

FIRE PUMP CONTROLLER for Diesel Engine Fire pumps



Type **EFP/FD3eU**

Logic based release 1.0 spec 2/0107

Features

The Metron Eledyne controller type EFP/FD3eU is designed to specifically meet the latest NFPA No.20 and UL218 rules for Diesel engine fire pump controllers.

This 'feature rich' controller is of a modular design implementing the latest components and logic technology available. It incorporates years of experience in the design and manufacture of fire pump control systems.

The user-friendly controls with high reliability control modules and relays have been exhaustively tested for performance and freedom from interference. As a result the controller is fully compliant with all the latest CE requirements for electromagnetic compatibility.

The components are installed in a NEMA 2 (IP54) dust and drip proof enclosure with an option of a NEMA 4 (IP65) weatherproof enclosure. Control function indicators and switches are all mounted on the door, and the AC mains isolator is door interlocking.



The controller's logic is based on discrete components using the latest technology with high quality high reliability pcb mounted relays. The control board controls all automatic engine cranking, battery under voltage and all other engine monitoring. The crank timer also incorporates an alternate battery start. Additionally this controller is suitable for all engine types with either 'energised to run' or 'energise to stop' fuel solenoids.

Inside the controller, mounted on the cabinet, are two independent fully automatic battery chargers. These are of a constant voltage and constant current design rated at 8Amps as standard. The battery chargers operate in such a manner as to ensure that the engine batteries are fully charged within 24 hours from a fully discharged state. Also located within the battery chargers is a battery and battery charger monitoring circuit.

The controller may be wall mounted or fixed to the engine skid using anti vibration mounts. A free-standing plinth is also available as an option. If a chart recorder, drain valve or pressure switch is required then they are mounted on the side of the enclosure, away from any electrical circuits.

Standard Controller Specifications

Starting

The controller will start the engine from a drop in water pressure by a normally closed input, normally open remote start input or by manual means. The crank timer comprises of Six 15 second fixed crank periods separated by 15 second fixed rest periods. The crank cycle continues until the engine starts, if after all crank attempts have failed, the controller will annunciate 'failed to start'. Should a battery fail during cranking, all further cranking is completed from the other battery. When the engine starts, all further cranking is ceased and the engine running indicator illuminates.

Battery Monitoring

If the battery voltages drops below 60% of the rated battery voltage, the controller will automatically lock out this battery from further cranking, and the appropriate battery healthy indicator will go out. A non muteable alarm will also sound. There is a separate indicator for each battery.

Battery Charging

The battery chargers are of a thyristor based design. The intelligent control card in each battery charger provides the following features: Battery charger failure alarm, over current monitor, battery disconnected monitor and a battery over voltage monitor. The output is reverse polarity protected by a suitably rated fuse. The AC supply input is also fuse protected. A manual boost push button is provided.

Failure Alarms.

Circuits are supplied to provide local indicators and alarms for; Low oil pressure, High water temperature, AC/Charger failure, Failed to start, and engine overspeed.

Switches and Pushbuttons

There is a separate start push button for each battery. Should neither battery have sufficient charge then both push buttons can be pressed simultaneously. The start push buttons only become active when the mode switch is in the manual position. In this mode all automatic starting is inhibited. In automatic mode a special indicator 'auto mode on' will illuminate.

When the AC supply is present and the AC isolator is closed the dedicated AC on neon indicator will glow.

A test start push button when pressed, will energise the drain valve (if fitted), only active in automatic mode. A lamp test push button when pressed will illuminate all indicators.

A reset push button is fitted to allow the user to reset latched channels.

Volt free contacts

There are six remote alarm contacts as standard, these are ;Engine running x2
Fault on engine or controller, failed to start and switch in manual. The remaining set can be configured as pump on demand OR battery failure.

Controller Identification:-

EFP- 12v- 110V- FD3eU- followed by option letters
24v- 120V-
220V-
230V-

Standard Programmable Features:-

Shutdown in test (Option K)

When the engine is started in a test mode, this facility if enabled, will automatically shut the engine down in the event of a high water temperature or low oil pressure alarm. If a genuine fire situation occurs the engine will either keep running or re-start. If the engine is shutdown, the fault that caused it will remain latched until the user presses the reset push button.

Autostop timer (Option B)

After a specified minimum run time (factory preset timer) , the engine will stop automatically if all of the starting causes have cleared. Note that the engine will not shutdown if the AC/Charger failure indicator is on, this feature will allow the alternator to maintain the battery charge, this facility can be disabled. Factory preset from 30 to 60 minutes.

Mains / Battery charger failure start. (Option F)

In the event of a battery charger or AC failure, this option allows the engine to be started after a factory preset delay so that the engine alternator can be used to charge the batteries. Factory preset from 1-59 minutes. This AC / Battery charger failure start timer can also be set for shut down in test mode - Option F1

Engine stop timer.

The engine stop solenoid is energised for this time period. Factory preset from 2-30 seconds.

Note: The above standard programmable features are enabled in a special ‘memory card’. This memory card can only be programmed at Metron Eledyne, therefore these features must be specified at the time of order. New memory cards can be supplied to enable alternative features and different time periods.

