Instructions

REVERSO

FPS-80, FPS-150, and FPS-210

Fuel Polishing System

- **Digital, Touchscreen, or Mechanical timer**
- **Featuring Separ Filter fuel water separator**
- **Shutdown and visual / audio alarms**

Contact Us

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Davie, FL 33314
Ph: (954) 522-0885
contact@reversopumps.com
www.reversopumps.com

Table of Contents

1. Serial number plate
2. Vacuum gauge
3. Filtration : Separ Filter
4. Inlet
5. Base
6. Drain valve - *Push in and turn counter-clockwise to open*
7. Control panel with digital, touchscreen, or mechanical control
8. Power in
9. Hinged cover - *covers pump*
10. Outlet

Primary Inspection

- Upon delivery inspect the Fuel Polishing System (FPS) for any damage that may have occurred during shipment.
- Inspect the interior of the unit for mechanical or electrical damage.
- If the unit is damaged upon delivery, contact the shipping company immediately.

Mounting

- The FPS should be wall mounted on a hard, vertical surface capable of supporting the weight of the unit (using the bushing).
- A unit without an enclosure should be located under shelter, out of the weather if possible. The unit with the optional enclosure can be located in any location accessible to the operator.
- In all cases the unit should be located as close as possible to the tank being serviced. (refer to Max. Lift in Technical Specifications).
- When installing the unit below the level of the fuel on above ground fuel tanks, consideration should be made to the installation of an anti-siphon valve to prevent fuel spillage in the case of a leak in the piping system.

Electrical

- Installation of unit should only be performed by qualified installation personnel who have thoroughly read and understand the installation instructions covered in this manual.
- To avoid the risk of electric shock, make sure that the power supply is disconnected. Ensure that the power supply is at zero volts with a multimeter before making any electrical connections.
- To ensure operator safety the system must be connected to properly grounded power sources.
- Make sure that your unit and power supply are configured for the same voltage rating.
- Dry contacts are for external use.
- External control voltage must be supplied by customer.

Piping

Use quality approved fuel line materials with the recommended inner diameter (refer to Technical Specifications). Smaller plumbing will place excessive load on the motor and shorten its life. A full port ball valve should be installed on the inlet and outlet ports of the system (not included).

The pickup line(s) (suction) should originate from the lowest point of the tank and should be connected directly to the inlet. For optimal performance, ensure that this line is free and nothing is restricting flow. It is recommended to install a foot valve to keep the system primed, especially if the system is located above the lowest possible fuel level in the tank.

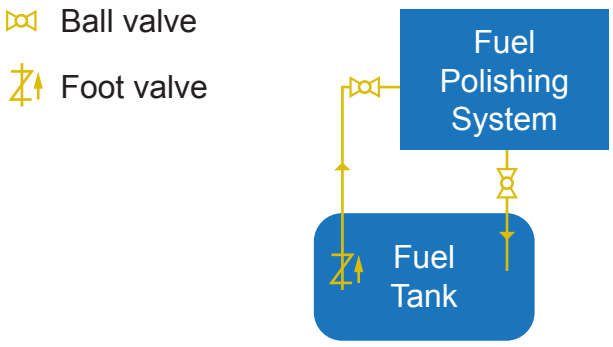
If the system is mounted below tank top level, a priming tee should be installed on the highest point of the suction line to be able to easily prime the systems suction line.

The return line(s) (discharge) should be connected to the outlet and enter the tank as far as possible from the pick up tube and extending 2/3 down into the tank. For optimal performance, ensure that the outlet, discharge or return, line(s) are free and nothing is restricting their flow.

The suction line of the system must be independent and separate from the suction line of the engine. Do not integrate into engine fuel system.

When installing this unit, FLEXIBLE CONNECTIONS MUST BE USED TO REDUCE STRESS on the plumbing and prevent damage to the unit.

Hoses, piping, and foot valves shown in the diagrams below are not provided with the system and must be provided by the user/contractor, unless agreed upon otherwise.



Warning

- The system has been developed to be used with diesel fuel only. DO NOT USE WITH GASOLINE.
- The system is designed to meet environmental standards for safe operation (NOT for use with fluids that have a flash point below 100°F (38°C) (e. g. gasoline, alcohol).

Control Panel with Digital Timer: Overview, Alarms, Reset

Female M12 Connector for dry contact (remote alarm) and motor running

Ethernet connector (for Modbus) (RJ45)

Overview

- Breaker for the system
- Breaker for the pump
- Siemens smart relay
- Timer push buttons: Automatic and Manual
- Stop/reset push button
- Status LED indicator lights:
  - Green: The unit is energized.
  - Red: Visible alarm, service system when triggered.
  - Blue: Pump is active, either manual or automatic mode. To verify that the pump is operating, check the vacuum gauge in a side of the filter, the gauge will be reading less than zero.
- Ethernet port
- Audio alarm

Alarms

- High vacuum: The vacuum switch on the system is set to -16 inHg. Once the system reaches this condition it is time to replace or backflush the element on the Separ Filter.
- High water level: When the water level reaches the maximum capacity on the filter bowl, the alarm will trigger. Proceed to drain the bowl.

If any alarm is triggered, proceed to de-energize the pump while servicing. Make sure to follow instructions listed in the manual.

Reset (Black Button)

- The buzzer will sound, and indicator light and the screen of the smart relay will be red and display the fault that is causing the alarm. Press black button to stop the buzzer alarm (audible alarm) indicator light will shut off but the smart relay remain on until the problem is solve.
- Use pump breaker to disconnect power from pump. Once the service is completed and the alarm issues are resolved continue to next step.
- Press and hold black button for 3 second to reset the alarm.

Set Date and Time

1. Make sure that the system is in Manual mode.
2. Press down arrow 2 times.
3. Press ESC.
4. Select Setup, press OK.
5. Select Clock, press OK.
6. Select Set clock, press OK. Use up/down arrows to select the number and right/left to move across the option. When done, press OK once.
7. Press ESC 3 times to go back to the main screen for manual mode.

