

Model FTI-20A



APPROVED

Engineering Specifications: When a Submersible Pump Replaces the FTI Pump & Motor Automated Diesel Fuel Maintenance System Diesel Fuel Tanks Up To 60,000 Gallons

1. Description

- A. Diesel fuel storage tank shall be equipped with a **FM APPROVED**, and **NFPA EQUIPMENT COMPLIANT**, automated fuel maintenance system to remove particulate through 1 micron and 99.5% water from stored diesel fuel.
- B. A fuel stabilizer shall be added to the diesel fuel in storage.
- C. A fuel biocide shall be added to the diesel fuel in storage.

2. Flow Meter and Flow Control Valve

- A. Flow Meter, Anodized Aluminum Body, Piston and Cone, 1" NPT
- B. Flow Control Valve, Phosphate Coated Steel, 1 ¼" NPT

3. Filtration Shall Consist Of:

- Stage 1: 100 Wire Mesh Strainer (149 Micron Element).
- Stage 2: 10 Micron Particulate Removal (Spin on Filter).
- Stage 3: 3 Micron Particulate Removal (Spin on Filter).
- Stage 4: Water Separation and Removal (Element type).
- Stage 5: 1 Micron Particulate Removal (Element type).

(All filters shall be spin-on removable and / or replaceable element types)

4. Suggested Filter Replacement Kit – PN: FRK-20A

(2 ea.) FL-FPD50-100M, (2 ea.) FL-FBO-60336, (2 ea.) FL-70-10N, (2 ea.) FL-70-03N

5. Controller Specifications:

1. Controller shall be a **UL LISTED, ASSEMBLY CONSISTING OF:**

- A) **Siemens S7-224 PLC** - Inputs/Outputs: 24, Program Memory: 8 Kbytes, Bit Processing Time: 0.37 ms.
PLC Shall Monitor: 1. Motor Contactor and Overload, 2. Five Stages Filtration, 3. Leak Detection, 4. Water Level Sensor, 5. System Pressure, 6. Strainer DP, 7. Low Flow (Flow or No Flow)
 - B) **Circuit Breaker** - 2 Pole, 15 Amps
 - C) **Lockable Disconnect Switch**
 - D) **Motor Contactor and Overload** -15 Amps, Single Phase, 230VAC, 1 1/2HP, Class 10
 - E) **Multi Pole Terminal Block** - 26 Amp, 18-12 AWG
 - F) **Siemens TP177 Touch Screen** – Siemens Windows Based Software, 50,000 Hrs, 32 Bit
 - G) **Signal Device (audible alarms)** - 230 VAC, 80 to 95 dB
- 2. Controller is programmable to operate up to four (4) separate diesel fuel storage tanks.
 - 3. Controller is programmable to time delay the following operations:
 - (A) Turning on of the fuel circulation pump (1-90 seconds). Required for Actuated ball Valves.
 - (B) Closing of Solenoid valves or actuated ball valves (1-90 seconds)
 - (C) Alarm Trip delay. (1-90 seconds)
 - (D) Low Flow Alarm Delay 1-6 minutes.(Default is set at 3 minutes)
 - 4. Controller includes an **audible alarm** and visual description for each alarm condition.
 - 5. Controller includes **two dry contacts** (one normally closed and one normally open) for remote **general alarm status**.
 - 6. **Optional- controller box strip heater** shall be a 50-watt, thermostat controlled, with UL component recognition (UR).
 - 7. Controller is capable of operating up to **(8) Solenoid valves** or **(8) Electric actuated ball valves**.
There are 4 relays, which operate 2 valves to each tank. One supply valve and one return valve per tank.
(Actuated ball valves must have 2 internal-SPDT switches. The two switches will turn the motor off when it reaches the full open and the full closed position)
 - 8. **OPTIONAL MODBUS / ETHERNET RTU RS485 COMMUNICATIONS**
(Call your local factory authorized representative for pricing)

6. Enclosure

1. Complete FTI assembly is housed in a 2-door cabinet with **Zinc Primer for corrosion and then Powder Coat Finish (doors are removable)**.
Manufactured to NEMA 3R standards and designed for rack or wall mounting.
2. Cabinet size: 48.0"W x 48.0"H x 16.5"D
3. **Leak detection:** Provided in cabinet.
4. **Total System Shipping Weight: 550 lbs.**

7. Electrical Connection

208/230V AC, Single Phase, 60 Hz, (Supply wiring to be determined by Submersible Pump Amperage)
(FTI Equipment control panel will be shipped as 208 / 230V AC Standard)

8. Plumbing

1. The **supply** or suction line shall be installed at the **sump**, or low end of the Diesel Fuel storage tank, with a **Foot Valve**, 1" from the bottom.
 2. The return line shall be installed to the opposite end of the storage tank.
 3. The installer will provide & install a submersible pump. The pump voltage must match the FTI control panel voltage as ordered.
 4. Should vertical suction lift exceed 15 ft., the circulation pump in the FTI cabinet will be removed and will be replaced with a submersible pump. (not supplied). The Submersible pump will be wired to the FTI control panel. A flow control valve and a flow meter will be installed in the FTI cabinet to adjust the flow at 20 GPM. **(Order the Standard FTI Control Panel for one tank)**
More than one tank order the **(Optional Multi-Tank Submersible Pump Panel Package)**
(call your local authorized representative for pricing)
 5. **(Low Flow will be monitored by the low set point on the pressure switch gauge)**
6. **System Inlet Connection – 1 1/4" NPT**
 7. **System Outlet Connection – 1 1/4" NPT**
 8. **Minimum Suggested Supply Line Pipe Size - 1 1/2"**

INSTALLATION PRECAUTIONS:

IF POWER TO THE FTI CONTROL PANEL IS TO BE TURNED OFF AFTER IT IS INSTALLED, THEN THE INSTALLER SHALL PROVIDE FOR THERMAL EXPANSION PROTECTION.

ALL MANUAL BALL VALVES SHALL REMAIN OPEN. THIS WILL ALLOW FUEL THERMAL EXPANSION TO FLOW BACK TO THE FUEL TANK.

THE FTI CONTROL PANEL WILL AUTOMATICALLY OPEN ALL ELECTRICALLY CONNECTED VALVES WHEN THE FTI PRESSURE SWITCH GAUGE REACHES 45 PSI. THIS WILL OPEN AND CLOSE ALL TANK VALVES FOR 15 SECONDS ONE TANK AT A TIME.

THIS FEATURE OPERATES AUTOMATICALLY ONLY WHEN POWER IS ON AND THE CONTROL PANEL IS SET TO AUTO OR MANUAL OFF MODES.

THE OPENING AND CLOSING OF VALVES WILL ACTIVATE 6 TIMES IN 24 HOURS, AFTER 6 TIMES THE CONTROL PANEL WILL GO INTO OVER PRESSURE ALARM.

THIS IS A PRECAUTION TO ALERT MANAGEMENT THAT YOU HAVE A THERMAL EXPANSION PROBLEM AND IT SHOULD BE ADDRESSED.

FTI WILL NOT BE RESPONSIBLE FOR ANY THERMAL EXPANSION DAMAGE DUE TO EXCESSIVE PRESSURE.

**Model FTI-20A as manufactured by
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