

December 2005

## FD100 Diesel Engine Controllers



## Product Description

The FD100 Diesel Engine Controller is designed to control and monitor 12 or 24 volt, diesel fire pump engines. All models are listed by UL and ULC, and approved by Factory Mutual and CSA, as well as meeting or exceeding the requirements of NFPA 20 and NFPA 70.

## Product Features

### Microprocessor Control

EATON Cutler-Hammer FD100 Diesel Engine Fire Pump Controllers are microprocessor based. All events surrounding the operation of the controller are stored within the memory, thus giving the ability to diagnose and troubleshoot problems based on an actual history of events. Events are time and date stamped.

A main display unit provides a read-out of parameters such as current pressure, volts and amps and will display error messages as well as provide alarm indication. A status report is available which can be printed locally. The status reports provide a record of the state of the controller as it was left after commissioning.

### Pressure Transducer: 0 - 600 psi

Each FD100 controller is equipped with a stainless steel, 0-600 psi pressure switch capable of withstanding a momentary surge pressure of 1000 psi.

### Run Period Timer

The run period timer is built into the FD100 microprocessor and can be accessed via the membrane / keypad. It is programmable from 0-60 minutes and should be reset to thirty (30) minutes when the controller is placed in service.

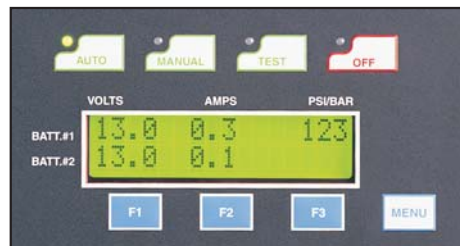
### Printer / Recorder

The industrial grade thermal printer is housed in a rugged steel enclosure within the controller. The on/off switch, feed and reset buttons are front accessible. A bi-color status LED is also visible on the front of the printer. Green indicates - "Printer Operational" while yellow indicates - "Out of Paper".



### Last 1024 Messages

The internal microprocessor stores the most recent 1024 messages in its memory. The messages can be printed, viewed on the LCD screen or downloaded to a computer. Each message is time and date stamped. The LCD display acts as a paperless chart recorder.



### Common Alarm Relay

The FD100 controller has a common alarm relay which energizes whenever there are any alarm conditions present. This relay is energized under normal conditions and has LED status indication.

### Additional Output Relays

Two additional output relays labeled Future #1 and Future #2, can be user programmed to operate for ten (10) different functions. Programming is done in the FD100 menu using the membrane / keypad.

### Alarm Relay Ratings

All alarm relays are rated at 10 Amps, 220VAC 1/3HP resistive load only.

### Engine Crank Cycle

Upon detecting a drop in system pressure, the microprocessor sends a start signal to the engine, initiating its' crank cycle.

The crank cycle consists of six periods of 15 second duration, separated by five rest periods of 15 second duration alternating on each set of batteries. If the engine does not start within this cycle, an audible and visible "Fail to Start" alarm is activated. Should voltage of either battery fall below 67% of normal during the crank cycle, a "Battery Failure" alarm will be activated and the FD100 will alter the cranking sequence by continuing the process with the remaining "good" battery.

The crank cycle terminates when the engine starts. The FD100 continues to monitor the batteries and engine for conditions such as: water temperature, oil pressure and speed (RPM).

### NEMA 2 Enclosures

All FD100 controllers come standard with NEMA 2 enclosures unless otherwise ordered. Available options include: NEMA 3R, 4, 4X, 12.

### AC Power Failure

The FD100 microprocessor retains a record in its' memory whenever AC power is applied / restored to the controller. The LCD display indicates the message "AC Power OK".

### Weekly Test Timer

Each diesel controller is equipped with a Weekly Test Timer, 24 hour clock, to automatically exercise the engine once a week for the time specified as per NFPA Pamphlet No. 20.

### Relay Board

The FD100 Relay Board is clearly labeled with pull-apart terminal blocks for ease of wiring and connections. All relays are labeled with full description as well as corresponding three letter designation as indicated on the wiring diagram.



A visual LED indicates the energized state of the relay.

All plug-in relays are identical 3PDT, allowing complete interchangeability.

All terminal numbers are indicated on both the stationary and moveable portion of the terminal blocks.

Pump Room Trouble and Engine Trouble common alarm relays are standard.

**FD100 Diesel Engine Controllers**

**Product Features**

**Alarm & Status Indication**

The display panel is equipped with sixteen indication LED's which indicate various functions and operations of the controller. They are colour keyed to the urgency of the indication. Green indicates normal running conditions, Yellow indicates supervisory alarms and Red indicates critical alarms.

**LCD Display / Function Panel**

The 2 line liquid crystal display allows viewing of all programming parameters in addition to battery and pressure information without opening the front door of the controller. Messages can also be downloaded to a laptop computer via the communications port located on the top of the main microprocessor board.



