OPERATION AND MAINTENANCE MANUAL

HIGH-FLOW COALESCING FILTER

Exclusion of Liability

We have used our best endeavors to ensure the contents of this document, however, errors cannot be ruled out. Consequently, we accept no liability for such errors as may exist in this document, nor for any consequential loss.

The information in this operation instructions relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

The content of this manual is checked regularly. Any corrections required will be incorporated in subsequent editions.

This manual is subject to technical modifications without prior notice.

Note:
This symbol marks an important note for the proper use of this equipment. The non-observance of these notes can lead to product damage and/or personal injury.

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1. Introduction

The FMS-C25-TP | FMS® High-Flow Coalescing Filter is a highly effective method of removing water and particulate from diesel fuels and can be used in a variety of applications from fuel polishing to transfer and dispensing.

Water in high pressure diesel fuel injection systems can cause damage to injectors and reduce lubricity in pumps causing increased wear. In addition, microbial growth in fuel storage systems thrive in the water, commonly found at the tank bottom and can quickly migrate through the fuel. In warm weather, microbial “blooms” can quickly overwhelm fuel tanks and cause fuel filters to fail. Today’s high pressure fuel injection systems have tighter tolerances, as low as 2 µm, and require efficient water removal to prevent costly wear and component damage. The FMS-C25-TP is a great choice for fuel maintenance, recirculation and kidney-loop applications supporting fleet operations. The FMS-C25-TP is rated with a high, single pass efficiency, capable of removing free and emulsified water as well as particulate matter from the following petroleum based fuels:

- Ultra-Low Sulfur Diesel and Low Sulfur Diesel
- Biodiesel blends
- Synthetic diesel and blends
- No. 2 fuel oil and heating oil

1. Features and Benefits

- Revolutionary fuel / water separation media technology in a three-phase element construction for high efficiency, single-pass removal of free-water
- Protects diesel fuel system components against failures caused by water transferred from the bulk fuel tank to the vehicle
- Prior generation coalescing products no longer provide high-efficiency separation in ULSD and Biofuels
- Water-In-Fuel (WIF) sensor options enable the user to integrate warnings, alarms, or control input for increased functionality
- For below freezing applications, the immersion sump heater ensures continued cold weather operation
- System automation is achievable with automatic water drain (AWD) feature using a remote 5 gallon (18 L) or 20 gallon (75 L) sump with alarm and high level float valve

2. Applications

- Industrial
- Mobile Vehicles
- Marine
- Mining Technology
- Agriculture
- Power Generation
- Common Rail Injector Systems
- Fleet
- Railroad
- Bulk Fuel Filtration

2. Warnings, Cautions, Notes

NOTES
This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert for the potential of personal injury. Follow the precautions and safe operating practices highlighted by this symbol. A signal word — DANGER, WARNING, or CAUTION — used with the safety alert symbol. DANGER identifies the most serious hazards. General precautions are on CAUTION labels.

1. Follow Safety Instructions
Read the safety messages in this manual and on the machine. Follow these warnings and instructions carefully. Review them frequently. Be sure all operators of this machine understand every safety message. Replace safety labels immediately if missing or damaged.

2. Operate Only If Qualified
Do not operate this machine unless you have read the operator's manual carefully and you have been qualified by supervised training and instruction. Familiarize yourself with the job site and your surroundings before operating.

3. Inspect Machine
Inspect equipment carefully before each use. Never start the product with a known unsafe condition. Keep all parts in good condition and properly installed. Fix damage and replace worn or broken parts immediately. Pay special attention to hydraulic hoses and electrical power cord.

4. Handle Fluids Safely—Avoid Fires

- The FMS-C25-TP should never be used around open flames due to risk of fire or explosion.
- The FMS-C25-TP is not to be used with any fluids other than DIESEL FUEL and other high flash point petroleum distillates.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers. Make sure machine is clean of trash, grease, and debris. Do not store oily rags; they can ignite and burn spontaneously.

5. Prepare for Emergencies
Be prepared if a fire starts. Keep a first aid kit and fire extinguisher handy. Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

6. Practice Safe Maintenance
Understand service procedure before doing work. Work areas should be level, clean, and dry. Before servicing equipment:

Keep all parts in good condition and properly installed. Fix damaged components immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

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

7. Handle Chemical Products Safely
Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with equipment include such items as lubricants, coolants, paints, and adhesives. A Safety Data Sheet (SDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques. Check the SDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and use recommended equipment.

