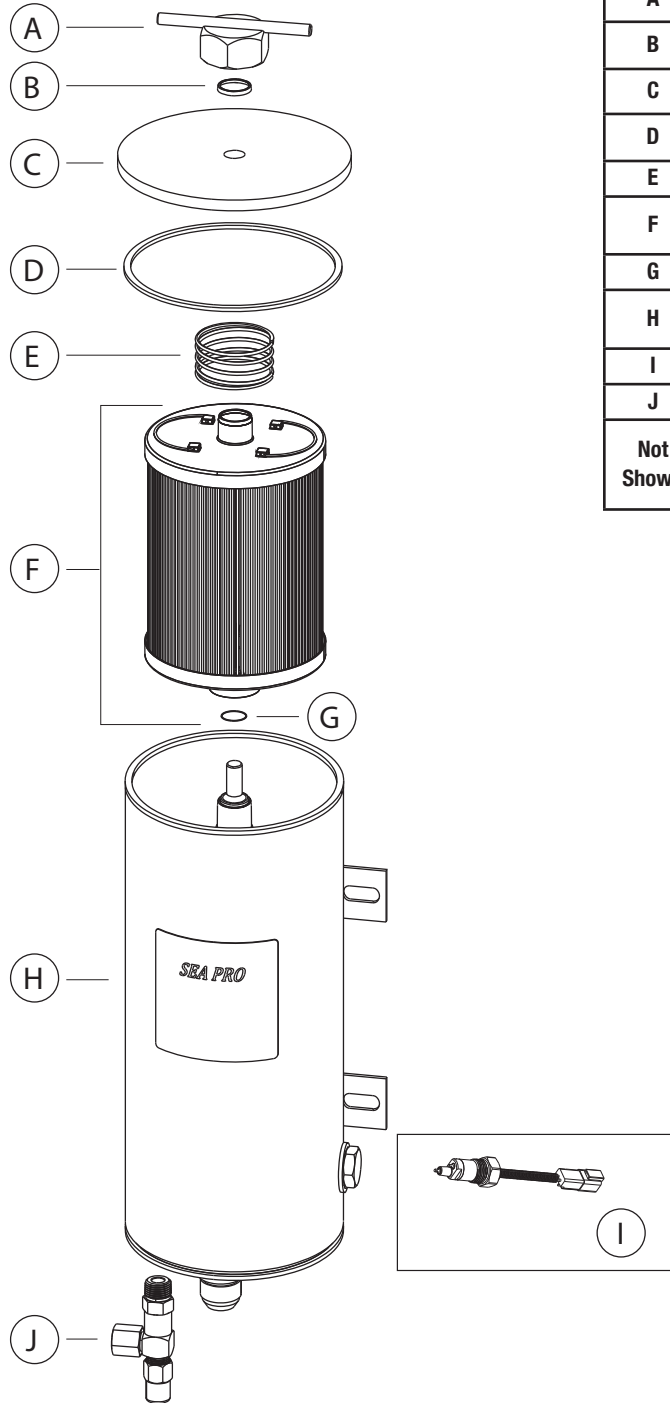


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Also meets the following standards: USCG, ANSI 1105, ASTM F1201
For additional agency approvals, see TB07/05-2 Certification Matrix Bulletin

Sea Pro Single Short

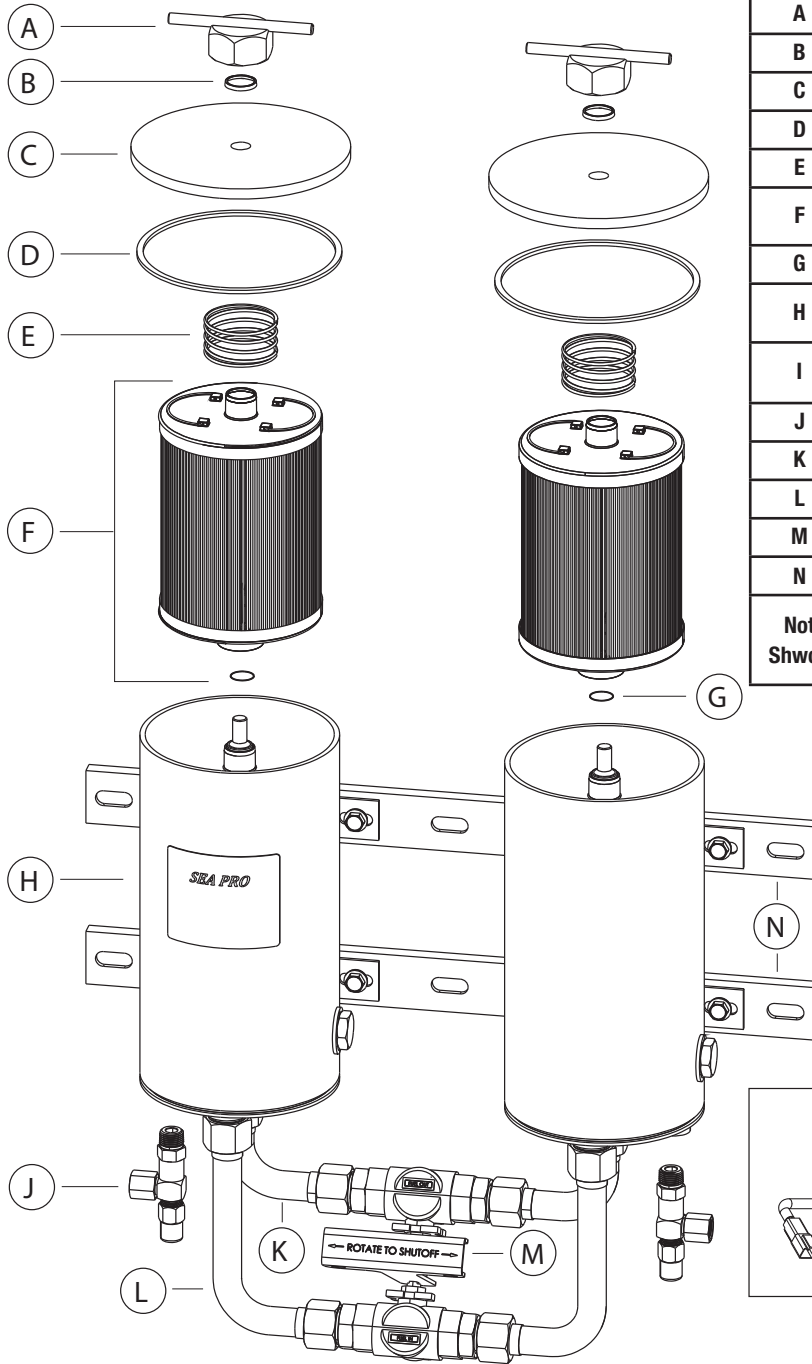


Parts List

Part	Description	Part Number
A	Top Nut Handle	SP1288
B	Nut Seal	SP1287
C	Service Cap	SP1286
D	Service Cap Seal	SP1285
E	Spring	SP1284
F	Replacement Element and Seals (Includes parts B, D, and G)	FS53021
G	Stand Pipe Gasket	SP1283
H	Sea Pro FH240 Single Short	See Ordering Information
I	WIF Sensor (optional)	SP1428
J	Drain Valve	SP1289
Not Shown	Compound Pressure Gauge	SP1639
	Priming Pump Kit	3961294 S
	Check Valve	3961295 S

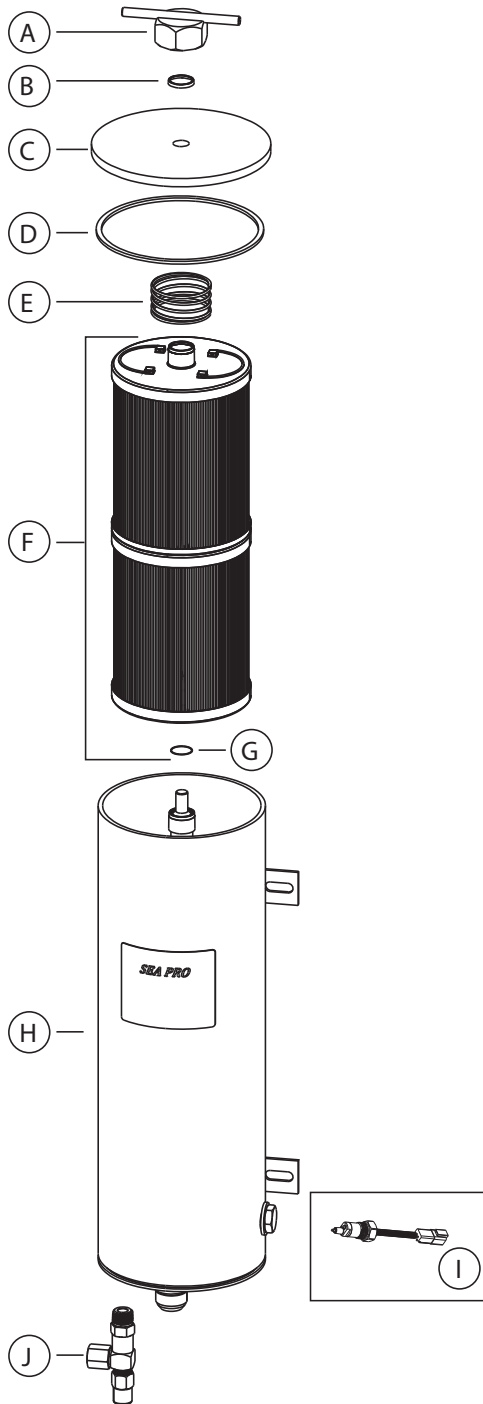
Sea Pro Duplex Short

Parts List



Part	Description	Part Number
A	Top Nut Handle	SP1288
B	Nut Seal	SP1287
C	Service Cap	SP1286
D	Service Cap Seal	SP1285
E	Spring	SP1284
F	Replacement Element and Seals (Includes parts B, D, and G)	FS53021
G	Stand Pipe Gasket	SP1283
H	Sea Pro FH240 Duplex Short	See Ordering Information
I	WIF Sensor Kit (optional) WIF Sensor	SP1433 SP1641
J	Drain Valve	SP1289
K	Fuel Out Manifold Kit	SP1296
L	Fuel In Manifold Kit	SP1297
M	Handle	SP1293
N	Bracket (two included in kit)	SP1298
Not Shown	Compound Pressure Gauge	SP1531
	Priming Pump Kit	3961294 S
	Check Valve	3961295 S

Sea Pro Single Tall



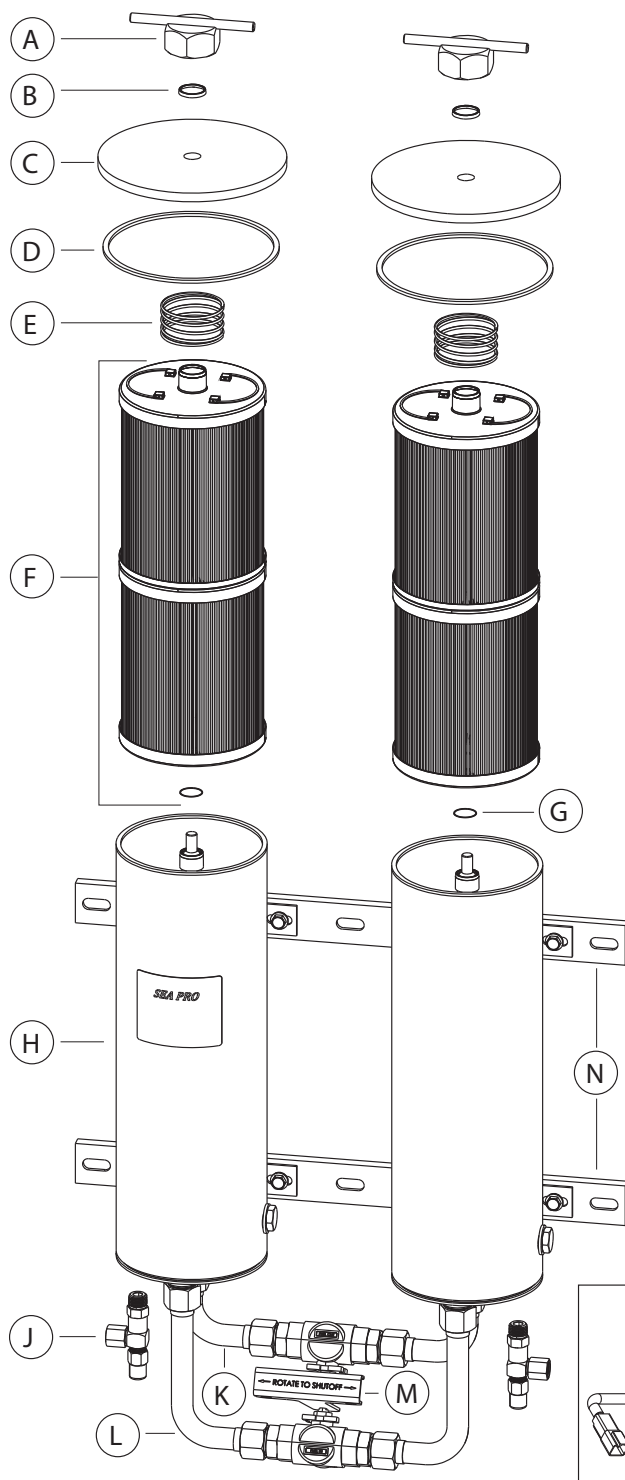
Parts List

Part	Description	Part Number
A	Top Nut Handle	SP1288
B	Nut Seal	SP1287
C	Service Cap	SP1286
D	Service Cap Seal	SP1285
E	Spring	SP1284
F	Replacement Element and Seals (Includes parts B, D, and G)	FS53022
G	Stand Pipe Gasket	SP1283
H	Sea Pro FH240 Single Tall	See Ordering Information
I	WIF Sensor (optional)	SP1428
J	Drain Valve	SP1289
Not Shown	Compound Pressure Gauge Priming Pump Kit Check Valve	SP1639 3961294 S 3961295 S

* Order this part directly from Fleetguard.

Note: Remove plug from water drain valve prior to operation.

Sea Pro Duplex Tall



Parts List

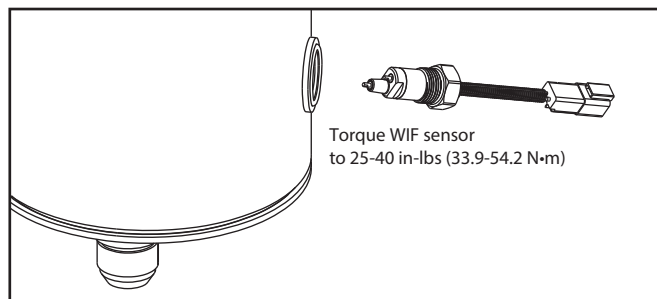
Part	Description	Part Number
A	Top Nut Handle	SP1288
B	Nut Seal	SP1287
C	Service Cap	SP1286
D	Service Cap Seal	SP1285
E	Spring	SP1284
F	Replacement Element and Seals (Includes parts B, D, and G)	FS53022
G	Stand Pipe Gasket	SP1283
H	Sea Pro FH240 Duplex Tall	See Ordering Information
I	WIF Sensor Kit (optional) WIF Sensor	SP1433 SP1641
J	Drain Valve	SP1289
K	Fuel Out Manifold Kit	SP1296
L	Fuel In Manifold Kit	SP1297
M	Handle	SP1293
N	Bracket (two included in kit)	SP1298
Not Shown	Compound Pressure Gauge Priming Pump Kit Check Valve	SP1531 3961294 S 3961295 S

Ordering Information

Part Number	Description
SP1428	Water-In-Fuel (WIF) Sensor (85 KOhm)
SP1641	Water-In-Fuel (WIF) Sensor (165 KOhm)
3950729 S	WIF Wiring Harness
SP72028	WIF Wiring Harness (Y harness)
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation



Specifications

Specification	WIF SP1428 (4919917)	Dual WIF 3966459 S (4919928) (qty 2)
Resistance Across Pins	82 kΩ ±2% (at 25° C)	165 kΩ ±2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC	5 – 50 VDC or VAC
Signal Type	Analog	Analog
Thread	1/2" 20 UNF-2A	1/2" 20 UNF-2A
Output Deutsch Connector	EDLRDT13-2PR-002	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT04-2P	DT06-2S
Height to Water Sensing (Switch is in ON Position)	1.21" (30.73 mm)	1.21" (30.73 mm)
Overall Length (WIF Body)	1.94" (49.28 mm)	1.94" (49.28 mm)
Distance Between Blades (Center to Center)	0.168" (4.27mm)	0.168" (4.27mm)

Specifications subject to change without notice.

Ordering Information

Housing Part Number	Filter Element	Unit Type	WIF	Drain	Pressure Gauge	Bracket Included	Fuel Flow	Port Size
FH24000	FS53021	Single Short	SP1428	Yes	SP1639	No	Bottom In / Bottom Out	1-5/16"-12 UN/UNF-2A 37° Flare

Replacement Filters

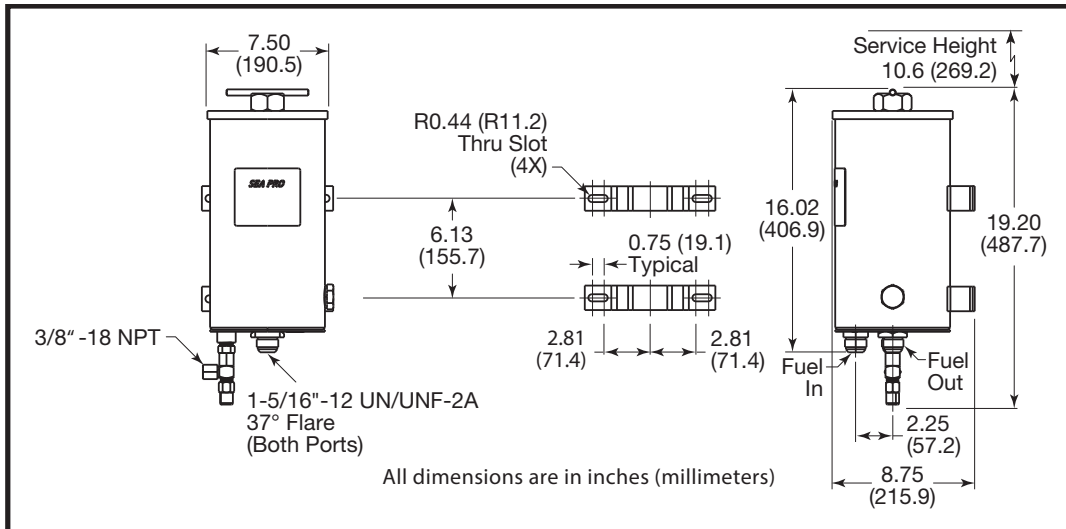
Part Number	Description
FS53021	NanoNet 5 micron (short)

Filter Specifications

Spin-On Filter

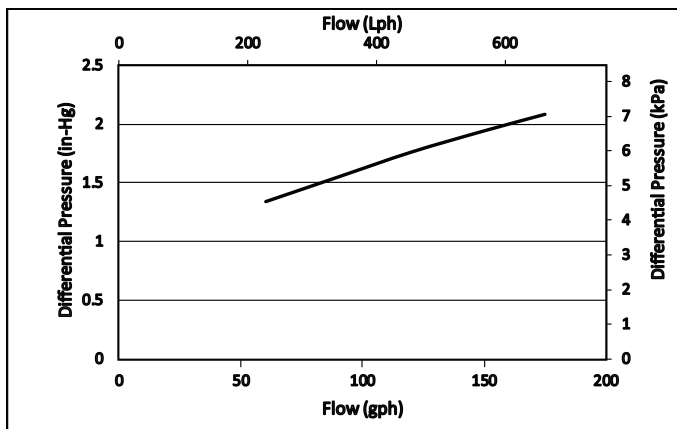
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Note: Restriction vs Flow test run per SAE J905 standard
Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Unit Type	WIF	Drain	Pressure Gauge	Bracket Included	Fuel Flow	Port Size
FH24001	FS53022	Single Tall	SP1428	Yes	SP1639	No	Bottom In / Bottom Out	1-5/16"-12 UN/UNF-2A 37° Flare

Replacement Filters

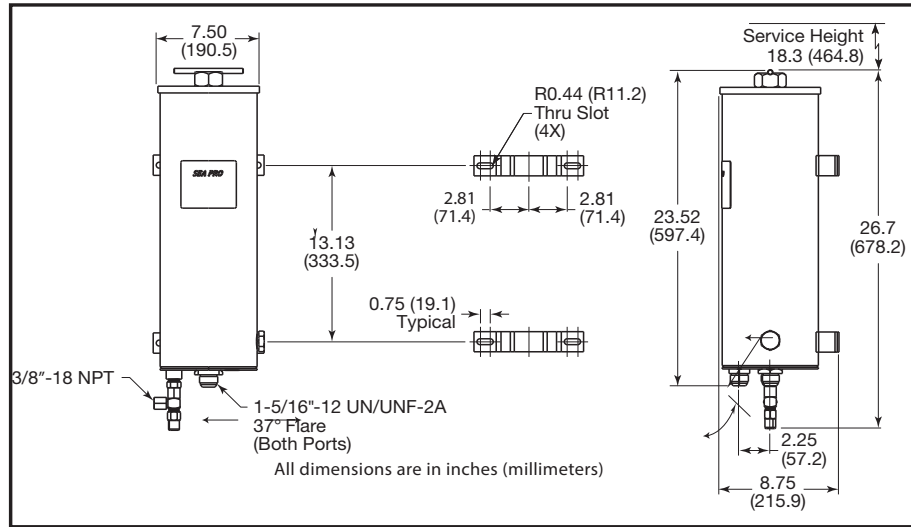
Part Number	Description
FS53022	NanoNet 5 micron (tall)

Filter Specifications

Spin-On Filter

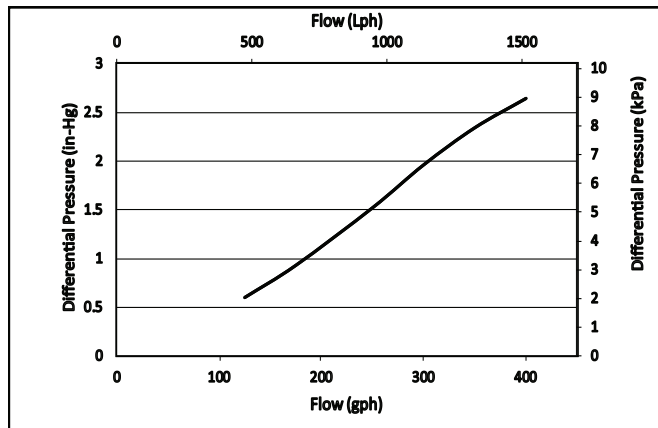
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

Filter Restriction vs Flow



Note: Restriction vs Flow test run per SAE J905 standard
Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Unit Type	WIF	Drain	Pressure Gauge	Bracket Included	Fuel Flow	Port Size
FH24002	FS53021	Duplex Short	Yes	Yes	SP1531	No	Bottom In / Top Out	1-5/16"-12 UN/UNF-2A 37° Flare

Replacement Filters

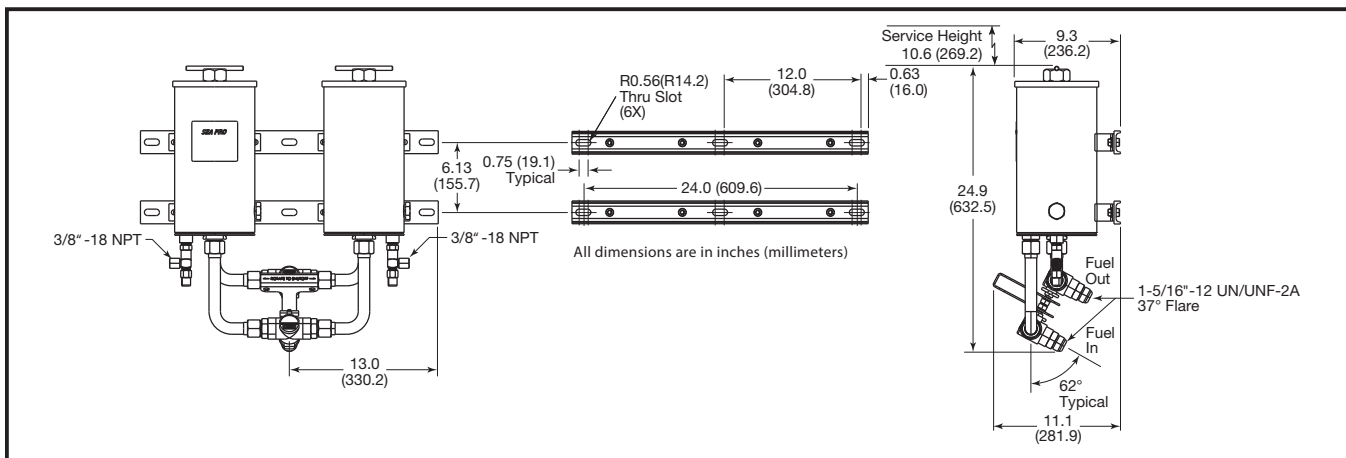
Part Number	Description
FS53021	NanoNet 5 micron (short)

Filter Specifications

Spin-On Filter

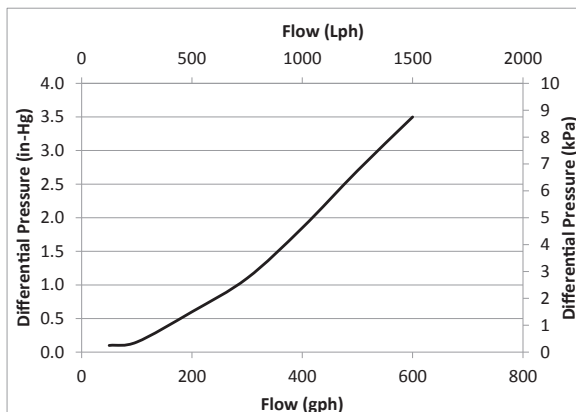
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions



Performance

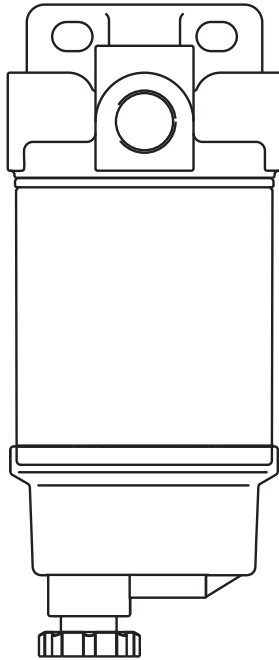
Filter Restriction vs Flow



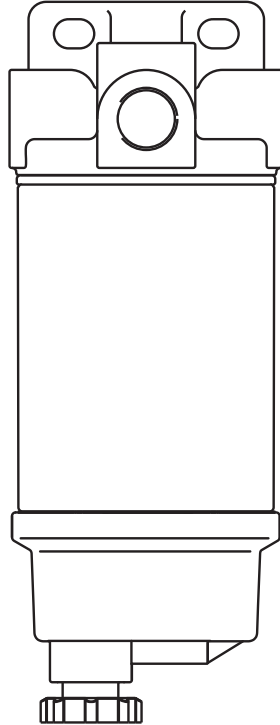
Note: Restriction vs Flow test ran per SAE J905 standard
Performance data based on #2 Diesel.

Spin-On Fuel/Water Separators

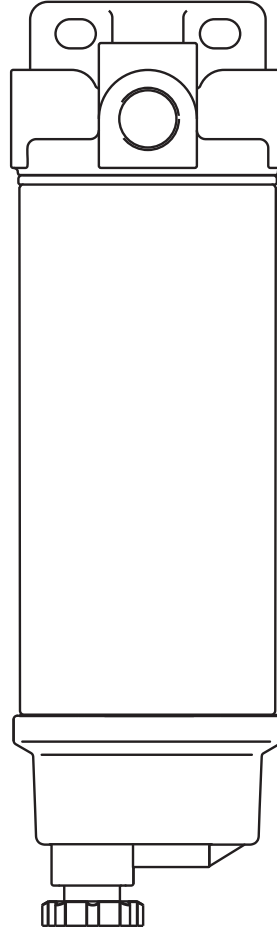
FS1240B



FS1241B



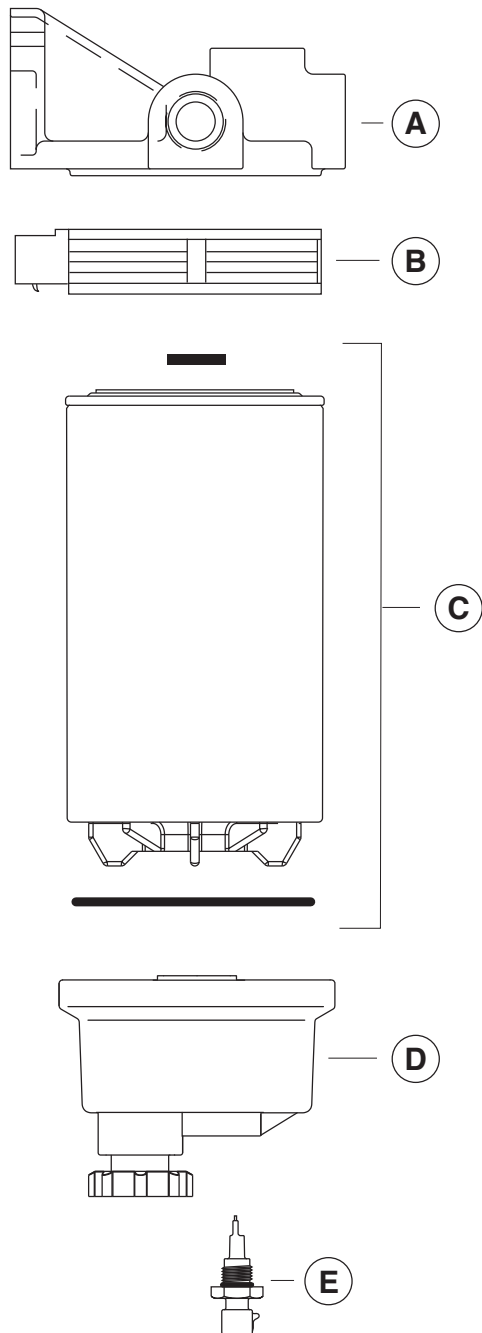
FS1242B



Specifications

Specification	FS1240B	FS1241B	FS1242B
Assembly Height Overall	5.87 in (149.0 mm)	6.87 in (175.0 mm)	8.87 in (225.0 mm)
Element Height Overall	3.80" (96.52 mm)	4.81" (122.17 mm)	6.83" (173.51 mm)
Diameter, max	3.75 in (95.0 mm)	3.75 in (95.0 mm)	3.75 in (95.0 mm)
Thread Size	1-14 UNS-2B	1-14 UNS-2B	1-14 UNS-2B
Weight (Dry)	1.0 lbs (0.45 kg)	1.15 lbs (0.52)	1.40 lbs (0.64 kg)
Flow Rate	30 gal/h (113.56 L/h)	45 gal/h (170.34 L/h)	90 gal/h (340.69 L/h)
Flow Direction	Outside/In	Outside/In	Outside/In

Specifications subject to change without notice.



Parts List

Part	Description	Part Number
A	Head Assembly	3833198 S
B	Heater and Gasket	3907766 S
C	Filter Element with Spud Seal and O-Ring Drain	See Individual Assembly Ordering Information
D	Clear Collection Bowl	3831871 S
E	Bowl Sensor	3834335 S
	Bowl Sensor for 12 VDC Systems (not shown)	3834217 S

Ordering Information

Assembly* Part Number	Filter Element
FS1240B	FS1240

* Assembly includes self-venting drain valve, clear collection bowl, and filter element.

