

# Diesel Engine Additive (Foam) Pump Controllers



## Product Description

The DIESEL Plus Foam Pump Controllers from Eaton are designed to control and monitor 12 or 24 volt, diesel fire pump engines and are among the most technically advanced diesel engine controllers available.

They are an enhanced version of the original microprocessor-based, FD100 Series of diesel engine controllers. Programming is straightforward due to the use of the core firmware and menu structure utilized in the LMR Plus Series of electric controllers.

The controller can be ordered with the option to display and output current values and status, on command, from various software protocols.

An embedded web page for retrieving diagnostics and history reports, can be accessed from the optional Ethernet communication port. An optional RS485 serial port can be used for direct connection to a computer for data transfer.

## Product Features Communication

### Embedded Web Page

The embedded web pages allow the user to view the current status of the controller as well as all amperage readings, set points, diagnostics, statistics, configuration and history. An external computer connected via the optional ethernet port is used to access the pages. The specific data required can be downloaded for reference purposes.

### Communication Types

#### USB

The USB port is used to download the controller message history, statistics, diagnostics, status and configuration data to a USB disk drive. The USB port can also be used to upload custom messages, additional languages, and update the microprocessor firmware.

#### Ethernet

An external computer can communicate with the Diesel Plus controller via the optional ethernet port. An embedded web page will display the controller's current status, as well as display all current readings, set points and history.

#### Modbus

The Diesel Plus foam pump controllers have the option to communicate to systems using the Regular level of Modbus (includes both RTU and ASCII transmission modes). Communication settings are user configurable through the Diesel Plus configuration menu.

### Field Connections

#### Standard Inputs

- Remote Start
- Fuel Spill
- Deluge Valve
- Low Foam Level
- Interlock On
- Remote Auto Start
- Low Fuel
- Programmable Inputs (9)

#### Programmable Inputs

Up to 9 additional, programmable inputs can be programmed to indicate up to 13 different types of inputs. They can be programmed to energize the common alarm output, link to relays and optional LED's and latch until reset by the user. All optional inputs, outputs and LED's can be linked, as required. They can also be programmed with time delay functions.

### Standard Output Relays

All standard output relays are 8 amp, DPDT.

- Interlock On
- Future # 2
- Low Fuel
- Auto Mode
- Common Alarm

### Optional Output Relays

There is provision to add up to eight additional relay outputs, via four optional relay output boards which mount in a snap-on configuration. Each board contains a maximum of 2 additional relays.



### Engine Run Relay

The Power I/O Board houses a 10 Amp engine run relay which is used for alarm purposes, or to power external louvers.

### Common Alarm Relay

The FDF120 controller has a common alarm relay which de-energizes whenever there are any alarm conditions present. This relay is energized under normal conditions and has LED status indication.

### Alarm Relay Rating

All alarm relays are rated 8 amps, 250Vac, resistive load only.

### Programmable Outputs

Up to 10 additional, programmable outputs (two standard; eight via optional output boards) can be programmed to indicate up to 45 output conditions. They can be programmed for fail safe and latch until reset by the user. All optional inputs, outputs and LED's can be linked, as required. They can also be programmed with time delay functions. As well, two optional alarm LED's can be programmed for up to 28 alarm conditions.

### Power / Voltage

**Universal Voltage Supply**  
The controller can be powered with supply voltages from 100Vac to 240Vac by connecting to the three input terminals L,N,G located on the bottom left of the engine board.



### Dual Output

12 or 24Vdc output is selectable via a DIP Switch located on the battery chargers. Note: Each controller is factory set for 12Vdc. If 24Vdc is required from the factory, it should be noted on the ordering information.

### Line Filter

A line filter incorporated onto the engine board, is used to reduce/eliminate external incoming voltage transients.

### AC Power Disconnect

A breaker located inside the controller on the Engine Board, is used to switch on and off AC power to the unit. It will illuminate when energized.

### DC Power Disconnect

The engine board houses two on-board circuit breakers used to switch on or off DC power from the batteries.

Each breaker has an LED mounted on the engine board that illuminates when the breaker is energized.