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

8. Wear Protective Clothing
Wear close fitting clothing and safety equipment appropriate to the job. Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the equipment.

9. Service Machines Safely
Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result. Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

10. Illuminate Work Area Safely

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the equipment. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

11. Work In Clean Area

Before starting a job:

- Clean work area and machine
- Make sure you have all necessary tools to do your job
- Have the right parts on hand
- Read all instructions thoroughly; do not attempt shortcuts

12. Use Proper Tools

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards. For loosening and tightening hardware, use the correct size tools. DO NOT use imperial measurement tools on metric fasteners. This is to avoid bodily injury caused by slipping wrenches.

13. Dispose of Waste Properly

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste includes such items as oil, fuel, coolant, brake fluid, filters, and batteries. Use leak-proof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source.

ELECTRICAL HAZARDS

- Do not operate equipment with electrical options near any water sources due to risk of electrocution.
- All work on the electrical equipment must be carried out by a qualified electrician.
- The electrical parts of the product must be regularly checked.
- Any loose contacts must be rectified immediately.
- The control panel must always be secured. It may be accessed only by authorized staff.
- When servicing the product, be sure to tag the component and its power supply so others who may not know of the unsafe condition will not attempt to operate it.
- Voltage or current hazard sufficient to cause shock, burn, or death.
- Remove power before servicing.

ELECTRICAL WARNING

The system may be supplied with optional electrical indicators, sensors, heaters and controls. The panel requires 120 VAC, 60 Hz as standard service. According to the options ordered, a proper circuit breaker should be installed to protect the motor and meet national and local electric codes.

3. Technical Assistance

For Technical Assistance please call 1-800-722-4810 or email fuelfiltrationmanager@schroederindustries.com.

