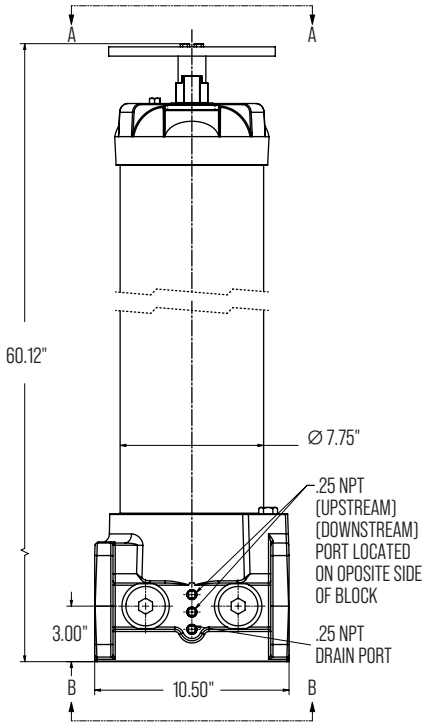
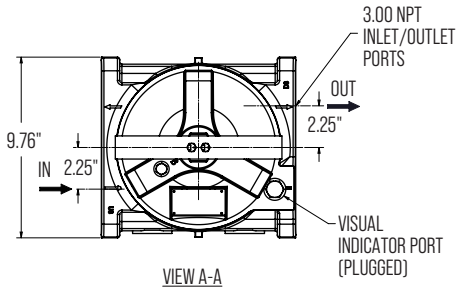
FILTER INSTALLATION

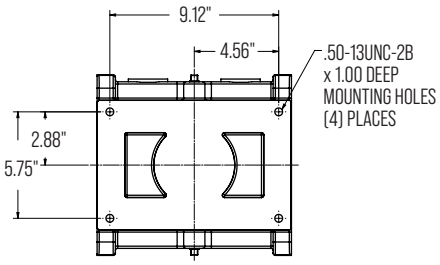
FMS-350-BP

- Define the fluid inlet and outlet ports.
- The fluid outlet is always/only through the lower port, opposite to the inlet.
- Install pressure gauges on US and DS ports; there is also an option for a port for a delta P indicator or a sensor with a connection to a light for saturation alarm.
- Screw the air purge button into the filter cap with a hose for drainage.
- Secure the filter using the holes/threads in its base.
- It is recommended to mount it on a safety/spill containment tray.
- Read the tolerances and do not exceed them (diagram); maximum recommended flow: 350 GPM.





VIEW A-A



VIEW B-B

HOUSING TECHNICAL SPECIFICATIONS

Max. Flow per Housing	350 gpm
Porting	3" NPT
Additional Ports	2 x test points,
	2 x manometers,
	1 x Delta P indicator (pop-up or sensor)
Elements Options	FMS-1/350-P
Max. Operating Pressure	500 psi (35 bar)
Min. Yield Pressure	2500 psi (172 bar)
Temperature Range	-20°F to 225° (-29°C to 107°C)
Bypass Setting	30 psi (40 psi optimal)
Porting Base	Cast Aluminum
Element Case	Steel
Cap	Ductile Iron
Weight	210 lbs
Element Change Clearance	36.8" (859 mm)

ELEMENT CHANGE INSTRUCTIONS

FMS-1/350-P

ELEMENT INSTALLATION

- Turn off the system to ensure there is no pressure or flow in the filter housing.
- Bleed the pressure from the filter using the purge plug on the filter cap.
- Drain the filter housing by removing the drain plug.
- Use an open-end wrench to loosen the threaded cap of the filter tube. Rotate the cap counterclockwise until it comes off the filter tube. (Note: the cap has a torque of 20 foot-pounds).
- Remove the contaminated element with a rotating motion of the filter head. Note that the spring plate and the spring are reusable.
- Inspect the O-ring on the cap and the backup ring, and replace them if necessary. (The part number for Buna N O-ring is LF-7363, Viton is LF-7363V, EPR is LF-7363B).
- Lubricate the seals of the element before placing the replacement element into the housing with system fluid.
- Replace the spring plate of the element and the spring at the top of the element.
- Carefully place the cap back over the newly installed element and position it onto the filter tube.
- Thread cap in clockwise manner until hand tight. Then open end wrench and tighten until cap bottoms out on filter tube and torque to 20 ft-lbs.
- Tighten the drain plug.
- Tighten the purge plug on the cap.