Set Manual Timer

1. Press yellow button to go to manual mode. Amber color will be flashing.
2. Press down arrow to see the manual time set.
3. Press and hold ESC. Use arrow to change unit of time in minutes or hours. Press OK and change the desired time to run the system. When done, press ESC.
4. Press up arrow to go back to the principal screen.
5. Keep press yellow button to start the pump running the system with the set time. Pump will automatically shut off after the preset run time is over.
6. If the time must be reduced or increased while the system is running, repeat the steps to change the time for manual mode.

Manual Mode Operation

1. Select this mode to run the system for a single preset time. Press the yellow button once to put system into manual mode. The smart relay will be flashing amber.
2. Press and hold the yellow button for 3 seconds to start the pump for manual mode. Once solid, release the button and the smart relay will turn solid amber while the indicator light will turn blue. This indicates that the pump is running.
3. Pump will automatically shut off after the preset run time is over. User will need to put system back into automatic mode if desired.
4. If manual mode must be stopped while the system is running, press the red button Stop/Reset.

Automatic Mode Operation

The system will start/stop automatically on the programmed days of the week and times. To set up the frequency take into consideration the size of the tank and the environmental conditions. When the Automatic Timer is selected, the pump will only begin running if within programmed date/time to run.

For an initial cleaning, we recommend the tank to be cycled 3 times. Once in Automatic mode, the cleaning can be performed once a week.

$$\textbf{\textit{Recommended Run Cycle (Manual Mode)}} = \frac{\textit{Volume of the tank x 3}}{\textit{Flow Rate of the System}}$$

Set Automatic Timer - Press green button to enter Automatic Mode

1. Press up/down arrow to view the days of the week.
2. Press ESC and hold for 3 seconds to set the dates and times for the selected day.
3. Use up/down arrow to go to ON time and OFF time. Press OK.
4. Change the hour using the left/right arrows to move the position on time, and use up/down arrows to change the number.
5. Press ESC twice to return to days of the week screen.
6. Repeat for every day that is schedule to run the system.
7. Press and hold green button for 3 seconds to start running the program.

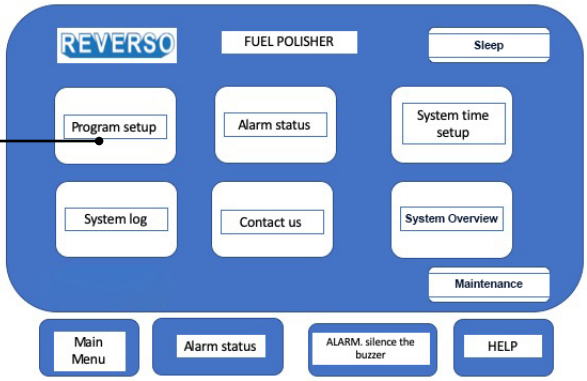
Modbus

For information about modbus, contact Reverso Pumps, Inc.

Female M12 Connector for dry contact (remote alarm) and motor running

Ethernet connector (for Modbus) (RJ45)