**Alarm LED's**

- Auto Mode
- Fail to Start
- Low Oil Pressure
- Engine Overspeed
- Engine Run
- Battery Failure
- Charger Failure
- Low Fuel Level
- High Fuel Level
- Fuel Spill
- High Engine Temperature
- Low Pump Room Temperature
- High Reservoir Level
- Low Reservoir Level

**Technical Data and Specifications**

**Line Terminals (Incoming Cables)**

Recommended Wire Size	Terminal Number	Distance
Stranded # 14 (1.63 mm)	1-5, 9, 10, 16-38, L, N	N. A.
Stranded # 14 (1.63 mm)	39 - 134	N. A.
Stranded # 10 (2.59 mm)	Ground	N. A.
Stranded # 10 (2.59 mm)	6, 7, 8, 11	0 feet to 25 feet (7.62m)
Stranded # 8 (3.26 mm)	6, 7, 8, 11	25 feet to 50 feet (7.62 - 15.24m)

**Standards & Certification**

The FD100 Diesel Engine Fire Pump Controllers meet or exceed the requirements of Underwriters Laboratories, Underwriters Laboratories Canada, Factory Mutual, the Canadian Standards Association, New York City building code, and are built to NFPA 20 standards.



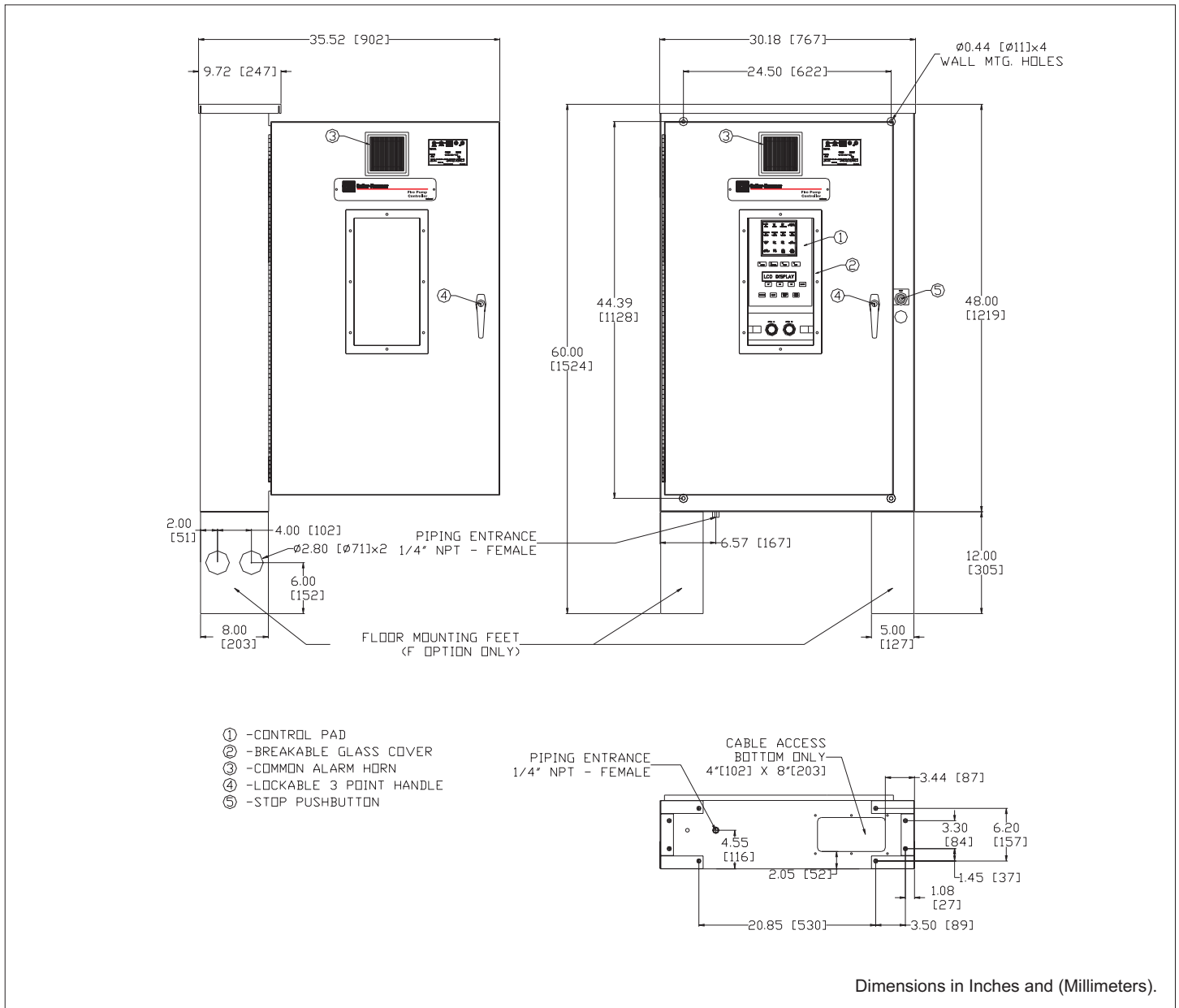
For CE Approved Dimensional drawing - see Page 1-5.