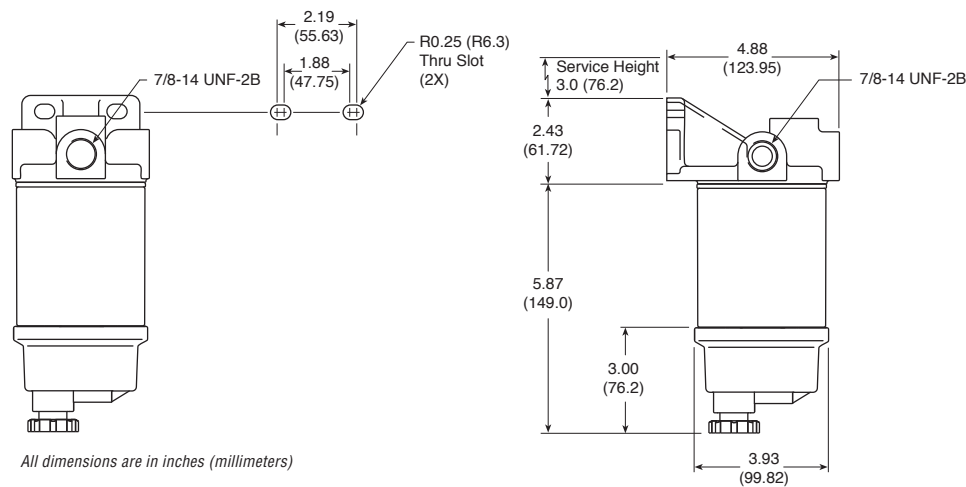
Replacement Filter

Part Number	Description
FS1240	30 gal/h (113.56 L/h) Spin-On Fuel/Water Separator

Filter Specifications

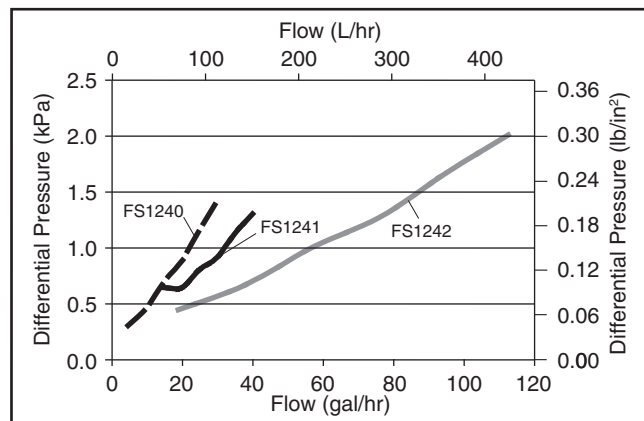
- Emulsified Water Separation: 90% per SAE J1488
- Free Water Separation: 90% per SAE J1839
- Efficiency: 98.7% @ 25 μ @ rated flow per SAE J1985

Mounting/Dimensions

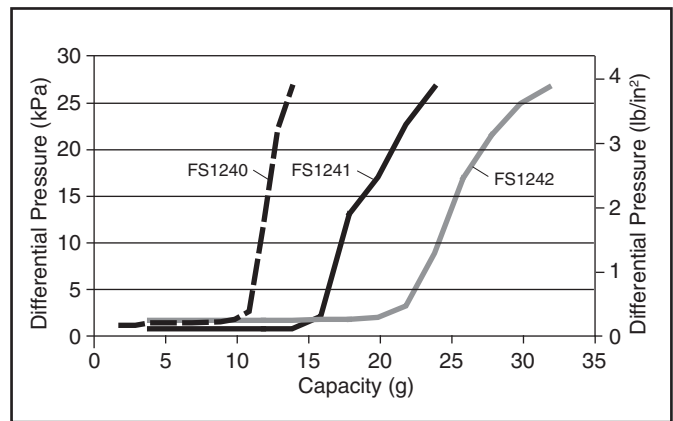


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Capacity vs Restriction tests run with a Flow Rate of 95 gal/h. Performance data based on #2 Diesel.

Ordering Information

Assembly* Part Number	Filter Element
FS1241B	FS1241

* Assembly includes self-venting drain valve, clear collection bowl, and filter element.

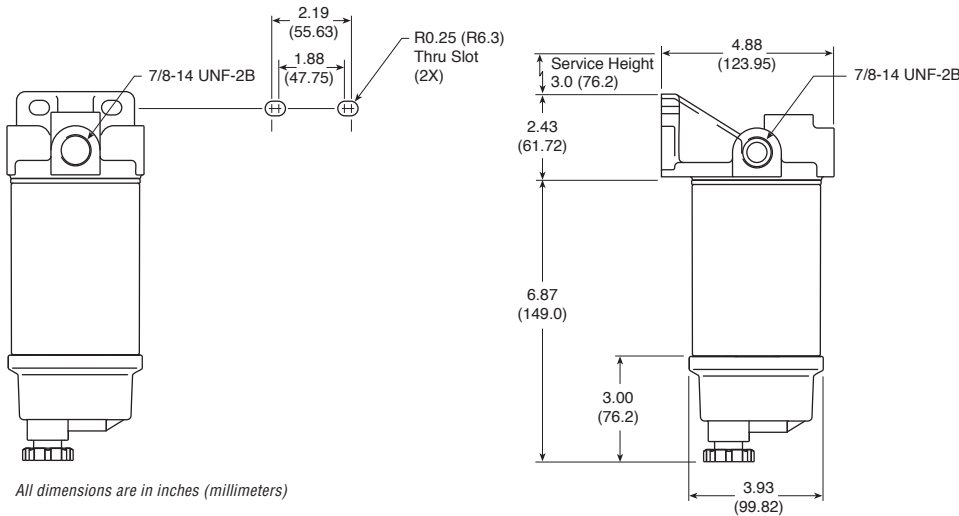
Replacement Filter

Part Number	Description
FS1241	45 gal/h (170.34 L/h) Spin-On Fuel/Water Separator

Filter Specifications

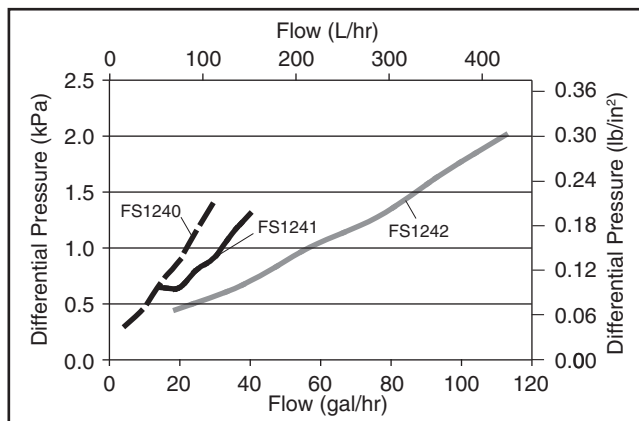
- Emulsified Water Separation: 90% per SAE J1488
- Free Water Separation: 90% per SAE J1839
- Efficiency: 98.7% @ 25 μ @ rated flow per SAE J1985

Mounting/Dimensions

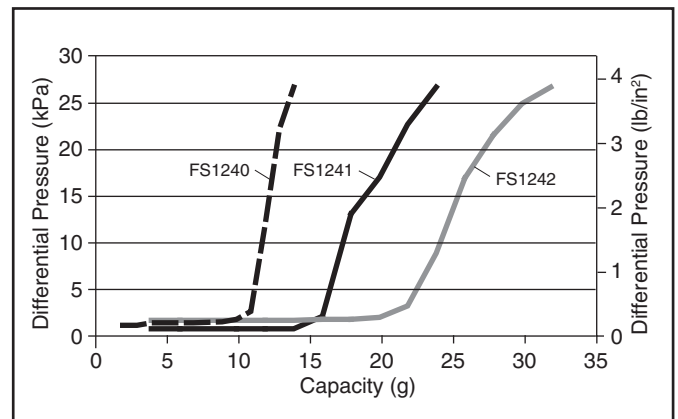


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Capacity vs Restriction tests run with a Flow Rate of 95 gal/h. Performance data based on #2 Diesel.

Ordering Information

Assembly* Part Number	Filter Element
FS1242B	FS1242

* Assembly includes self-venting drain valve, clear collection bowl, and filter element.

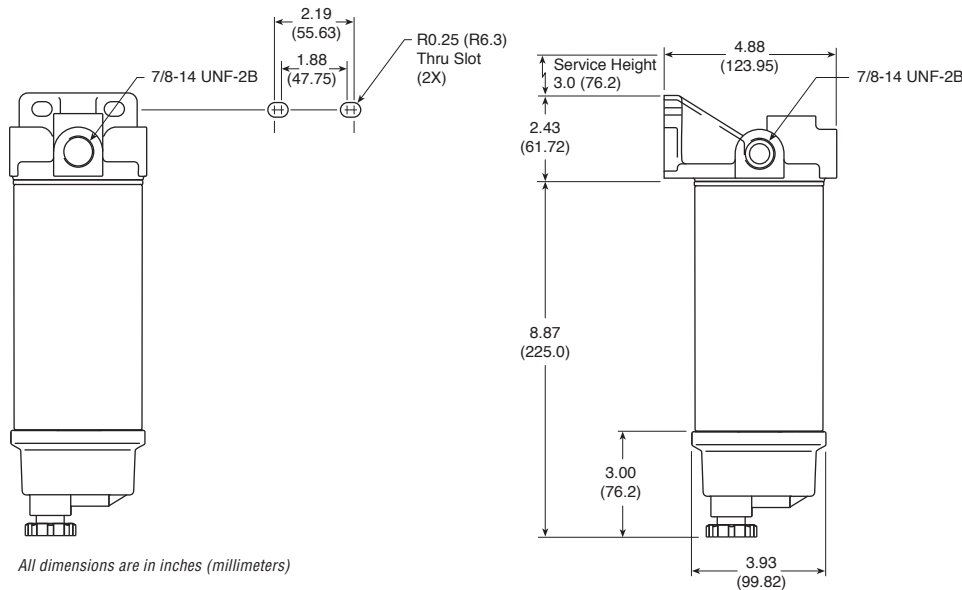
Replacement Filter

Part Number	Description
FS1242	90 gal/h (340.69 L/h) Spin-On Fuel/Water Separator

Filter Specifications

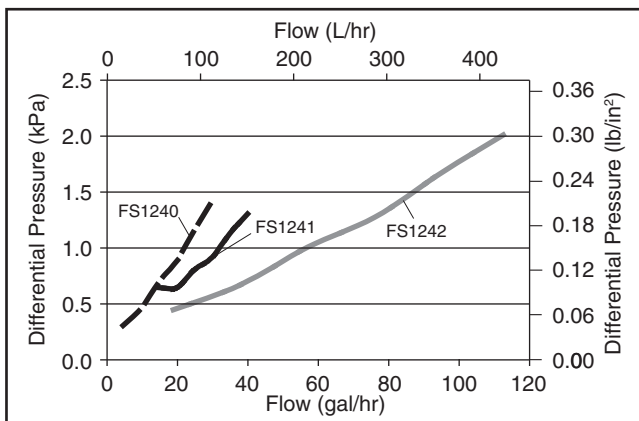
- Emulsified Water Separation: 90% per SAE J1488
- Free Water Separation: 90% per SAE J1839
- Efficiency: 98.7% @ 25 μ @ rated flow per SAE J1985
- FS1015 StrataPore Upgrade Efficiency: 98.7% @ 10 μ @ rated flow per SAE J1985

Mounting/Dimensions

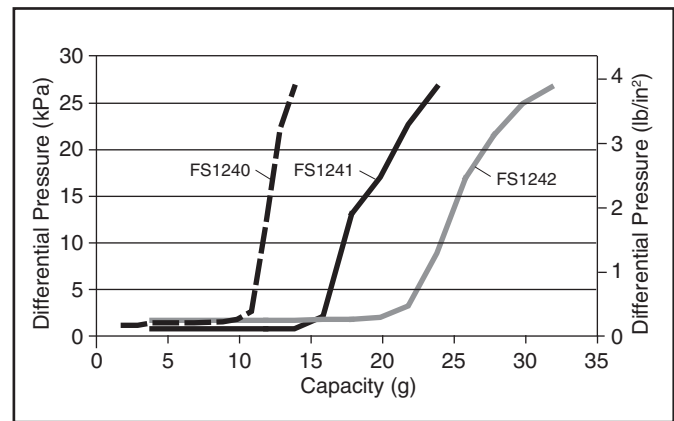


Performance

Filter Restriction vs Flow

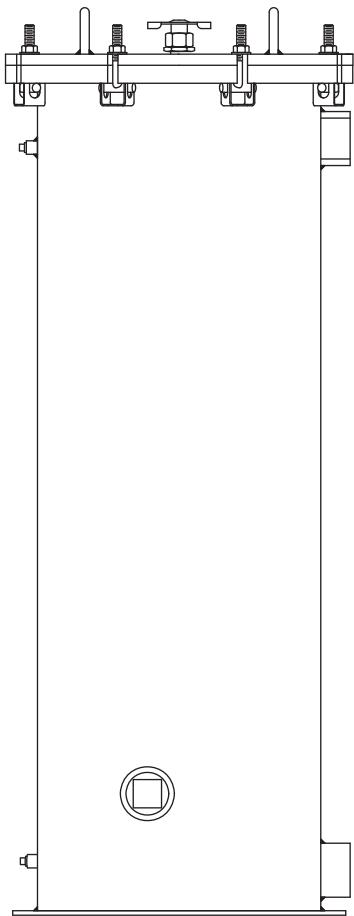
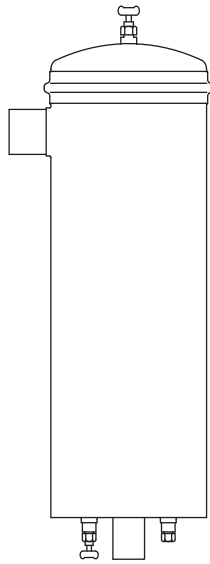


Filter Capacity vs Restriction



Note: Capacity vs Restriction tests run with a Flow Rate of 95 gal/h. Performance data based on #2 Diesel.

Stationary Fuel Coalescers



Introduction

Fleetguard® Stationary Fuel Coalescer

To appreciate the 99% water and dirt removal efficiency of the Fleetguard Stationary Fuel Coalescer, it is important to understand why a coalescer is valuable in the first place.

Water in Fuel

Inconsistencies in diesel fuel handling, storage and delivery all contribute to water in fuel. Water can also enter underground storage tanks through deteriorated tank walls, vents or through filler tubes. Changes in temperature and additions of warmer fuel can cause condensation to form and collect at the bottom of the tank. Whatever the cause, water is generally present in fuel, and it exists in two forms: free water and emulsified water.

A static holding tank accumulates free water, which is visible as large droplets or as a layer found at the bottom of the tank. However, once vibration or movement occurs in the fuel system, free water breaks down into very small droplets and emulsifies with the fuel. The fuel pump also breaks down free water. The result is emulsified water, water droplets small enough to escape detection by the unaided eye. An emulsion of fuel and water will have a milky appearance.

Water Contamination of Either Type Spells Danger to Your Engine

Diesel injection systems consist of precision components with extremely close tolerances relying completely on the fuel for lubrication. Water causes a multitude of difficulties both for the fuel system as well as for the engine itself. Water can lead to scored pump surfaces, destruction of the injector nozzle, premature valve wear, and cracked cylinder liners – just to name a few of the possible problems.

Sulfur, in concentrations as high as 0.5% in today's fuels, combines with water to form corrosive acids. These acids can not only damage the fuel injection system, they can also find their way into the lubricating oil, resulting in premature bearing wear.

Water accumulated during diesel fuel storage encourages bacterial growth. These bacteria and other microbes are a significant cause of untimely engine fuel filter plugging.

Optimum engine life and economic performance depend upon having pure fuel delivered to the combustion chambers.

The Benefits

When properly installed, the Fleetguard Stationary Fuel Coalescer offers:

- Lower maintenance costs
- Longer engine operating life
- Better fuel economy
- Reduced exhaust emissions

With flexible installation options, you can achieve clean fuel with no system-damaging water.

Common Water Removal Methods

Many devices claim 100% water removal. The majority of these devices fall into two categories: mechanical or pleated separators. Mechanical separators usually employ either centrifugal action or static deflection to remove larger drops of free water from diesel fuel. Pleated paper separators use a single stage, water-repellent paper to separate the large drops of free water from the fuel passing through the media. These two methods of fuel/water separation remove free water but have little or no effect on emulsified water. However, many fuel systems contain more emulsified water than free water.

How a Coalescer Works

The practical removal of both free and emulsified water mandates the use of coalescence. The Fleetguard Stationary Fuel Coalescer uses a two-stage process for water removal. In the first stage, inside-out flow dynamics direct fuel through a fibrous media that allows fuel to pass through but attracts and holds the emulsified water. These tiny droplets of water unite, or coalesce, to form larger droplets of free water. This free water is then released to the second stage, water repellent media, which easily separates the free water from the fuel. Separated water simply drops into a collection sump.

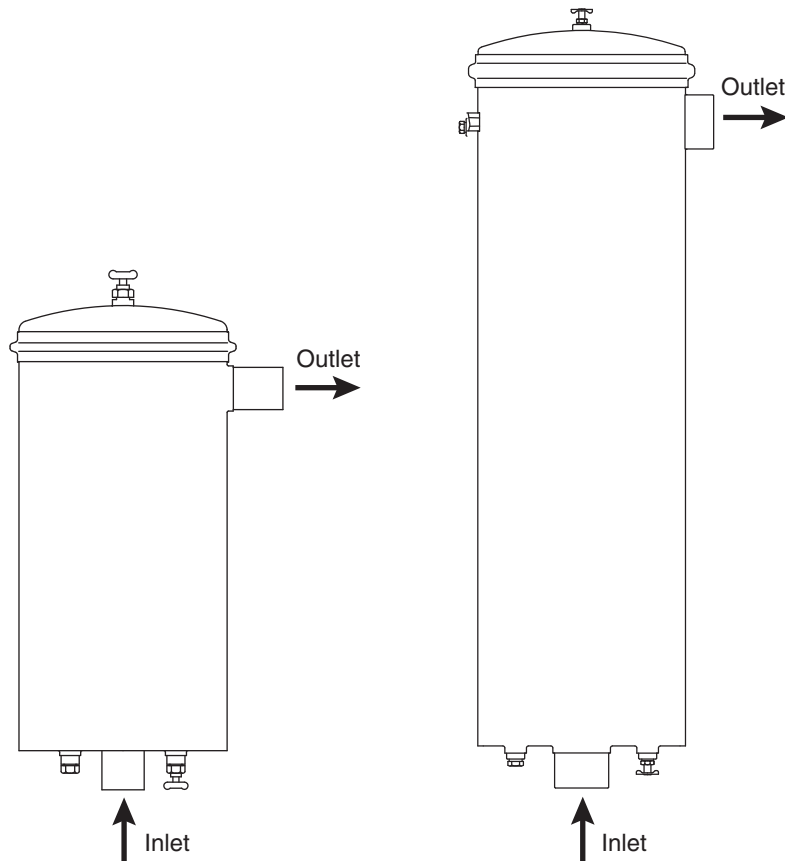
Beyond Water Separation

Stationary Fuel Coalescers have excellent contaminant efficiency in addition to their water removal capabilities and will remove water indefinitely until they become plugged with contaminants. Water removal efficiency is unaffected by the filtration process.

The Fleetguard Stationary Fuel Coalescer is a floor standing, multiple element unit. A wide range of accessories are available to fit your specific application. Unlike conventional separators, these units can be installed on either the pressure side or suction side of the transfer or fuel pump.



Coalescers Feature Inside-Out Flow

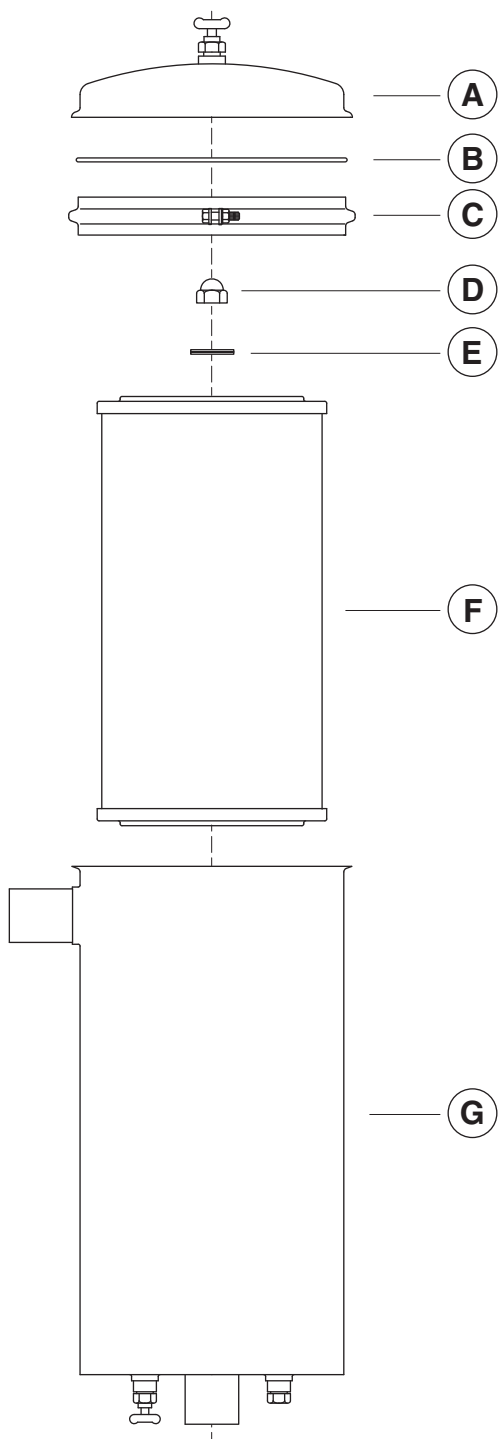


Specifications

Housing Part Number	Design Pressure lb/in ² (kPa)	Flow Rate* gal/min (L/min)	Pressure Drop** in Hg (kPa)
91284N	75 (517.1)	6 (22.7)	2.5 (8.5)
91293N	75 (517.1)	15 (56.8)	2.5 (8.5)

* Clean filter at rated flow, based on #2 Diesel fuel.

** Change filter at 5 PSID (34.5 kPa) above initial pressure drop.



Parts List

Part	Description	Part Number	
		91284N	91293N
A	Cover Assembly	N/A	N/A
B	O-Ring	Q58403	Q58878
C	Band Clamp	Q53087A	N/A
D	Seal Nut Assembly	N/A	Q53473
E	Gasket	Q58031	Q58403
F	Filter Element	88471N	88473N
G	Housing	91284N	N/A

Ordering Information

Housing Part Number	Filter Element
91284N	88471N
91293N	88473N

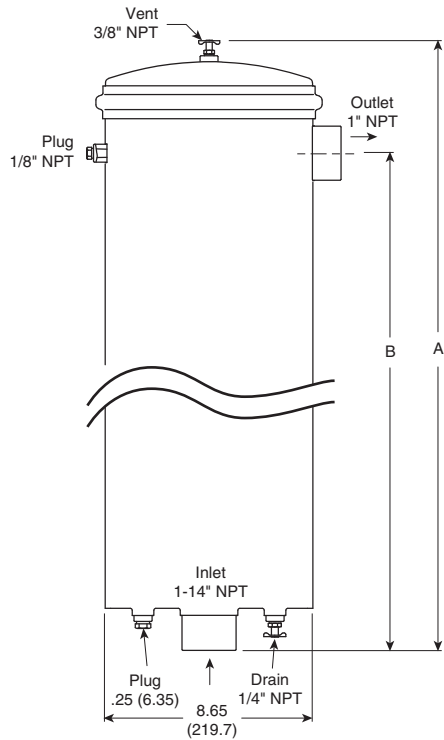
Replacement Elements

Part Number	Description
88471N	Two-stage coalescing element
88473N	Two-stage coalescing element

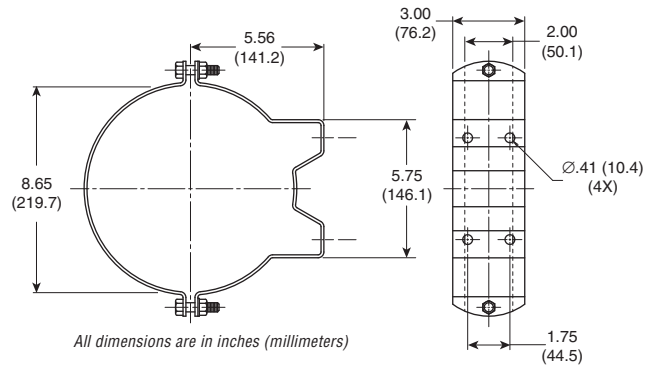
Filter Efficiency

- Emulsified Water Removal: 99% per SAE J1488
- Free Water Removal: 99% efficiency per SAE J1839
- Contaminant Efficiency: $B_5 = 100$

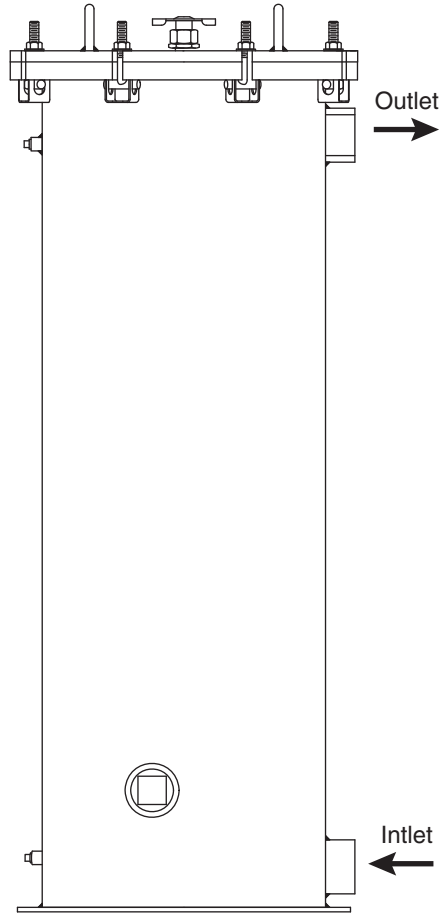
Mounting/Dimensions



Part Number	A Height in (mm)	B Inlet Height in (mm)
91284N	21.5 (546.1)	16.62 (442.2)
91293N	32.46 (822.5)	27.5 (698.5)



Coalescers Feature Inside-Out Flow

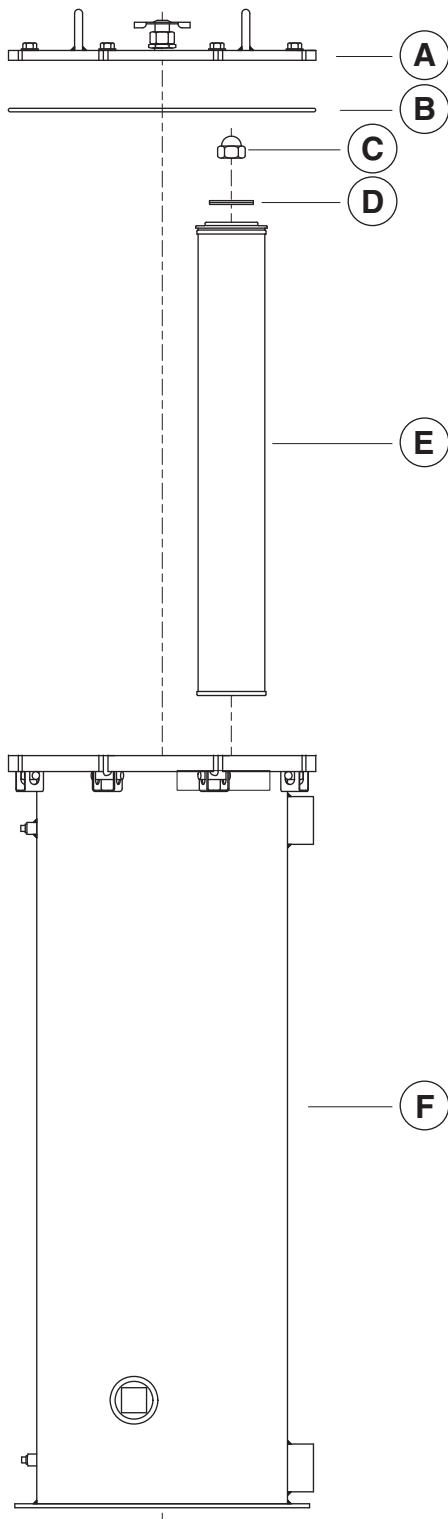


Specifications

Part Number	Design Pressure lb/in ² (kPa)	Flow Rate* gal/min (L/min)	Pressure Drop** in Hg (kPa)
91292N	75 (517.1)	100 (378.5)	3.5 (11.9)

* Clean filter at rated flow, based on #2 Diesel fuel.

** Change filter at 5 PSID (34.5 kPa) above initial pressure drop.



Parts List

Part	Description	Part Number
A	Cover Assembly	Q80660A
B	O-Ring	Q79058
C	Seal Nut Assembly	N/A
D	Gasket	Q58878
E	Filter Element	88472N
F	Housing	91292N

Ordering Information

Housing Part Number	Filter Element
91292N	88472N

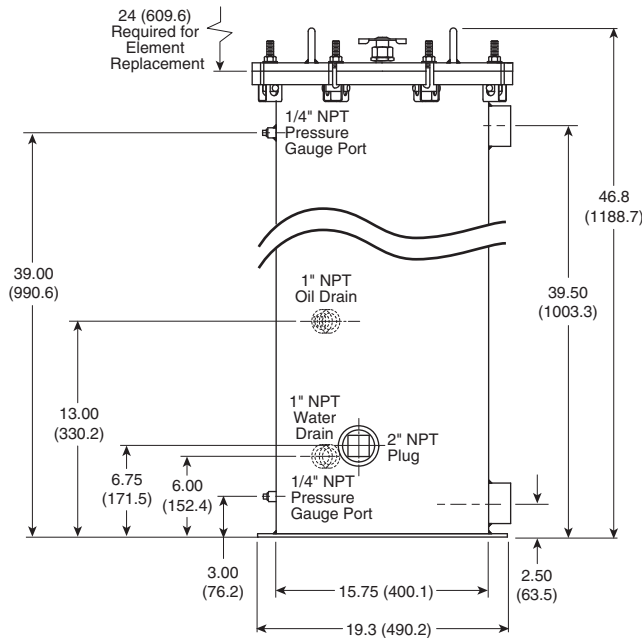
Replacement Filter

Part Number	Description
88472N	Two-stage coalescing element

Filter Efficiency

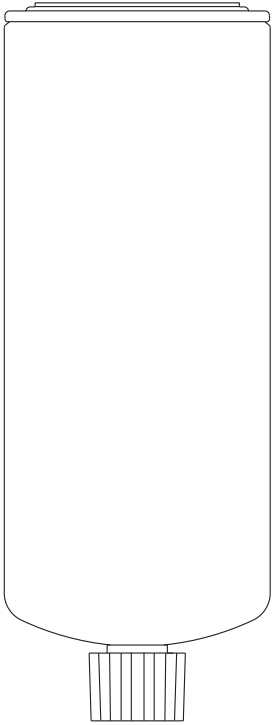
- Emulsified Water Removal: 99% per SAE J1488
- Free Water Removal: 99% efficiency per SAE J1839
- Contaminant Efficiency: $B_5 = 100$

Mounting/Dimensions

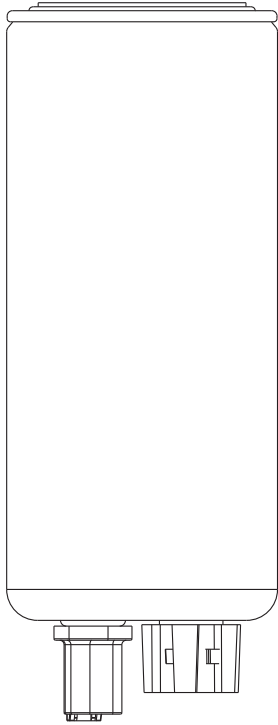


Lubricity-Enhancing Filters

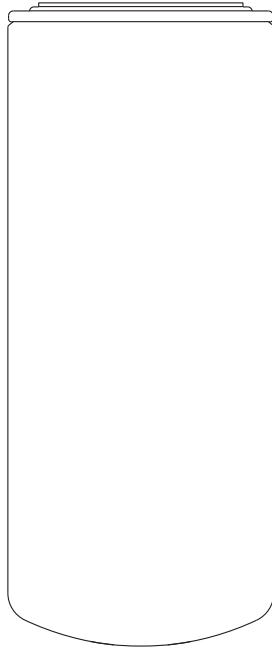
FS20000



FS20022



FA15700



Lubricity-Enhancing Filters

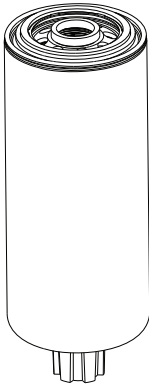
For customers who choose to run light fuels in Tier 2 Cummins B Series engines with electronic and mechanical fuel pumps, or Jet A fuel in airport ground equipment, Cummins Filtration designed a spin-on filter with slow-release chemical technology. These filters are also recommended for applications using Kerosene, Winter Fuel Blends (50% #2 and 50% #1 Diesel) and Low Sulfur Diesel (below 50 ppm sulfur). The patented chemical technology improves fuel lubricity and works with proprietary StrataPore™ media for extra protection from abrasives:

Fleetguard FS20000 and FS20022 Slow Release Lubricity-Enhancing Fuel Filtration Systems protect components from excessive wear, enhance fuel lubricity for life of the filter and remove free and emulsified water. FA15700 is a lubricity doser only.

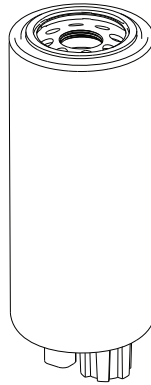
These fuel additives, emission related chemicals and lubricity-enhancing products, along with Fleetguard fuel processors, Ultra Low Sulfur Diesel and Biodiesel up to B20 compatible fuel filtration, and proprietary StrataPore multi-layer media, ensure maximum protection and performance for your fuel system while meeting global emissions guidelines.