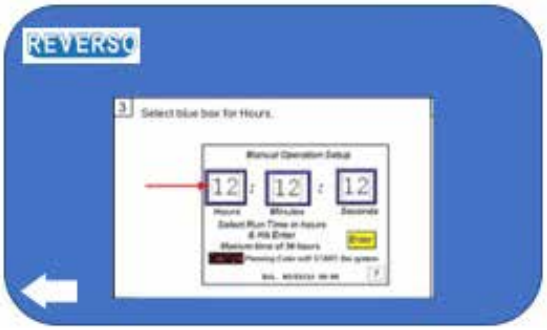
Main Menu



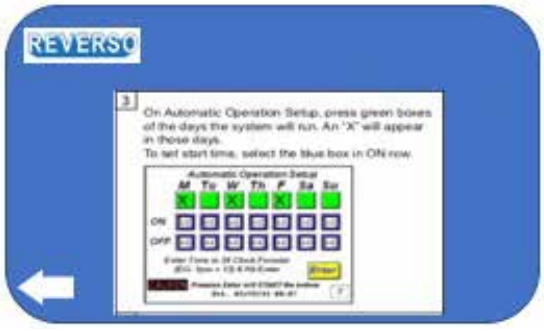
Program Setup

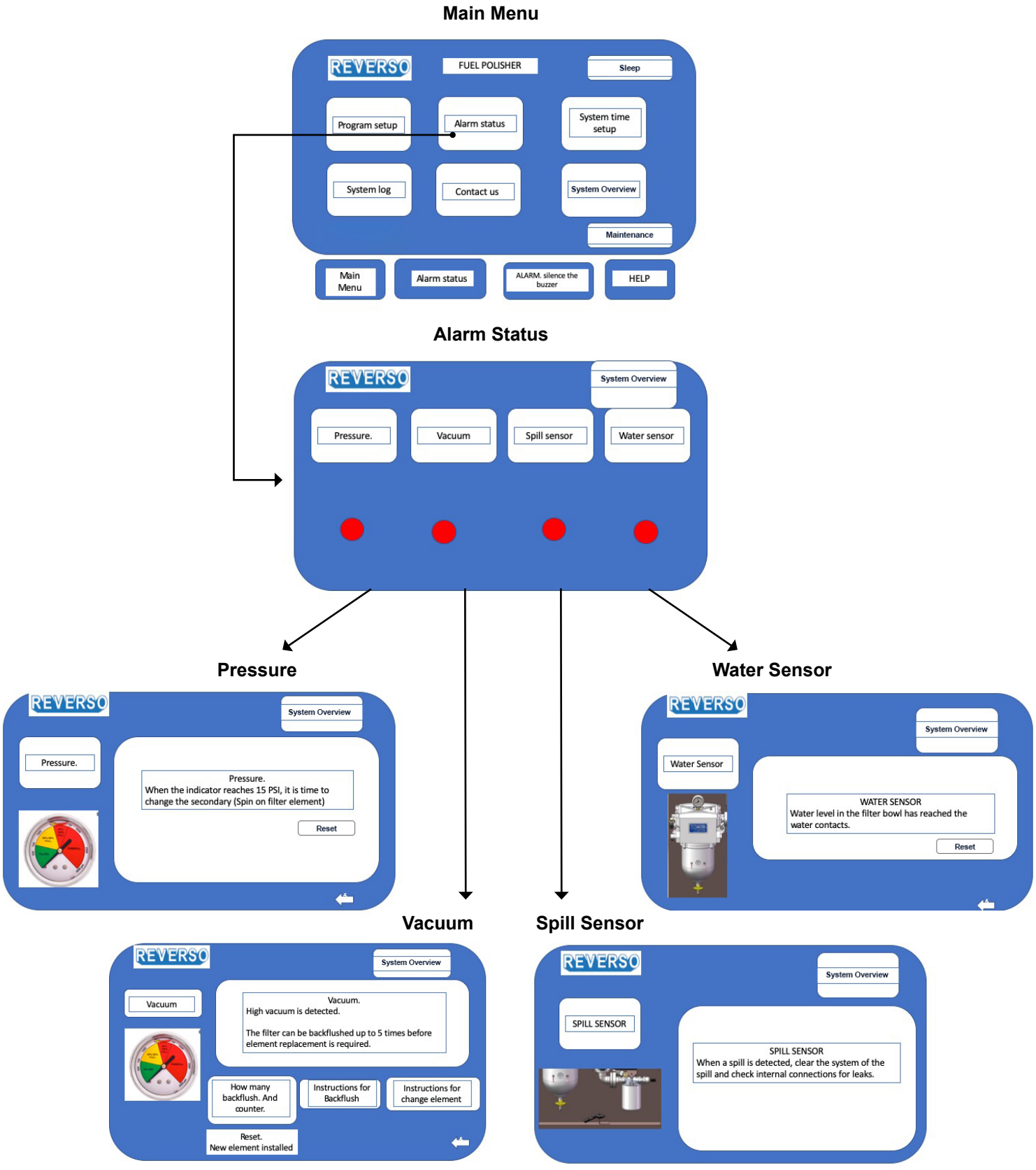
Select between manual and automatic operation.

Manual



Automatic

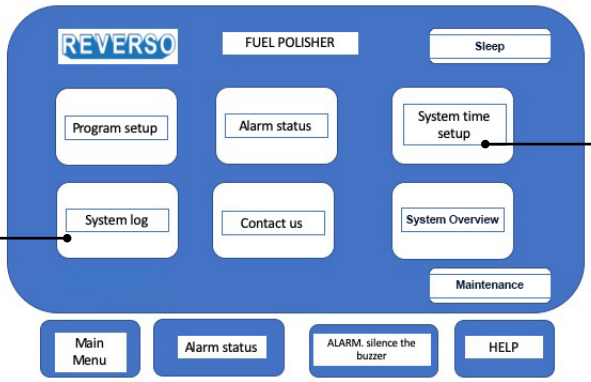




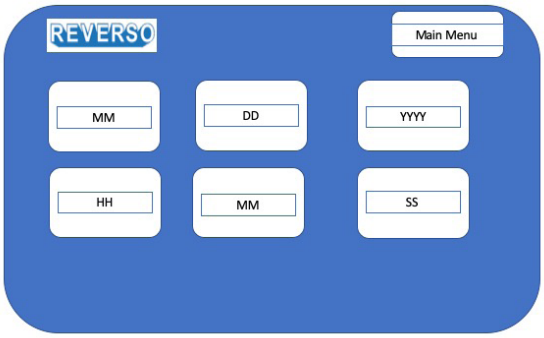
Note:

- Every 3rd high vacuum alarm, it will alert for filter element replacement. The number beside hi-vacuum indicates how many backflushing have been executed since the last element replacement.
- Marine Fuel Polishing Systems (FPS models), do not include pressure sensor and spill sensor.

Main Menu



System Time Setup

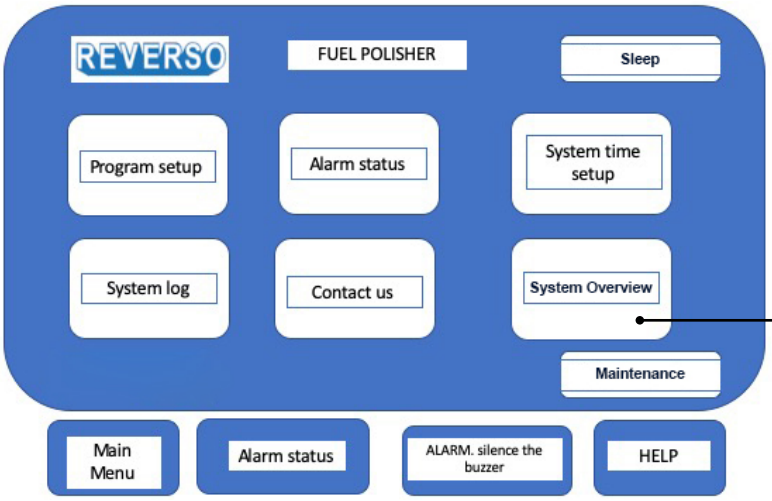


Set the current date and time.