## Alarm and Status Indication

### Accessibility

All alarm and status LED's as well as the LCD Display and programming buttons are accessible from the front of the controller.

## LCD Display

The Controller Display Board contains a 4 Line by 40 Characters wide, backlit, LCD display which is capable of generating multiple languages. The display will show the current system pressure, time and date, charger output voltage and any custom messages, alarms or timer values.



## Status LED's

The controller is supplied with six (6) green status LED's for the following:

- LOW PRESSURE
- ENGINE RUN
- REMOTE START
- INTERLOCK ON
- DELUGE VALVE
- One Programmable LED

## Alarm LED's

The controller is supplied with twenty (20) red alarm LED's for the following:

- BATTERY #1 FAILURE
- CHARGER # 1 FAILURE
- BATTERY #2 FAILURE
- CHARGER # 2 FAILURE
- LOW PRESSURE
- SYSTEM OVER PRESSURE
- LOW FOAM LEVEL
- LOW FUEL
- FAIL TO START
- HIGH ENGINE TEMP
- LOW OIL PRESSURE
- ENGINE OVER SPEED
- ECM SELECTOR IN ALT POSITION
- FUEL INJECTION MALFUNCTION
- ECM WARNING
- ECM FAILURE
- HIGH RAW WATER TEMP.
- LOW ENGINE TEMPERATURE
- FUEL SPILL
- One Programmable LED

## Statistics

Up to 26 statistical points are recorded to provide a quick review of how the system has been operating. The statistics can be viewed on the main display, saved to a USB disk drive, or viewed on the embedded webpage.

## Diagnostics

Up to fifty three diagnostic points are recorded that can be used to help in troubleshooting issues with the controller. The diagnostics can be viewed on the main display, saved to a USB disk drive, or viewed on the embedded webpage.

## Message History

Up to 10k alarm/status messages can be stored in the controller memory. They can be viewed on the main display, saved to a USB disk drive, or viewed on the embedded webpage.

## DC Fail

A visual indication and audible alarm is provided to indicate DC power loss due to one or both batteries being disconnected from the controller. This indication will also be provided if the controller is not operating due to an electronic board failure.

## Programmable Features

- Languages
  - (English, French, Spanish Standard. Other languages are available. Consult factory.)
- Date and Time
- Pressure Start and Stop Points
- Low and High Pressure Alarms
- Stop Mode
- Low Suction Shutdown
- Pressure Recording Parameters
- Run Period Timer
- Weekly Test Timer
- Sequential Start Timer
- AC Failure Alarm
- AC Fail to Start

## Enclosures

### Ratings

All FDF120 controllers come standard with NEMA 2 enclosures unless otherwise ordered.

Available options include: NEMA 3R, 4, 4X, 12.

## Reduced Size

A streamlined internal design has allowed the overall size of the DIESEL Plus controllers to be reduced from previous models. See dimensional drawings on our website.



## Technical Specifications

- Supply Voltage: 100-240Vac
- Output Voltage: 12-24Vdc
- Hertz: 50/60 Hz
- Enclosure:
  - Standard NEMA 2
  - Optional NEMA 3R, 4, 4X, 12
- Temperature:
  - 4 to +50 deg. C
  - 39 to +122 deg. F
- Alarm Relays: DPDT 8amp
- Engine Run Relay: DPDT 10amp
- Crank / Fuel Stop Relays: SPDT
- Pressure Transducer: 500psi
- Immunity Compliance:
  - Environment A
  - Emission Compliance: Environment B

## Battery Chargers

- Mode: Switching
- Dual 10 Amp
- Communication to Power I/O Board
- Diagnostics Recording
- Lead Acid or NiCad Three Step Charge
- Internal Temperature Monitoring
- Universal Voltage Input
- Selectable Dual Voltage Output



## Standards & Certification

The FDF120 Diesel Engine Fire Pump Controllers meet or exceed the requirements of Underwriters Laboratories, Factory Mutual Research (FM), the Canadian Standards Association, New York City building code, CE mark and U.B.C. / C.B.C Seismic requirements, and are built to NFPA 20 standards.

