Metron Eledyne

FIRE PUMP CONTROLLER

for Diesel Engine Fire pumps

EFP/FD3e *mk2*

Logic based release 1.3 spec 1/9806

FEATURES

The Metron Eledyne controller type EFP/FD3e is designed to specifically meet the latest NFPA No.20 and UL218 rules for Diesel engine fire pump controllers.

This enhanced '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 NEMA 4 (IP65) weatherproof enclosure. Control function indicators and switches are all mounted on door for ease of maintenance. This full door design also provides a large aperture to the gear tray components when open.

The controller's logic system 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 function. Additionally, this controller is suitable for all engine types with either 'energised to run' or 'energise to stop' fuel solenoid outputs.

Inside the controller, mounted on the geartray are two independent, fully automatic battery chargers. These are of a constant voltage and constant current design rated at 10 Amps as standard. The battery charger operates in such a manner as to ensure that the engine batteries are fully charged within 24 hours. Also located within the battery charger module is a 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. Mounted on the side of the controller is the pressure switch, drain valve and optionally a pressure recorder. By having the water components outside the cabinet, the electrical equipment are not exposed to water.

STANDARD CONTROLLER SPECIFICATIONS

Starting

The controller will start the engine from a drop in water pressure by a normally open 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

There are two independent battery chargers which are thyristor based. An intelligent control card (One per battery charger) automatically enables the boost - equalise - float cycle to ensure the batteries are fully charged. A battery charger failure alarm is also provided by each battery charger. The battery charger output is 10A. Please contact Metron Eledyne for further specifications regarding the battery charger.

FM55714

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.

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.

NEW SPECIAL MK2 FEATURES

The FD3e mk2 controller has some new features that enables some programmability. There are 4 aux lamp channels and 3 relay outputs fitted as standard, and any one of these can be programmed for;

No.	Function	No.	Function
01	Engine Running	27	Controller unavailable
02	Pump on demand	28	Crank timer operating
03	Battery fault	29	Shutdown in test
04	Aux 1 input, monitor only	30	Drain valve open
05	Aux 1 input, monitor and muteable alarm	31	Alarm bell on
06	Aux 1 input, monitor and non mute alarm	34	Failed to start
07	Aux 1 input, oil channel monitor, c/w alarm	35	Reset push button pressed
08	Aux 2 input, monitor only	39	Auto mode
09	Aux 2 input, monitor and muteable alarm	40	Pressure switch start
10	Aux 2 input, monitor and non mute alarm	43	Delay start operating
11	Aux 2 input, oil channel monitor, c/w alarm	44	Auto stop timer operating
13	Locked out monitor	49	POD / processor fault
16	Air flaps closed	59	Weekly start due
18	Deluge valve start		
19	Emergency stop input	50	Aux input 20
20	Low oil pressure	51	Aux input 21
21	High water temperature	52	Aux input 22
22	Engine overspeed	53	Aux input 23
23	Test Mode on	54	Aux input 24
24	AC/charger failure	55	Aux input 25
25	Manual Mode	56	Aux input 26
26	Remote start activated	57	Aux input 27

MONITORS AND ALARMS

LAMPS (14 Channel Annunciator)	Volt free Contacts
AC/Charger failure	Engine running x2
Battery A Healthy	Failed to start
Battery B Healthy	Fault on engine or controller
Auto mode	Automatic mode
Aux 1 (Normally pump on demand)	Relay Aux 1 (Often Pump on demand)
Failed to start	Relay Aux 2
Aux 2 (Normally engine running)	Relay Aux 2
Engine overspeed	
Low oil pressure	
High water temperature	
Aux 3	
Aux 4	
AC mains on (separate indicator)	

PUSH BUTTONS AND SWITCHES

Push Buttons	Switches
Crank A	AC Mains Isolator (door interlocked)
Crank B	Mode switch (auto / manual)
Test Start	**Annunciator**
Engine Stop	Lamp Test
	Set/ reset
	Mute

CONTROLLER IDENTIFICATION

EFP-	12v-	110V-	FD3e-	followed by option function letters
	24v-	120V-		
		220V-		
		230V-		

Metron Eledyne Ltd

18 Autumn Park, Dysart Road, Grantham
Lincolnshire NG31 7DD. United Kingdom

Tel: +44 1476 516120
Fax: +44 1476 516121

Email: info@metroneledyne.co.uk
Website: www.metroneledyne.co.uk

Metron Inc

1505 West Third Avenue
Denver, CO 80223

Tel: +1 303 592 1903
Fax: +1 303 534 1947

Website: www.metroninc.com

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 8 programmable additional normally open/normally closed dry contacts for any alarm mentioned in the above table.
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.
U2	Pressure Switch and Drain Valve.
U3	Pressure switch, Drain Valve, 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 auxiliary indicators are provided, each can be programmed from the table above.
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.

Note: One of the options U3 or U2 must be fitted for FM approval.

Note: Many of 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 timing 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 may be void.