ELEMENT TECHNICAL SPECIFICATIONS

Efficiency	Beta 4>4193 (ISO 16889:99)
DHC	3000gr @300gpm (MTD)
	6000gr @75gpm
Maximum Pressure	150 psi
Recommended Flow	350 gpm
Dimensions	42x6.25x6.25”
Weight	21 lbs
Housings	FMS-350-BP

⚠ **Reminder: When restarting the system, it is crucial to purge the filter housing by slightly loosening the purge plug to eliminate trapped air. This ensures that the filter housing is completely filled with system fluid and that the entire surface of the element is effective in removing contaminants.**

OPERATION MANUAL

FMS-C70-BP

EXCLUSION OF LIABILITY

We have taken every measure to ensure the accuracy of this document, however, errors may still exist.

As such, we assume no liability for any errors or consequential losses arising from this document.

The instructions provided here are specific to certain operating conditions and applications. For any other applications or operating conditions that are not covered, please get in touch with the relevant technical department. Please note that the instructions are subject to technical modifications.

This manual's content is checked periodically. Necessary corrections will be incorporated in subsequent editions.

This manual may undergo technical modifications without prior notice.

Note: ⚠ This symbol denotes important notes to ensure proper usage of the equipment. Failure to follow these notes may result in damage to the product and/or personal injury.

TABLE OF CONTENTS

1 INTRODUCTION

The FMS Bulk Diesel Fuel Coalescing Filter (FMS-C70-BP) is designed to efficiently remove water from diesel fuels at high flow rates. Water in a high-pressure diesel fuel injection system can reduce lubricity causing seizure of close tolerance parts and increased wear. Additionally, microbial growth in fuel storage systems begins in free water at the bottom of the tank and can rapidly migrate through the fuel. In warm climates, microbial 'blooms' can quickly overwhelm and cause fuel filters to bypass, allowing contamination to reach fuel injectors. Today's high-pressure fuel injection systems have tighter tolerances, as low as 2 µm, and require efficient water removal to avoid costly wear and component damage. The FMS-C70-BP from FMS is an excellent option for high flow fuel transfer, kidney circuit applications, and supply filtration that supports fleet operations or high flow fuel systems. With a single pass efficiency of 99.5%, the FMS-C70-BP is capable of removing free water and particles from petroleum-based fuels:

- ULSD15 and low sulfur diesel
- Biodiesel blends
- Synthetic diesel and blends
- Fuel oil Number 2 heating oil

1.1 FEATURES AND BENEFITS

- Revolutionary fuel/water separation media technology in one element construction three phase for high efficiency.
- Undergo free water removal
- Protects expensive Tier III and Tier IV engine components from failure caused by water transferred from the bulk fuel tank to the vehicle.
- Previous generation coalescent products no longer provide high efficiency separation in ULSD and biofuels.
- Antistatic media is standard for all coalescing elements.
- Full automation can be achieved with the fail-safe auto-drain feature using a 5 gallon (18 L) or 20 gallon (75 L) remote sump with alarm and auto shut-off.
- Complete automation can be achieved with the fail-safe automatic drainage function using a 5-gallon (18 L) or 20-gallon (75 L) remote sump with alarm and automatic shutdown.

1.2 APPLICATIONS

- Industrial
- Maritime
- Agriculture
- Common Rail Injector Systems
- Railway
- Mobile Vehicles
- Mining Technology
- Power Generation
- Fleets
- Bulk Fuel Filtration

2 WARNINGS, PRECAUTIONS, NOTES

NOTES:
This symbol is the safety alert symbol. Whenever you spot this symbol on your machine or in the manual, you should be alert to the possibility of personal injury. Follow the precautions and safe operating practices highlighted by this symbol. The signal word (DANGER, WARNING, or CAUTION) is used along with the safety alert symbol. DANGER identifies the most serious hazards. General precautions are found on CAUTION labels.

2.1 FOLLOW SAFETY INSTRUCTIONS

Please read the safety messages present in this manual and on the machine, and follow them carefully. Make sure to check them frequently. It is important that all operators of this machine understand these safety messages. If any safety labels are missing or damaged, please replace them immediately.