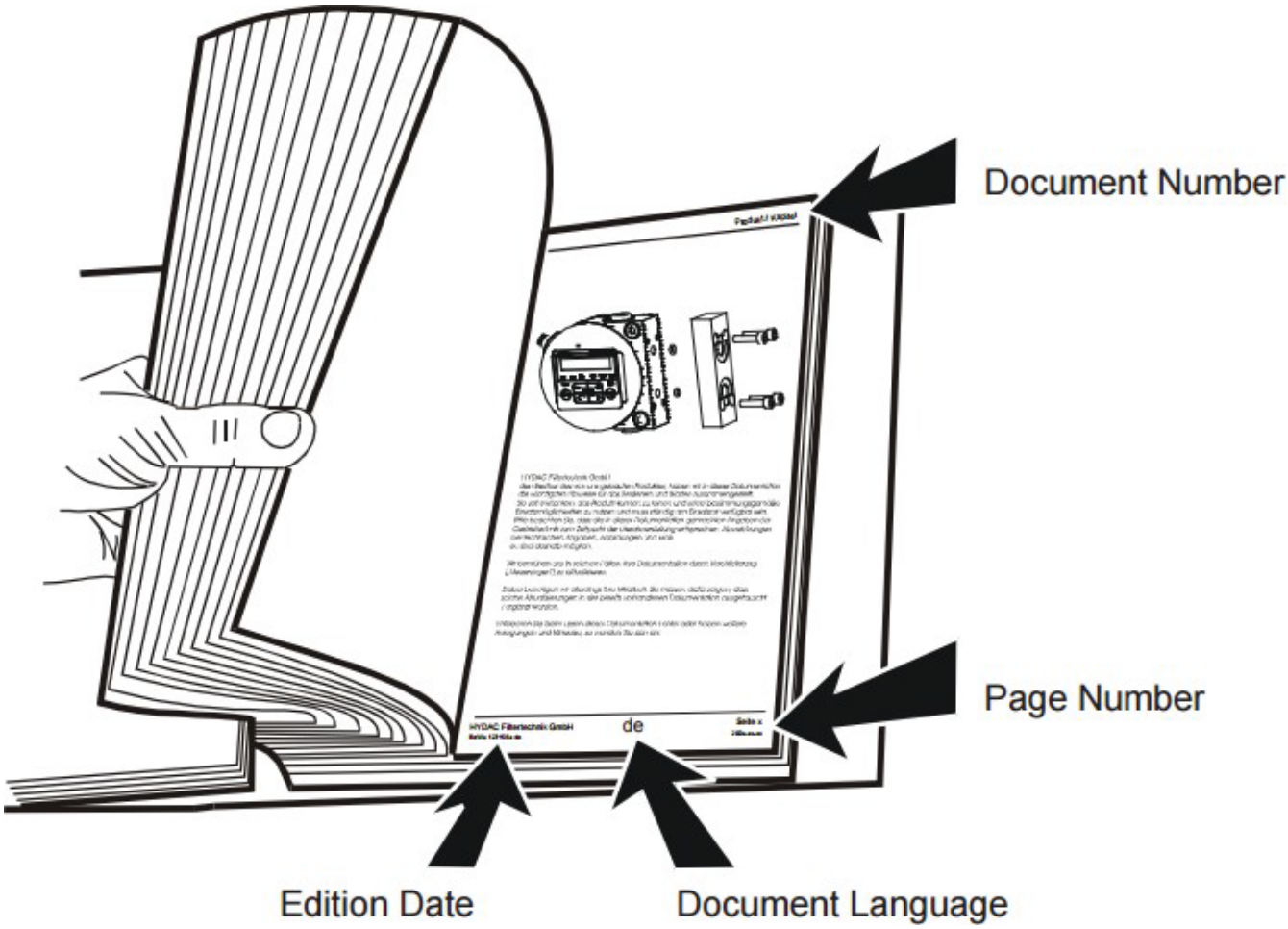
3.1 Using the Documentation

Note that the method described for locating specific information does not release you from your responsibility of carefully reading these instructions prior to starting the unit up for the first time and at regular intervals in the future.

What do I want to know?
I determine which topic I am looking for.

Where can I find the information I'm looking for?
The documentation has a table of contents at the beginning. There, I select the chapter I'm looking for, along with the corresponding page number.

The document number with its edition date enables you to order another copy of the operating and maintenance instructions. The index is incremented every time the manual is revised or changed.



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

4. Commissioning

1. Set-Up

- Upon receipt of the FMS-C25-TP, carefully remove all of the factory installed packaging and dust plugs.
- Verify that all of the options ordered are supplied with the product.
- Mount the housing securely on the application as intended, ensuring that the mounting is in the vertical orientation. Use the (4) mounting holes located in the top of the filter head. They require a 3/8”-16 UNC fastener, with no more than ½” thread engagement into the filter head.
- Follow the directions under “Maintenance Instructions” on “Servicing the Element” to install the coalescing element.
- The filter housing comes from the factory with the filter element already installed.
- If supplied with the manual drain valve, ensure the valve is in the closed position before proceeding.
- If required, make sure that you have an electrical service compatible with the electrical options supplied with product.
- If supplied, mount the optional control panel and/or optional remote sump tank securely to the application in close proximity to the FMS-C25-TP housing, as the cables and tubing must be able to reach the connectors on the filter housing connections.

Note:
Mounting provisions for the tank and control panel are not included

2. Optional Automatic Water Drain (AWD) Installation

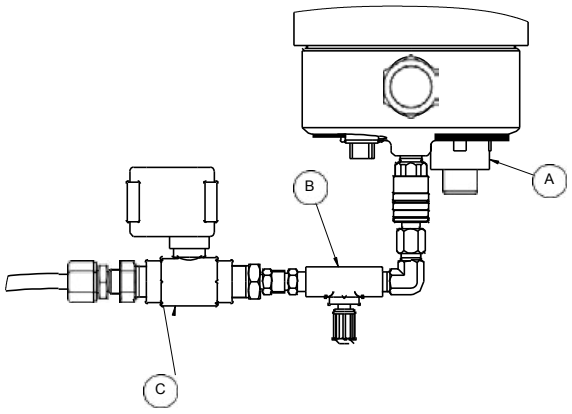


Figure A

Item No.	Qty.	Description	Part No.
A	1	WATER LEVEL SENSOR, HDP	13016 67
B	1	NEEDLE VALVE, .25 NPT	76002 57
C	1	BALL VALVE, MOTORIZED	76248 51

Table A

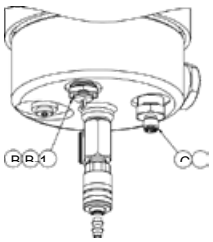
3. AWD Needle Valve Setting Procedure

There is an adjustable needle valve supplied with the AWD feature. This is used to prevent an emulsion of water and fuel from being discharged during the draining of the sump through a flow control valve. This allows for a less turbulent flow, meaning that the setting can be dialed in to provide a more pure water discharge from the sump, reducing unnecessary fuel disposal from the sump.