Type	FS20000 filters are premium quality filters with a Lubricity-Enhancing Additive with patented slow release technology and utilizing StrataPore™ media. FS20022 filters use capillary pressure release technology and utilize StrataPore™ media. FA15700 is a lubricity doser only without fuel filtration or water separation function.
Composition	Slow Release Filters disperse premium Lubricity-Enhancing Additive over the life of the filter. The additive is released into the fuel using pressure gradient capillary technology in the FS20022 and a polymeric slow release diffusion mechanism in the FS20000. The media consists of the revolutionary StrataPore media for extra protection from abrasive particles.
Application	Required for light fuel applications of Tier 2 compliant Cummins B Series engines with electronic and mechanical fuel pumps. Other light fuel applications where additional protection is required include airport ground equipment (Jet A fuel), applications that use Kerosene, Winter Fuel Blends (50% #2 and 50% #1 Diesel) and Low Sulfur Diesel (below 50 ppm sulfur).
Benefits	<ul style="list-style-type: none">• Enhances Fuel Lubricity for the life of the filter• Provides Lubricity-Enhancing Additive with patented slow release technology• Removes both free and emulsified water, excluding FA15700• Protects fuel system from abrasive wear particles, excluding FA15700• Unique thread size prevents non-chemical filters from mistakenly being used

FS20000



FS20022



FA15700



Specifications

Specification	FS20000	FS20022	FA15700
Rated Flow	90 gal/h (227 L/h)	40 gal/h (151 L/h)	See Service Interval
Height	9.806" (249.07 mm)	9.79" (248.67 mm)	8.75" (222.21 mm)
Outside Diameter	3.67" (93.37 mm)	3.69" (93.73 mm)	3.67" (93.37 mm)
Rated Efficiency	98.7% efficient at 5 microns per single pass SAE J1985	98.7% efficient at 25 microns per single pass SAE 1985	N/A
Rated Capacity	25 g per SAE J905	13 g per SAE J905	N/A
Service Interval	250 hours or 6 months from date of installation (whichever comes first)	500 hours engine operation per 5000 gallons fuel treated	250 hours: In applications having a filter flow rate of 17.75 GPH (1.12 L/min) 500 hours: In applications having a filter flow rate of 13.47 GPH (0.85 L/min)
Thread Size	1-1/8-16 UN-2B	1-1/8-16 UN-2B	1-1/8-16 UN-2B
Head Dimensions	3.7" (93.98 mm) x 3.5 (98.9 mm)	3.7" (93.98 mm) x 3.5 (98.9 mm)	3.7" (93.98 mm) x 1.96 (49.8 mm)

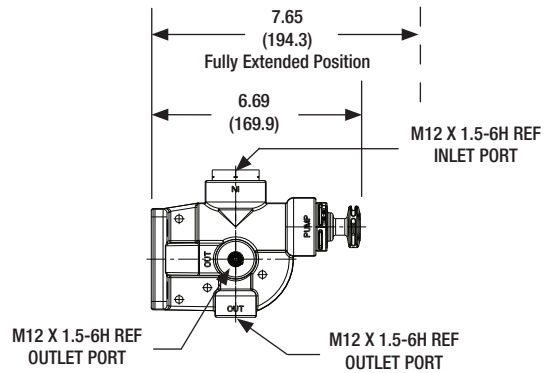
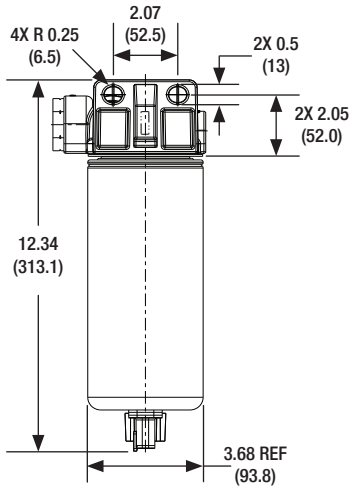
Specifications subject to change without notice.

Modules

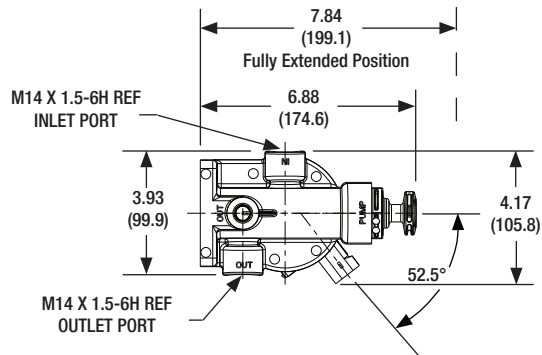
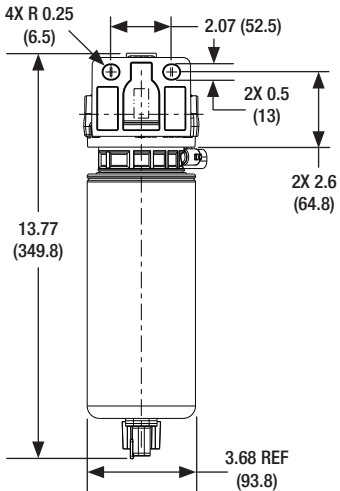
Module PN	Inlet Size	Outlet Size	Priming Pump	Heater	Max Width (mm)	Max Length (mm)	Max Height (mm)	Element	Heater Voltage	Heater Current (A)	Heater Power (W)	Heater Kit
3951006 S	M12 x 1.5	M12 x 1.5	Yes	No	124.25	171.3	312.08	FS20022	NA	NA	NA	NA
3963018	M14 x 1.5	M14 x 1.5	Yes	Yes	105.8	174.6	349.8	FS20022	12	25	300	3951359 S
3966807 S	M14 x 1.5	M14 x 1.5	Yes	No	98.0	174.6	334.3	FS20022	NA	NA	NA	NA
3967890 S	M12 x 1.5	M12 x 1.5	Yes	No	125.0	162.0	329.85	FS20022	NA	NA	NA	NA
3938173 S	M12 x 1.5	M12 x 1.5	No	No	100.98	95.82	288.19	FS20000	NA	NA	NA	NA

Mounting/Dimensions

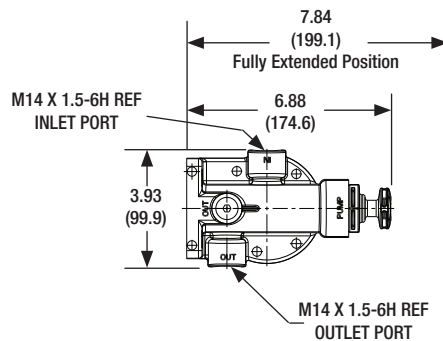
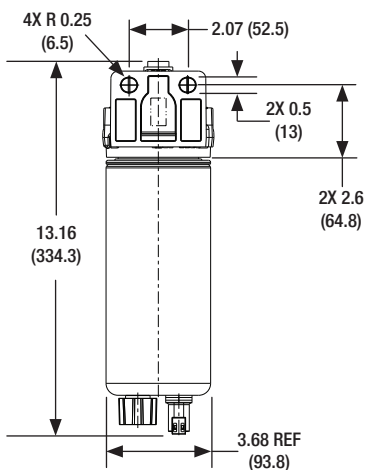
3951006 S



3963018



3966807 S



All dimensions are in inches (millimeters)

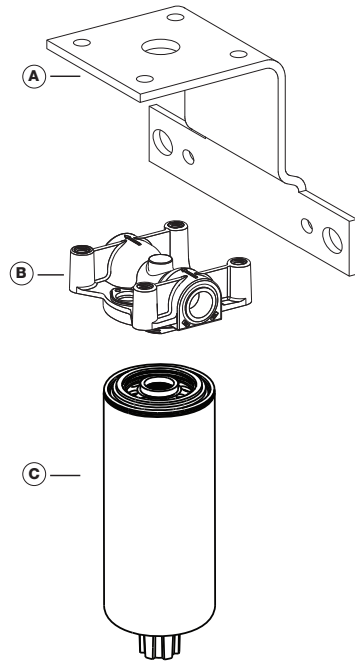
Parts List

Part	Description	Part Number
A	Mounting Bracket (sold separately)	0256535 S
B	Doser Remote Head	3957451 S
C	Filter	FS20000

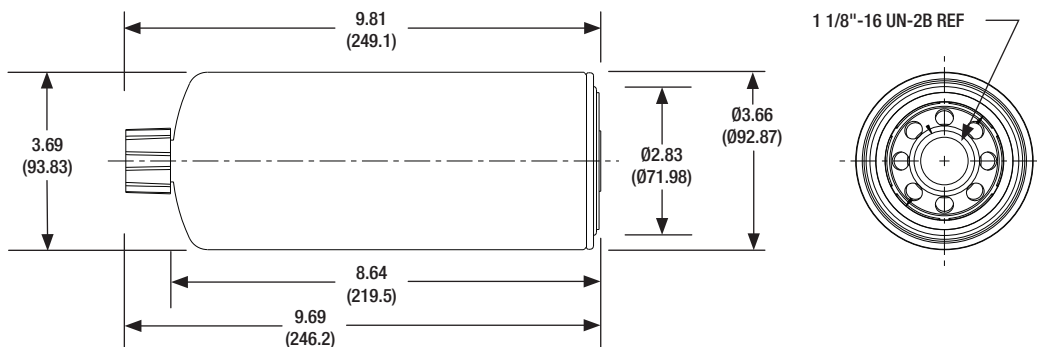
Filter Specifications

Specification	3938173S
Height Overall	11.2" (285.22 mm)
Length Overall	3.7" (93.38 mm)
Width Overall	3.98" (100.98 mm)
Thread Inlet	1/2"-14 NPTF
Thread Outlet	1/2"-14 NPTF
Filter Thread	1-1/8"-16 UN-2B

FS20000



Dimensions



All dimensions are in inches (millimeters)

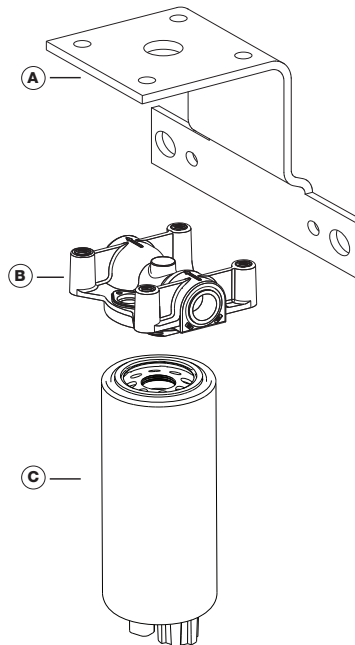
Parts List

Part	Description	Part Number
A	Mounting Bracket (sold separately)	0256535 S
B	Doser Remote Head	3957451 S
C	Doser Filter	FS20022

Filter Specifications

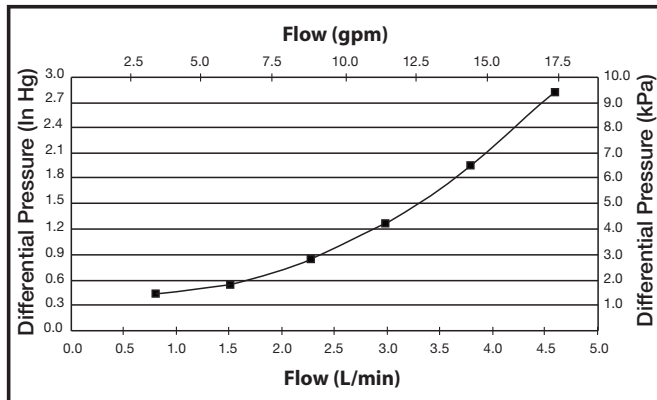
Specification	FS20022
Height Overall	9.8" (249.27 mm)
Length Overall	3.7" (93.38 mm)
Width Overall	3.7" (93.17 mm)
Thread Inlet	1/2"-14 NPTF
Thread Outlet	1/2"-14 NPTF
Filter Thread	1-1/8"-16 UN-2B

FS20022

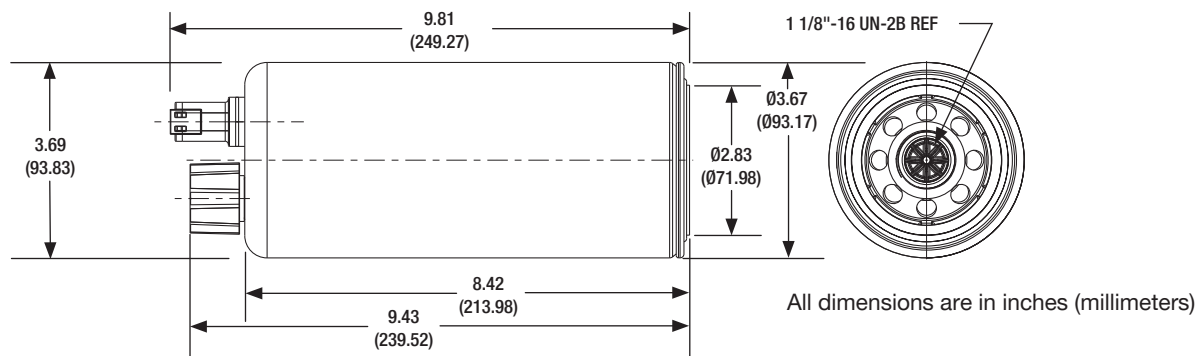


Performance

Filter Flow vs Restriction



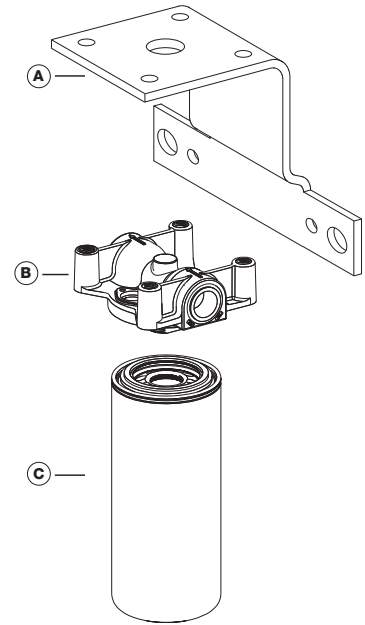
Dimensions



Parts List

Part	Description	Part Number
A	Mounting Bracket (sold separately)	0256535 S
B	Doser Remote Head	3957451 S
C	Doser Filter	FA15700

FA15700



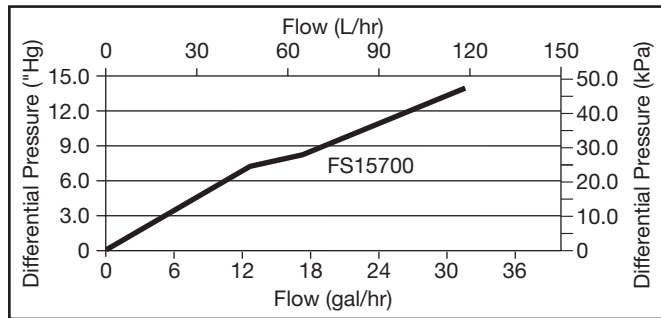
Filter Specifications

Specification	FA15700
Height Overall	8.871" (225.32 mm)
Thread Size	1-1/8"-16 UN-2B
Dome Outside Diameter	3.676" (93.37 mm)
Service Interval	<p>500 Hours: In applications having a fuel flow rate of 13.50 gal/hr (51.0 L/hr) or less.</p> <p>250 Hours: In applications having a fuel flow rate between 13.50 gal/hr (51.0 L/hr) and 17.8 gal/hr (67.4 L/hr).</p> <p>For applications with higher fuel flow rates: Multiple units may be possible, depending upon application and required performance. Contact Cummins Filtration for assistance with these applications.</p>
Rated Temperature	140 °F (60 °C)

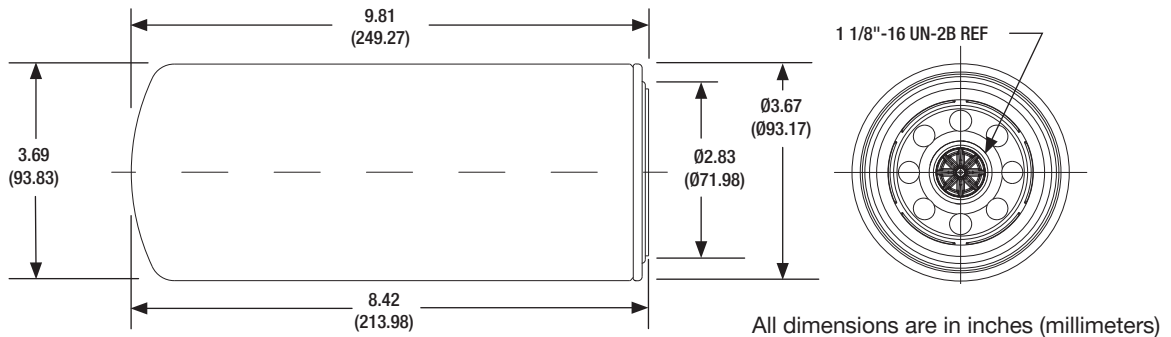
Specifications subject to change without notice.

Performance

Filter Flow vs Restriction



Dimensions

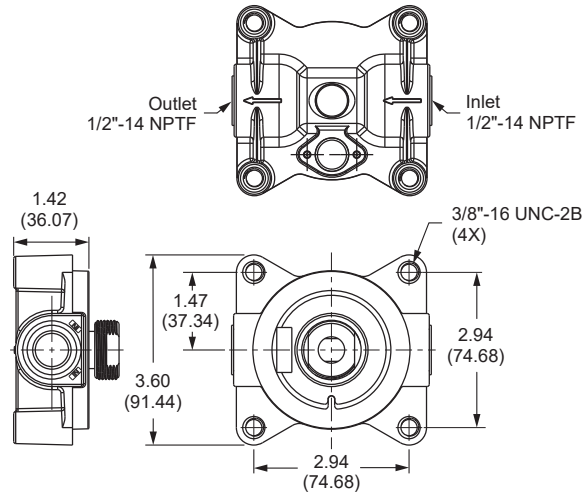


Remote Mount Head

Specifications

Specification	3957451 S
Height Overall	1.42" (36.07 mm)
Length Overall	3.7" (94.0 mm)
Width Overall	3.6" (91.44 mm)
Thread Inlet	1/2"-14 NPTF
Thread Outlet	1/2"-14 NPTF
Largest Thread	1-1/8"-16 UN-2A

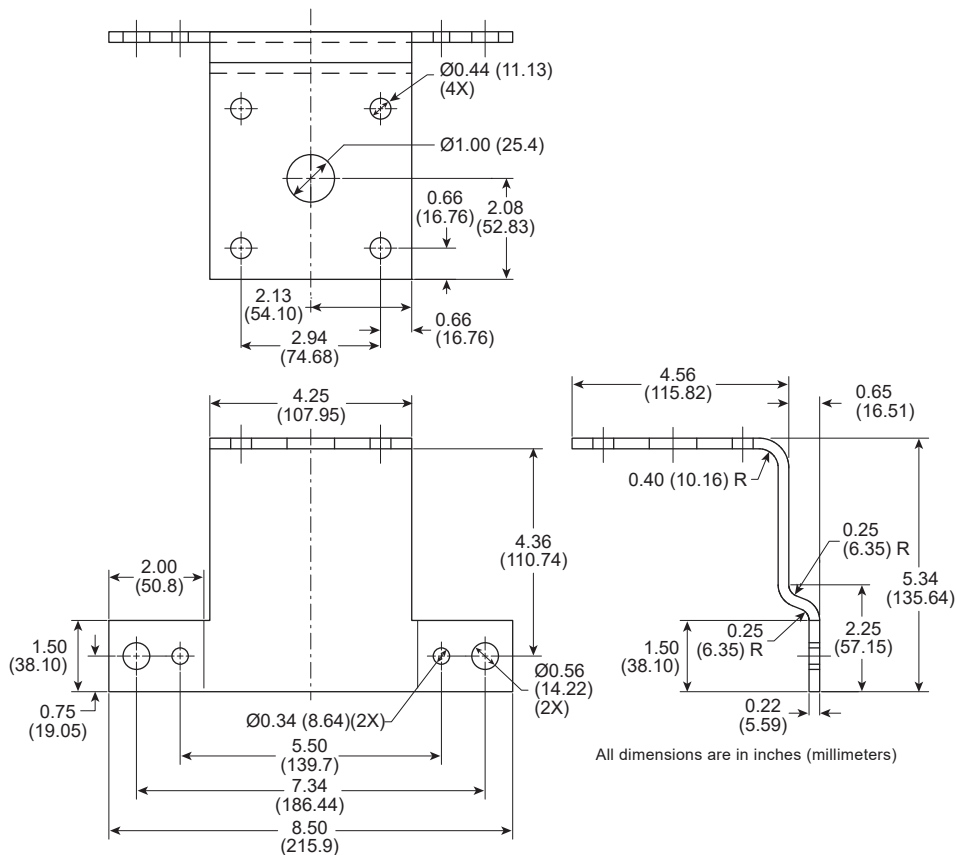
Dimensions



All dimensions are in inches (millimeters)

Mounting Bracket

Dimensions

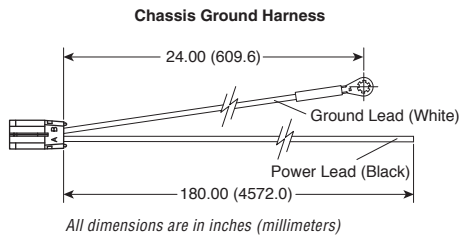
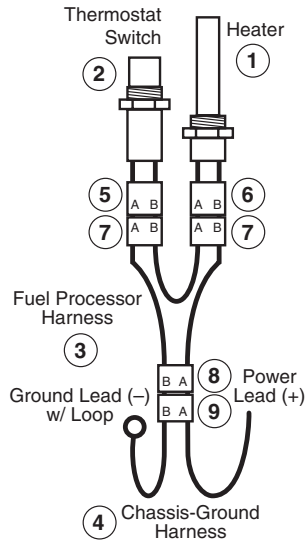


All dimensions are in inches (millimeters)



Discontinued Products





Note: Wiring Harness required for all Fuel Pro applications. Sold separately.

12 V and 24 V Heater for Fuel Pro

	Heater	3944450 S	3945136 S
1	Heater	3944450 S	3945136 S
	Description	12 VDC	24 VDC
	Product	Fuel Pro®	Fuel Pro
2	Thermostat Switch	3946703 S	3946673 S
3	Fuel Processor Harness	3945120 S – Included with all Fuel Pro units	
4	Chassis-Ground Harness	3945123 S Power Lead – 180" (457.2 cm) Ground Lead – 24" (60.96 cm) Sold separately	

Connectors for 12 V and 24 V Heater Kits for Fuel Pro

	Heater	3944450 S	3945136 S
5	Connector	Packard 12015792	
6	Connector	Packard 12015792	Packard 12103584
7	Connector	Packard 12015793 – 2 pieces	
8	Connector	Packard 12103584 – 1 piece	
9	Connector	Packard 12010973	

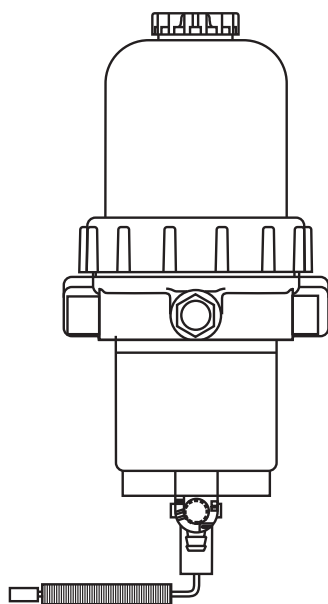
Replacement Kits

Part Number	Replaces Previous Number	Description
3959748 S	–	12 V Heater Upgrade Kit
3959749 S	–	24 V Heater Upgrade Kit
3959750 S	–	24 V Preheater Upgrade Kit
3959751 S	3944456 S	12 V Preheater Upgrade Kit
3959752 S	3944455 S	12 V Replacement Heater/Thermo Kit
3959753 S	3946703 S	12 V Replacement Heater/Thermo Kit
3959754 S	3946707 S	12 V Combo Heater Kit
3959755 S	3946708 S	24 V Combo Heater Kit

Note: Contact Cummins Filtration® Customer Assistance for proper part number information.



Filter/Separator/Warmer

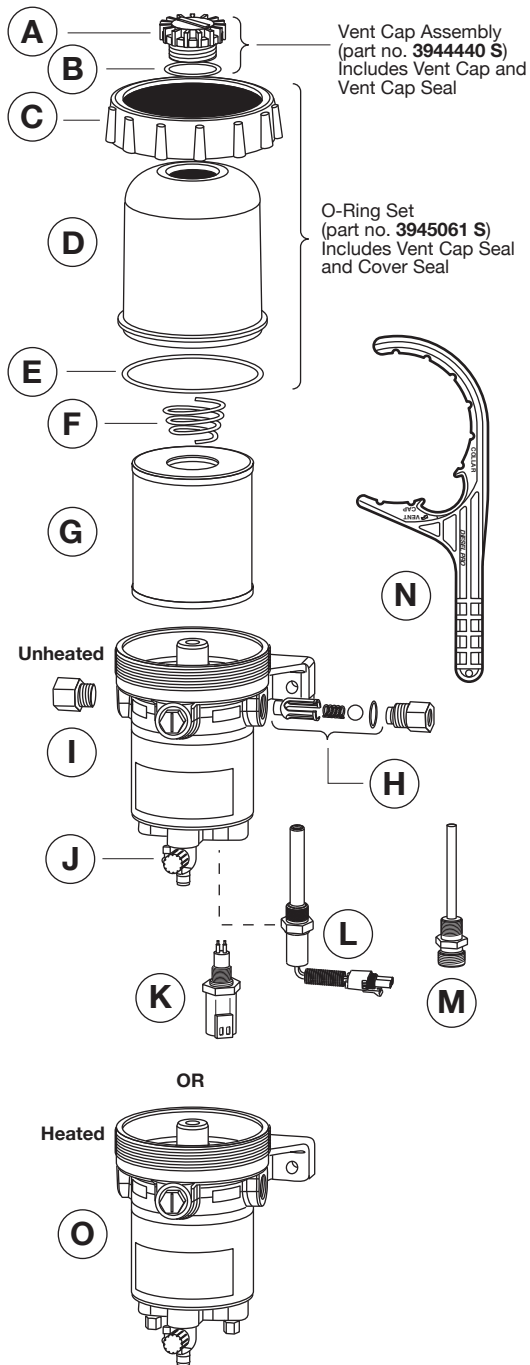


Diesel Pro® 232

Specifications

Specification	Diesel Pro®
Height Overall	14.0" (356.6 mm)
Depth Overall	5.90" (150 mm)
Width, max	6.25" (159 mm)
Mount Bracket Centers or Rear Mount Centers	5.25" (133.4 mm) 3.0" (76.2 mm)
Weight (Dry)	4.94 lbs (2.24 kg)
Fuel Connections (Inlet)	3/8" NPTF (M16 x 1.5)
Fuel Connection (Outlet)	3/8" NPTF (M16 x 1.5)
Fuel Capacity (w/o filter)	15.2 fl oz (0.45 L)
Operation Fuel Flow Rate	60 gal/h (230 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	11.0 fl oz (0.32 L)
Filter Service Clearance	Min. 1.5" (38.1 mm)
Mounting Bracket	Cast in Head
Electrical Heater	12 VDC, 150 W, 13 A ± 3 A 24 VDC, 150 W, 6.5 A ± 2 A 24 VDC, 250 W, 9.7 A ± 3 A 120 VAC, 37 W, 3 A ± 0.05 A
Fluid Heater	Optional
Fuel Types	Compatible for use with #1 Diesel, #2 Diesel, Kerosene, Biodiesel, and JP8

Specifications subject to change without notice.



Parts List

Part	Description	Part Number
A	Vent Cap	Vent Cap and Assembly 3944440 S
B	O-Ring	
C	Collar	3945059 S
D	Cover	3945148 S
E	O-Ring Pack - included with each replacement element	3944459 S
	Biodiesel Gasket Pack - only required for >B5 fuel	3950444 S
F	Filter Spring	3944441 S
G	Filter Element	See Ordering Information
H	Check Valve Service Kit	3945062 S
I	Diesel Pro® FH232, Unheated	See Ordering Information
J	Drain Valve	3945063 S
K	Water-In-Fuel (WIF) Sensor	3911940 S
L	12 VDC, 150 W Combo/Thermo Heater	3945064 S
	24 VDC, 150 W Combo/Thermo Heater	3945065 S
	24 VDC, 250 W Combo/Thermo Heater	3960976 S
M	120 VAC, 37 W Electric Heater	3951841 S
N	Collar Wrench, Plastic	3944460 S
	Collar Wrench, Metal	3944458 S
O	Diesel Pro FH232, Heated	See Ordering Information
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S

Note: The WIF sensor is not included, but can be purchased separately.

Ordering Information

Housing Part Number	Filter Element	Pre-Heater 1	Pre-Heater 2	Fluid Heat	WIF	Fuel Flow	Fuel In & Fuel Out Port Size
FH23200	FS19730	N/A	N/A	N/A	N/A	In Right/Out Left	3/8" NPTF
FH23201	FS19730	24 VDC	N/A	N/A	N/A	In Right/Out Left	3/8" NPTF
FH23202	FS19730	12 VDC	N/A	N/A	N/A	In Right/Out Left	3/8" NPTF
FH23209 M	FS19785	Ports Available	N/A	N/A	Yes	In Right/Out Left	M16 x 1.5
FH23210 M	FS19785	24 VDC	N/A	N/A	Yes	In Right/Out Left	M16 x 1.5
FH23211 M	FS19785	24 VDC	N/A	Yes	Yes	In Right/Out Left	M16 x 1.5
FH23215	FS19731	12 VDC	N/A	N/A	Yes	In Right/Out Left	3/8" NPTF
FH23216 M	FS19785	12 VDC	N/A	Yes	Yes	In Right/Out Left	M16 x 1.5

Note: The Diesel Pro® 232 can be upgraded to a Diesel Pro 233 by replacing the cover with Fleetguard® part number **3945060 S** and the filter with Fleetguard part number **FS19624**. For more information, contact Cummins Filtration® Customer Assistance.

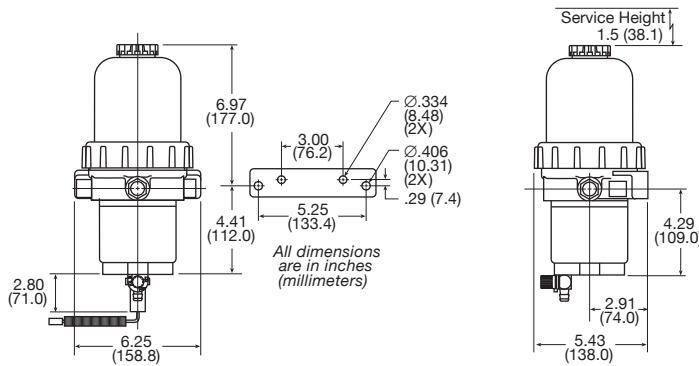
Replacement Filters

Part Number	Description
FS19730	StrataPore™ 7 micron
FS19731	StrataPore 10 micron
FS19785	StrataPore 25 micron

Filter Specifications

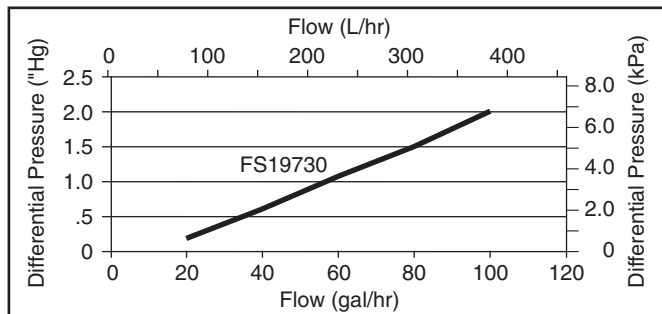
- Emulsified Water Separation: 95% efficiency at 100 gal/h (379 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 100 gal/h (379 L/h) flow per SAE J1839

Mounting/Dimensions

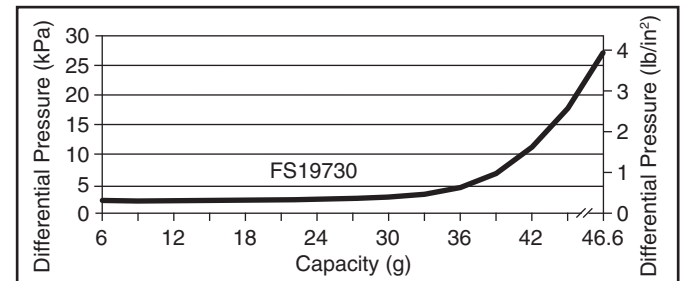


Performance

Filter Restriction vs Flow

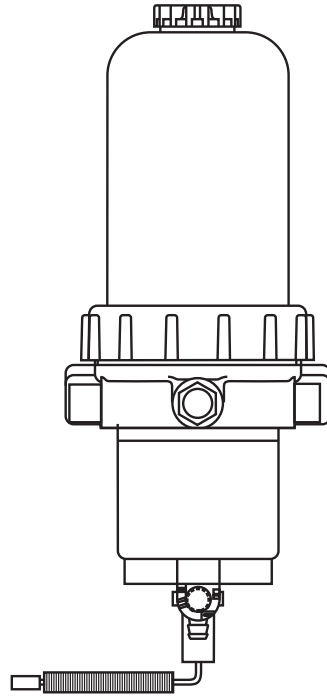


Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Filter/Separator/Warmer

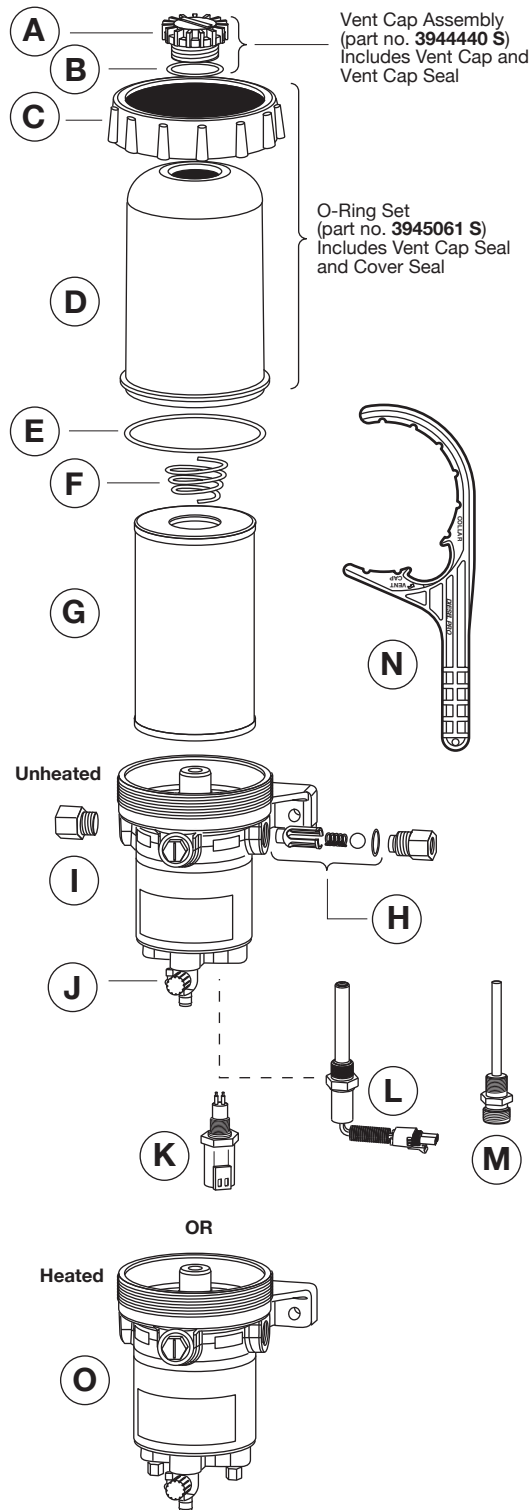


Diesel Pro[®] 233

Specifications

Specification	Diesel Pro [®]
Height Overall	16.5" (419 mm)
Depth Overall	5.90" (150 mm)
Width, max	6.25" (159 mm)
Mount Bracket Centers or Rear Mount Centers	5.25" (133.4 mm) 3.0" (76.2 mm)
Weight (Dry)	4.94 lbs (2.24 kg)
Fuel Connections (Inlet)	3/8" NPTF (M16 x 1.5)
Fuel Connection (Outlet)	3/8" NPTF (M16 x 1.5)
Fuel Capacity (w/o filter)	15.2 fl oz (0.45 L)
Operation Fuel Flow Rate	90 gal/h (341 L/h)
Recommended Applications	Light and Medium Duty Engines
Water Trap Capacity	11.0 fl oz (0.32 L)
Filter Service Clearance	Min. 1.5" (38.1 mm)
Mounting Bracket	Cast in Head
Electrical Heater	12 VDC, 150 W, 13 A ± 3 A 24 VDC, 150 W, 6.5 A ± 2 A 24 VDC, 250 W, 9.7 A ± 3 A 120 VAC, 37 W, 3 A ± 0.05 A
Fluid Heater	Optional
Fuel Types	Compatible for use with #1 Diesel, #2 Diesel, Kerosene, Biodiesel, and JP8

Specifications subject to change without notice.