2.2 OPERATE ONLY IF QUALIFIED

Do not operate this machine unless you have carefully read the operator's manual and have received supervised training and instruction. Familiarize yourself with the workplace and its surroundings before operating.

2.3 INSPECT THE MACHINE

Please inspect the equipment thoroughly before each use. Never start the product with a known hazardous condition. Keep all parts in good condition and installed correctly. Repair damage and replace worn or broken parts immediately. Pay special attention to the hydraulic hoses and electrical power cord.

- Handle Liquids Safely - Avoid Fires
- **FMS-C70-BP** should never be used near open flames due to the risk of fire or explosion.
- **FMS-C70-BP** should never be used with any fluid other than DIESEL FUEL.
- Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.
- Make sure the machine is clean of trash, grease and debris.
- Do not store oily rags; they can ignite and burn spontaneously.

2.4 PREPARE FOR EMERGENCIES

Be prepared if a fire starts. Have a first aid kit and fire extinguisher on hand. Keep emergency numbers for doctors, ambulance services, hospitals, and fire departments near your phone.

2.5 PRACTICE SAFE MAINTENANCE

Before starting work, it is important to understand the service procedure. Work areas must be level, clean, and dry. Prior to repairing the machine:

- Place the machine on a level surface.
- Allow to cool if hot

NOTE: Do not modify this product except with written approval from the company.

Keep components in good condition. Repair damaged components immediately. Remove any dirt, oil, or grease buildup.

2.6 HANDLE CHEMICALS SAFELY

Direct exposure to hazardous chemicals can result in serious injuries. Potentially hazardous chemicals used with equipment include items such as lubricants, coolants, paints, and adhesives. A Material Safety Data Sheet (MSDS) provides specific details about chemicals: physical and health hazards, safety procedures, and emergency response techniques. Verify the MSDS before starting any work with a hazardous chemical. This way, you will know exactly what the risks are and how to safely perform the job. Then, follow the recommended procedures and equipment. (Contact FMS before using with fluids other than those recommended in this manual).

BURN DANGER
Do not touch. Allow to cool before servicing.

2.7 WEAR PROTECTIVE CLOTHING

Wear tight-fitting clothing and safety equipment appropriate for the job. Operating the equipment safely requires full operator attention. Do not use radio or music headphones while operating the machine.

2.8 MAINTAIN MACHINES SAFELY

Tie long hair behind your head. Do not wear a tie, scarf, loose clothing, or necklace when working near machine tools or moving parts. Serious injury could result if these items become trapped. Remove rings and other jewelry to avoid electrical shorts and entanglement in moving parts.

2.9 ILLUMINATE THE WORK AREA SAFELY

Illuminate your work area appropriately but safely. Use a portable safety light when working inside or under the machine. Ensure that the bulb is surrounded by a wire cage. The hot filament from a broken bulb can accidentally ignite spilled fuel or oil.

2.10 WORK IN A CLEAN AREA

- Before starting a job:
- Clean the work area and the machine.
- Ensure you have all the necessary tools for your job.
- Have the right parts on hand.
- Read all instructions carefully; do not attempt shortcuts.

2.11 USE THE RIGHT TOOLS

Use appropriate tools for the job. Improvised tools and procedures can create safety hazards. To loosen and tighten fittings, use tools of the correct size. DO NOT use imperial measurement tools on metric fasteners. This is to prevent bodily injuries caused by wrench slippage.

2.12 DISPOSE OF WASTE PROPERLY

Improper waste disposal can threaten the environment and ecology. Potentially harmful waste includes items such as oil, fuel, coolant, brake fluid, filters and batteries. Use leak-proof containers when draining liquids. Do not use food or drink containers that could mislead someone to drink from them. Do not pour waste onto the ground, down a drain, or into any water source.

ELECTRICAL HAZARDS

- Do not operate the system near water sources due to the risk of electric shock.
- All work on electrical equipment must be carried out by a qualified electrician.
- The electrical parts of the product should be checked periodically.
- Any loose connections must be rectified immediately.
- The control box must always be secured. Only authorized personnel may access it.
- When repairing the product, make sure to label the component and its power source so that others unfamiliar with the unsafe condition do not attempt to operate it.
- Risk of voltage or current sufficient to cause electric shocks, burns, or death.
- Disconnect power before servicing.