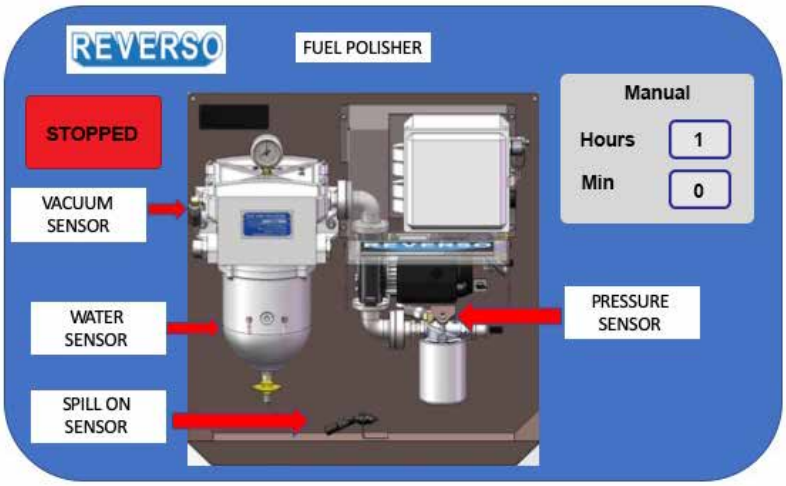
System Log

Alarm	Status
I	Sensor was OFF and turn ON
IO	Sensor was ON and turn OFF

Main Menu

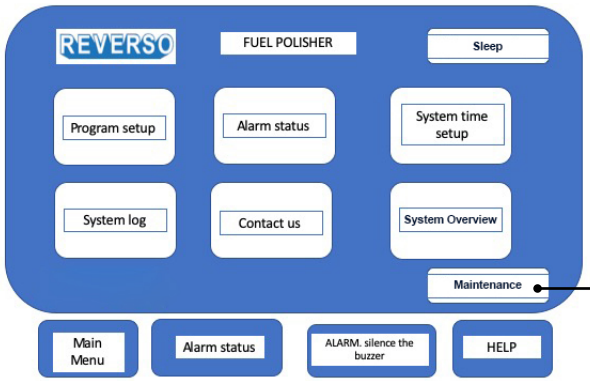


System Overview

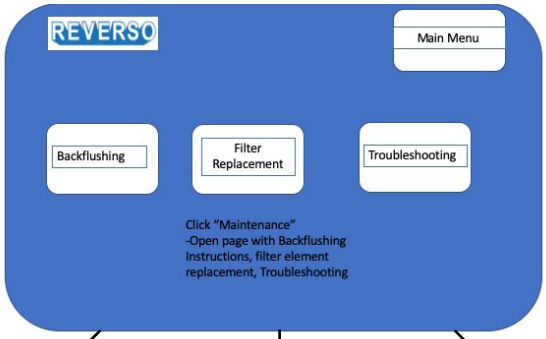


Note: Marine Fuel Polishing Systems (FPS models), do not include pressure sensor and spill sensor.

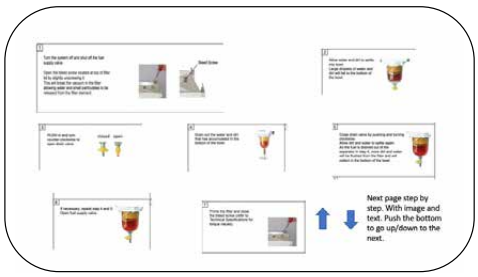
Main Menu



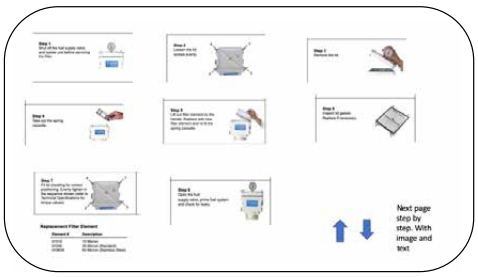
Maintenance



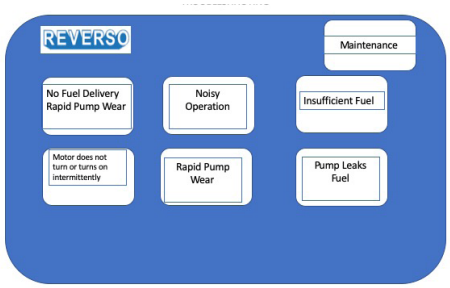
Backflushing



Filter Element Replacement



Troubleshooting



Alarms

- High vacuum: The vacuum switch on the system is set to -16 inHg. Once the system reaches this condition it is time to replace or backflush the element on the Separ Filter.
- High water level: When the water level reaches the maximum capacity on the filter bowl, the alarm will trigger. Proceed to drain the bowl.