Parts List

Part	Description	Part Number
A	Vent Cap	Vent Cap and Assembly 3944440 S
B	O-Ring	
C	Collar	
D	Cover	3945060 S
E	O-Ring Pack - included with each replacement element Biodiesel Gasket Pack - only required for >B5 fuel	3944459 S 3950444 S
F	Filter Spring	3944441 S
G	Filter Element	See Ordering Information
H	Check Valve Service Kit	3945062 S
I	Diesel Pro® FH233, Unheated	See Ordering Information
J	Drain Valve	3945063 S
K	Water-In-Fuel (WIF) Sensor	3911940 S
L	12 VDC, 150 W Combo/Thermo Heater 24 VDC, 150 W Combo/Thermo Heater 24 VDC, 250 W Combo/Thermo Heater	3945064 S 3945065 S 3960976 S
M	120 VAC, 37 W Electric Heater	3951841 S
N	Collar Wrench, Plastic Collar Wrench, Metal	3944460 S 3944458 S
O	Diesel Pro FH232, Heated	See Ordering Information
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S

Note: The WIF sensor is not included, but can be purchased separately.

Ordering Information

Housing Part Number	Filter Element	Pre-Heater 1	Pre-Heater 2	Fluid Heat	WIF	Fuel Flow	Fuel In & Fuel Out Port Size
FH23302	FS19624	N/A	N/A	N/A	N/A	In Right/Out Left	3/8" NPTF
FH23303	FS19624	12 VDC	N/A	N/A	N/A	In Right/Out Left	3/8" NPTF
FH23304	FS19624	24 VDC	N/A	N/A	N/A	In Right/Out Left	3/8" NPTF
FH23308	FS19728	N/A	N/A	N/A	Yes	In Right/Out Left	3/8" NPTF
FH23315 M	FS19728	Ports Available	N/A	N/A	Yes	In Right/Out Left	M16 x 1.5
FH23316 M	FS19728	24 VDC	N/A	N/A	Yes	In Right/Out Left	M16 x 1.5
FH23317 M	FS19728	24 VDC	N/A	Yes	Yes	In Right/Out Left	M16 x 1.5

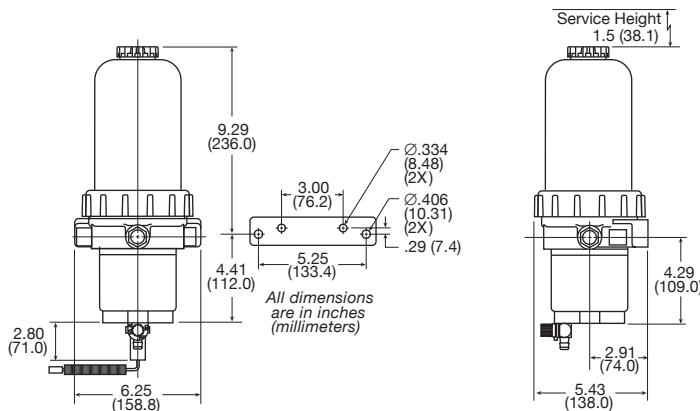
Replacement Filters

Part Number	Description
FS19761	EleMax™ StrataPore™ 5 micron
FS19624	EleMax StrataPore 7 micron
FS19729	EleMax Cellulose 50 micron
FS19728	EleMax StrataPore 25 micron
FS19727	EleMax StrataPore 10 micron

Filter Specifications

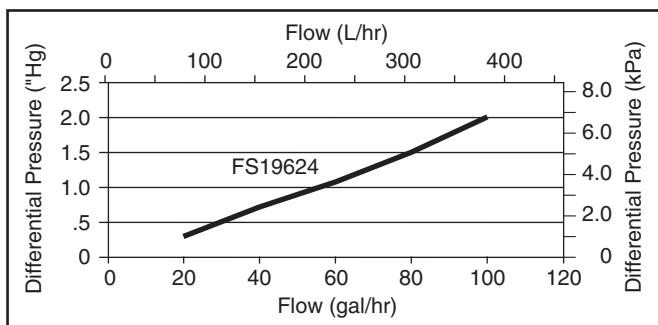
- Emulsified Water Separation: 95% efficiency at 60 gal/h (227 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 60 gal/h (227 L/h) flow per SAE J1839

Mounting/Dimensions

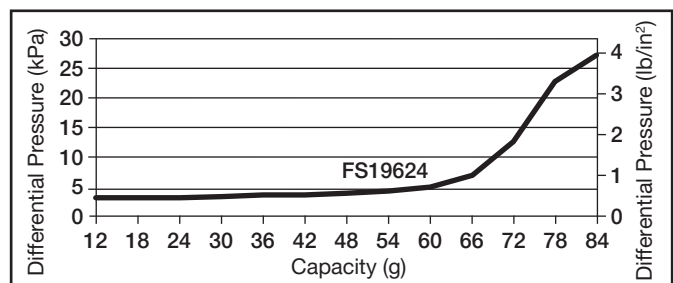


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



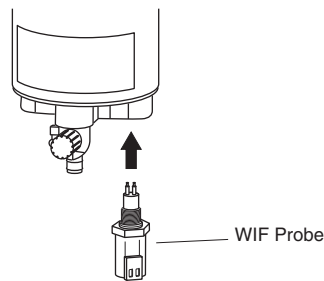
Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Part Number	Description
3911940 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation



Specifications

Specification	WIF
Resistance Across Pins	82 k Ω \pm 2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC
Signal Type	Analog
Thread	M14 x 2 – 6 g
Output Deutsch Connector	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT06-2S
Height to Water Sensing (Switch is in ON Position)	0.58" (14.73 mm)
Overall Length	2.328" (59.12 mm)
Length – Top of Probe to Bottom of Knuckle	1.201" (30.50 mm)
Length – Bottom of Knuckle to Top of Pin	0.79" (20.0 mm)
Distance Between Pins (Center to Center)	0.215" (5.46 mm)

Specifications subject to change without notice.

Ordering Information

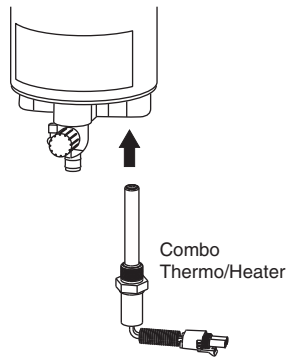
Part Number	Description
3945064 S	12 VDC, 150 W Combo Thermo/Heater
3945065 S	24 VDC, 150 W Combo Thermo/Heater
3960976 S	24 VDC, 250 W Combo Thermo/Heater

Specifications

Specification	3945064 S	3945065 S	3960976 S
Volts	12 VDC	24 VDC	24 VDC
Watts	150 W	150 W	250 W
Amps	13 ± 3 A	6.5 ± 2 A	9.7 ± 3 A
Cold Resistance	0.86 - 1.02 Ω	3.5 - 4.1 Ω	2.45 - 2.55 Ω
Switch Open Temp.	≥ 62 °F (17 °C)	≥ 62 °F (17 °C)	≥ 62 °F (17 °C)
Switch Closed Temp.	≤ 40 °F (4 °C)	≤ 40 °F (4 °C)	≤ 40 °F (4 °C)

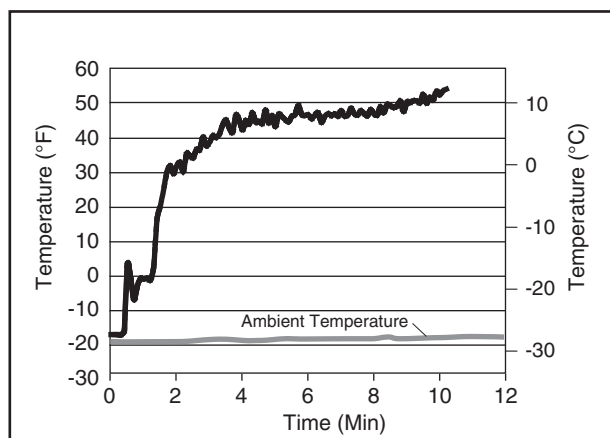
Specifications subject to change without notice.

Installation

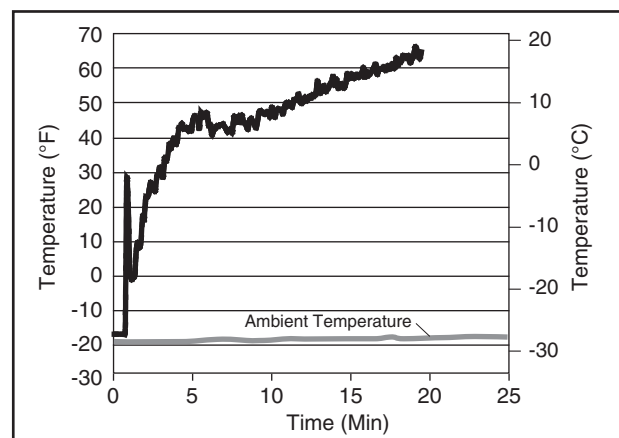


Performance

Temperature vs Time - #2 Diesel Fuel



Temperature vs Time - SME Biodiesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975. Tests for SME (Soybean Methyl Ester) Biodiesel Fuel run per ASTM D-975 and ASTM D6751.

Ordering Information

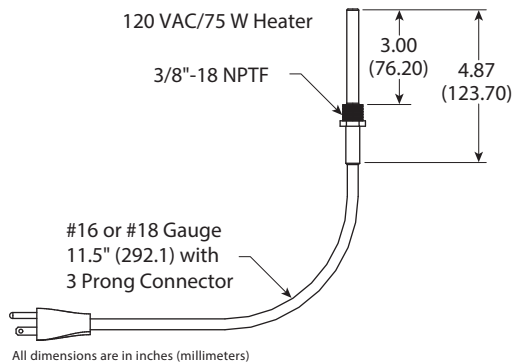
Part Number	Description
3951841 S	120 VAC, 37 W Heater

Specifications

Specification	3951841 S
Volts	120 VAC
Watts	37 W
Amps	0.3 A
Cold Resistance	396 - 411 Ω
Plug	Molded 120 V Male Wall Plug
Temp. Rating	221 °F (105 °C)
Cordset Length	11.5" (29.2 cm)

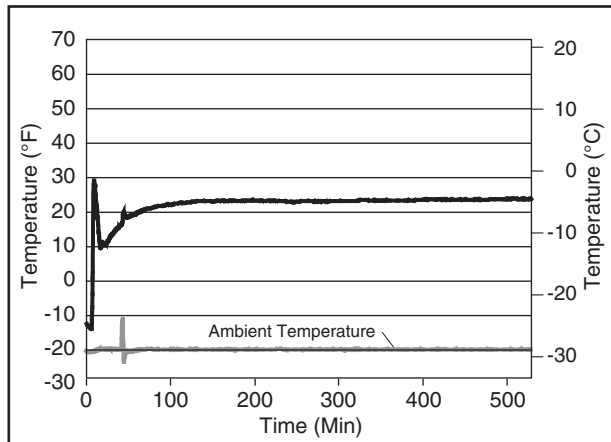
Specifications subject to change without notice.

Installation

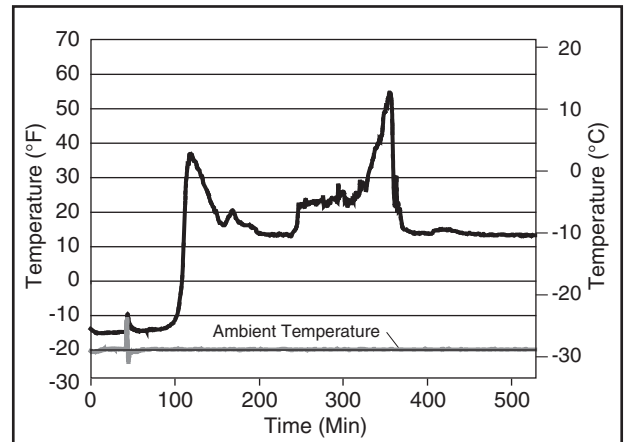


Performance

Temperature vs Time - #2 Diesel Fuel

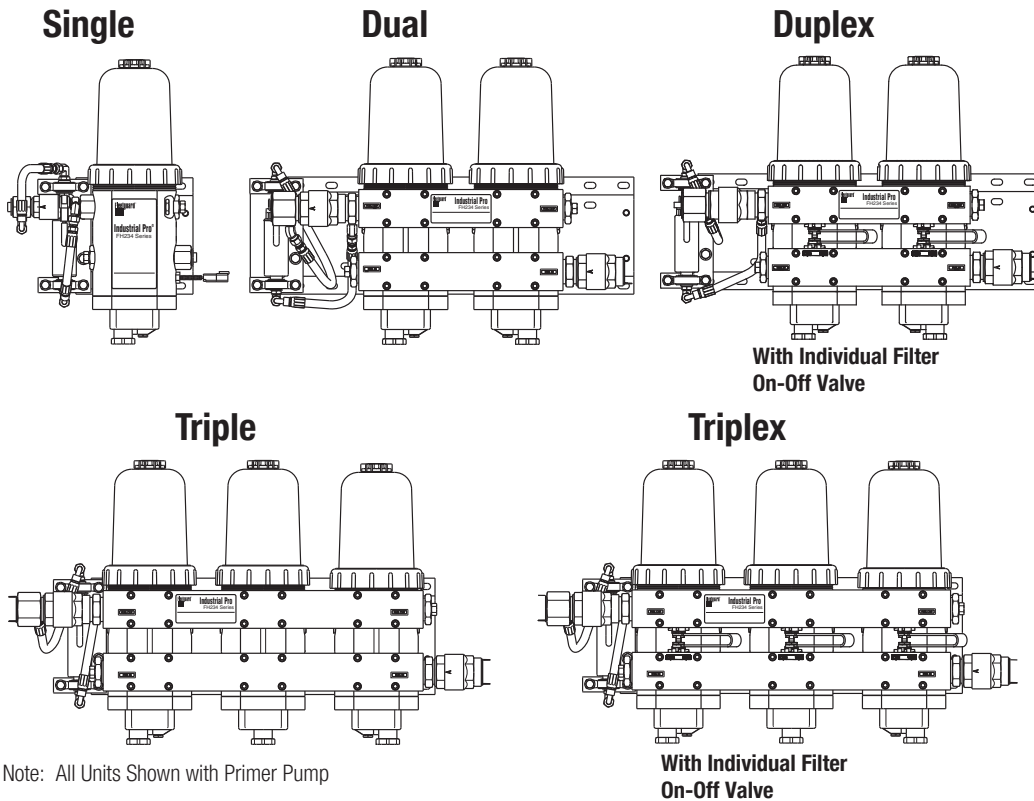


Temperature vs Time - SME Biodiesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975. Tests for SME (Soybean Methyl Esther) Biodiesel Fuel run per ASTM D-975 and ASTM D6751.

Discontinued Products



Industrial Pro[®] 234 Series

Note: All Units Shown with Primer Pump

FH234XXX (Rev. 2) Indicates Unit Is a Low Restriction Model

Note: Effective March 2006, Cummins Filtration[®] switched to a lower restriction design for the Fleetguard[®] Industrial Pro[®] series. These low restriction units have some dimension changes and a significant reduction in overall restriction of between 3.4 - 6.8 kPa (0.49 - 0.98 lb/in²), depending on the model. The low restriction units can be identified by the label located on the right side of the unit. The part number will contain "Rev. 2" if it is a low restriction unit. This revision number does not appear on the originally designed units.

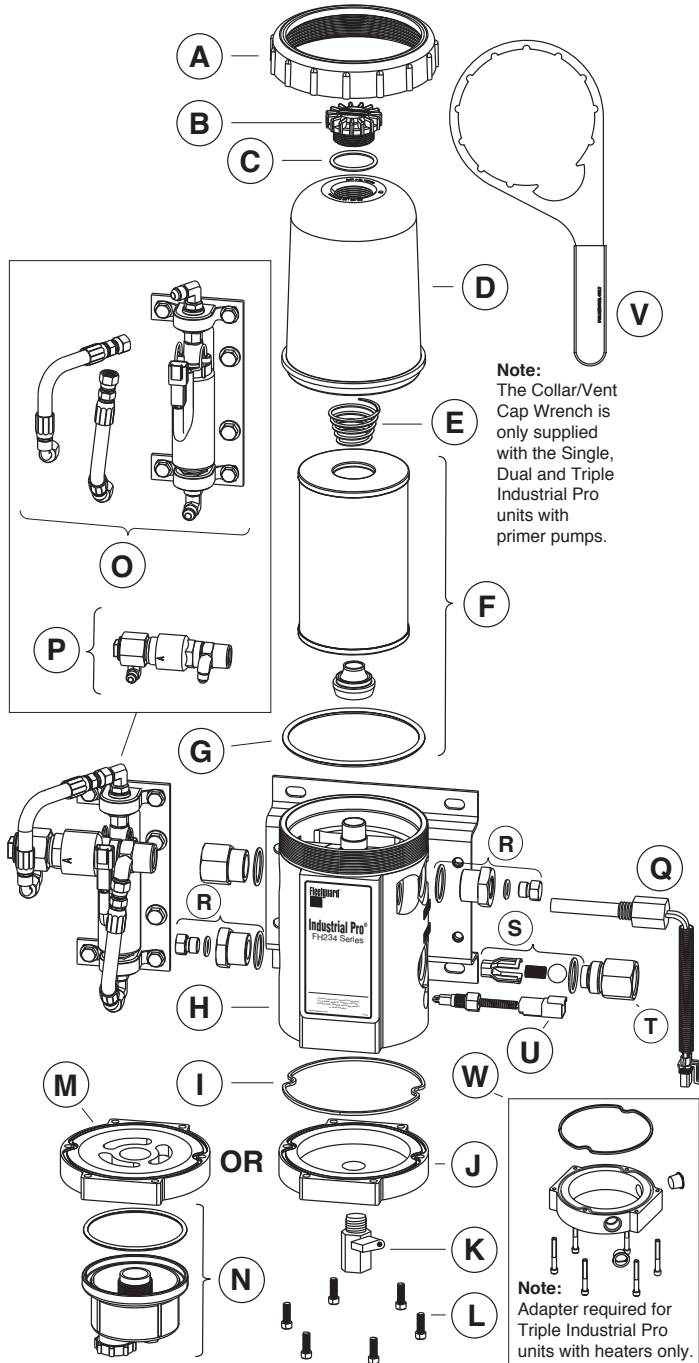
Specifications

Specification	Single	Dual/Duplex	Triple/Triplex
Height Overall	19.02" (483.1 mm)	19.02" (483.1 mm)	19.02" (483.1 mm)
Depth Overall	7.27" (187.2 mm)	10.47" (265.8 mm)/11.04 (280.4)	10.46" (265.8 mm)/11.04 (280.4)
Width, max	6.30" (160.0 mm)	18.75" (476.3 mm)	22.24" (564.9 mm)
Mt. Brkt. Centers (Vert.)	4.25" (108.0 mm)	6.60" (167.6 mm)	6.60" (167.6 mm)
Mt. Brkt. Centers (Horiz.)	5.20" (132.0 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)
Weight (Dry)	17 lbs (7.7 kg)	51 lbs (23.1 kg)	70 lbs (31.75 kg)
Fuel Capacity (w/o filter)	0.37 gal (1.4 L)	0.74 gal (2.8 L)	1.11 gal (4.2 L)
Fuel Connections	3/4" NPT (M26 x 1.5)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)
Fuel Flow Rate	200 gal/hr (757 L/hr)	400 gal/hr (1515 L/hr)	600 gal/hr (2272 L/hr)
Recommended Applications	Heavy Duty Engines	Heavy Duty Engines	Heavy Duty Engines
Water Trap Capacity	20.3 fl oz (600 ml)	40.6 fl oz (1200 ml)	60.9 fl oz (1800 ml)
Filter Service Clearance	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)
Electrical Heater	One Heater Required: 12 VDC, 250 W, 21 A ± 3 A 24 VDC, 250 W, 10 A ± 2 A	Two Heaters Required: 12 VDC, 250 W, 21 A ± 3 A 24 VDC, 250 W, 10 A ± 2 A	Three Heaters Required: 12 VDC, 250 W, 21 A ± 3 A 24 VDC, 250 W, 10 A ± 2 A
Primer Pump (Single, Dual and Triple Units Only)	Supply Voltage: 24 VDC Temperature Range: -20 °F (-29 °C) - 250 °F (120 °C)		
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Kerosene, Biodiesel, and JP8		

Specifications subject to change without notice.



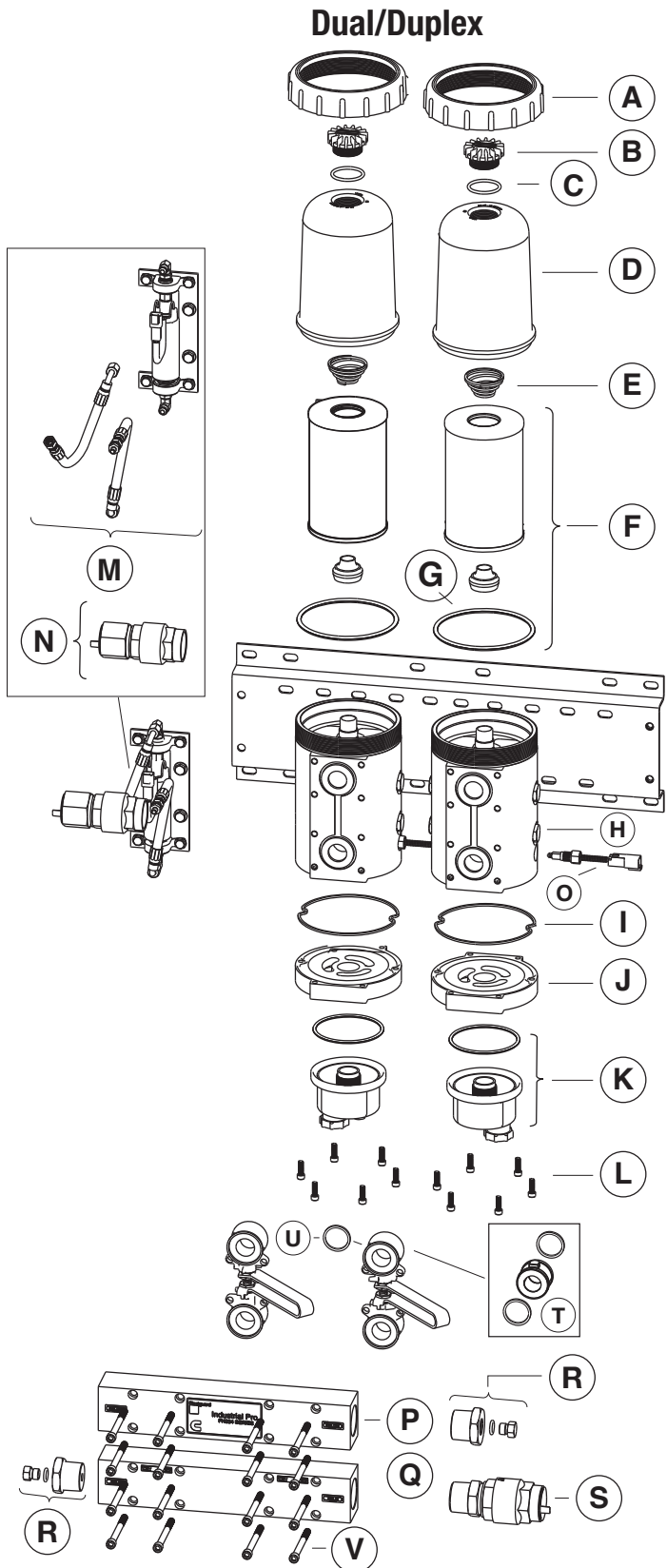
Industrial Pro® Single



Parts List

Part	Description	Part Number
A	Collar	3946706 S
B	Vent Cap	Vent Cap and Assembly 3944440 S
C	O-Ring	
D	Cover	SP1244
E	Filter Spring	3944441 S
F	Filter Element (includes Grommet and O-Rings)	See Ordering Information
G	O-Ring Pack - included with each replacement element	3944449 S
H	Industrial Pro®	See Ordering Information
I	Bottom Seal	3945125 S
J	Bottom Plate	3956011 S
K	Drain Valve	3944453 S
L	Bottom Bolts (6)	3946704 S
M	Bottom Plate	3947502 S
N	Bowl Assembly and Bowl Assembly Seal	3960670 S
O	Single Primer Pump Kit (Pump, Hoses, Bracket, and Vibration Isolators)	SP1124
	Inlet Hose	SP1067
	Outlet Hose	SP1068
P	Single Primer Pump Fitting Set:	3961283 S
Q	12 VDC Combo Thermo/Heater	3959754 S
	24 VDC Combo Thermo/Heater	3959755 S
R	SAE 3/4" Plug with M14 Diagnostic Port and O-Ring Seal	SP1046
S	Check Valve Service Kit (Single unit only)	SP1073
T	Check Valve Body: Dual/Duplex/Triple/Triplex only	3954139 S
U	Water-In-Fuel (WIF) Sensor	3957158 S
V	Collar/Vent Cap Wrench	3944448 S
W	Heater/Thermoswitch Adapter	3956562 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S
	120 VAC Electric Heater	See AC Heater Unit page

Note: The WIF sensor is not included, but can be purchased separately.



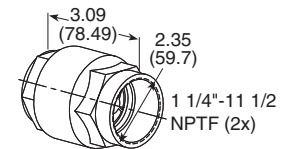
Parts List

Part	Description	Part Number
A	Collar	3946706 S
B	Vent Cap	Vent Cap and Assembly 3944440 S
C	O-Ring	
D	Cover	SP1244
E	Filter Spring	3944441 S
F	Filter Element (includes Grommet and O-Rings)	See Ordering Information
G	O-Ring Pack - included with each replacement element	3944449 S
H	Industrial Pro®	See Ordering Information
I	Bottom Seal	3945125 S
J	Bottom Plate	3956011 S
K	Bowl Assembly and Bowl Assembly Seal	3960670 S
L	Bottom Bolts (6)	3946704 S
M	Dual/Duplex/Triple/Triplex Primer Pump Kit (Pump, Hoses, Bracket, and Vibration Isolators)	3961287 S
	Inlet Hose	SP1066
	Outlet Hose	SP1066
N	Dual/Duplex Primer Pump Fitting Set	3961284 S
O	Water-In-Fuel (WIF) Sensor	3957158 S
P	Dual Inlet/Outlet Manifold with Plug	3968219 S
Q	Duplex Inlet/Outlet Manifold with Plug	3968220 S
R	Diagnostic Fitting and Plug	SP1046
S	Check Valve Assembly	SP1045
T	Manifold Spacer and Seals for Units without Valves	3968209 S
U	Shut-Off Valve Kit for Units with Valves only (Two Valve Kit)	3970753 S
V	Manifold Capscrew (12)	3968205 S

Check Valve

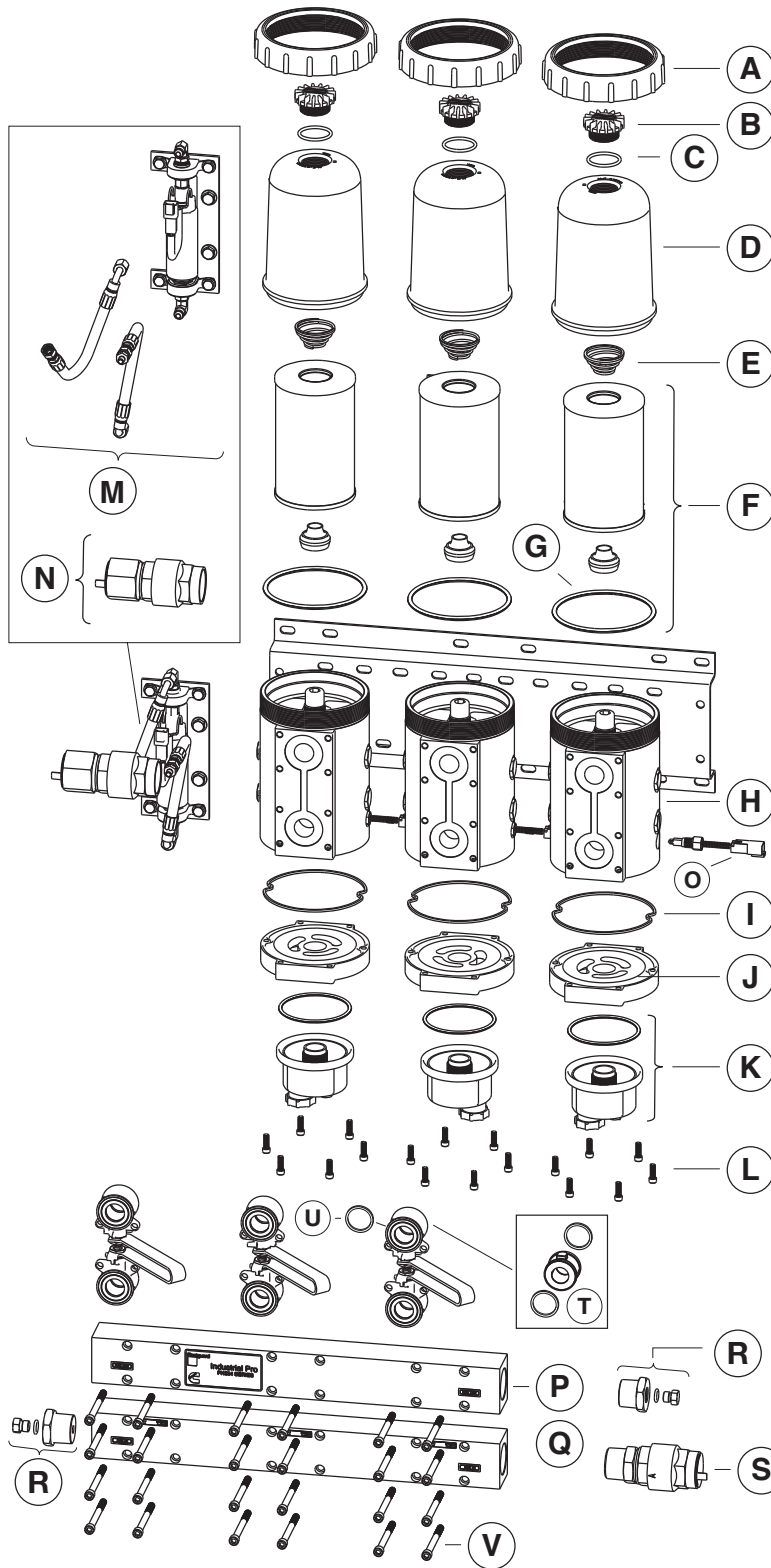
For Dual/Duplex systems, if a check valve is required, part no. 3954139 S must be purchased and installed at or near the inlet of the Industrial Pro assembly.

Note: When the engine is shut off, fuel levels may drop until the engine is restarted.