ELECTRICAL WARNING

The system may come equipped with optional indicators, sensors, heaters, and electrical controls. The panel requires 120 VAC, 60 Hz as standard service. Depending on the requested options, an appropriate circuit breaker must be installed to protect the motor and comply with national and local electrical codes.

3 TECHNICAL ASSISTANCE

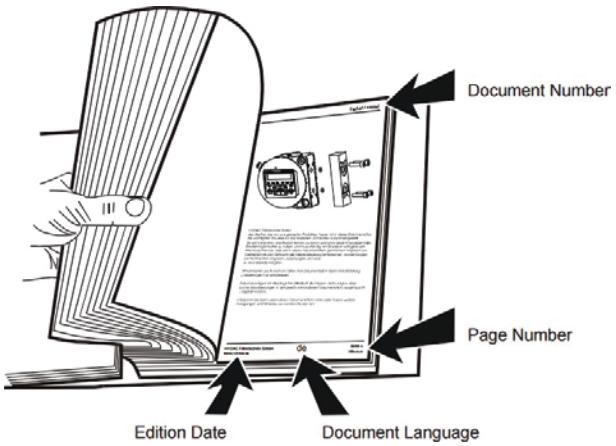
For technical assistance, please call 1-724-340-4210 or email fms@fms-filtration.com

3.1 USING THE DOCUMENTATION

Please note that the method described for locating specific information does not exempt you from the responsibility of thoroughly reading these instructions before commissioning the unit for the first time and at regular intervals in the future.

What do I want to know?
I determine the topic I am looking for.
Where can I find the information I am looking for?
The documentation has a table of contents at the beginning. There, I select the chapter I am looking for, along with the corresponding page number. The document number with its edition date allows you to request another copy of the operating and maintenance instructions. The table of contents is updated each time the manual is revised or changed.

While every precaution has been taken to ensure the accuracy and completeness of this literature, FMS International, Inc. assumes no responsibility and disclaims all liability for damages resulting from the use of this information or for any errors or omissions.



4 COMMISSIONING

4.1 SET-UP / CONFIGURATION

When receiving the **FMS-C70-BP**, carefully remove all packaging and factory-installed dust caps.

- Verify that all requested/ordered options have been supplied with the product.
- Securely mount the housing in the application as intended, ensuring that the assembly is in a vertical orientation.
- Follow the instructions in the "Maintenance Instructions" under "Element Service" to install the coalescing element.
- If supplied with the manual drain valve, ensure the valve is in the closed position before proceeding.
- If necessary, ensure you have an electrical service compatible with the product.
- If supplied, securely mount the control panel and the remote sump tank near the FMS-C70-BP housing, as the cables must be able to reach the connectors of the FMS-C70-BP housing connections."

NOTE: Mounting arrangements/provisions for tank and control panel not included.

4.2 DISMANTLING AND LONG-TERM STORAGE

When ready to store the case for long-term storage, follow the procedure below:

- If installed, close the customer-supplied inlet and outlet shut-off valves.
- If equipped, turn off and disconnect the electrical supply to the **FMS-C70-BP** control panels.
- Open the manual drain valve located at the base of the housing. Then, remove the filter cap and properly dispose of the fluid.
- Remove the element and dispose of it properly. Clean the bowl, head, and lid of any residue, spray the inside of the bowl with a corrosion inhibitor, and reinstall the lid.
- Plug the inlet and outlet ports when removing customer-supplied connections.

4.3 CONNECTION

- Install the SAE 24 connection on the inlet and outlet side of the ICF housing.
- If equipped, connect the sensors and/or valve to the corresponding connectors leading to the control panel, and ensure that the power switches are in the off position. Then, plug the electrical plugs into the supplied outlet.