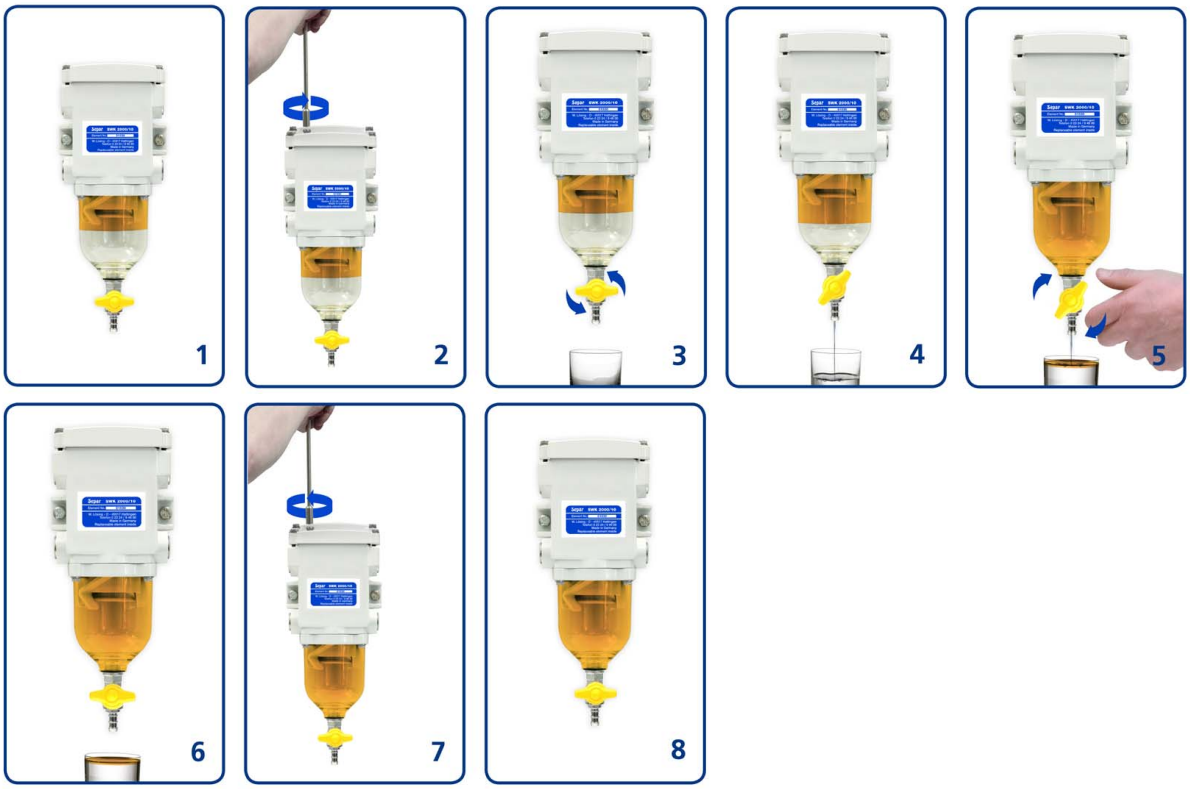
If any alarm triggered, proceed to de-energize the pump while servicing. Make sure to follow instructions listed in the manual. When done, press reset button.

Operation

1. Ensure the fuel supply valve is open and the system is primed.
2. Ensure power to the system and the green power light is illuminated.
3. Turn timer knob clockwise to desired number of hours for operation.
4. Pump will start running immediately, and the timer will count down to zero over time.

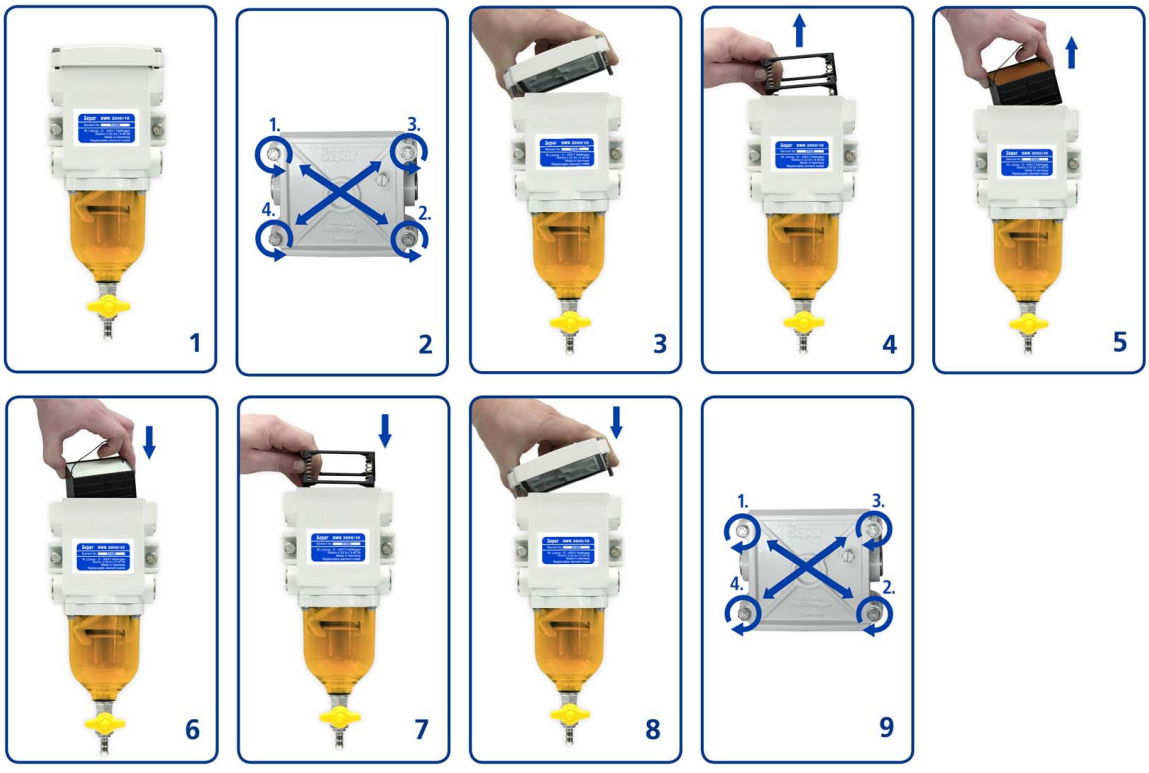
Backflushing

- Prior to service, ensure the system is off.
- Backflushing is for particulate removal only and will not remove sludge once embedded in the filter media.
- See Technical Specifications for torque recommendations.
- May be done up to 5 times until element replacement is required.



Filter Element Replacement

- Prior to service, ensure the system is off.
- See Technical Specifications for torque recommendations.