- Remove the metal retaining ring from between the red locking ring and the black adjustment dial and pull the red ring towards the black dial.
- Start with the valve in the fully closed position (fully turned in the clockwise direction). Take note that when in the closed position, the “0” on the adjustment dial should be facing the outlet of the valve.
- Follow the settings on the table below based upon your fuel system specifications. The pressure listed in the table is NOT the differential pressure across the element, but the difference between the inlet and outlet port pressures.

Note:
Without the ability to measure the pressure at the filter inlet and outlet during operation, the drain flow can be measured to set the discharge rate. The target flow rate of discharge from the water drain is 1 Liter per minute. Adjust the needle valve open or closed to achieve this target flow rate.

Housing Differential Pressure		Valve Setting
psi	bar	Turns Out from the Closed Position
10	0.7	2.5
20	1.4	1.8
30	2.1	1.6
50	3.4	1.3
70	4.8	1.2
90	6.2	1.1
110	7.6	1
130	9	0.9
150	10.3	0.8



HEATER OPTION

Figure B

4. Decommissioning & Long-Term Storage

When ready to store the filter for long term storage follow the procedure listed below:

- If equipped, close the customer supplied inlet and outlet shut-off valves.
- If equipped, shut-off and disconnect the electrical supply to the control panel(s).
- Drain the contents of the housing through the drain port at the bottom of the filter housing and dispose of the fluid properly.
- Remove the coalescing filter bowl, remove the element and dispose of it properly. Wipe the bowl and head clean of any residue and reinstall the bowl.
- Plug inlet and outlet ports upon removing the customer supplied connections.

5. Connection

- Install either the SAE -24 ORB connection or the 1 ½" NPTF connection to the inlet and outlet side of the filter housing.
- If equipped with the optional electrical equipment, connect the electrical connectors coming from the control panel to the corresponding sensor, heater, or valve and make sure any power switches on the control panel are in the off position. Then connect the panel electrical cord with plug to the supplied outlet.

5. Specifications

Flow Rating:	Up to 25 gpm (95 L/min)
Max. Operating Pressure:	150 psi (10.3 bar)
Min. Yield:	2600 psi (179 bar)
Temp. Range:	32°F to 225°F (0°C to 107°C) Standard; -20°F to 225°F (-29°C to 107°C) Heater Option
Bypass Setting:	40 psi (2.8 bar)
Porting Head: Element Case: Sump:	Cast Aluminum, Anodized Aluminum, Anodized Cast Aluminum, Anodized
Weight of FMS-C25-TP:	19.45 lbs. (8.82 kg)
Element Change Clearance:	4.5" (114 mm)

6. Operating Instructions

1. Turning the System On

- After proper installation of the filter assembly, confirm that any customer supplied valves on the inlet and outlet are open, and if equipped, the manual drain valve is closed.
- If equipped with the Automatic Water Drain, turn the switch located on the control panel to the on position.
- The system can now be powered up. Visually inspect the housing and any connecting fittings and hoses to check for system leaks and tighten any loose fittings if necessary.

2. During Operation

During operation of the FMS-C25-TP it will be necessary to drain the sump of the coalescing filter as water is separated from the fuel and collects at the bottom of the housing. How often this occurs depends upon the amount of water found within the fuel being filtered, and will vary case by case.

- Using the sight gauge, 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 falls below the level of the sight glass.
- Using the WIF sensor with indicator light, when the light illuminates the valve should be opened and the sump drained until the water level falls below the sight glass level and confirm that the light turns off.
- Using the Automatic Water Drain option, the indicator on the panel will illuminate when the sensor indicates there is water in the sump. This then automatically signals the valve to open, allowing the water to drain from the sump until the sensor indicates that there is no more water present, causing the valve to close.