All dimensions are in inches (millimeters)

Industrial Pro® Triple/Triplex



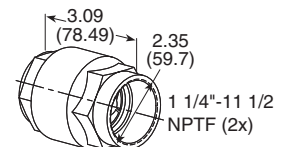
Parts List

Part	Description	Part Number
A	Collar	3946706 S
B	Vent Cap	Vent Cap and Assembly
C	O-Ring	3944440 S
D	Cover	SP1244
E	Filter Spring	3944441 S
F	Filter Element (includes Grommet and O-Rings)	See Ordering Information
G	O-Ring Pack - included with each replacement element	3944449 S
H	Industrial Pro®	See Ordering Information
I	Bottom Seal	3945125 S
J	Bottom Plate	3947502 S
K	Bowl Assembly and Bowl Assembly Seal	3960670 S
L	Bottom Bolts (6)	3946704 S
M	Dual/Duplex/Triple/Triplex Primer Pump Kit (Pump, Hoses, Bracket, and Vibration Isolators)	3961287 S
	Inlet Hose	SP1066
	Outlet Hose	SP1066
N	Triple/Triplex Primer Pump Fitting Set	3961285 S
Q	12 VDC Combo Thermo/Heater	3959754 S
	24 VDC Combo Thermo/Heater	3959755 S
P	Triple Inlet/Outlet Manifold with Plug	3968221 S
Q	Triplex Inlet/Outlet Manifold with Plug	3968222 S
R	Diagnostic Fitting and Plug	SP1046
S	Check Valve Assembly	SP1045
T	Manifold Spacer and Seals for Units without Valves	3968209 S
U	Shut-Off Valve Kit for Units with Valves only (Three Valve Kit)	3968207 S
V	Manifold Capscrew (12)	3968205 S

Check Valve

For Triple/Triplex systems, if a check valve is required, part no. **3954139 S** must be purchased and installed at or near the inlet of the Industrial Pro assembly.

Note: When the engine is shut off, fuel levels may drop until the engine is restarted.



All dimensions are in inches (millimeters)

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23400	FS19763	200 (757)	No	No	Optional	Yes	Yes	N/A	Left or Right	3/4" NPT	M26 x 1.5

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M26 x 1.5 fittings, use part no. 3954136 S (which includes an outlet M26 x 1.5 outlet fitting, M26 x 1.5 inlet fitting with check valve body, check valve ball, check valve retainer, and check valve spring) and install to inlet and outlet ports of housing.

Replacement Filters

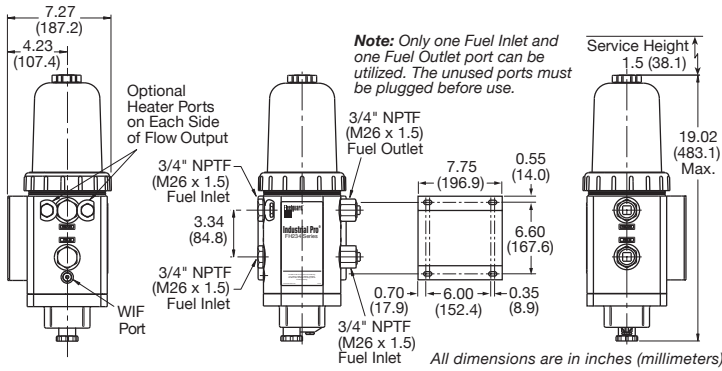
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

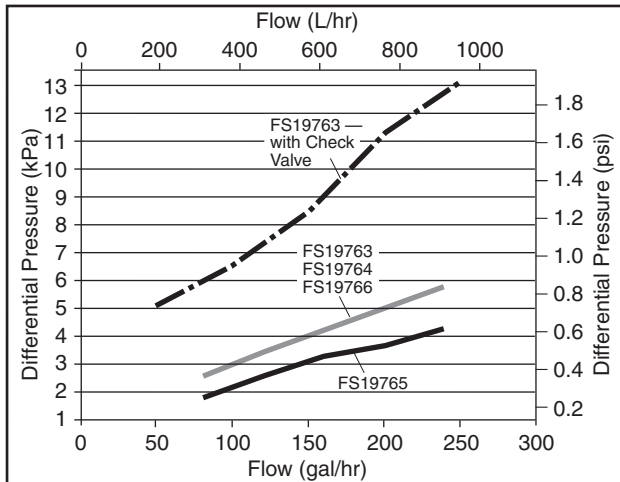
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

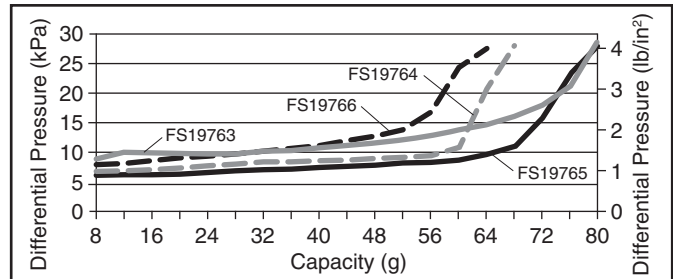


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23466	FS19763	200 (757)	Yes	No	Yes	Yes	Yes	Ports Available	In Left/Out Right	3/4" NPT	M26 x 1.5

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M26 x 1.5 fittings, use part no. 3954136 S (which includes an outlet M26 x 1.5 outlet fitting, M26 x 1.5 inlet fitting with check valve body, check valve ball, check valve retainer, and check valve spring) and install to inlet and outlet ports of housing.

Replacement Filters

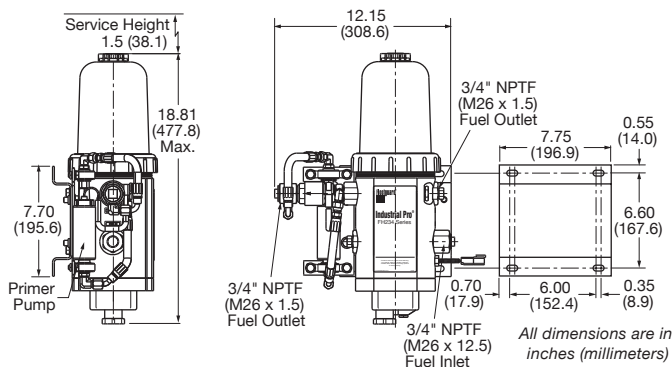
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

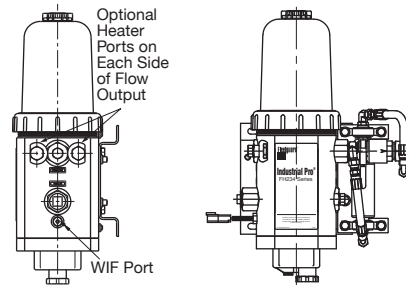
Plus Size Filter

- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

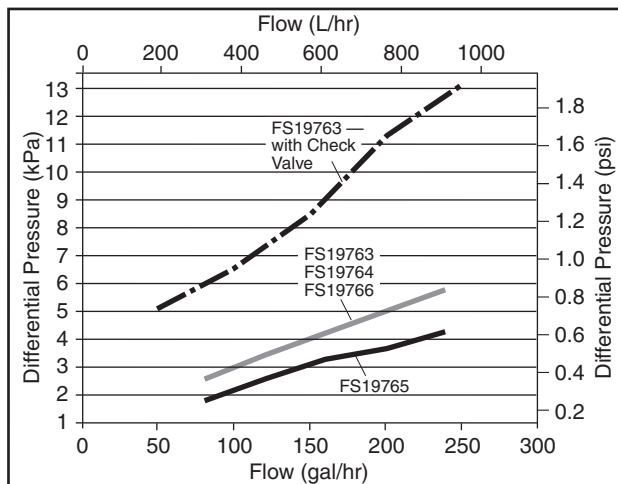


Note: The FH23466 has reversed Pump and Inlet/Outlet as shown below.

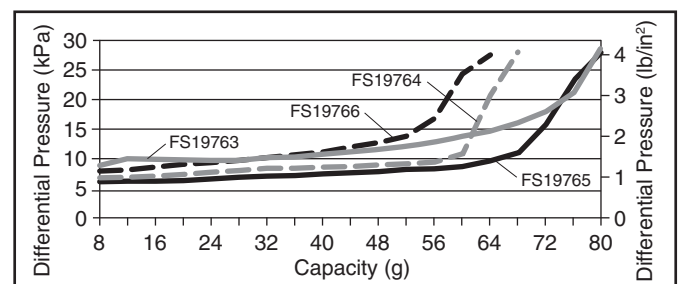


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23439	FS19763	400 (1514)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

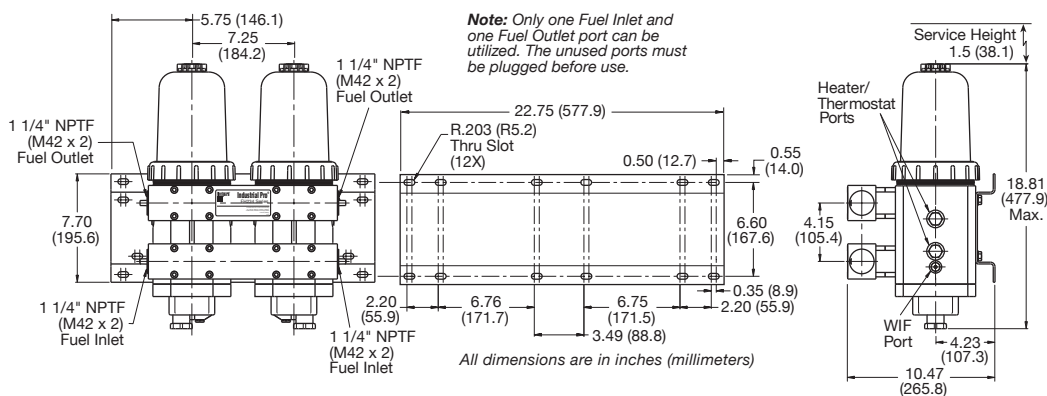
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

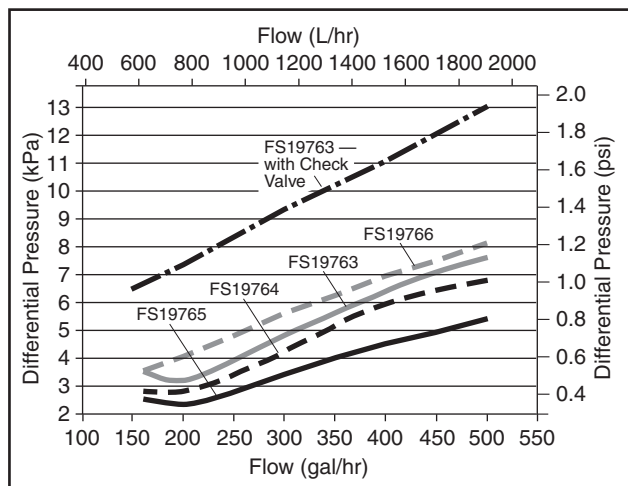
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

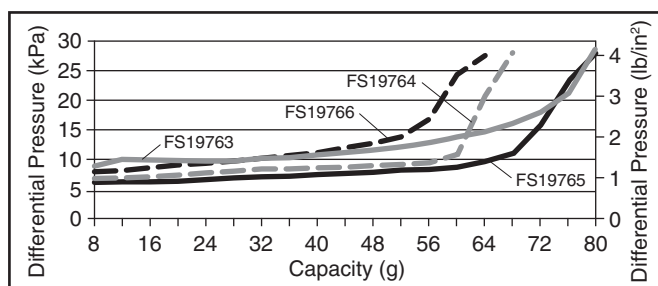


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23458	FS19763	400 (1514)	Yes	No	Yes	Yes	Yes	Ports Available	In Right/Out Left	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

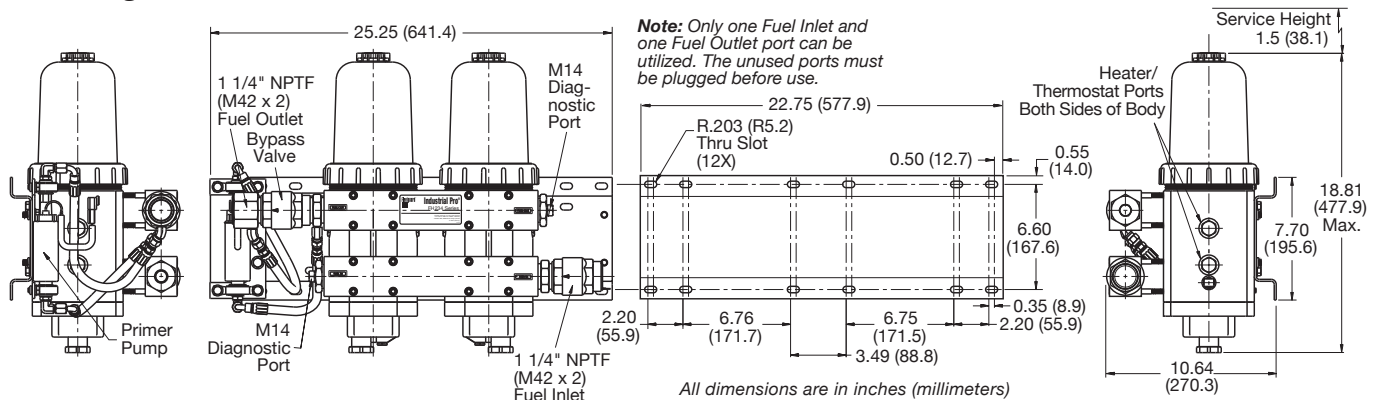
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

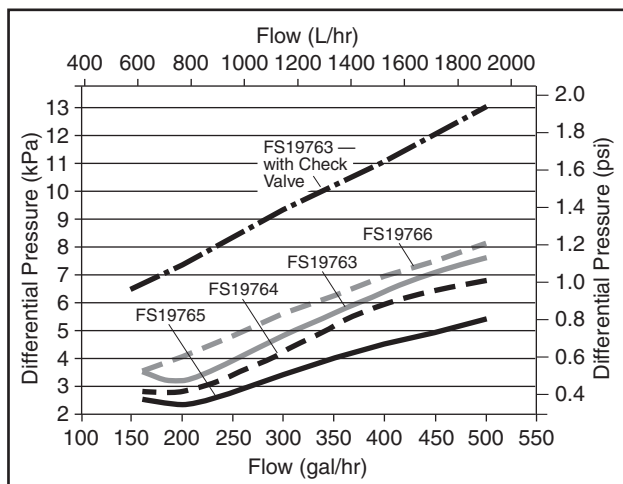
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

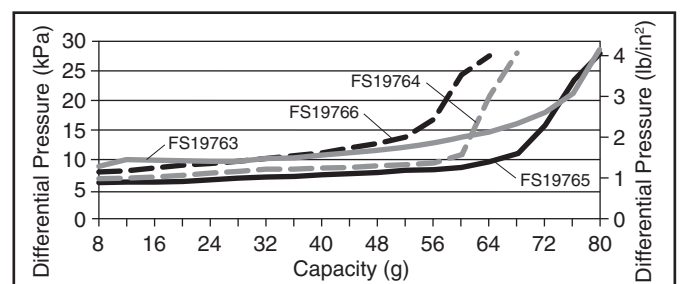


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23440	FS19763	400 (1514)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

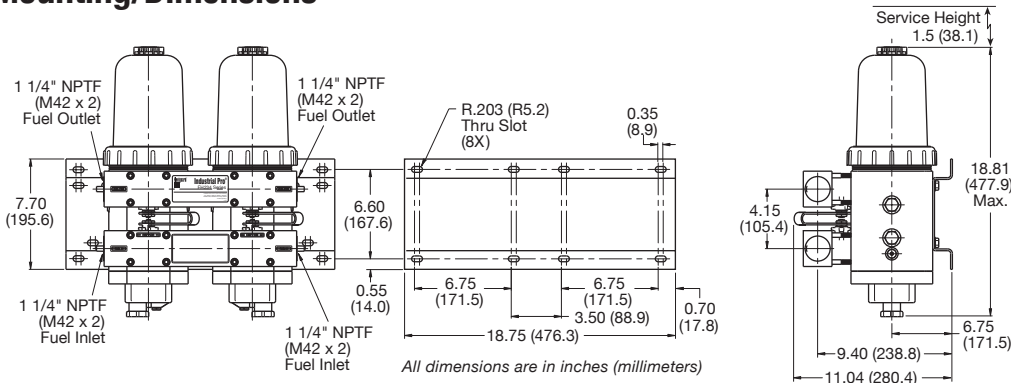
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

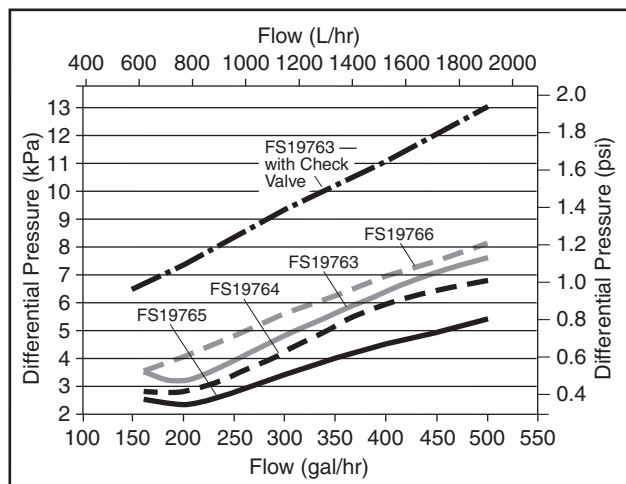
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

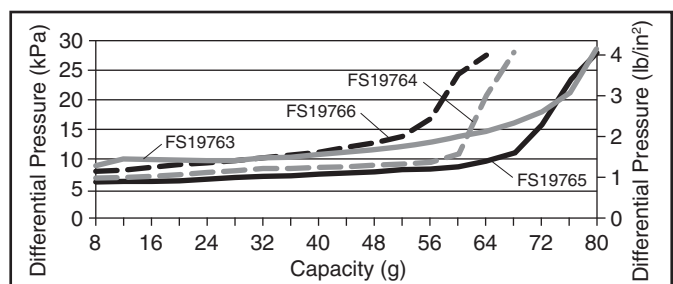


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23467	FS19763	400 (1514)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4"-11.5 NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

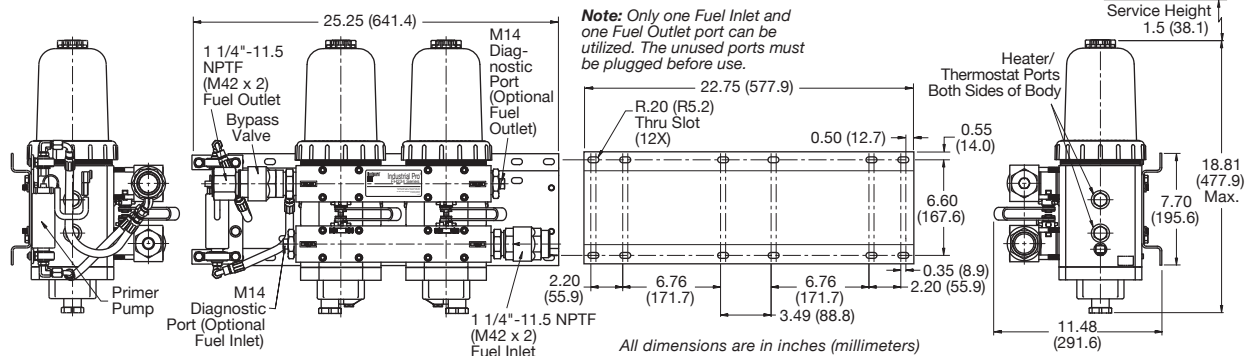
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

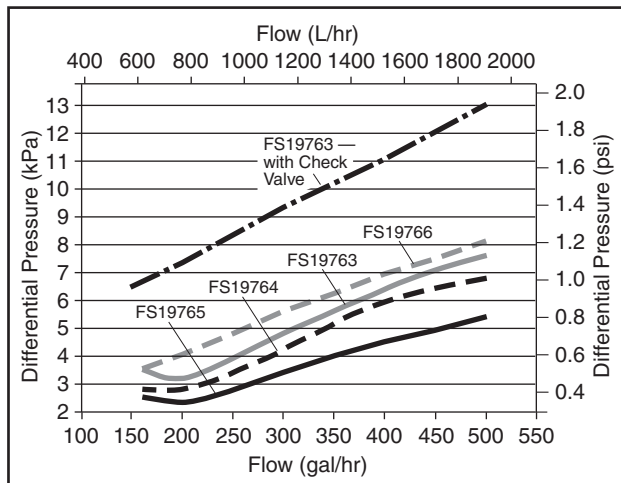
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

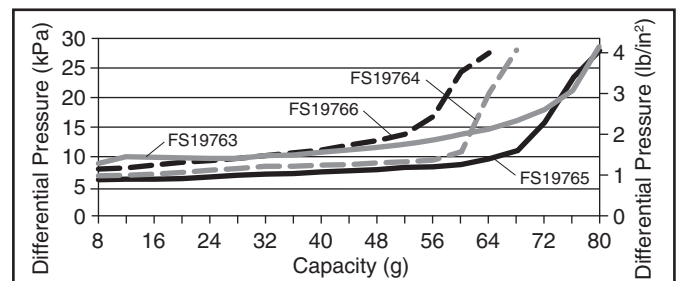


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23441	FS19763	600 (2271)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4" NPT	M42 x 2
FH23491	FS19765	600 (2271)	No	No	Yes	Yes	Yes	24 VDC	Left or Right	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

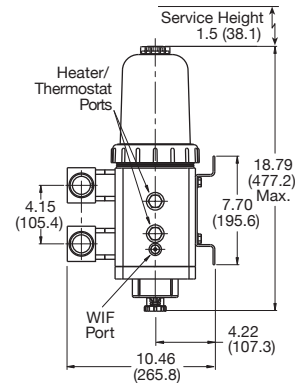
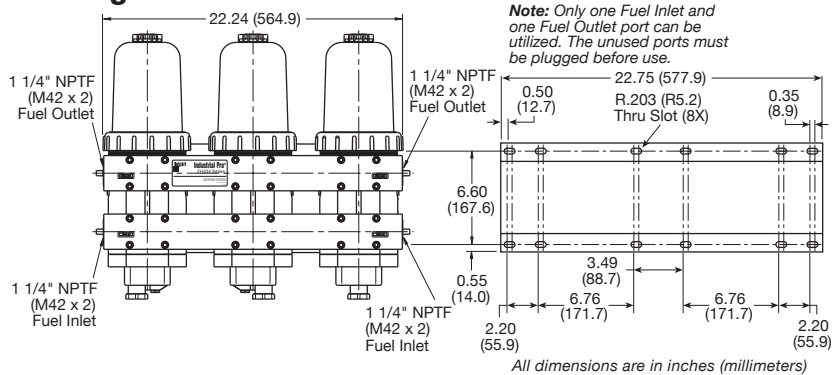
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

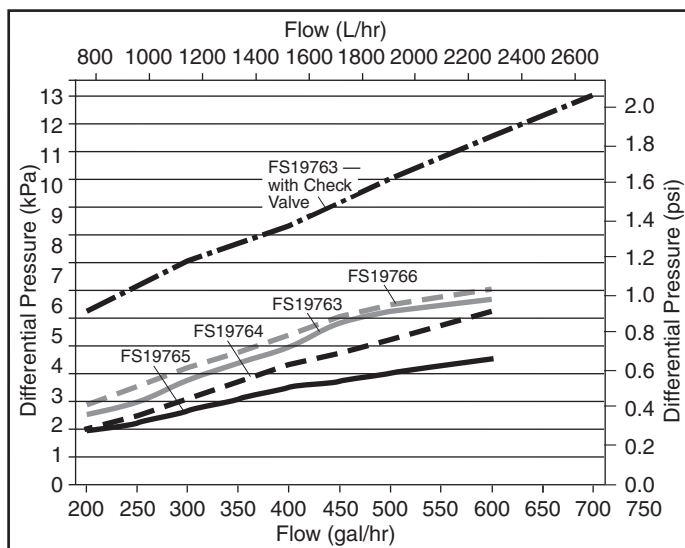
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

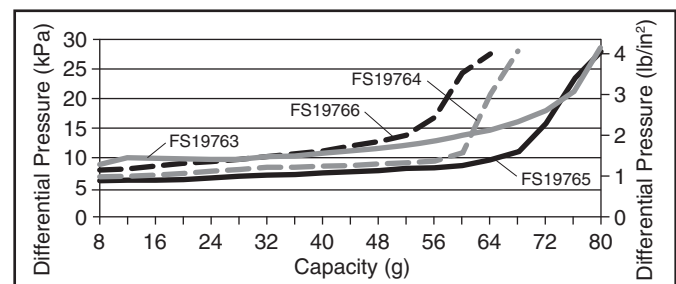


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23459	FS19763	600 (2271)	Yes	No	Yes	Yes	Yes	Ports Available	In Right/Out Left	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

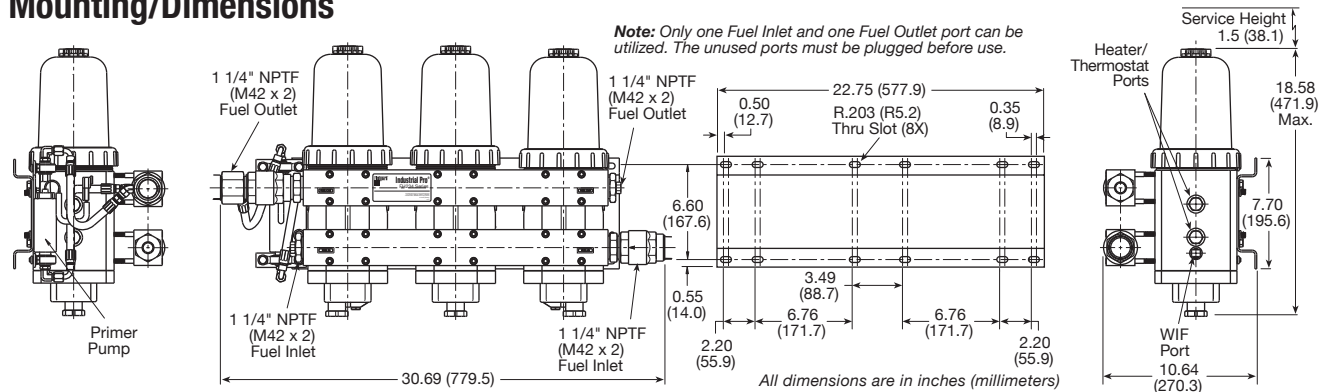
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

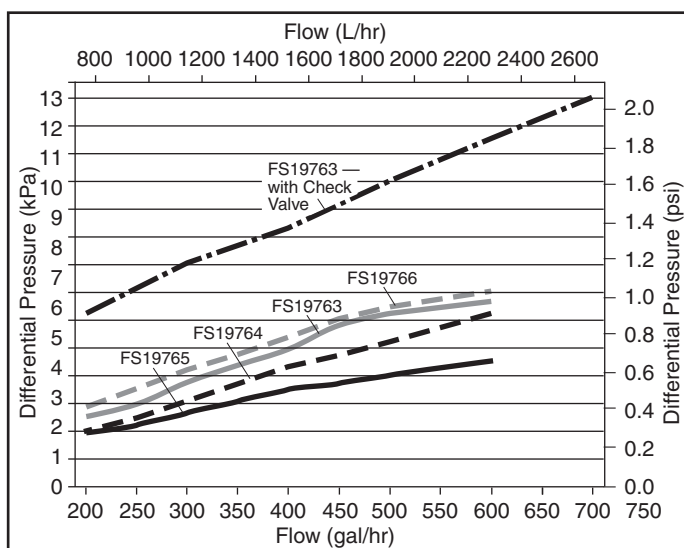
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

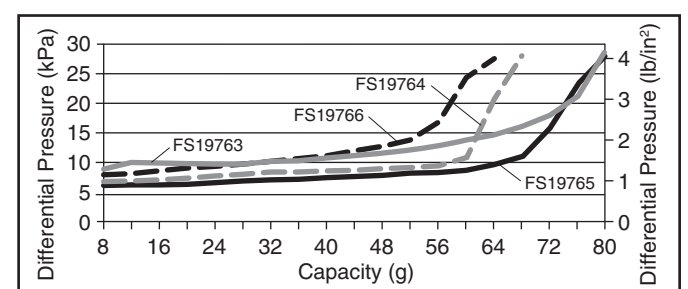


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
FH23438	FS19763	600 (2271)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4" NPT	M42 x 2
FH23477	FS19765	600 (2271)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

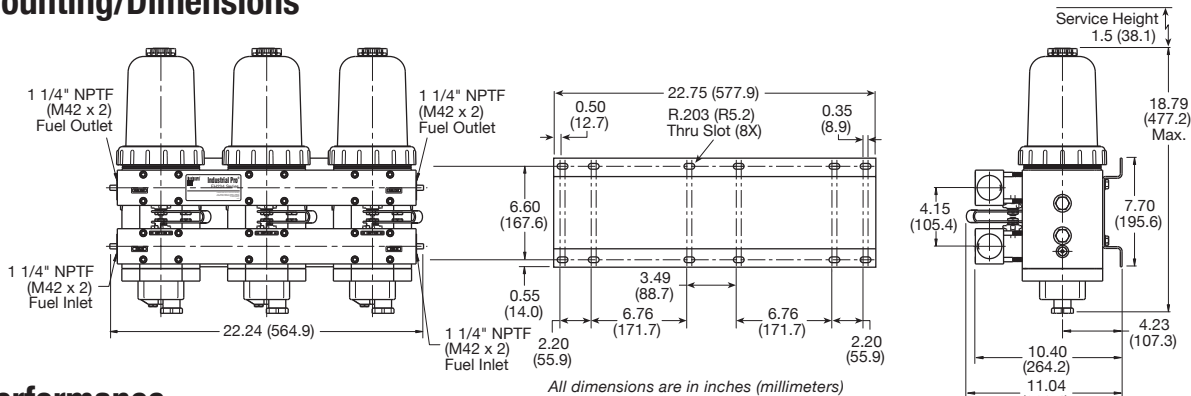
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

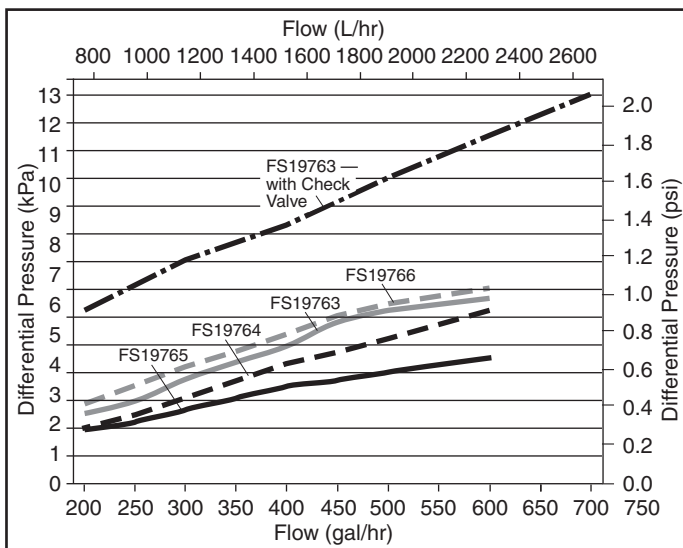
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

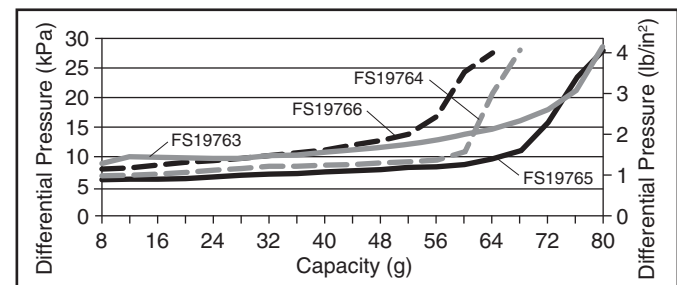


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23468	FS19763	600 (2271)	Yes	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4"-11.5 NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number 3957158 S, available separately.

*** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

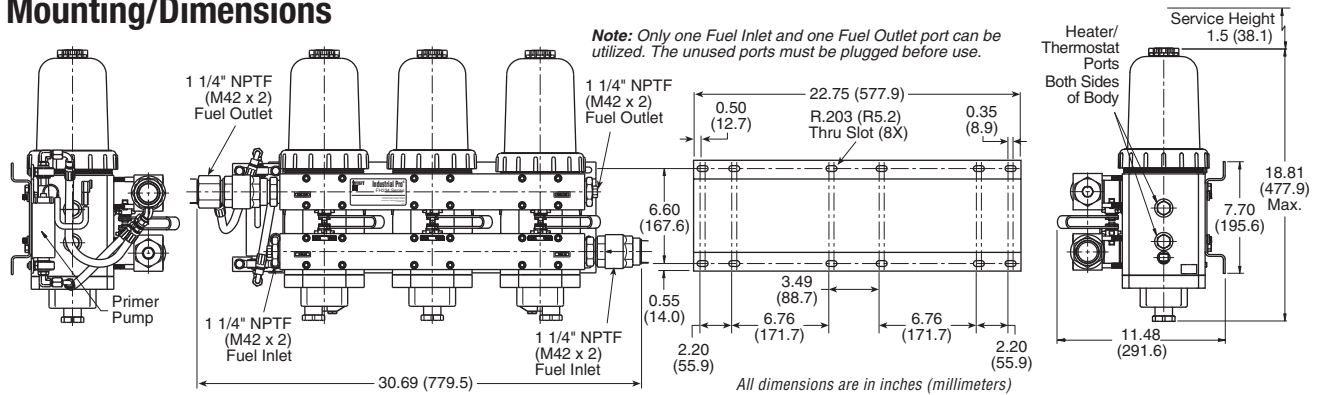
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19729	EleMax Cellulose 50 Micron
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

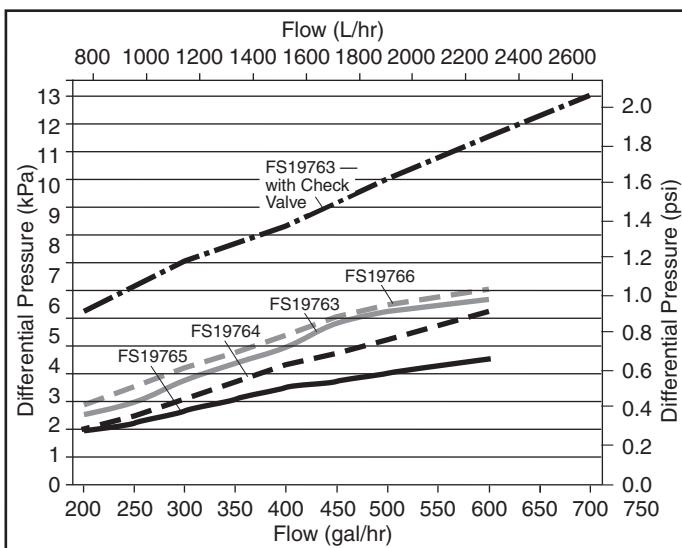
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

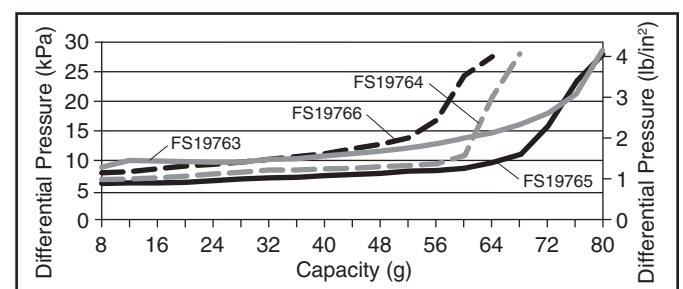


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

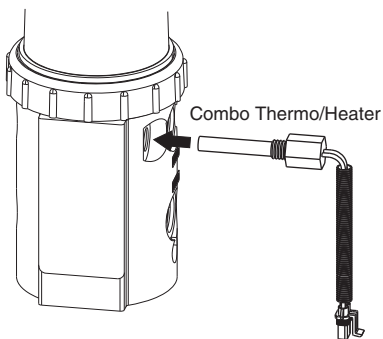
Part Number	Description
3959754 S	12 VDC Combo Thermo/Heater
3959755 S	24 VDC Combo Thermo/Heater

Specifications

Specification	3959754 S	3959755 S
Volts	12 VDC	24 VDC
Watts	250 W	250 W
Amps	≤ 20.6 A	10.4 ± 1 A
Cold Resistance	0.614 - 0.770 Ω	2.0 - 2.43 Ω
Switch Open Temp.	≥ 62 °F (17 °C)	≥ 62 °F (17 °C)
Switch Closed Temp.	≤ 40 °F (4 °C)	≤ 40 °F (4 °C)

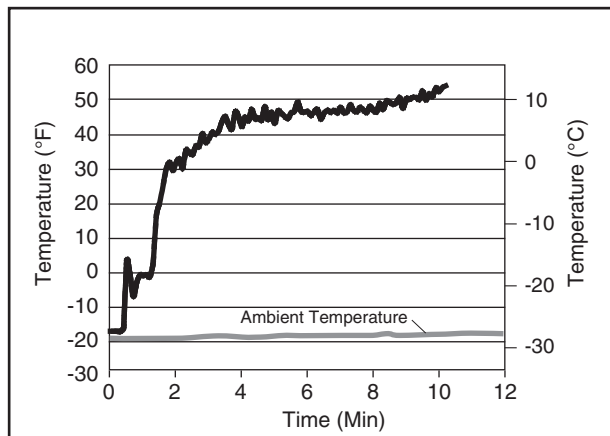
Specifications subject to change without notice.

Installation

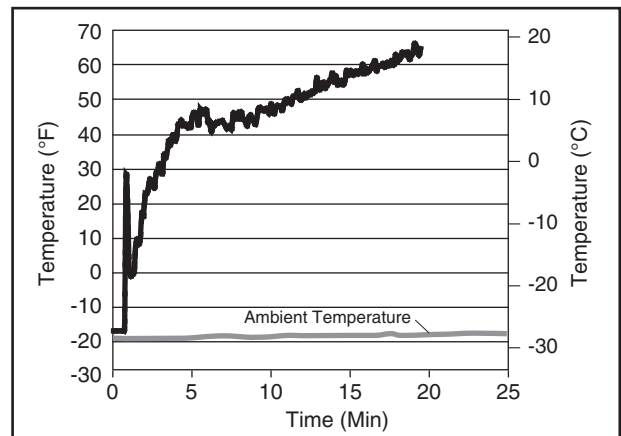


Performance

Temperature vs Time - #2 Diesel Fuel



Temperature vs Time - SME Biodiesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975. Tests for SME (Soybean Methyl Ester) Biodiesel Fuel run per ASTM D-975 and ASTM D6751.

Ordering Information

Part Number	Description
3945121 S	120 VAC/75 W Heater
3945126 S	Single Cordset
3946716 S	Y Cordset (Y cord to processor and block heater w/ locking ring)

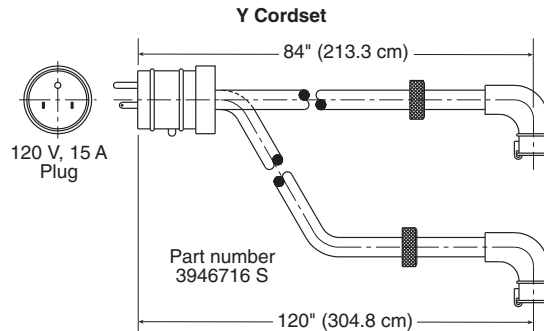
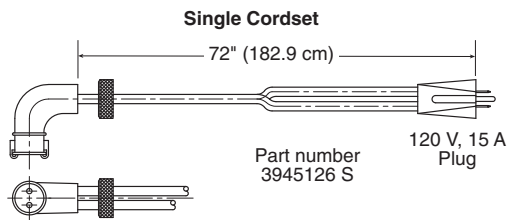
Specifications

Heater	
Specification	3945121 S
Volts	120 VAC
Watts	75 W
Amps	0.63 ± 0.1 A
Cold Resistance	187 ± 12 Ω

Cordsets		
Specification	3945126 S	3946716 S
Plug	120 V Male Wall Plug	120 V Male Wall Plug
Temp. Rating	221 °F (105 °C)	221 °F (105 °C)
Cordset Length	72" (182.9 cm)	Straight Leg – 84" (213.3 cm) Long Leg – 120" (304.8 cm)

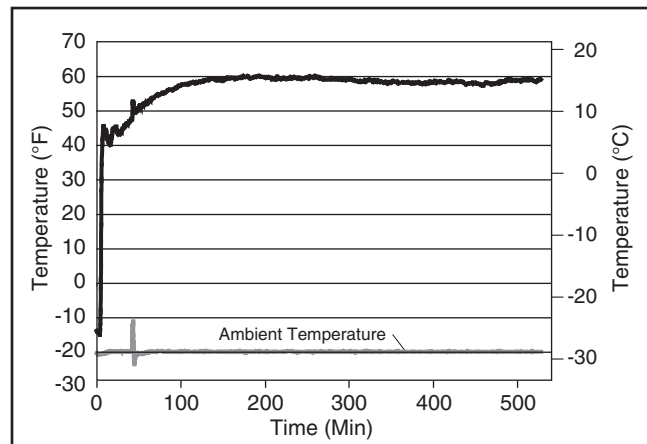
Specifications subject to change without notice.

Installation



Performance

Temperature vs Time - #2 Diesel Fuel



Note: Tests for #2 Diesel Fuel run per ASTM D-975.

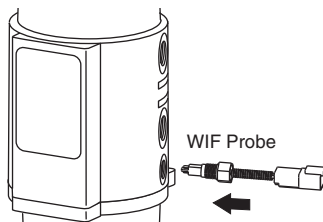
Ordering Information

Part Number	Description
3957158 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation

Note:
Depending on the model (Single, Dual, Duplex, Triple or Triplex), the WIF port can be located on the bottom left or the bottom right side of the unit.

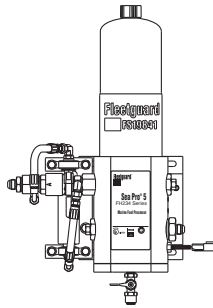


Specifications

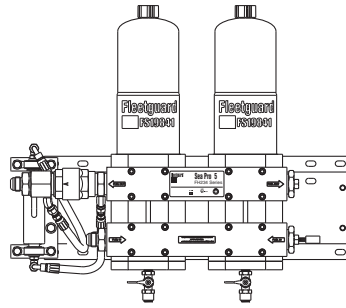
Specification	WIF
Resistance Across Pins	82 k Ω \pm 2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC
Signal Type	Analog
Thread	1/2" 20 UNF-2B
Output Deutsch Connector	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT06-2S
Height to Water Sensing (Switch is in ON Position)	0.58" (14.73 mm)
Overall Length	2.328" (59.12 mm)
Length – Top of Probe to Bottom of Knuckle	1.201" (30.50 mm)
Length – Bottom of Knuckle to Top of Pin	0.79" (20.0 mm)
Distance Between Pins (Center to Center)	0.215" (5.46 mm)

Specifications subject to change without notice.

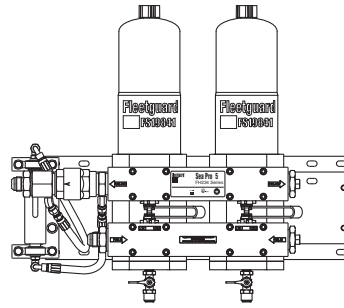
Single



Dual

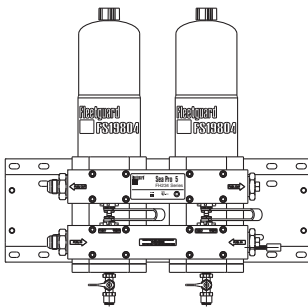


Duplex

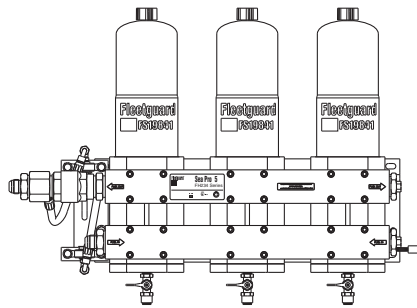


With Individual Filter On-Off Valve

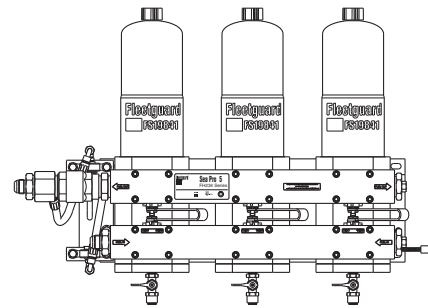
Duplex w/o Pump



Triple



Triplex



With Individual Filter On-Off Valve

Specifications

Specification	Single	Dual	Duplex	Triple	Triplex
Height Overall	22.27" (566 mm)	22.27" (566 mm)	22.27" (566 mm)	22.27" (566 mm)	22.27" (566 mm)
Depth Overall	7.24" (184 mm)	10.64" (270 mm)	10.64" (270 mm)	10.64" (270 mm)	10.64" (270 mm)
Width, max	11.98" (304 mm)	25.36" (644 mm)	25.36" (644 mm)	31.37" (797 mm)	31.37" (797 mm)
Mt. Brkt. Centers (Horiz.)	5.20" (132 mm)	6.60" (168 mm)	6.60" (168 mm)	6.60" (168 mm)	6.60" (168 mm)
Mt. Brkt. Centers (Vert.)	4.25" (108 mm)	6.76" (172 mm)	6.76" (172 mm)	6.76" (172 mm)	6.76" (172 mm)
Weight (Dry)	15.2 lbs (6.9 kg)	50.33 lbs (22.83 kg)	53.57 lbs (24.30 kg)	68.28 lbs (73.14 kg)	73.14 lbs (33.18 kg)
Fuel Capacity (w/o filter)	0.71 gal (2.7 L)	1.42 gal (5.4 L)	1.42 gal (5.4 L)	2.13 gal (8.1 L)	2.13 gal (8.1 L)
Fuel Connections	SAE #12 (37° Flare, 1-1/16"-12)	SAE #12 (37° Flare, 1-1/16"-12)	SAE #12 (37° Flare, 1-1/16"-12)	SAE #12 (37° Flare, 1-1/16"-12)	SAE #12 (37° Flare, 1-1/16"-12)
Water Trap Capacity	11.0 fl oz (325 ml)	22.0 fl oz (650 ml)	22.0 fl oz (650 ml)	33.0 fl oz (976 ml)	33.0 fl oz (976 ml)
Filter Service Clearance	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)
Fuel Types	Compatible for use with Diesel #1, Diesel #2, Kerosene, Biodiesel, and JP8				

Specifications subject to change without notice.



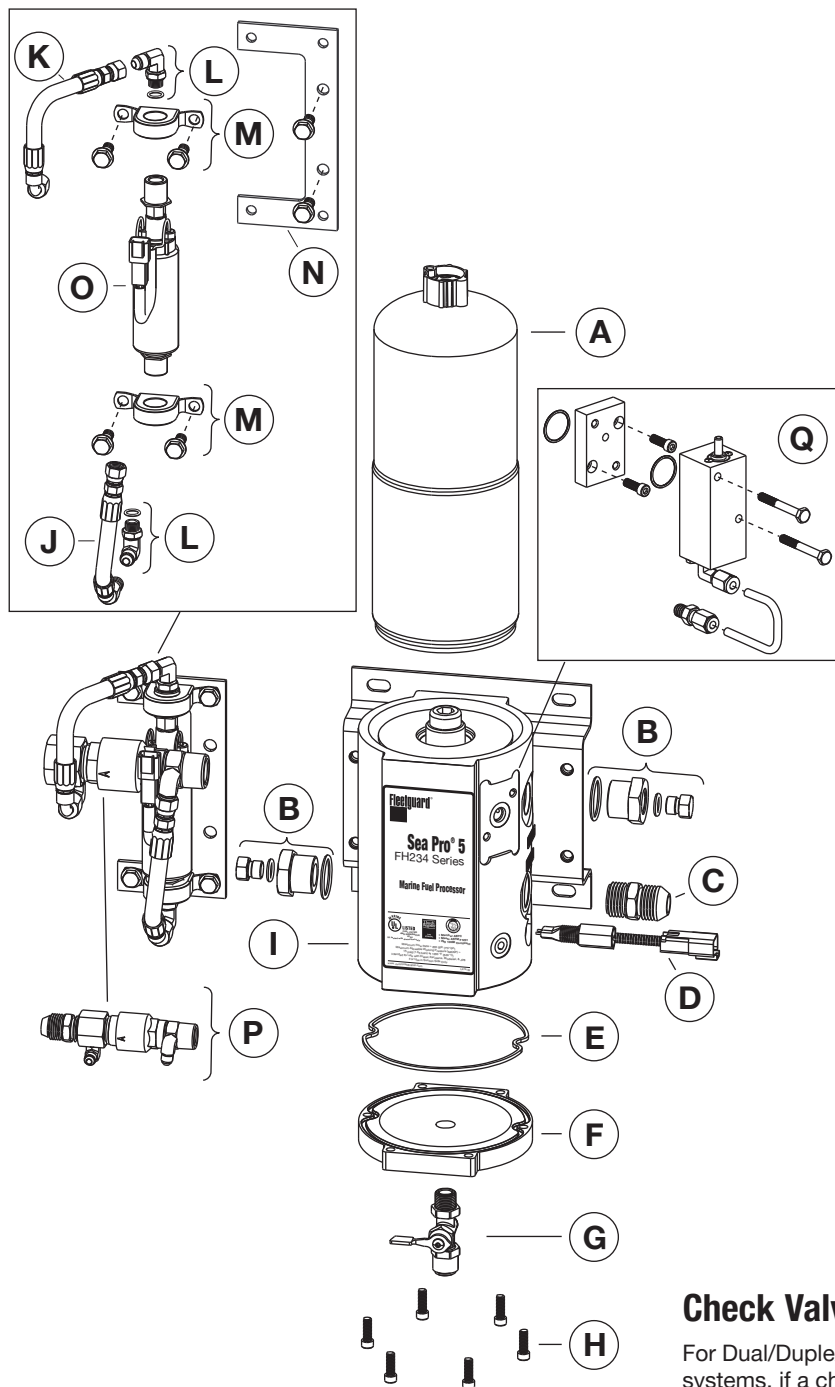
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Also meets the following standards: USCG, ANSI 1105, ASTM F1201

For additional agency approvals, see TB07/05-2 Certification Matrix Bulletin



Sea Pro® 5 Single



Parts List

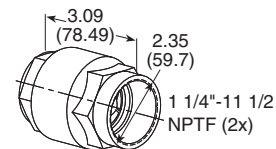
Part	Description	Fleetguard® Part Number	Cummins Part Number
A*	Spin-On Filter	FS19841	-
B	SAE 3/4" Plug with M14 Diagnostic Port and O-Ring Seal	Not Service Replaceable	
C	SAE #12 Flare Adapter (Standard SAE J514 or MIL-F-18866 Fitting)	3968203 S	4919995
D	Water-In-Fuel (WIF) Sensor	3960826 S	4919917
E	Bottom Seal	3970958 S	4919920
F	Bottom Plate	3970959 S	4919921
G	Drain Valve	3954131 S	4919916
H	Bottom Bolts (6)	3946704 S	4919915
I*	Sea Pro® 5	See Individual Unit Ordering Information	
J	Lift Pump Inlet Hose	SP1069	4919983
K	Lift Pump Outlet Hose	SP1070	4919984
L	90° Fittings and O-Ring Seals	Not Service Replaceable	
M	Vibration Isolators	3946691 S	4919914
N	Lift Pump Bracket and Bolts	Not Service Replaceable	
O	Primer Pump	SP1124	4919922
P	Primer Pump Fitting Set for Single Units	3961296 S	4919918
Q	Delta Pressure (DP) Gauge Kit for Single Body Units	3966456 S	4919919

* Order this part directly from Fleetguard.

Note: Remove plug from water drain valve prior to operation.

Check Valve

For Dual/Duplex and Triple/Triplex systems, if a check valve is required, part no. **3954139 S** must be purchased and installed at or near the inlet of the Sea Pro assembly.



All dimensions are in inches (millimeters)

Note: When the engine is shut off, fuel levels may drop until the engine is restarted.

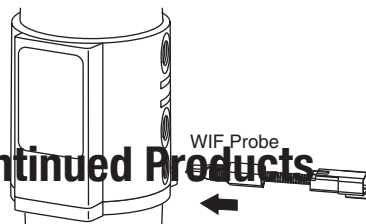
Ordering Information

Part Number	Description
3960826 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation

Note: Depending on the model (Single, Dual, Duplex, Triple or Triplex), the WIF port can be located on the bottom left or the bottom right side of the unit.



Specifications

Specification	WIF 3960826 S (4919917)	Dual WIF 3966459 S (4919928) (qty 2)
Resistance Across Pins	82 k Ω \pm 2% (at 25° C)	165 k Ω \pm 2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC	5 – 50 VDC or VAC
Signal Type	Analog	Analog
Thread	1/2" 20 UNF-2A	1/2" 20 UNF-2A
Output Deutsch Connector	EDLRDT13-2PR-002	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT04-2P	DT06-2S
Height to Water Sensing (Switch is in ON Position)	1.21" (30.73 mm)	1.21" (30.73 mm)
Overall Length (WIF Body)	1.94" (49.28 mm)	1.94" (49.28 mm)
Distance Between Blades (Center to Center)	0.168" (4.27mm)	0.168" (4.27mm)

Specifications subject to change without notice.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size
FH23460	FS19841	200 (757)	Yes	No	Yes	Yes	In Right/Out Left	SAE #12 (37° Flare, 1-1/16"-12)
FH23473	FS19841	200 (757)	Yes	Yes	Yes	Yes	In Right/Out Left	SAE #12 (37° Flare, 1-1/16"-12)

* DP = Differential Pressure

Replacement Filters

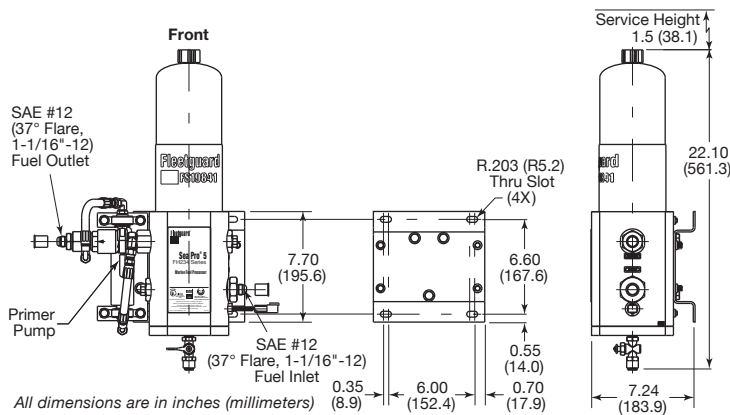
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

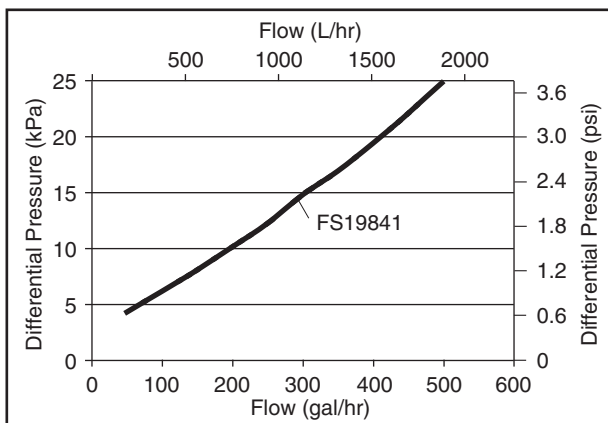
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

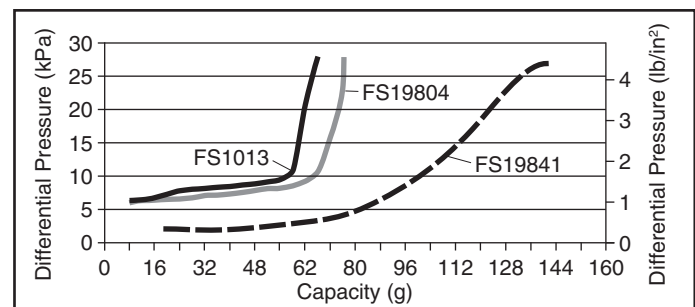


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size
FH23461	FS19841	400 (1514)	Yes	No	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)
FH23469	FS19841	400 (1514)	Yes	Yes	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)

* DP = Differential Pressure

Replacement Filters

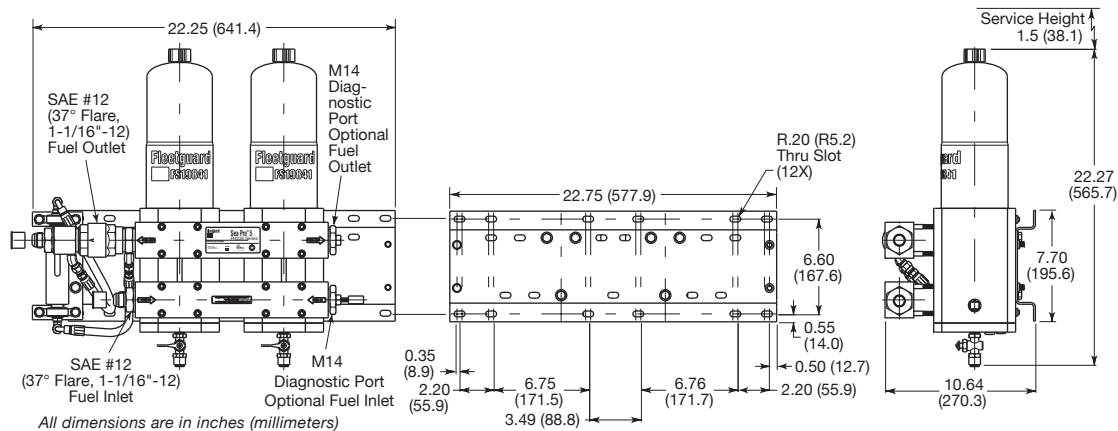
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

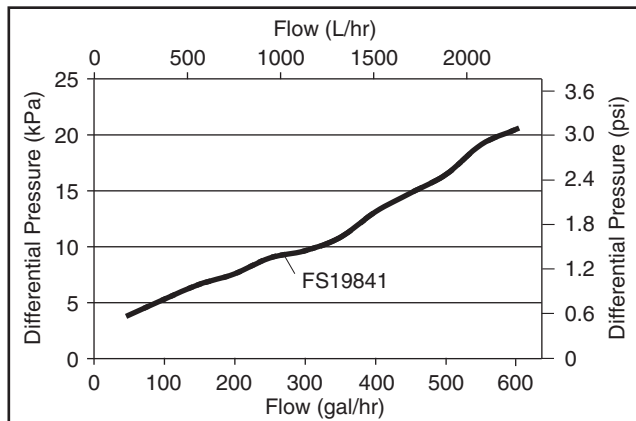
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

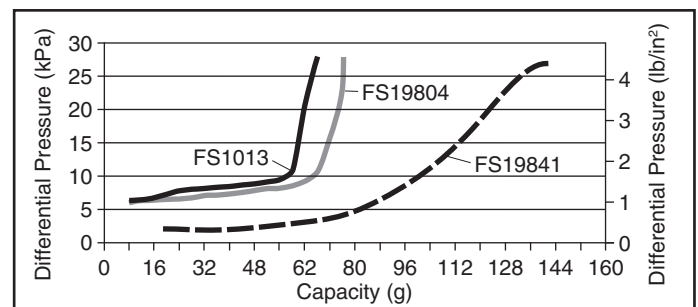


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size
FH23465	FS19841	400 (1514)	Yes	No	Yes	Yes	In Left/Out Right	SAE #12 (37° Flare, 1-1/16"-12)
FH23472	FS19841	400 (1514)	Yes	Yes	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)

* DP = Differential Pressure

Replacement Filters

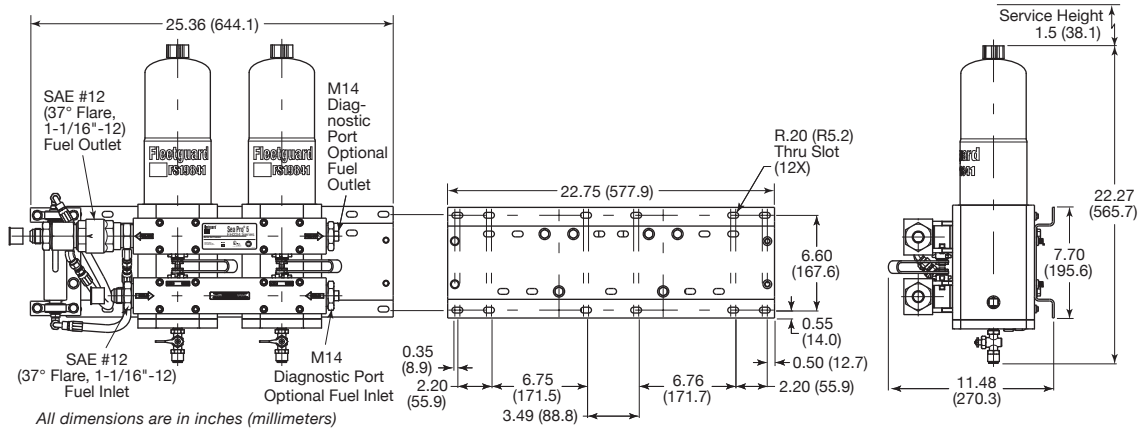
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

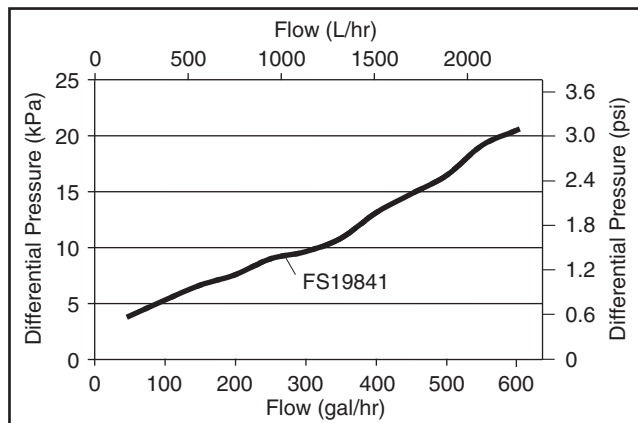
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

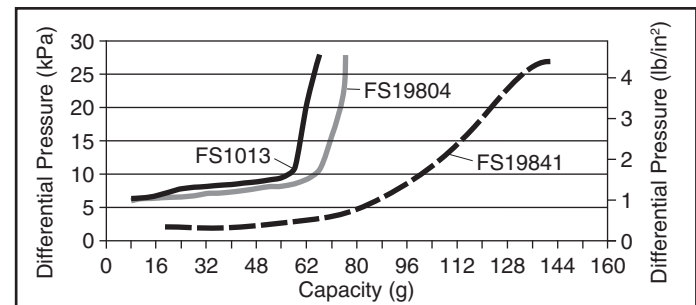


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size
FH23463	FH19841	400 (1514)	No	No	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)

* DP = Differential Pressure

Replacement Filters

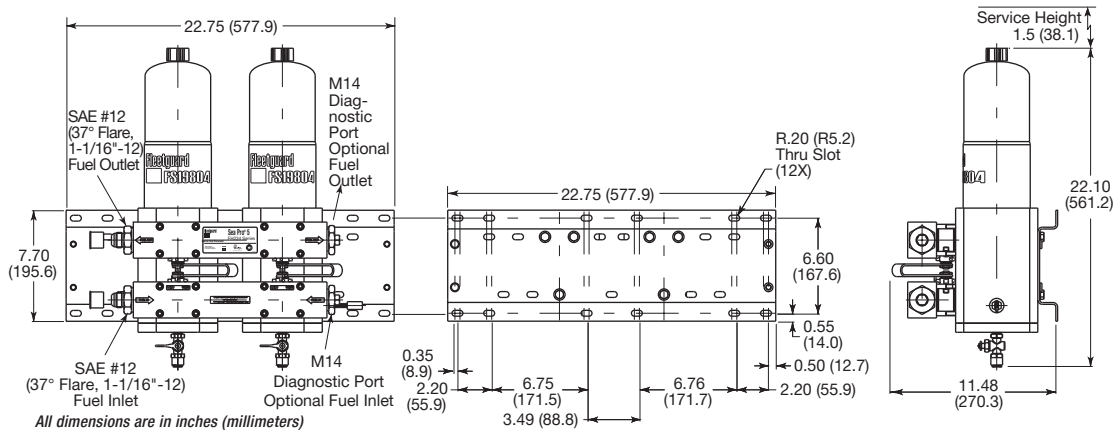
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

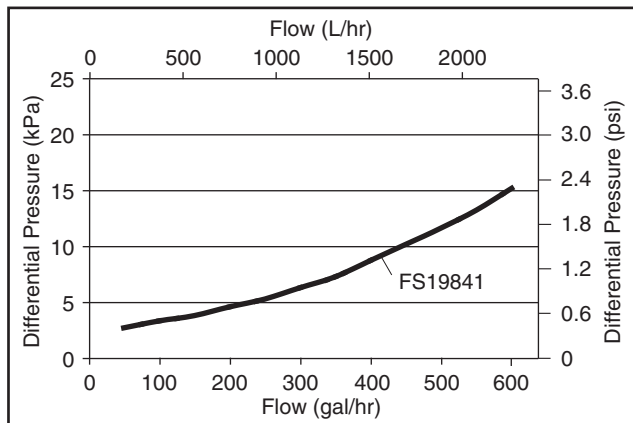
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

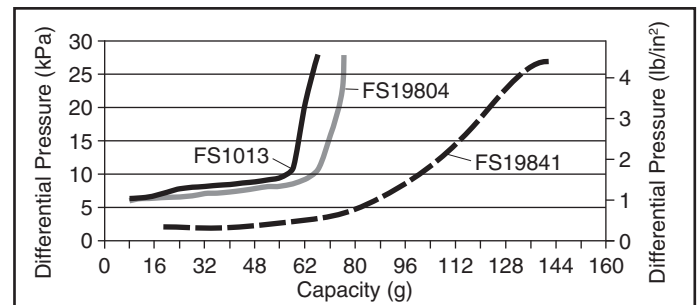


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size
FH23462	FS19841	600 (2271)	Yes	No	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)
FH23470	FS19841	600 (2271)	Yes	Yes	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)
FH23497	FS19841	600 (2271)	No (not shown)	Yes	Yes	Yes	In Right/Out Right	SAE #12 (37° Flare, 1-1/16"-12)