Nominal Flow Rate	System rated at 80 GPH *(303 LPH)*. *Actual flow rate may vary due to conditions of installation.*
Voltage	12V or 24V DC
Circuit Breaker	10A / 12V DC 5A / 24V DC
Pump Type	Gear
Pump Body	Nickel-plated brass
Pump Shaft	Stainless steel
Pump Rating	IP67
Self-priming	4.9 ft *(1.5m)* with foot valve above liquid level
Control	Digital, Touchscreen, or Mechanical
Inlet / Outlet	1/2” Male JIC
Recommended Hose	Minimum 1/2” inner diamter (ID) using quality approved fuel line materials
Filter Torque Values	Bowl Screws 8 Nm (70.8 in-lbs) Lid 8 Nm (70.8 in-lbs) Bleed Screw 4 Nm (35.4 in-lbs)

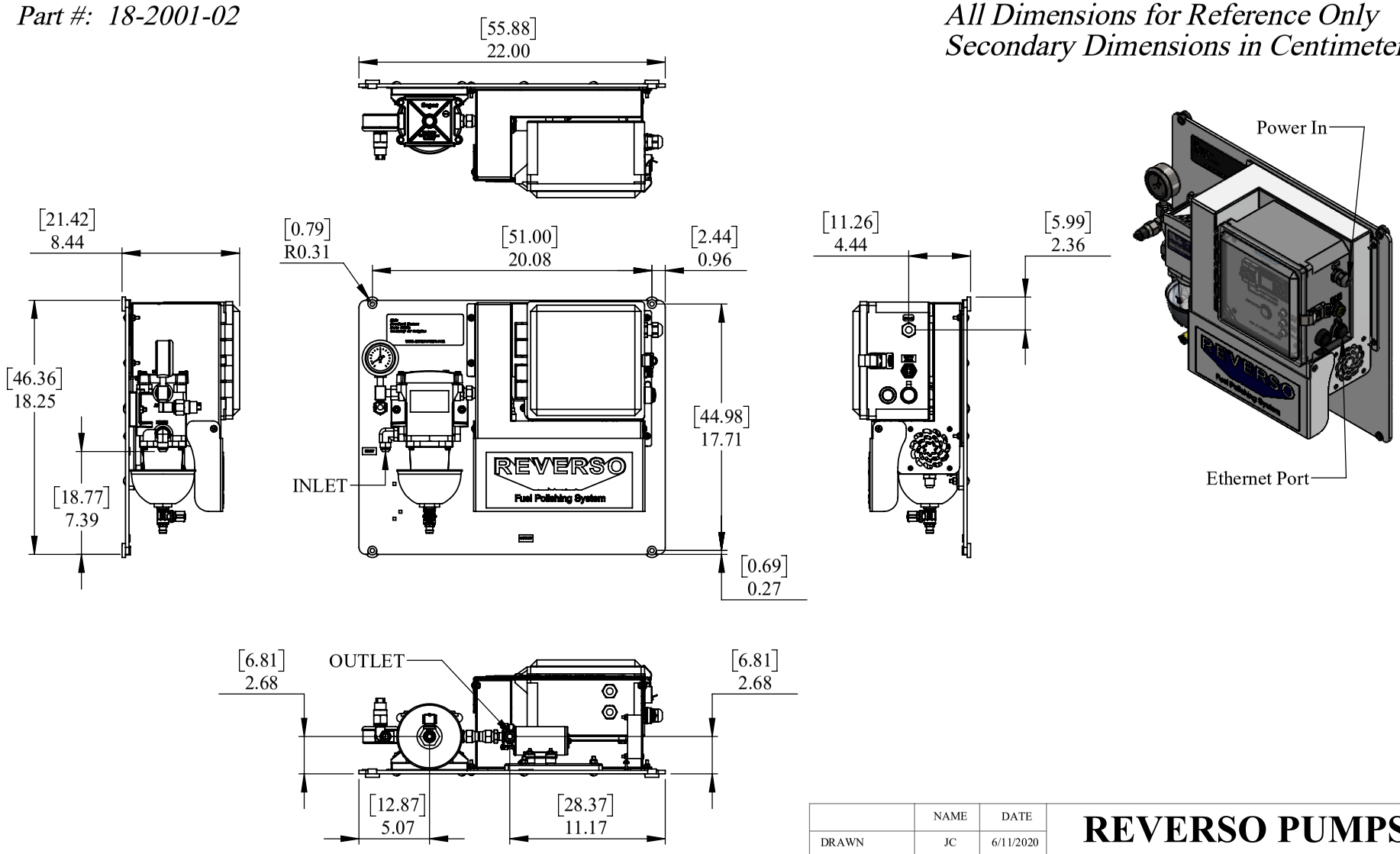
Spare Parts

Part #	**Description**
57-0051050	Separ 00510/50, 10 micron element
57-0053050	Separ 00530/50, 30 micron element
57-0056050	Separ 00560/50S, 60 micron element, stainless
62-10367	Separ lid gasket
62-10366	Separ bowl gasket
05-0839	Vacuum gauge

Dimensions are the same for 24V DC, and versions with touchscreen or mechanical control panels.

Part #: 18-2001-02

All Dimensions for Reference Only
Secondary Dimensions in Centimeters



	NAME	DATE
DRAWN	JC	6/11/2020
CHECKED	JC	2/2/2021
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

REVERSO PUMPS

TITLE:

Fuel Polishing System - 80GPH Marine Model - 12vDC - Basic Digital Controller

SIZE	DWG. NO.	REV
A	FPS-80-ER-R_A	A

SCALE: 1:10 | WEIGHT: | SHEET 1 OF 4

TECHNICAL SPECIFICATIONS

Port Size - 1/2" MJIC

Weight - 20lbs. / 9.0 kg (estimated)

Power - 10A @ 12vDC

Flow Rate - 80 gph/ 303 Lph

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL ± 1/64
ANGULAR: MACH ± BEND ±0.2
TWO PLACE DECIMAL ±.01
THREE PLACE DECIMAL ±.005

DO NOT SCALE DRAWING

Nominal Flow Rate	System rated at 150 GPH *(568 LPH)*. *Actual flow rate may vary due to conditions of installation.*
Voltage	12V or 24V DC
Circuit Breaker	10A / 12V DC 5A / 24V DC
Pump Type	Gear
Pump Body	Nickel-plated brass
Pump Shaft	Stainless steel
Pump Rating	IP67
Self-priming	4.9 ft *(1.5m)* with foot valve above liquid level
Control	Digital, Touchscreen, or Mechanical
Inlet / Outlet	1/2” Male JIC
Recommended Hose	Minimum 1/2” inner diamter (ID) using quality approved fuel line materials
Filter Torque Values	Bowl Screws 8 Nm (70.8 in-lbs) Lid 8 Nm (70.8 in-lbs) Bleed Screw 4 Nm (35.4 in-lbs)