7. Maintenance Instructions

1. Manual Valve: Draining the Sump

Open the manual valve located at the bottom of the coalescing housing. Do so slowly to prevent the fast flow of water from creating an emulsion between the water in the sump and the fuel above it. The collected fluid should be disposed of properly, in accordance with your local environmental regulations.

2. Automatic Water Drain (AWD): Draining the Remote Sump

Since the AWD drains the integral sump on the FMS-C25-TP housing automatically, the larger 5 or 20 gallon remote tank will need to be drained less frequently. At regular intervals, when the tank is nearing capacity, simply open the valve at the tank drain and collect the fluid, which should then be disposed of properly. If the tank reaches capacity, a high level float valve will shut-off flow into the tank, preventing any leaking or spillage. A separate high level float alarm with light and audible alarm will actuate alerting the operator that the tank is at full capacity and needs to be serviced.

3. Servicing the Elements

Equipment Required: Strap wrench capable of being installed on a 6” or larger diameter filter, a container to hold dirty element and fluid from the filter housing, a small cup of grease (Viton seal compatible), and thread anti-seize compound.

4. To Change FMS-C25-TP Coalescing Element

1. Make sure that the system has been turned off and the filter housing has been isolated by closing any upstream and/or downstream valves

Note:
To ensure your safety and the safety of those around you, be sure to follow any lock-out/tag-out procedures as required by the site, your employer, and by law when servicing equipment

2. With the filter isolated, drain the FMS-C25-TP filter by opening the manual drain valve installed on the bottom of the bowl. Close the drain valve when fully drained to prevent any drips or spills during disassembly, reassembly, or start-up
3. Disconnect the quick coupler attached to the drain valve and, if installed, any electrical connections made to the WIF sensor, sump heater, and/or automatic water drain components installed into the bottom of the FMS-C25-TP element bowl
4. Using a non-marring strap wrench, break loose the filter element bowl to the left when looking at the filter assembly with the head oriented up
5. Remove the strap wrench and use one hand to support the bottom of the bowl while using the other hand to continue to spin the top of the element bowl free from the filter head

Note:
Use caution when the bowl is almost free from the filter head, as the bowl and element assembly can drop if not supported by a hand while removing

6. Remove the element from the bowl by pulling it upward, free from the bowl, and dispose
7. Wipe the threads clean of any previously applied anti-seize compound using ONLY a lint-free cloth
8. Grease the grommets and o-ring seals of the new element and use anti-seize compound to reapply on the element bowl threads

Note:
The use of anti-seize compound is mandatory at each element change to prevent damage or galling of the bowl threads

9. Insert the element into the filter bowl until firmly seated, align the FMS® bushing of the filter head with the top hole of the filter element, and begin to thread the element bowl into the filter head while supporting the bottom of the bowl with one hand
10. Tighten the filter element bowl by hand until the bowl bottoms into the threads. This can be confirmed by inspecting the threads and they are no longer visible
11. Use the strap wrench to tighten the filter element bowl to the right when looking at the filter assembly with the head oriented up hand tight
12. Reconnect the quick connect to the drain valve and any electrical connections that were disassembled during Step 3
13. Ensure that the drain valve is closed, reopen any upstream/downstream isolation valves, and follow the safe procedures for removing any lock-out tags before restarting the system
14. With the system operating immediately after element change out, inspect the filter housing to ensure proper sealing and no leaks