5 SPECIFICATIONS

HOUSING TECHNICAL SPECIFICATIONS

Flow Classification	Up to 70 gpm (265 L/min) for ULSD1
Input/output connection	3" NPT
Upper drainage connection	1/4" NPT ball valve
Lower drainage connection	1/4" NPT ball valve
Max. Operating Pressure	100 psi (7 bar); 45 psi (3 bar) with sight glass
Min. Performance Pressure	400 psi (27.6 bar) without sight glass
Nominal Fatigue Pressure	Contact factory
Temperature Range	-20°F to 165°F (-29°C to 74°C) Standard
	32°F to 165°F (0°C to 74°C) with optional sight glass
Bypass indication	25 psi (1.7 bar) (bottom indication options available)
Bypass Setting	30 psi (2 bar)
Porting Base	Anodized Aluminum
Element Case	Epoxy Paint w/High-phos Electroless
	Nickel Plating (Standard)
Cap	Nickel Coated Ductile Iron
Weight	155 lbs (77 kg)
Element Change Clearance	33.8" (858 mm)

6 OPERATING INSTRUCTIONS

6.1 SYSTEM STARTUP

- After proper installation of the **FMS-C70-BP**, confirm that the customer-supplied valves on the inlet and outlet are open, and, if equipped, the manual drain valve is closed.
- If equipped with automatic water drain, turn the switch located on the control panel to the ON position.
- The system can now be started. Visually inspect the housing, fittings, and hoses for any leaks in the system and tighten loose fittings if necessary.

NOTE: After the initial startup or after changing elements, it may be necessary to purge air from the housing. This can be achieved by pressing the purge plug on the cap until all air is removed from the housing.

6.2 DURING OPERATION

During operation of the **FMS-C70-BP**, the coalescing filter sump will need to be drained as water separates from the fuel and accumulates at the bottom of the housing. The frequency with which this occurs depends on the amount of water present in the filtered fuel and will vary case by case.

- Without the optional sight glass, the manual valve must be opened at regular intervals determined by the user to ensure high coalescence performance.
- With the optional sight glass indicator, the contents of the sump can be determined and if there is an indication of water in the sump at the sight glass level, the sump should be drained until the water level drops below the sight glass level. .
- With the automatic water drain option, the panel indicator will illuminate when the sensor indicates that there is water in the sump. This then signals the valve to open, allowing water to drain from the sump until the sensor indicates that no more water is present, causing the valve to close.

7 MAINTENANCE INSTRUCTIONS

7.1 MANUAL VALVE: SUMP DRAINAGE

Open the manual valve located at the bottom of the coalescing housing. Do this slowly to prevent the rapid flow of water from creating an emulsion between the water in the sump and the fuel above it. The collected liquid must be disposed of properly.

7.2 AUTOMATIC WATER DRAIN (AWD) – REMOTE SUMP DRAIN

Since AWD drains the integral sump in the **FMS-C70-BP** housing automatically, the larger 5 or 20 gallon remote tank will need to be drained less frequently. At regular intervals or when the tank alarm sounds and the warning light comes on, simply open the valve on the tank drain and collect the liquid, which should then be disposed of properly.

7.3 MAINTENANCE OF ELEMENTS

Equipment required: 1½” open-end wrench, a container to hold the dirty element and filter housing fluid, and a small cup of grease.

ELEMENT REPLACEMENT INSTRUCTIONS

FMS-C70-BPE

7.4 CHANGING THE FMS-C70-BP COALESCING ELEMENT

1. Drain the FMS-C70-BP filter by opening the manual drain valve at the bottom of the cast piece.
2. Remove the filter cap with a 1 1/2" wrench.
3. Take out the element through the top of the FMS-C70-BP filter tube.
4. Lubricate the washers and O-rings of the new element and the filter cap, and insert the element through the top of the FMS-C70-BP filter tube.
5. Reinstall the filter cap carefully and hand-tighten as much as possible to ensure proper alignment with the element.
6. Tighten by hand with the 1 1/2" wrench.

7.5 REPLACEMENT ELEMENTS

ELEMENT TECHNICAL SPECIFICATIONS

Efficiency	98.6% SAE J1488 Certified
WHC	Drain
Maximum Flow	80 gpm
Recommended Flow	70 gpm
Dimensions	40x6x6"
Weight	18 lbs
Housings	FMS-C70-BP

7.6 REPLACEMENT PROGRAM

The elements should be replaced when the bar indicator on the cap shows that the differential pressure across the element approaches the bypass pressure. The useful life of the element varies from case to case, depending on the application in which it is installed.

8 WARRANTY

For the most current warranty and limitation of liability statement, please refer to HYDAC's latest “Terms of Sale”.

L-4431

APPENDIX A: DIMENSIONAL DRAWING / PARTS LIST