Note also that if serial number of the ‘memory card’ does not match the serial number of the controller, then any future warranty issues will be void.

Delay start timer. (Fitted as standard)

This is used to prevent the engine from starting upon a sudden pressure drop, thus ensuring that the engine is only started in a true low pressure situation. This feature can also be used on multiple pump installations to keep the pumps from starting simultaneously. It is accomplished by the use of a timer supplied in all controllers except the lead controller. The standard timer is factory preset from 1-120 seconds but is adjustable on site via a special external potentiometer. Please inform us of delay start required at the time of ordering.

Description of Options

- A *Alternator diode block.* Allows both batteries to be charged simultaneously from the alternator output. Maximum current carrying capacity of 60A.
- B *Auto stop timer.*
- D *Delay start timer* (Fitted as standard, but please specify time period so that it can be factory preset.)
 - D1 *Deluge valve start.* A separate normally closed start signal, which uses the delay start timer before cranking is commenced.
- E1a *Engine heater circuit 1 <500W.* The engine heater circuit is isolated from the main AC isolator switch, and a separate circuit breaker is installed allowing heaters upto 500W to be used.
- E1b *Engine heater circuit 1, for 500-1kW heaters*
- E1c *Engine heater circuit 1, for 1-2kW heaters*
- E1d *Engine heater circuit 1, for 2-3kW heaters*

- E2a *Engine heater circuit 2, for <500W heaters*
 E2b *Engine heater circuit 2, for 500-1kW heaters*
 E2c *Engine heater circuit 2, for 1-2kW heaters*
 E2d *Engine heater circuit 2, for 2-3kW heaters*
 F AC mains / battery charger failure start
 F1 AC mains / battery charger failure start with shutdown in test mode
 G *Anti condensation heater.* When the controller is to be used in adversely low temperature conditions, this option will maintain a safe temperature for the controller to continue operating reliably.
 H1 *Non muteable auxiliary channel*
 H1a *Muteable auxiliary channel*
 H1b *Auxiliary channel - lamp only*
 H2 *Non muteable auxiliary channel*
 H2a *Muteable auxiliary channel*
 H2b *Auxiliary channel - lamp only*
 H2c *Auxiliary oil channel, and non muteable alarm.* (Will also shut down in test if option K is fitted).
 K *Shutdown in test facility* for low oil pressure and high water temperature
 R *8 individual remote alarm contacts.* This option provides normally open/normally closed dry contacts for remote monitoring of certain alarms:-
 low oil pressure, High water temperature, Engine overspeed , Test mode on, Pump on demand OR Battery Fault, AC/ Charger failure, Auxiliary 1 and Auxiliary 2.
- Speedswitch and Tachometer.* This is an option to allow engine speed pulses to be input.
- T1 *Mounting lugs.* This option allows the controller to be fixed by external mounting lugs.
 T2 *Lifting eye bolts.* This option allows the controller to be lifted by the use of lifting eye bolts.
 T3 *Plinth.* This option allows the controller to become free standing, by use of a specially designed plinth.
 T4 *AV Mounts.* This option enables the controller to be mounted directly to the engine skid.
 U1 *Pressure switch.* This pressure switch allows the starting pressure to be set upto 17bar. The unit is tested upto 25 bar. There is a separate pressure differential adjustment.
 U2 *Pressure switch and drain valve.* This arrangement gives a drain valve and pressure switch plumbed up on the side of the controller. The drain valve is opened when either the test push button is pressed or if the weekly start timer is fitted and timed out.
 U3 *Pressure switch and drain valve and chart recorder.* All three pieces of equipment are plumbed up on the side of the controller. The chart recorder records upto seven days of pressure readings without attention.
 U4 *Programmable weekly start timer.* An easily programmable weekly start timer allows the engine to be started once a week, as required by NFPA.
 U5 *Chart recorder and pressure switch.*
 U6 *IP65 Chart recorder and pressure switch and drain valve.* This option is for out door applications, and comprises of a IP65 rated chart recorder enclosure.
 U7 *IP65 Pressure switch and chart recorder.*
 V *Temperature Probe.* This option allows the battery charger to automatically compensate the float voltage proportionally to the ambient temperature.
 W *IP65 cabinet.* This option seals the cabinet and external 'water' components to IP65 / NEMA4 standards.
 X *380-480 input.* When 120/240v AC input is not available, a separate transformer is wired to allow greater voltages to be used.
 Y1 *Expansion module.* This option allows the 8 expansion auxiliary inputs to be displayed. In addition four further indicators are on this unit: Remote start, Battery fault, Controller Unavailable and Manual Mode.
 Y2 *8 Expansion auxiliary inputs.* This allows 8 inputs to be fed into the control unit. Each channel can be configured for; Latched or non latched, muteable or non muteable, normally open or closed, shutdown in test, first out annunciation or indicator only. Use option Y1 for indicators.
 Z1 *Wiring of free issued engine instruments*
 Z2 *Engine instrumentation package.* Comprising of Engine hours run counter, engine oil pressure gauge, and engine water temperature gauge.

Note: One of the options U3 or U2 and U4 must be fitted for full compliance with NFPA20.

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