* DP = Differential Pressure

Replacement Filters

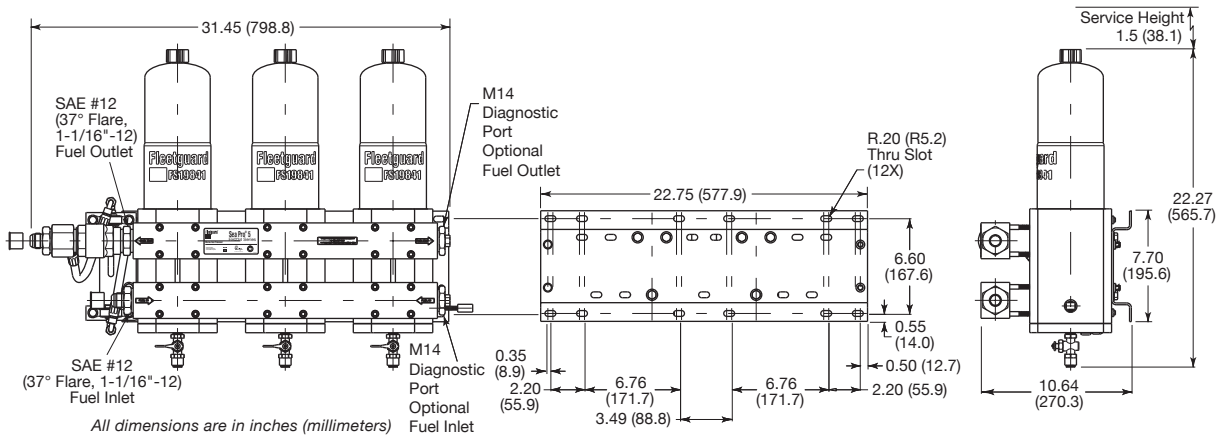
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

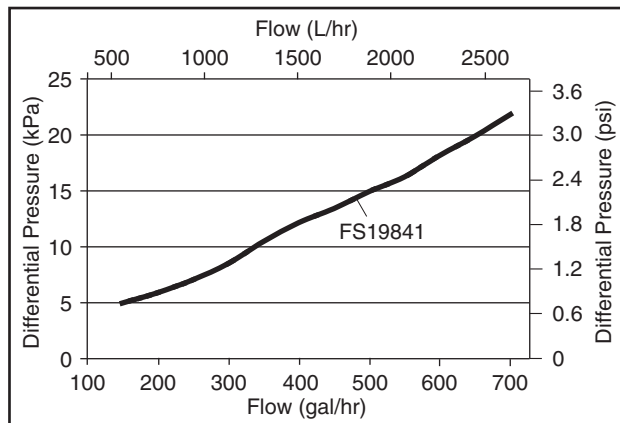
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

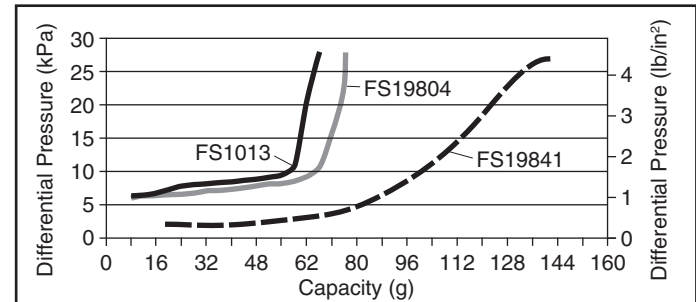


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size
FH23464	FS19841	600 (2271)	Yes	No	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)
FH23471	FS19841	600 (2271)	Yes	Yes	Yes	Yes	In Left/Out Left	SAE #12 (37° Flare, 1-1/16"-12)

* DP = Differential Pressure

Replacement Filters

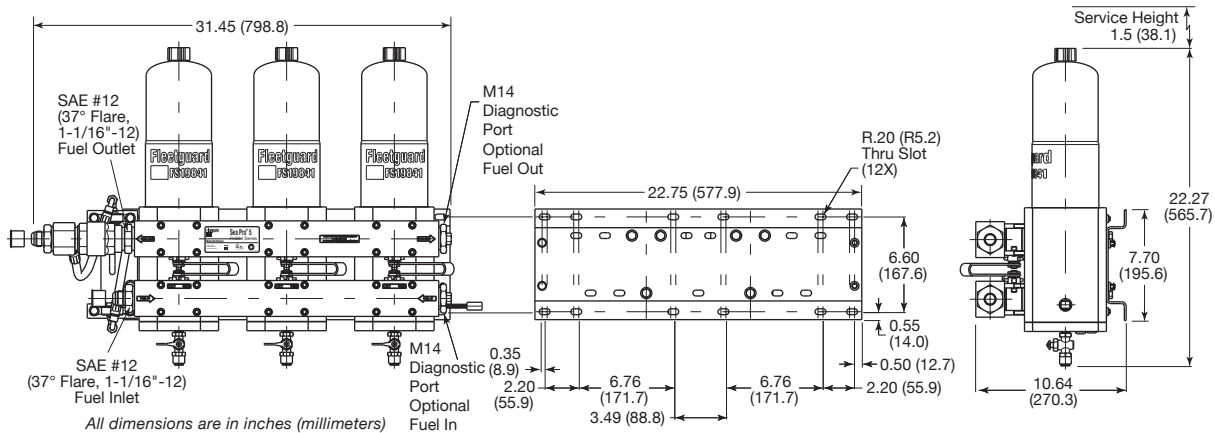
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

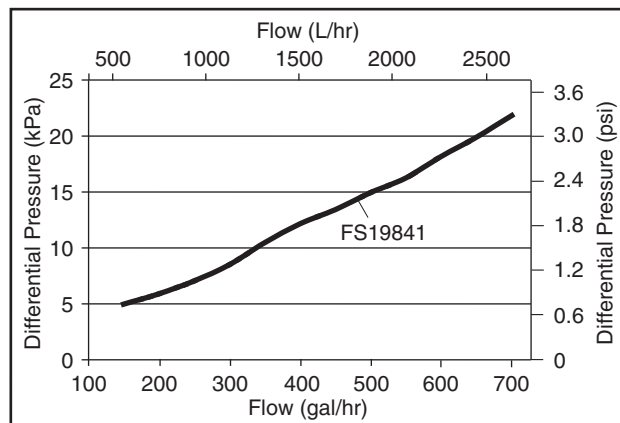
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

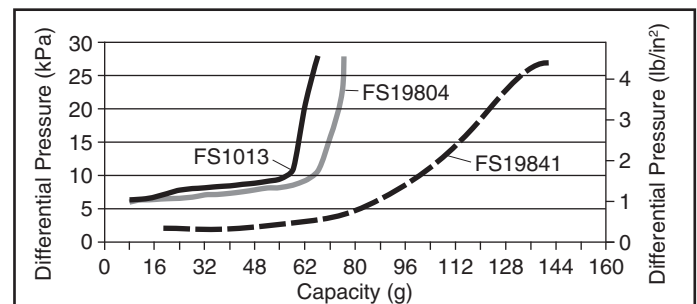


Performance

Filter Restriction vs Flow

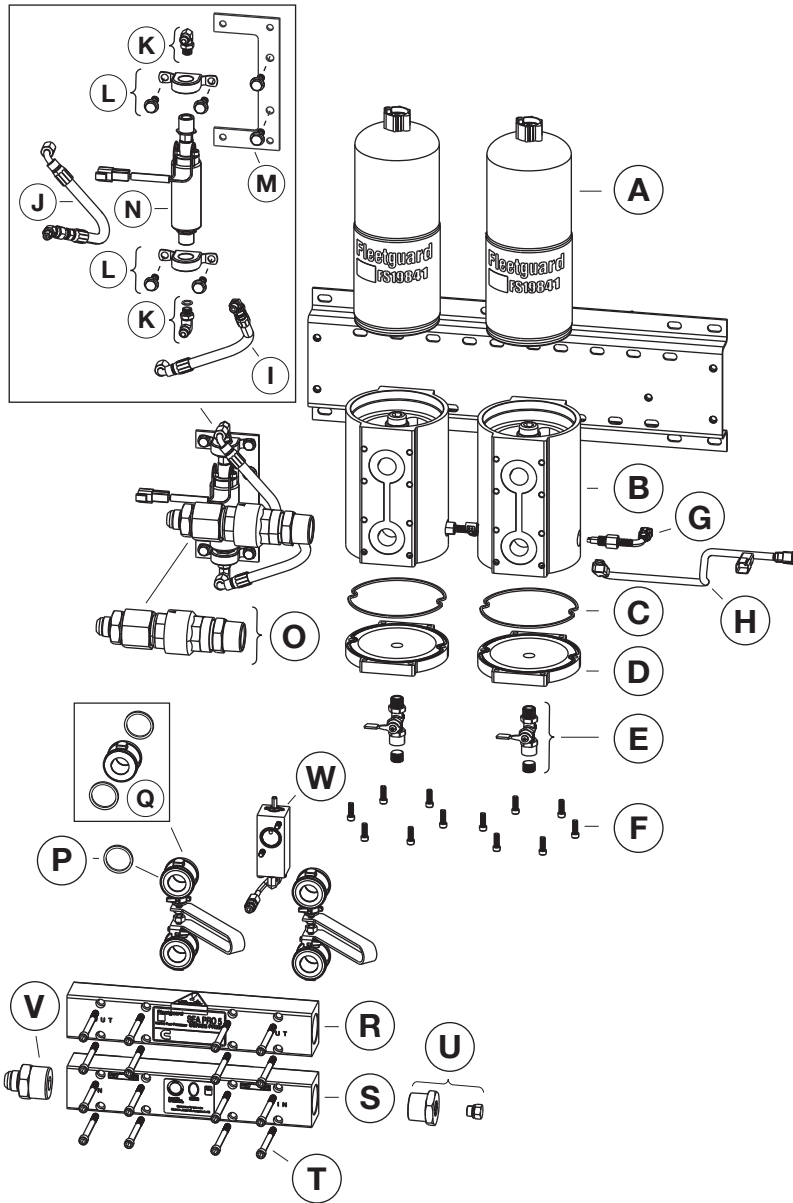


Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Sea Pro® 5 Dual/Duplex



Parts List

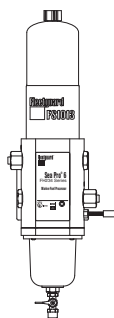
Part	Description	Fleetguard® Part Number	Cummins Part Number
A*	Spin-On Filter	FS19841	-
B*	Sea Pro® 5	See Individual Unit Ordering Information	
C	Bottom Seal	3970958 S	4919920
D	Bottom Plate	3970959 S	4919921
E	Drain Valve	3954131 S	4919916
F	Bottom Bolts (6)	3946704 S	4919915
G	Water-In-Fuel (WIF) Sensor - Dual Duplex	3960826 S 3966459 S	4919917 4919928
H	Dual Water-In-Fuel (WIF) Harness (Duplex only)	3966458 S	4919927
I	Lift Pump Inlet Hose	SP1069	4919983
J	Lift Pump Outlet Hose	SP1070	4919984
K	90° Fittings and O-Ring Seals	Not Service Replaceable	
L	Vibration Isolators	3946691 S	4919914
M	Lift Pump Bracket and Bolts	Not Service Replaceable	
N	Primer Pump	SP1124	4919922
O	Primer Pump Fitting Set for Dual/Duplex/Triple/Triplex Units	3961295 S	4919925
P	Shut-Off Valve Kit (for Assemblies with Valves only): Two Valve Kit	3970753 S	4919937
Q	Manifold Spacer Seal for Assemblies without Valves	3968209 S	4919932
R	Dual/Duplex Outlet Manifold w/ Plug	3968211 S	4919934
S	Dual/Duplex Inlet Manifold w/ Plug	3968210 S	4919933
T	Manifold Capscrew (12)	3968205 S	4919930
U	SAE 3/4" Plug with M14 Diagnostic Port and O-Ring Seal	Not Service Replaceable	
V	SAE #12 Flare Adapter (Standard SAE J514 or MIL-F-18866 Fitting)	3968203 S	4919929
W	Delta Pressure (DP) Gauge Kit for Multiple Body Units	3966457 S	4919926

* Order this part directly from Fleetguard.

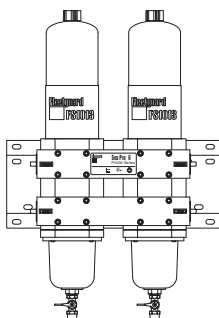
Note: Remove plug from water drain valve prior to operation.

Sea Pro® 6

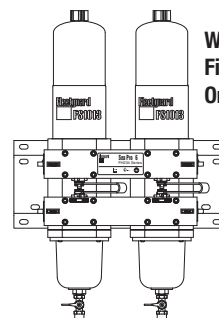
Single



Dual

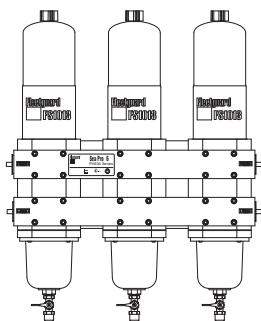


Duplex

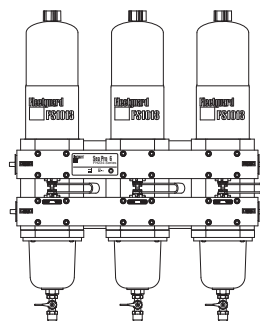


With Individual
Filter
On-Off Valve

Triple



Triplex



With Individual
Filter
On-Off Valve

FH234XXX (Rev. 2)

Indicates Unit Is
a Low Restriction
Model

Note: Effective April 2007, Cummins Filtration® switched to a lower restriction design for the Fleetguard® Sea Pro® 6 series. These low restriction units have some dimension changes and a significant reduction in overall restriction of between 3.4 - 6.8 kPa (0.49 - 0.98 lb/in²), depending on the model. The low restriction units can be identified by the label located on the right side of the unit. The part number will contain "Rev. 2" if it is a low restriction unit. This revision number does not appear on the originally designed units.

Specifications

Specification	Single	Dual	Duplex	Triple	Triplex
Height Overall	27.13" (689.0 mm)	27.30" (693.4 mm)	27.30" (693.4 mm)	27.30" (693.4 mm)	27.30" (693.4 mm)
Depth Overall	7.08" (179.8 mm)	10.40" (264.2 mm)	11.48" (291.6 mm)	10.46" (265.8 mm)	11.48" (291.6 mm)
Width, max	6.30" (160.0 mm)	18.75" (476.3 mm)	18.75" (476.3 mm)	21.18" (538.0 mm)	21.18" (538.0 mm)
Mt. Brkt. Centers (Horiz.)	5.20" (132.1 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)
Mt. Brkt. Centers (Horiz.)		3.50" (88.9 mm)	3.50" (88.9 mm)	3.50" (88.9 mm)	3.50" (88.9 mm)
Mt. Brkt. Centers (Vert.)	4.25" (108.0 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)
Weight (Dry)	19.01 lbs (8.62 kg)	40.53 lbs (18.38 kg)	41.34 lbs (18.75 kg)	71.43 lbs (32.40 kg)	72.99 lbs (33.11 kg)
Fuel Capacity (w/o filter)	0.37 gal (1.40 L)	0.74 gal (2.80 L)	0.74 gal (2.80 L)	1.11 gal (4.20 L)	1.11 gal (4.20 L)
Fuel Connections	3/4" NPT (M26 x 1.5)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)
Water Trap Capacity	40.5 fl oz (1196 ml)	91.0 fl oz (2392 ml)	91.0 fl oz (2392 ml)	131.5 fl oz (3588 ml)	131.5 fl oz (3588 ml)
Filter Service Clearance	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)
Fuel Types	Compatible for use with #1 Diesel, #2 Diesel, Kerosene, Biodiesel, and JP8				

Specifications subject to change without notice.



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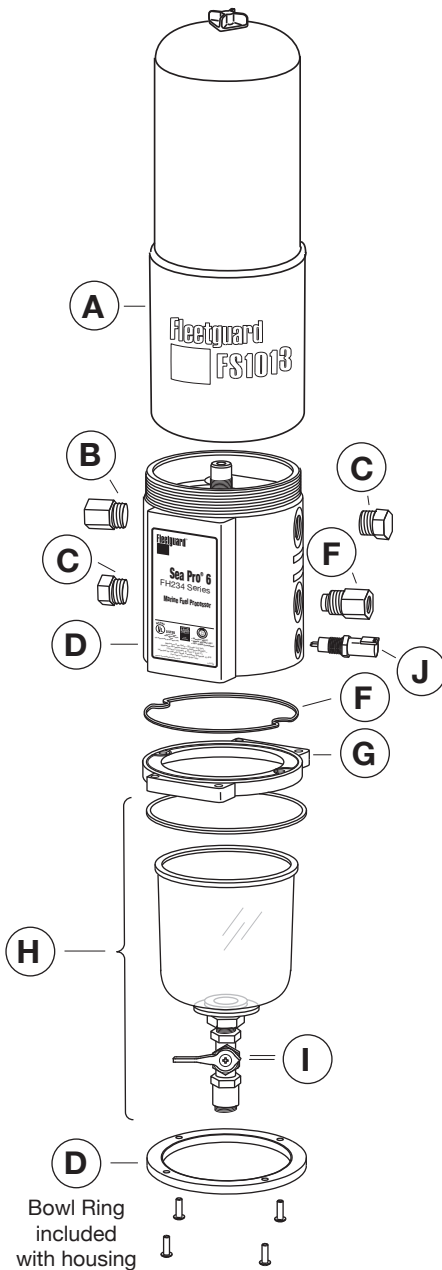
Also meets the following standards: USCG, ANSI 1105, ASTM F1201
For additional agency approvals, see TB07/05-2 Certification Matrix Bulletin



Parts List

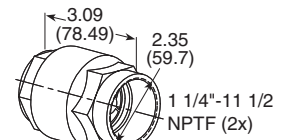
Part	Description	Part Number
A	Spin-On Filter	FS1013
B	Outlet Fitting	Airway # 6405-14-12
C	3/4" NPTF Plugs	Airway # 6408-14-0
D	Sea Pro® 6	See Individual Unit Ordering Information
E	3/4" NPTF Inlet Fitting	3946712 S
F	Bottom Plate Seal	3945125 S
G	Bottom Plate	3954132 S
H	Bowl Kit	3954130 S
I	Drain Valve	3954131 S
J	Water-In-Fuel (WIF) Sensor	3960826 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S

Note: The WIF sensor is not included, but can be purchased separately.



Check Valve

For Dual/Duplex and Triple/Triplex systems, if a check valve is required, part no. 3954139 S must be purchased and installed at or near the inlet of the Sea Pro assembly.



All dimensions are in inches (millimeters)

Note: When the engine is shut off, fuel levels may drop until the engine is restarted.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23411	FS1013	200 (757)	No	No	No	Yes	Left or Right	3/4"-14 NPTF	M26 x 1.5
FH23414	FS1013	200 (757)	No	No	Yes	Yes	Left or Right	3/4"-14 NPTF	M26 x 1.5
FH23446	FS19804	200 (757)	No	No	Yes	No	Left or Right	3/4"-14 NPTF	M26 x 1.5

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M26 x 1.5 fittings, use part no. **3954136 S** (which includes an outlet M26 x 1.5 outlet fitting, M26 x 1.5 inlet fitting with check valve body, check valve ball, check valve retainer, and check valve spring) and install to inlet and outlet ports of housing.

Replacement Filters

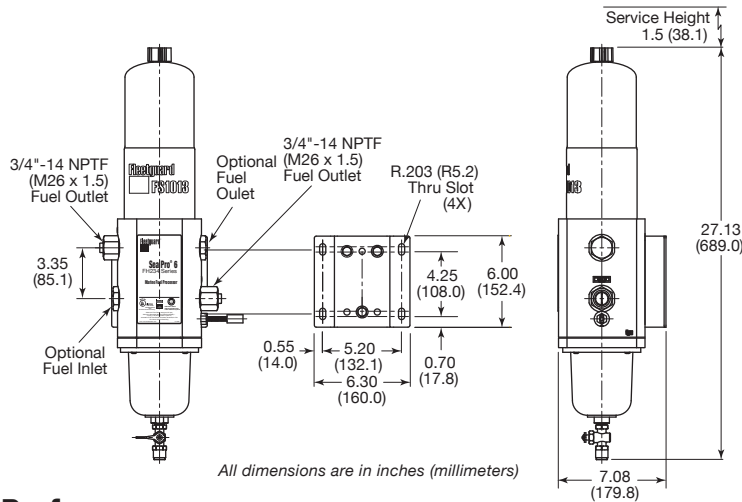
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

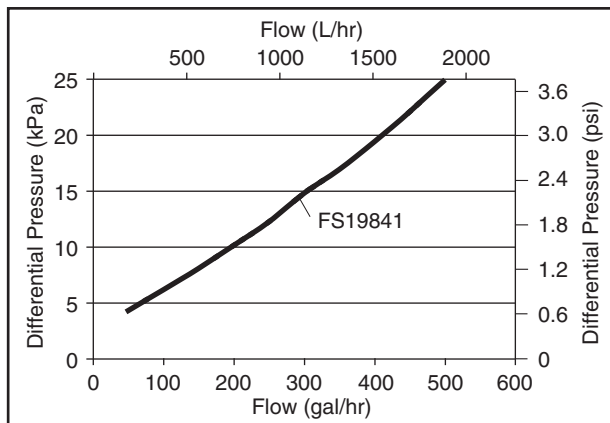
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

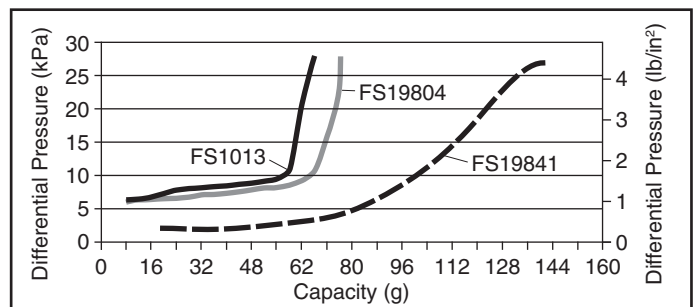


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23412	FS1013	400 (1515)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. 3956561 S (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

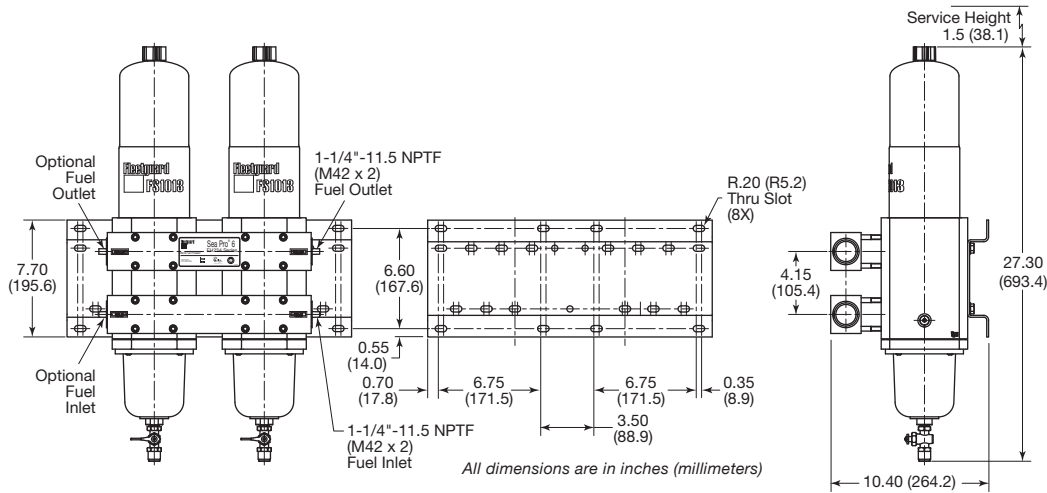
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

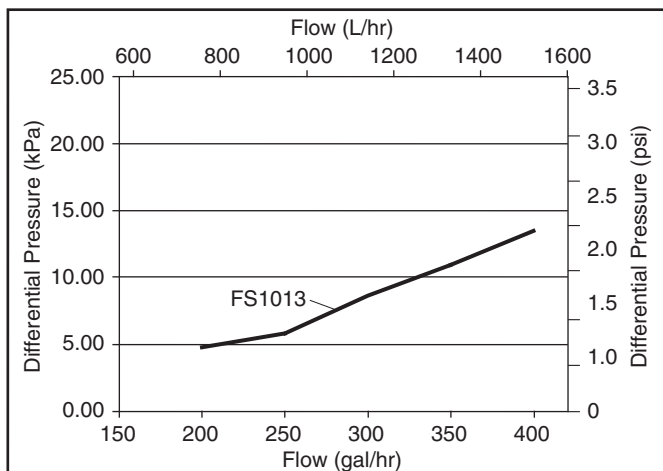
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

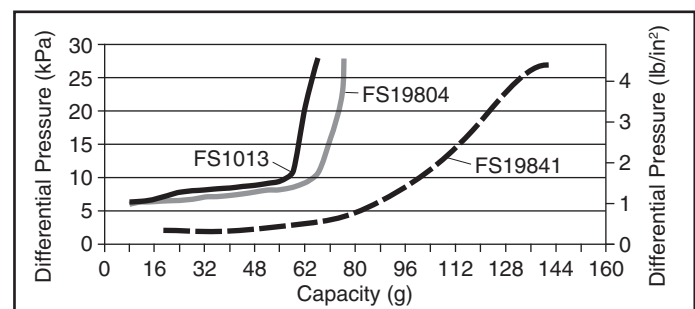


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23417	FS1013	400 (1515)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

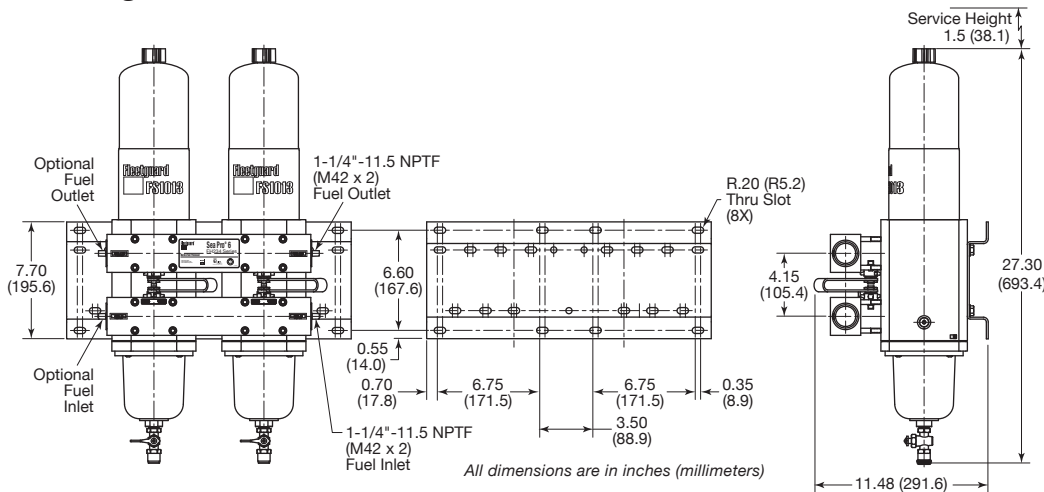
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

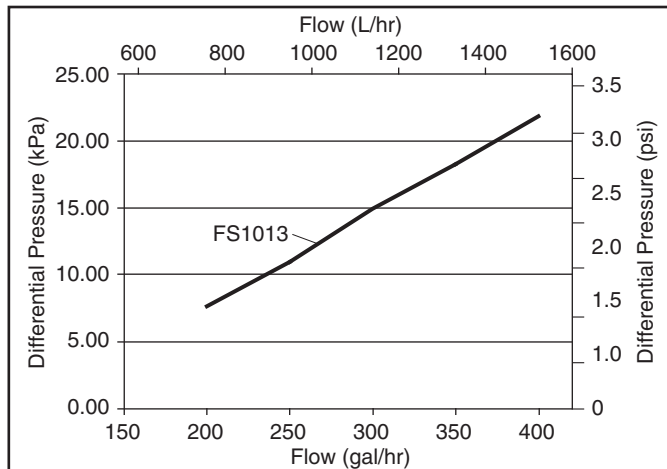
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

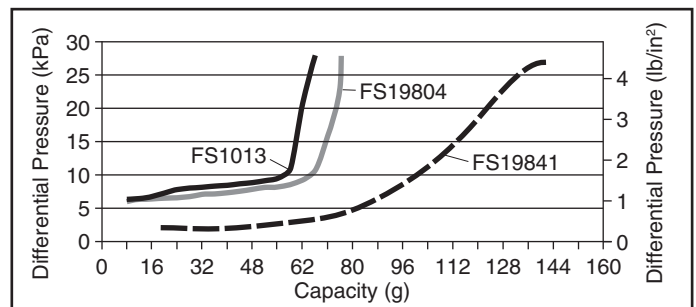


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23413	FS1013	600 (2272)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

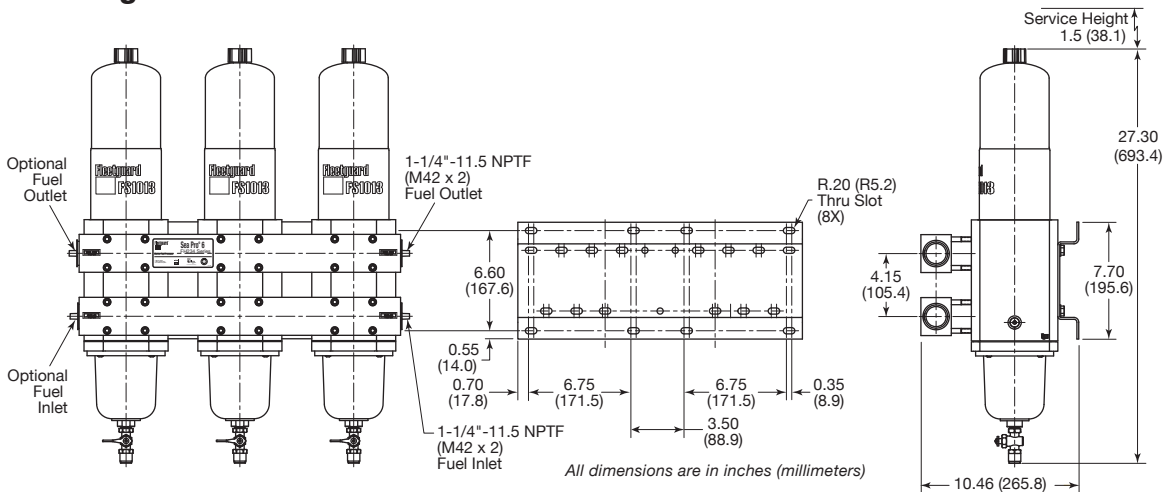
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

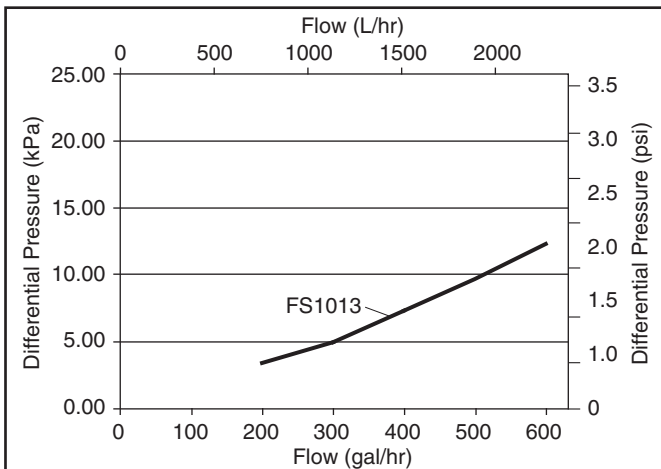
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

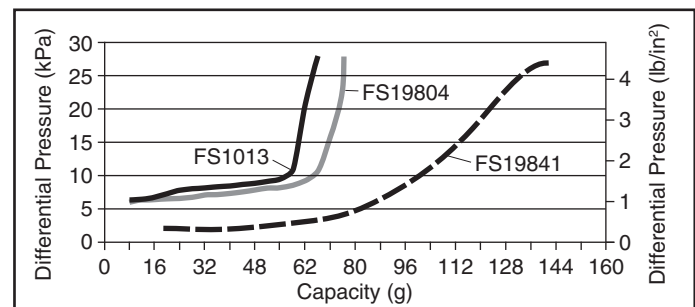


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23418	FS1013	600 (2272)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

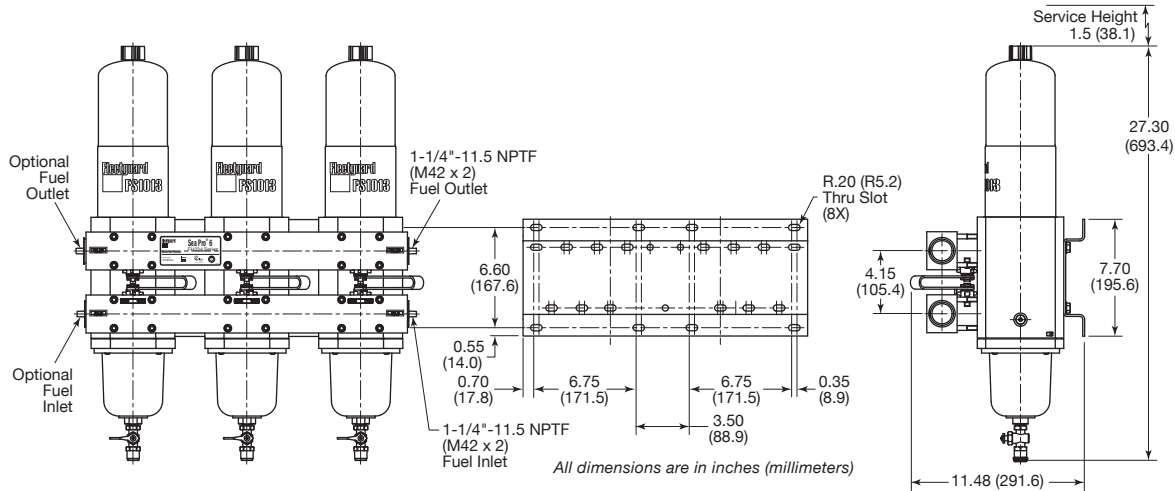
Part Number	Description
FS19841	StrataPore™ 7 micron Spin-On Filter
FS1013	StrataPore 10 micron Spin-On Filter
FS19804	StrataPore 25 micron Spin-On Filter

Filter Specifications

Spin-On Filter

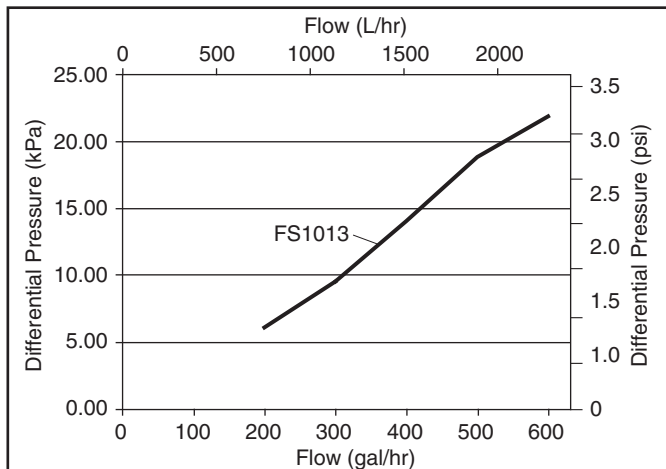
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

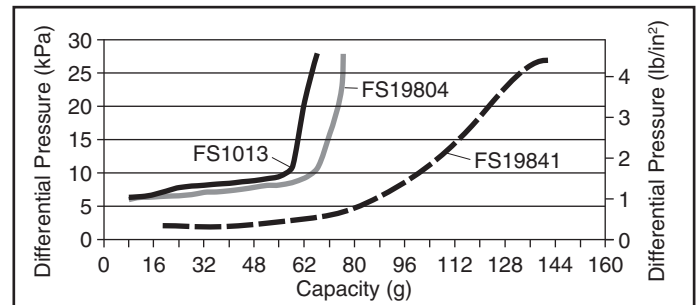


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

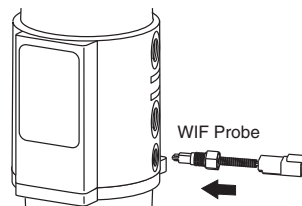
Ordering Information

Part Number	Description
3957158 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation

Note:
Depending on the model (Single, Dual, Duplex, Triple or Triplex), the WIF port can be located on the bottom left or the bottom right side of the unit.



