

STANDARD

The diesel engine fire pump controller shall be built in complete compliance to the latest NFPA20 standard

ENGINE STARTING

The diesel engine fire pump controller shall be a Tornatech model GFD micro-processor based rated for incoming AC voltage of

- ☐ 120 Volt / 1 phase / 60hz
- ☐ 220 – 240 Volt / 1 phase / 50hz or 60hz

and for DC battery voltage of

- ☐ 12 VDC
- ☐ 24 VDC

ENCLOSURE RATING

The standard enclosure shall be NEMA/UL/CSA type 2 – IP42 or optional:

- ☐ NEMA/UL/CSA 12 – IP54
- ☐ NEMA/UL/CSA 4 – IP66
- ☐ NEMA/UL/CSA 4X – IP66

OPERATIONAL COMPONENTS

The diesel engine fire pump controller shall be supplied with the following operational components:

- Two independent fully automatic battery chargers rated for 10 amperes, continuous charging, complete with:
 - AC input filter
 - Current limiter
 - Over current shut off
 - 500 mA trickle charge
 - Dead cell detection
 - Low battery voltage alarm

In case of battery failure, the charger shall initiate an alarm and provide a signal to prevent the use of the defective battery during the start attempt cycle.

- 304 stainless steel pressure transducer rated for 0-300psi
- 4" bell
- Individual battery circuit breakers
- Individual manual crank push buttons
- Stop push button
- Master selector switch (MANUAL–OFF–AUTO)
- Run period timer for automatic stop
- Sequential start timer
- Provision for remote start and deluge valve start
- Drain solenoid valve for weekly exercise
- System overpressure adjustable setting and alarm contact for pressure limiting device
- Pressure recording device with communication port accessible without opening the main controller door
- Remote alarm circuits rated 8A. 250 VAC for:
 - Engine run (DPDT)
 - Main selector switch in Auto (1N/O)
 - Main selector switch Off or Manual (1N/O)
 - Engine trouble (DPDT)
 - Controller trouble (DPDT)
 - Pump room alarms DPDT)

DIGITAL ANNUNCIATOR INTERFACE

The diesel engine fire pump controller shall be supplied with a digital annunciator interface completely accessible without having to open the controller door. The digital annunciator interface shall be comprised of a 4-line, 20 character continuously back lit digital display screen, keypad type pushbuttons, high luminosity LED's and have the same NEMA rated degree of protection as the enclosure of the diesel engine fire pump controller. The digital annunciator interface shall numerically display:

- Individual charger / battery voltage and amperage
- Individual charging modes
- Time and date
- Specific alarm indication
- Type of starting indication
- Pump on Demand
- Crank cycle indication
- Minimum run period timer
- Sequential start timer
- Weekly test timer
- Cut-In and Cut-Out pressure settings
- System pressure

The cut-in, cut-out and system pressure indication shall be continuously displayed. The ability to change the unit of measurement from Psi to Bar shall be provided through the adjustment of a dipswitch located inside the controller. Diesel engine fire pump controllers without the capability of digitally displaying the cut-in, cut-out and system pressure shall not be accepted.

The digital annunciator interface shall high luminosity LED's for:

- AC Power On
- Battery 1 Failure
- Charger 1 Failure
- Engine Low Oil Pressure
- Engine Overspeed
- Engine Fail to Start
- Pump Room Alarm
- Weekly Test
- Main Switch in Auto
- Battery 2 Failure
- Charger 2 Failure
- Engine High Temperature
- Engine Run
- Fail When Running
- Deluge Valve/Remote Start
- Controller Trouble

Diesel engine fire pump controllers supplied with traditional neon or incandescent bulb pilot lights with coloured lens shall not be accepted.

The digital annunciator interface shall have keypad type pushbuttons for:

- Lamp Test / Silence
- Cut-in pressure setting
- Cut-out pressure setting
- Run Test
- Print
- Paper Feed

The cut-in and cut-out adjustments shall have independent pushbuttons accessible without having to open the controller door which will raise the setting one unit (Psi or Bar) at a time and also raise the setting by 10 units if held pressed for more than one second. The logic of adjustment shall be so that the cut-out setting must be set before the cut-in setting and that the cut-in setting cannot be raised above the cut-out setting. The adjustment of the cut-out and cut-in shall be tamper proof through the setting of a dipswitch installed inside the controller.

PRESSURE AND EVENT RECORDING

The diesel engine fire pump controller shall be equipped with a pressure and event recorder. The recorder will register and keep in memory general system information, pressure fluctuations over time that have occurred over the previous seven (7) days and events and alarms that have occurred over the previous fifteen (15) days. General system information, events and alarms include the following:

- Time and date of retrieval of data
- Cut-in and Cut-out setting
- Date of the last change of the cut-in and cut-out setting
- Date, time and pressure readings of the minimum and maximum pressure registered over the previous 7 days
- Engine elapsed run time
- Weekly test information
- Automatic, manual and all pump start count
- Specific alarms time and date

PRESSURE SENSING DEVICE

The diesel engine fire pump controller shall be supplied with a 304 stainless steel pressure transducer rated for fresh water operation between 0 and 300psi with $\pm 2\%$ accuracy and a minimum burst pressure of 420psi. The pressure transducer shall be used to display the pressure in the sprinkler system and also control the automatic start circuit. The pressure transducer shall be installed inside the controller directly mounted to a bulkhead allowing for an external connection to the sprinkler system sensing line. Controllers supplied with mechanical pressure sensing devices with or without mercury shall not be accepted.

FIELD ADJUSTMENTS AND OPERATION

The diesel engine fire pump controller shall ship from the factory set for manual stop and shall be field adjustable for automatic stop if required by adjusting a minimum run period timer. The minimum run period timer shall be accessed through the setting of a dipswitch and shall display both a text indication and the remaining time of the timer.

The diesel engine fire pump controller shall provide a crank cycle of three (3) fifteen (15) second start attempts per battery with fifteen (15) second rest periods in between the starting attempts.

A sequential start on delay timer shall be supplied and shall be field adjustable. The sequential start on delay timer shall be accessed through the setting of a dipswitch and shall display the remaining time of the timer.

A weekly test timer shall be supplied as standard equipment. The timer shall allow for the setting of the date and start and stop times of the weekly test. This timer shall be field adjustable and accessed through the digital annunciator interface and shall display the remaining time of the timer.

A RUN TEST pushbutton shall be provided to start the diesel engine by energizing the solenoid valve and creating an artificial pressure drop which will be sensed by the pressure transducer and hold the engine running for 10 minutes.

For options see section GFD Options