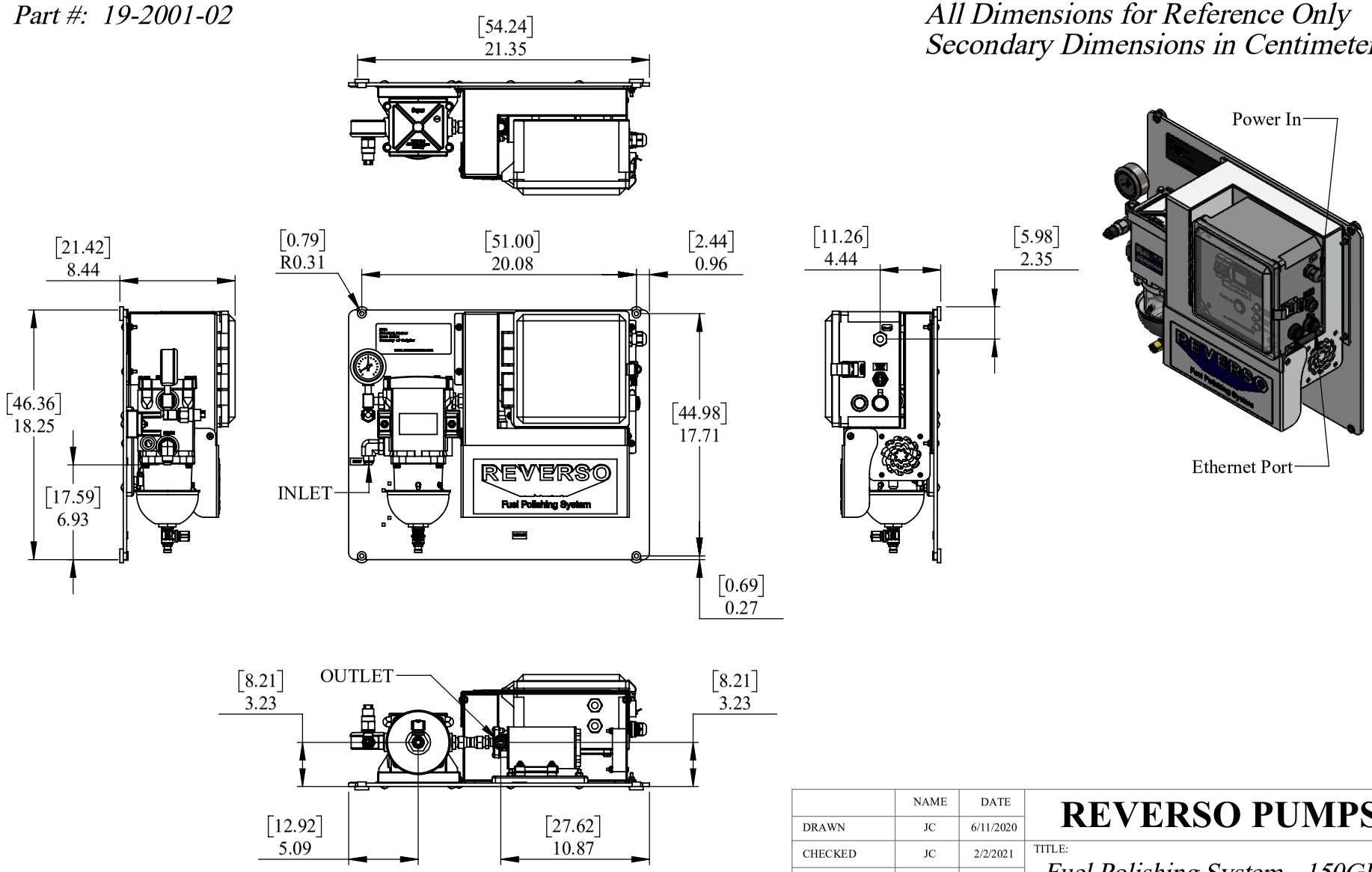
Spare Parts

Part #	**Description**
58-01010	Separ 01010, 10 micron element
58-01030	Separ 01030, 30 micron element
58-01060	Separ 01060S, 60 micron element, stainless
64-10362	Separ lid gasket
64-10361	Separ bowl gasket
05-0839	Vacuum gauge

Dimensions are the same for 24V DC, and versions with touchscreen or mechanical control panels.

Part #: 19-2001-02

All Dimensions for Reference Only
Secondary Dimensions in Centimeters



	NAME	DATE
DRAWN	JC	6/11/2020
CHECKED	JC	2/2/2021
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

REVERSO PUMPS

TITLE:
Fuel Polishing System - 150GPH Marine Model - 12vDC - Basic Digital Controller

SIZE	DWG. NO.	REV
A	FPS-150-ER-R_A	

SCALE: 1:10 | WEIGHT: | SHEET 1 OF 4

TECHNICAL SPECIFICATIONS

Port Size - 1/2" MJIC

Weight - 25lbs. / 11.34 kg (estimated)

Power - 10A @ 12vDC

Flow Rate - 150 gph/ 567.8 Lph

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL ± 1/64
ANGULAR: MACH ± BEND ±0.2
TWO PLACE DECIMAL ±.01
THREE PLACE DECIMAL ±.005