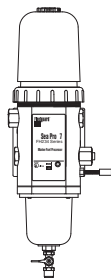
Specifications

Specification	WIF
Resistance Across Pins	82 k Ω \pm 2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC
Signal Type	Analog
Thread	1/2" 20 UNF-2B
Output Deutsch Connector	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT06-2S
Height to Water Sensing (Switch is in ON Position)	0.58" (14.73 mm)
Overall Length	2.328" (59.12 mm)
Length – Top of Probe to Bottom of Knuckle	1.201" (30.50 mm)
Length – Bottom of Knuckle to Top of Pin	0.79" (20.0 mm)
Distance Between Pins (Center to Center)	0.215" (5.46 mm)

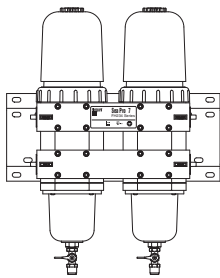
Specifications subject to change without notice.

Sea Pro® 7

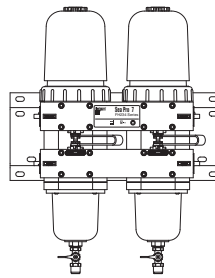
Single



Dual

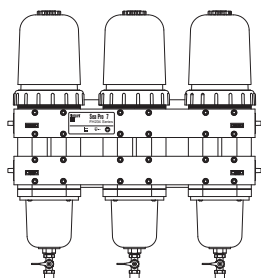


Duplex

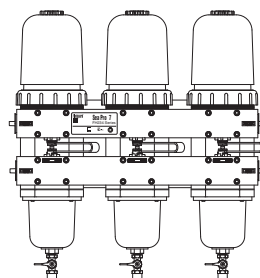


With Individual
Filter
On-Off Valve

Triple



Triplex



With Individual
Filter
On-Off Valve

FH234XXX (Rev. 2)

Indicates Unit Is
a Low Restriction
Model

Note: Effective April 2007, Cummins Filtration® switched to a lower restriction design for the Fleetguard® Sea Pro® 7 series. These low restriction units have some dimension changes and a significant reduction in overall restriction of between 3.4 - 6.8 kPa (0.49 - 0.98 lb/in²), depending on the model. The low restriction units can be identified by the label located on the right side of the unit. The part number will contain, "Rev. 2," if it is a low restriction unit. This revision number does not appear on the originally designed units.

Specifications

Specification	Single	Dual	Duplex	Triple	Triplex
Height Overall	23.71" (602.3 mm)	23.41" (594.6 mm)	23.41" (594.6 mm)	23.68" (613.7 mm)	23.68" (613.7 mm)
Depth Overall	7.36" (186.9 mm)	10.40" (264.2 mm)	11.48" (291.6 mm)	10.46" (265.8 mm)	11.48" (291.6 mm)
Width, max	6.30" (160.0 mm)	18.75" (476.3 mm)	18.75" (476.3 mm)	21.18" (538.0 mm)	21.18" (538.0 mm)
Mt. Brkt. Centers (Horiz.)	5.20" (132.1 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)
Mt. Brkt. Centers (Horiz.)		3.50" (88.9 mm)	3.50" (88.9 mm)	3.50" (88.9 mm)	3.50" (88.9 mm)
Mt. Brkt. Centers (Vert.)	4.25" (108.0 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)	6.75" (171.5 mm)
Weight (Dry)	18.92 lbs (8.58 kg)	40.35 lbs (18.30 kg)	41.16 lbs (18.67 kg)	71.16 lbs (32.28 kg)	72.72 lbs (32.99 kg)
Fuel Capacity (w/o filter)	0.37 gal (1.40 L)	0.74 gal (2.80 L)	0.74 gal (2.80 L)	1.11 gal (4.20 L)	1.11 gal (4.20 L)
Fuel Connections	3/4" NPT (M26 x 1.5)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)	1-1/4" NPT (M42 x 2)
Water Trap Capacity	40.5 fl oz (1196 ml)	91.0 fl oz (2392 ml)	91.0 fl oz (2392 ml)	131.5 fl oz (3588 ml)	131.5 fl oz (3588 ml)
Filter Service Clearance	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)	Min. 1.5" (38.1 mm)
Fuel Types	Compatible for use with #1 Diesel, #2 Diesel, Kerosene, Biodiesel, and JP8				

Specifications subject to change without notice.

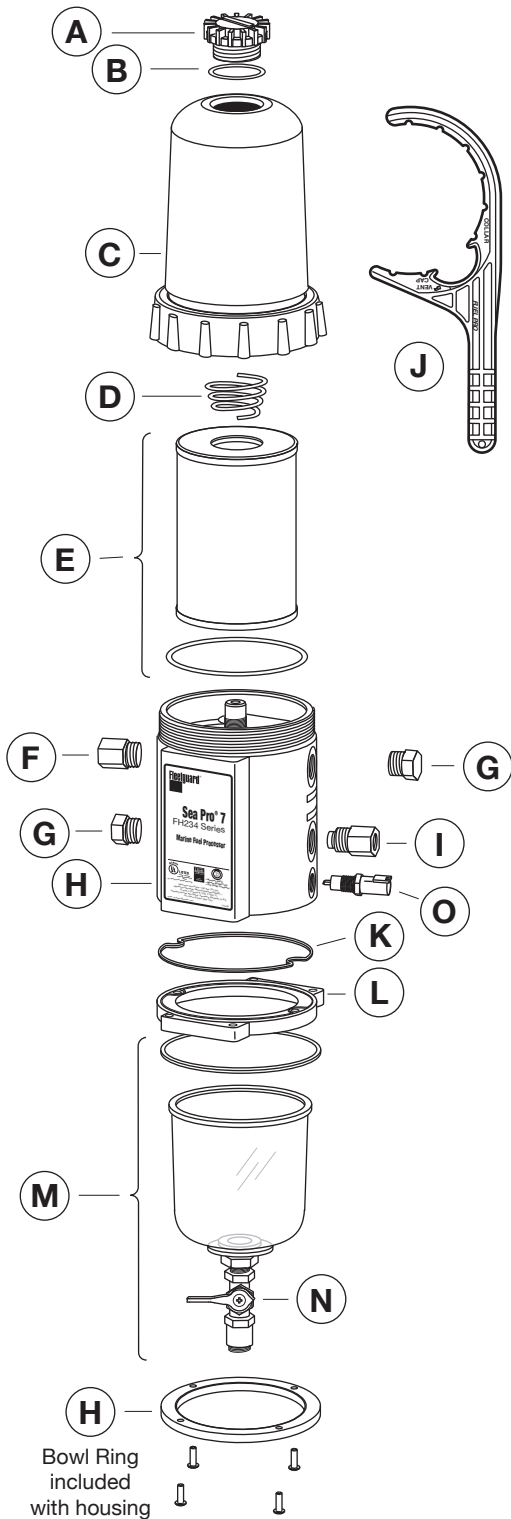


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Also meets the following standards: USCG, ANSI 1105, ASTM F1201
For additional agency approvals, see TB07/05-2 Certification Matrix Bulletin





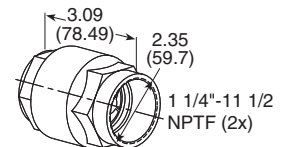
Parts List

Part	Description	Part Number
A	Vent Cap	Vent Cap and Assembly 3944440 S
B	Vent Seal	
C	Cover Assembly (includes Cover, Shield and Collar)	3954128 S
D	Filter Spring	3944441 S
E	Filter Element (includes Grommet and O-Rings)	FS19763
F	Outlet Fitting	Airway # 6405-14-12
G	3/4" NPTF Plugs	Airway # 6408-14-0
H	Sea Pro® 7	See Individual Unit Ordering Information
I	3/4" NPTF Inlet Fitting	3946712 S
J	Collar/Vent Cap Wrench	3944451 S
K	Bottom Plate Seal	3945125 S
L	Bottom Plate	3954132 S
M	Bowl Kit	3954130 S
N	Drain Valve	3954131 S
O	Water-In-Fuel (WIF) Sensor	3960826 S
Not Shown	WIF Wiring Harness	3950729 S
	WIF LED	3946670 S

Note: The WIF sensor is not included, but can be purchased separately.

Check Valve

For Dual/Duplex and Triple/Triplex systems, if a check valve is required, part no. **3954139 S** must be purchased and installed at or near the inlet of the Sea Pro assembly.



All dimensions are in inches (millimeters)

Note: When the engine is shut off, fuel levels may drop until the engine is restarted.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23419	FS19763	200 (757)	No	No	No	Yes	Left or Right	3/4"-14 NPTF	M26 x 1.5
FH23422	FS19763	200 (757)	No	No	Yes	Yes	Left or Right	3/4"-14 NPTF	M26 x 1.5
FH23447	FS19765	200 (757)	No	No	No	No	Left or Right	3/4" NPT	M26 x 1.5
FH23448	FS19765	200 (757)	No	No	Yes	No	Left or Right	3/4" NPT	M26 x 1.5

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M26 x 1.5 fittings, use part no. **3954136 S** (which includes an outlet M26 x 1.5 outlet fitting, M26 x 1.5 inlet fitting with check valve body, check valve ball, check valve retainer, and check valve spring) and install to inlet and outlet ports of housing.

Replacement Filters

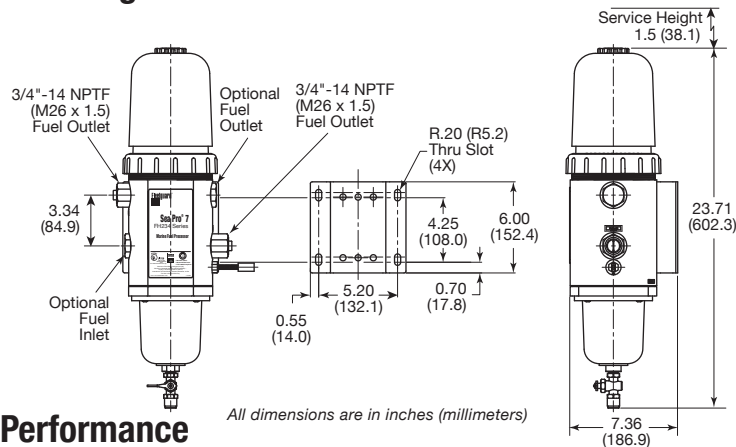
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

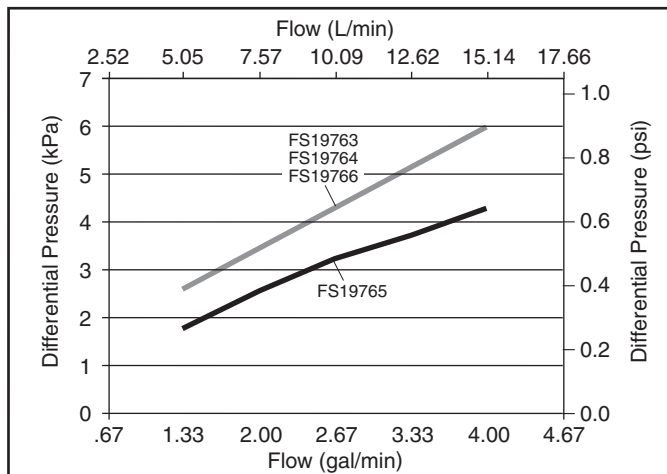
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

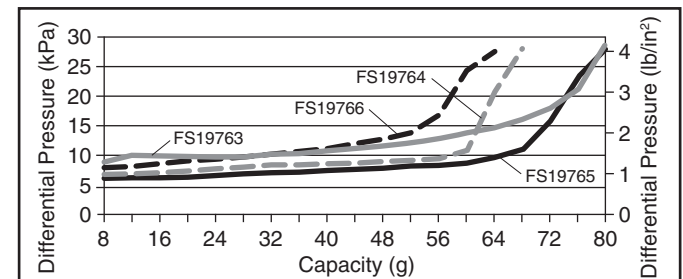


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23420	FS19763	400 (1515)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

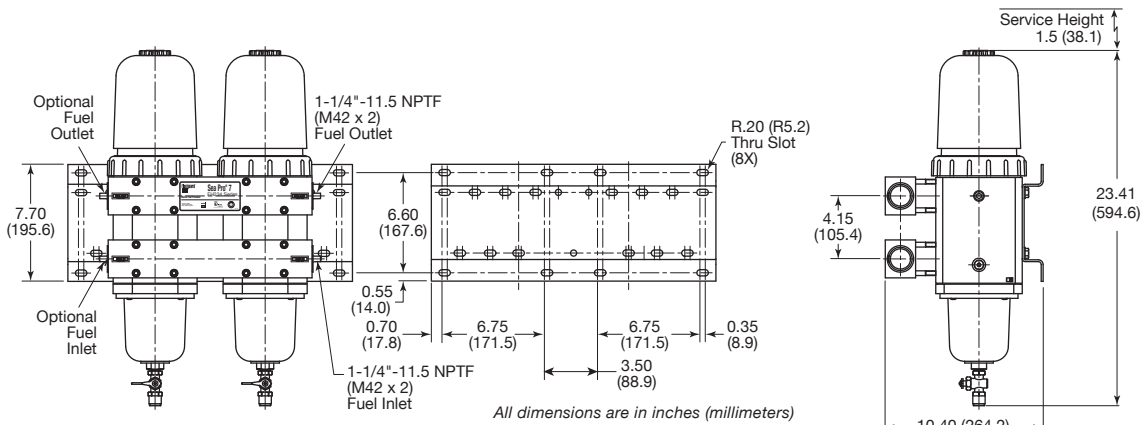
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

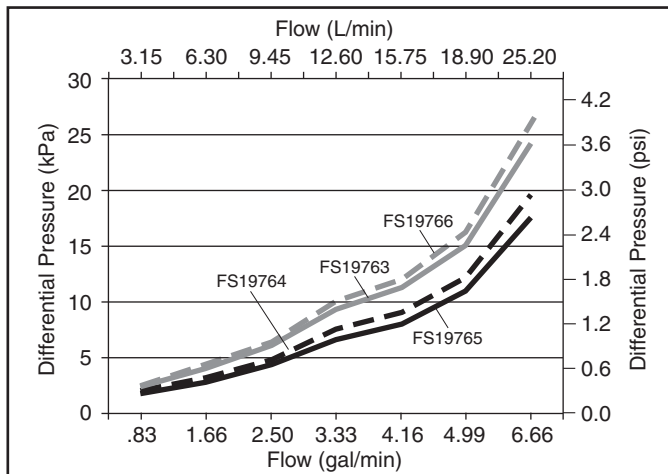
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

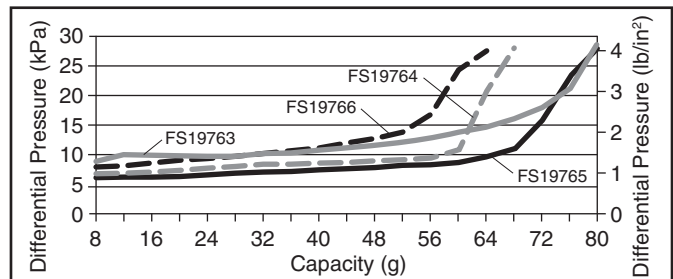


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23425	FS19763	400 (1515)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

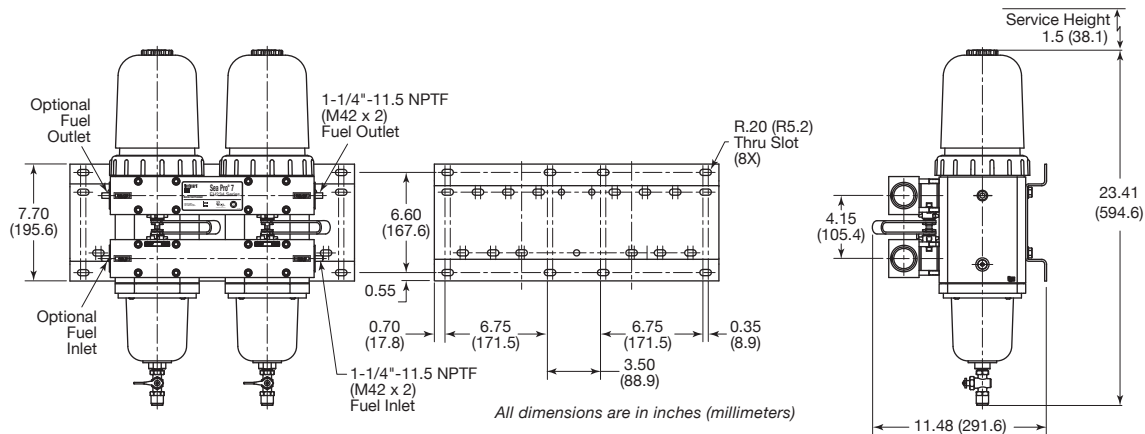
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

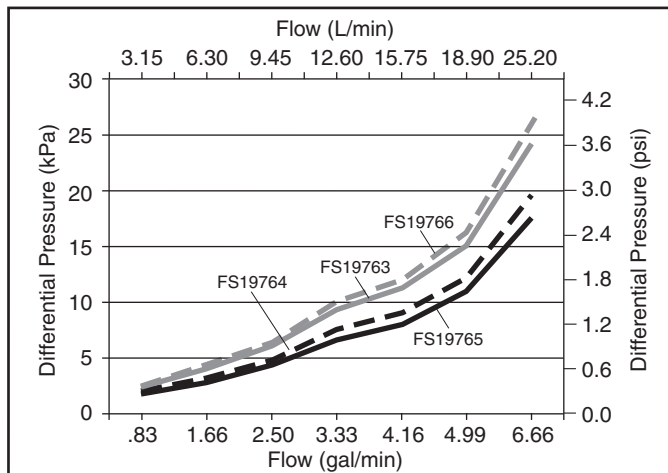
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

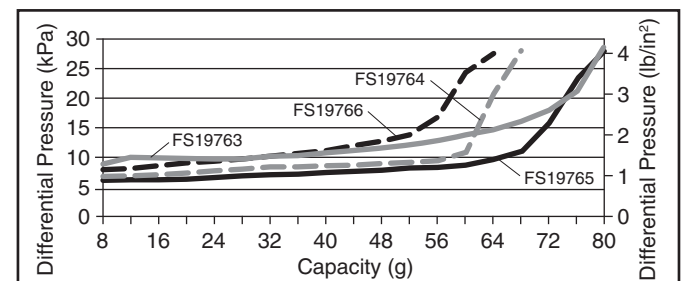


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23421	FS19763	600 (2272)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

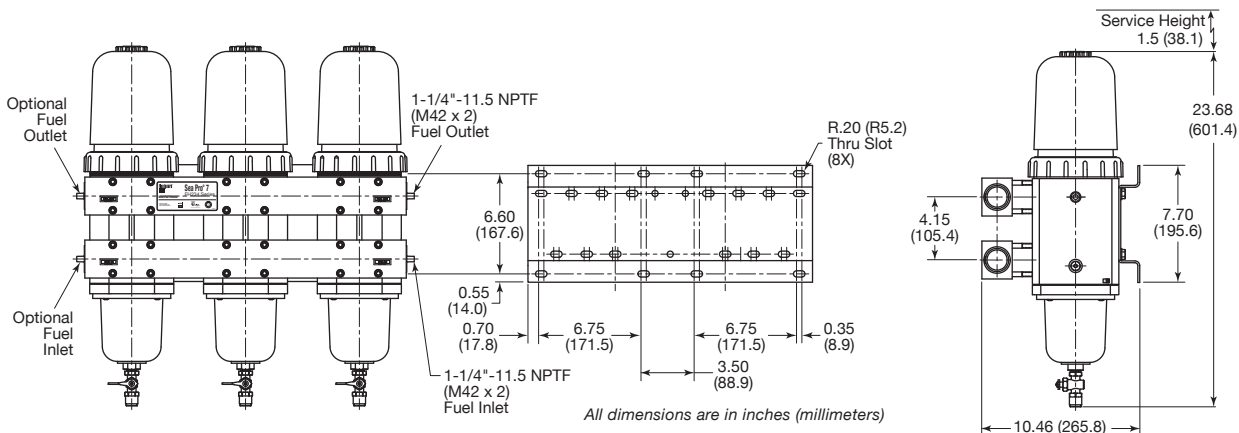
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

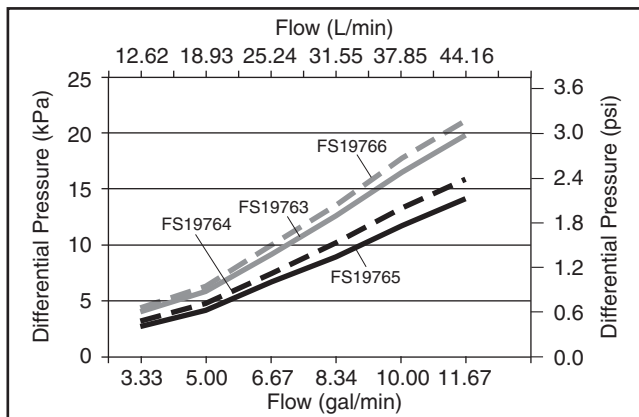
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

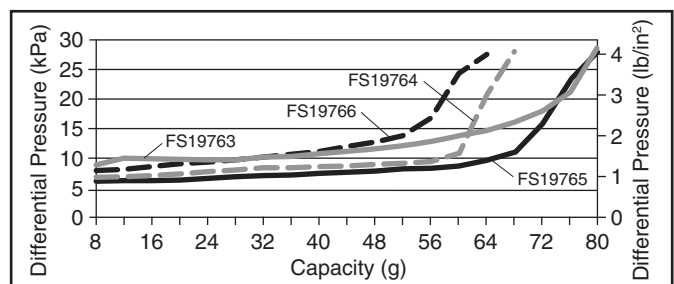


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF	Drain	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size** (metric)
FH23426	FS19763	600 (2272)	No	No	No	Yes	Left or Right	1-1/4"-11.5 NPTF	M42 x 2

* DP = Differential Pressure

** Metric connections require metric adapter fittings. For M42 x 2 fittings, use part no. **3956561 S** (which contains two M42 x 2 fittings) and install to inlet and outlet ports of assembly.

Replacement Filters

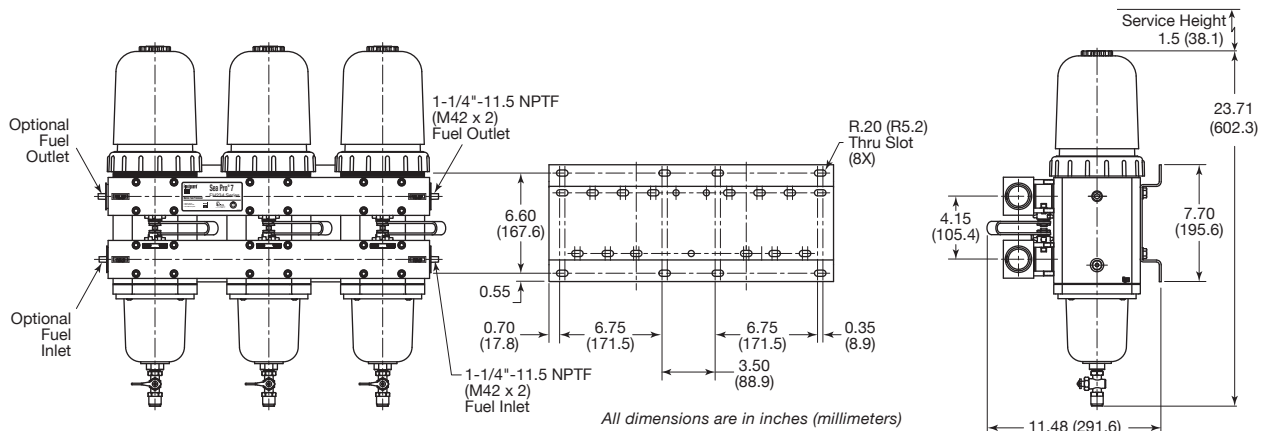
Part Number	Description
FS19766	EleMax™ StrataPore™ 5 micron (plus size)
FS19763	EleMax StrataPore 7 micron (plus size)
FS19764	EleMax StrataPore 10 micron (plus size)
FS19765	EleMax StrataPore 25 micron (plus size)
FS19905	EleMax Cellulose 50 micron (plus size)

Filter Specifications

Plus Size Filter

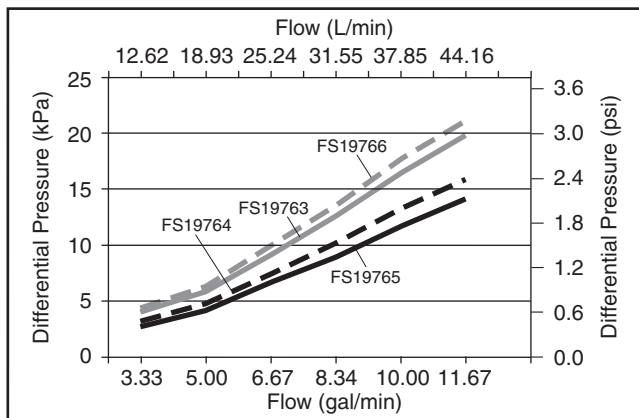
- Emulsified Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1488
- Free Water Separation: 95% efficiency at 180 gal/h (681 L/h) flow per SAE J1839

Mounting/Dimensions

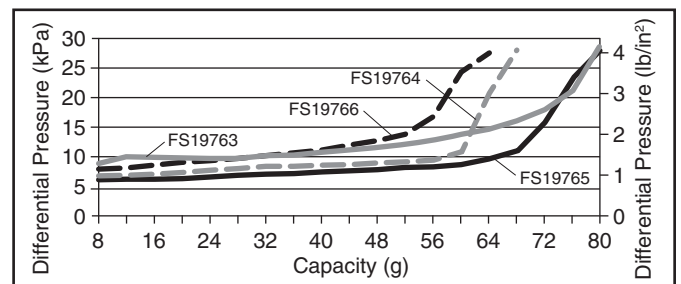


Performance

Filter Restriction vs Flow



Filter Capacity vs Restriction



Note: Restriction vs Flow and Capacity vs Restriction tests run per SAE J905 standard. Performance data based on #2 Diesel.

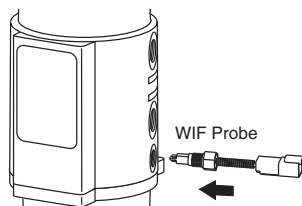
Ordering Information

Part Number	Description
3957158 S	Water-In-Fuel (WIF) Sensor
3950729 S	WIF Wiring Harness
3946670 S	WIF LED

Note: The WIF sensor is not included, but can be purchased separately.

Installation

Note: Depending on the model (Single, Dual, Duplex, Triple or Triplex), the WIF port can be located on the bottom left or the bottom right side of the unit.



Specifications

Specification	WIF
Resistance Across Pins	82 kΩ ±2% (at 25° C)
Voltage Rating	5 – 50 VDC or VAC
Signal Type	Analog
Thread	1/2" 20 UNF-2B
Output Deutsch Connector	EDLRDT13-2PR-002
WIF Harness Deutsch Connector	DT06-2S
Height to Water Sensing (Switch is in ON Position)	0.58" (14.73 mm)
Overall Length	2.328" (59.12 mm)
Length – Top of Probe to Bottom of Knuckle	1.201" (30.50 mm)
Length – Bottom of Knuckle to Top of Pin	0.79" (20.0 mm)
Distance Between Pins (Center to Center)	0.215" (5.46 mm)

Specifications subject to change without notice.

Discontinued Products

FH230 Series Fuel Pro®

Ordering Information

Housing Part No.	Filter Element*	Pre-Heater 1	Pre-Heater 2	Fluid Heat	WIF	Fuel Flow
FH23070	FS19763	N/A	N/A	Ports Avail.	No	In Rt./Out Lt.

FH234 Series Industrial Pro®

Ordering Information

Housing Part Number	Filter Element	Fuel Flow gal/h (L/h)	Primer Pump	DP* Gauge	WIF**	Drain	Check Valve	Heat	Fuel In & Fuel Out	Fuel In & Fuel Out Port Size	Fuel In & Fuel Out Port Size*** (metric)
Single											
FH23402	FS19763	200 (757)	No	No	Optional	Yes	Yes	12 VDC	Left or Right	3/4" NPT	M26 x 1.5
FH23401	FS19763	200 (757)	No	No	Optional	Yes	Yes	24 VDC	Left or Right	3/4" NPT	M26 x 1.5
FH23453	FS19765	200 (757)	No	No	Optional	Yes	Yes	24 VDC	Left or Right	3/4" NPT	M26 x 1.5
Single with Primer Pump											
FH23457	FS19763	200 (757)	Yes	No	Yes	Yes	Yes	Ports Available	In Right/Out Left	3/4" NPT	M26 x 1.5
Dual											
FH23435	FS19765	400 (1514)	No	No	Optional	Yes	No	Ports Available	Left or Right	1-1/4" NPT	M42 x 2
Triple											
FH23494	FS19765	600 (2271)	No	No	Yes	Yes	No	24 VDC	Left or Right	1-1/4" NPT	M42 x 2
FH23495	FS19905	600 (2271)	No	No	Yes	Yes	No	24 VDC	Left or Right	1-1/4" NPT	M42 x 2
Triple with Primer Pump											
FH23488	FS19765	600 (2271)	Yes	No	Yes	Yes	Yes	24 VDC	Left In/Left Out	1-1/4" NPT	M42 x 2

* DP = Differential Pressure

** Water-In-Fuel (WIF) sensor, part number **3957158 S**, available separately.

*** Metric connections require metric adapter fittings. For M26 x 1.5 fittings, use part no. **3954136 S** (which includes an outlet M26 x 1.5 outlet fitting, M26 x 1.5 inlet fitting with check valve body, check valve ball, check valve retainer, and check valve spring) and install to inlet and outlet ports of housing.

AC Heater Unit

Ordering Information

Part Number	Description
3945121 S	120 VAC/75 W Heater

Specifications

Heater	
Specification	3945121 S
Volts	120 VAC
Watts	75 W
Amps	0.63 ± 0.1 A
Cold Resistance	187 ± 12 Ω

Single Element Design Coalescer

Parts List

Part	Description	Part Number	
		91284N	91293N
A	Cover Assembly	Q80039A	Q80749A
B	O-Ring	-	-
C	Band Clamp		Q52874A
D	Seal Nut Assembly	Q53776	-
E	Gasket	-	-
F	Filter Element	-	-
G	Housing	-	91393N

Multiple Element Design Coalescer

Parts List

Part	Description	Part Number
A	Cover Assembly	-
B	O-Ring	-
C	Seal Nut Assembly	Q53779
D	Gasket	-
E	Filter Element	-
F	Housing	-