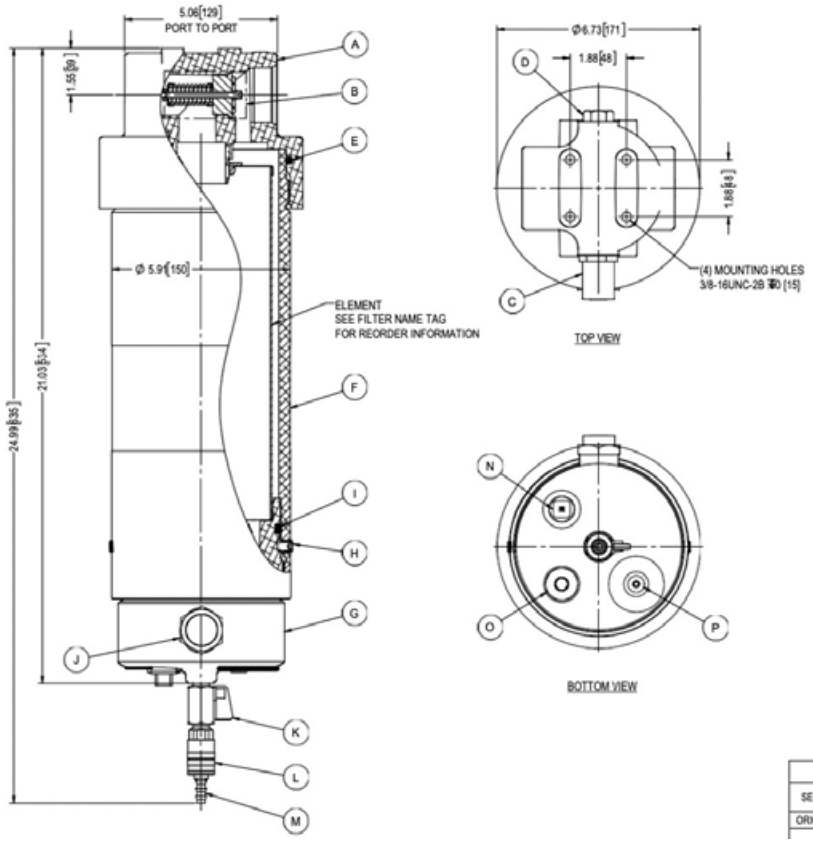
5. Replacement Schedule

Elements should be replaced when visual indicator changes from a visible green to red, showing that the differential pressure across the element is approaching the bypass pressure. The life of the element varies case by case depending upon the application it is being used for.

6. Warranty

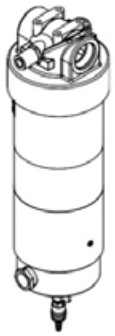
For the most current warranty and limitation of liability statement, please refer to the latest FMS International Inc. “Terms of Sale.”

Appendix A



GHCF FILTER PARTS LIST

ITEM	QTY.	PART DESCRIPTION	SERIES: ORIGINAL PART NO.
A	1	HEAD, GHCF-S24-D5, ANODIZED	7637220
		HEAD, GHCF-P24-D5, ANODIZED	7636204
B	1	BYPASS VALVE, 40 PSI	7607207
C	1	VISUAL INDICATOR, D5V-40	7627448
D	1	PLUG, INDICATOR PORT, SS, VITON	7619269
E	1	O-RING, ARP-568-358, VITON	7636524
F	1	ENCLOSURE, ANODIZED	7637202
G	1	SUMP, ANODIZED	7637201
H	2	SET SCREW, .37-16UNC X .50	7636800
I	1	O-RING, 124MM x 6MM, VITON	7637742
J	1	SIGHT GAUGE, 16NPT	7636529
K	1	BALL VALVE, 04FP-04MP, BRASS	7624848
L	1	QUICK DISCONNECT COUPLING, 04MP, BRASS	7636527
M	1	QUICK DISCONNECT X HOSE BARB, 04, BRASS	7636526
N	1	PLUG, 08MP, SS	7619298
O	1	PLUG, 08BSPP, VITON	7637837
P	1	PLUG, M10X1.5, VITON	7637836
Q		SEAL KIT, VITON (NOT SHOWN)	7636956

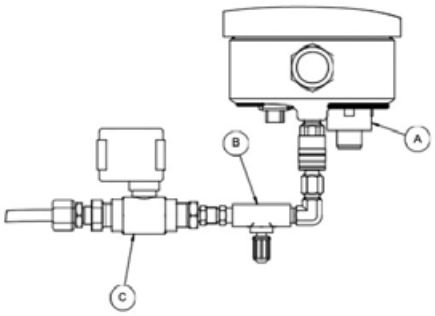


GHCF FILTER SERIES LIST

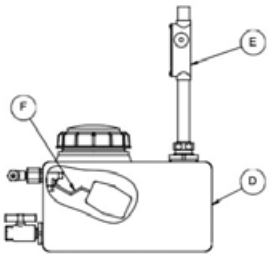
SERIES	DATE ISSUED	DATE IMPLEMENTED	DESCRIPTION
ORIGINAL	11/14/2018	3/31/2018	FILTER INTRODUCTION