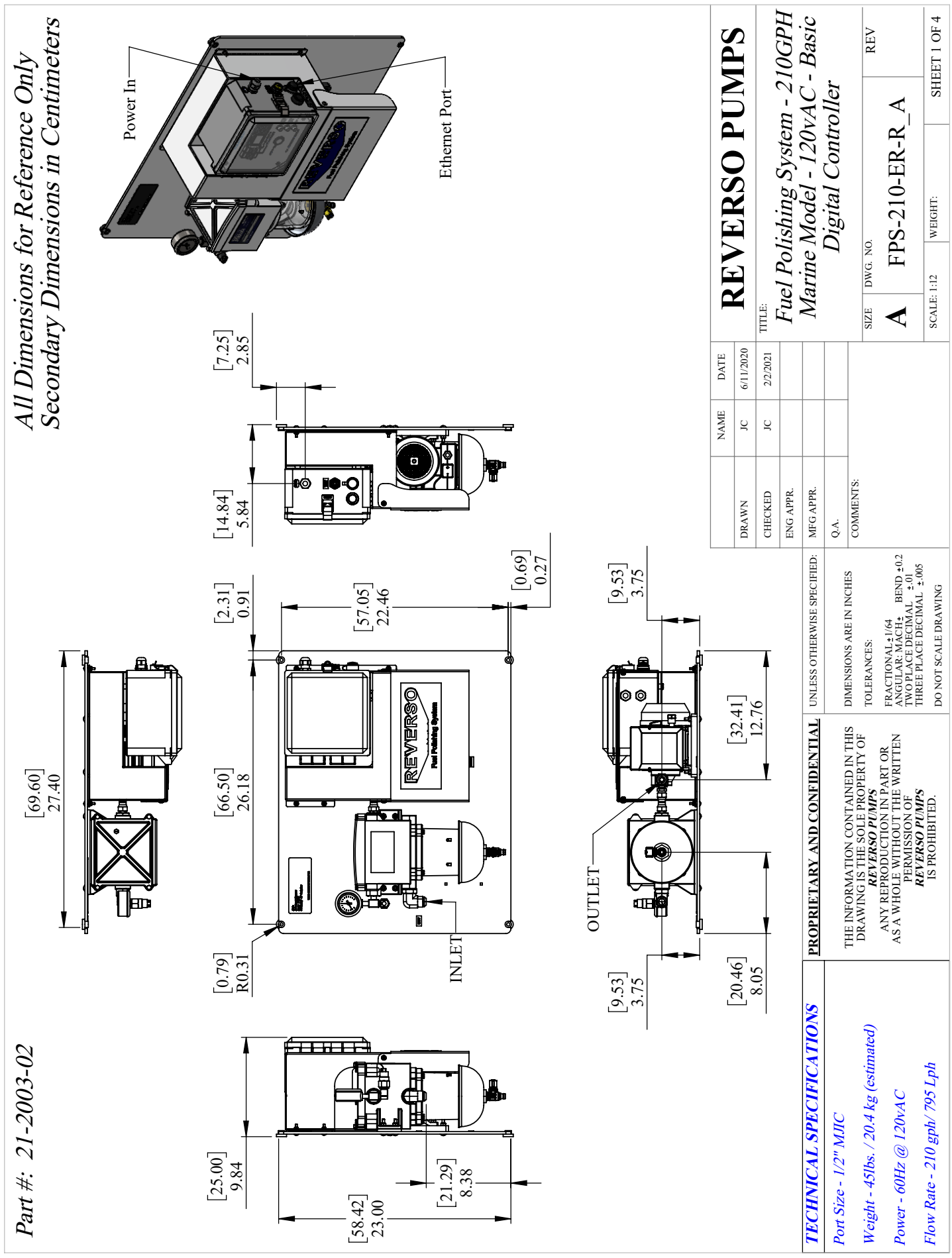
DO NOT SCALE DRAWING

Nominal Flow Rate	System rated at 210 GPH *(795 LPH)*. *Actual flow rate may vary due to conditions of installation.*
Voltage	120V AC 60Hz single phase or 220V AC 50Hz single phase
Circuit Breaker	10A / 120V AC 10A / 220V AC
Pump Type	Gear
Pump Body	N/A
Pump Shaft	Stainless steel
Pump Rating	IP55
Self-priming	4.9 ft *(1.5m)* with foot valve above liquid level
Control	Digital, Touchscreen, or Mechanical
Inlet / Outlet	3/4” Male JIC
Recommended Hose	Minimum 3/4” inner diamter (ID) using quality approved fuel line materials
Filter Torque Values	Bowl Screws 8 Nm (70.8 in-lbs) Lid 8 Nm (70.8 in-lbs) Bleed Screw 4 Nm (35.4 in-lbs)

Spare Parts

Part #	**Description**
59-01810	Separ 01810, 10 micron element
59-01830	Separ 01830, 30 micron element
59-01860	Separ 01860S, 60 micron element, stainless
65-30421	Separ lid gasket
65-30423	Separ bowl gasket
05-0839	Vacuum gauge

Dimensions are the same for 220V AC, and versions with touchscreen or mechanical control panels.



Issue	Possible Causes and Action
Low / No Flow	• Pump is worn or does not run. • Pump and filter are not primed. • Fuel supply or discharge line blocked. Check the alarm. • Lift is too high. • Air leak in fuel supply to pump. • Inlet or outlet valve closed. Check the solenoid valve. • Foot (check) valve installed backwards. • Air leak at inlet. • Piping improperly installed or dimensioned. • Fuel water separator is clogged. Service filter.
Rapid pump wear	• Pump has been run dry. Ensure sufficient fuel supply.
Noisy operation	• Ensure sufficient fuel supply. • Air in the suction hose. Check hose is submerged in the fuel or check for leak.
Motor does not turn or turns intermittently	• Control power not available • Tripped circuit breaker on control board • Pump failed and seized • Motor failure • Check service switch is in the ON position (-)
Pump leaks fuel	• Loose pump plumbing fittings • Worn pump shaft seal • Excessive heat from over head storage tank • Worn pump o-rings or seals
Electrical	• Verify voltage and breaker.