			SERIES: ORIGINAL
ITEM	QTY.	PART DESCRIPTION	PART NO.
A	1	WATER LEVEL SENSOR, HDP	1301667
A-1	1	SENSOR CABLE (NOT SHOWN)	7637881
B	1	NEEDLE VALVE, .25 NPT	7600257
C	1	BALL VALVE, MOTORIZED	7624851
D	1	PLASTIC TANK	
		5 GALLON	7623762
		20 GALLON	7635226
E	1	HIGH LEVEL ALARM	7626489
F	1	FLOAT VALVE	7630836
G	1	CONTROL PANEL	*SEE BELOW

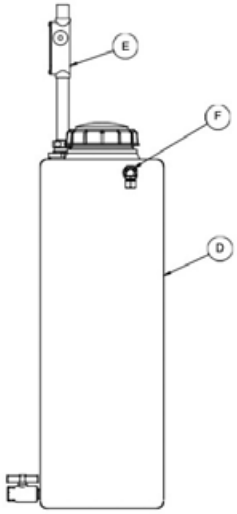
*CONTROL PANEL PART NUMBER AND SIZE VARY DEPENDING ON THE OPTION(S) SELECTED.



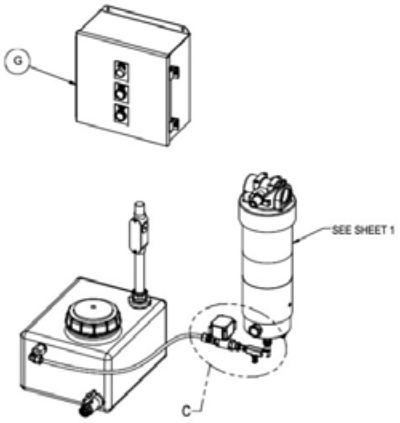
DETAIL C



5 GALLON TANK



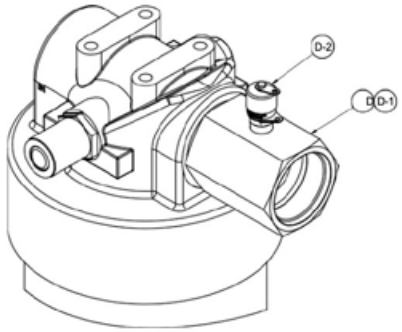
20 GALLON TANK



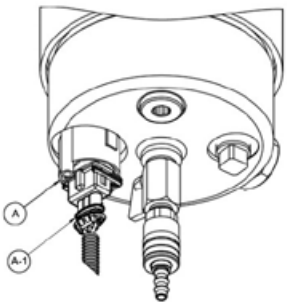
AUTO WATER DRAIN OPTION

			SERIES: ORIGINAL
ITEM	QTY.	PART DESCRIPTION	PART NO.
A	1	WATER LEVEL SENSOR, HDP	1301667
A-1	1	WIF SENSOR CABLE	7637881
B	1	HEATER, 75W, 110-240V	7637878
B-1	1	HEATER CONNECTOR (NOT SHOWN)	7637879
B-2	1	HEATER CABLE, 6FT (NOT SHOWN)	7637880
C	1	TEMPERATURE SWITCH, 24VDC/240VAC	7637877
C-1	1	SWITCH CABLE (NOT SHOWN)	7608412
D	1	TEST POINT FITTING	
		BUSHING, 24MORB-24FORB, ALUMINUM	7636954
		BUSHING, 24MNPT- 24FNPT, ALUMINUM	7636955
D-1	1	O-RING, VITON (NOT SHOWN, USE W/ 7636954)	7627601
D-2	1	TEST POINT, SP1215NPT14VSSM	7622692
E	1	CONTROL PANEL (NOT SHOWN)	*SEE BELOW

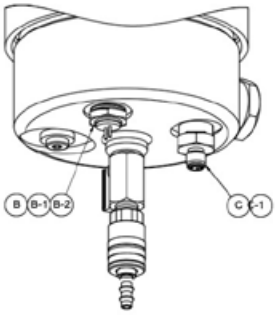
*CONTROL PANEL PART NUMBER AND SIZE VARY DEPENDING ON THE OPTION(S) SELECTED.



DOWNSTREAM TEST POINT OPTION



WATER LEVEL SENSOR OPTION



HEATER OPTION