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**FD100 Diesel Engine Controllers**

**Dimensions**

**Standard Enclosure - Type NEMA 2, 12**



Approx. Weight Lbs. (Kg)
250 (113)

**NOTE:**

1. All Enclosures finished in Fire Pump red.
2. Cable Entrance bottom only.
3. Standard Enclosure type NEMA 2,12
4. Enclosure made from #14 Gauge (0.75) HR Steel.

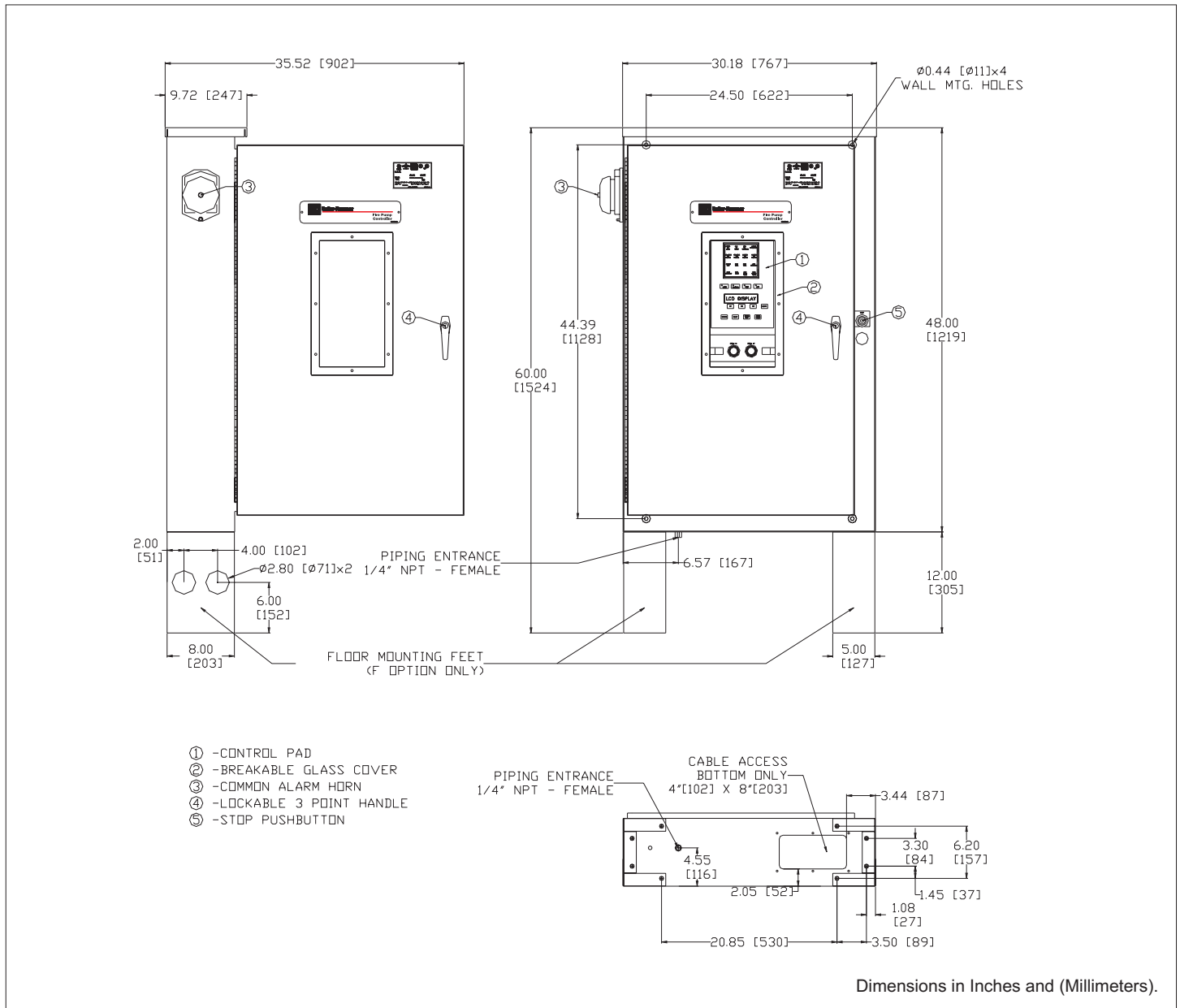


**N. Y. C.**  
APPROVED

**FD100 Diesel Engine Controllers**

**Dimensions**

**Standard Enclosure - Type NEMA 3R (\* 4, 4X)**



Approx. Weight Lbs. (Kg)
250 (113)

**NOTE:**

1. All Enclosures finished in Fire Pump red.
2. Cable Entrance bottom only.
3. Standard Enclosure type NEMA 3R
4. Enclosure made from #14 Gauge (0.75) HR Steel.

\* NEMA 4, 4X enclosures are supplied:  
 Without wall mounting holes.  
 With 1/4 Turn latches instead of 3 point handle.



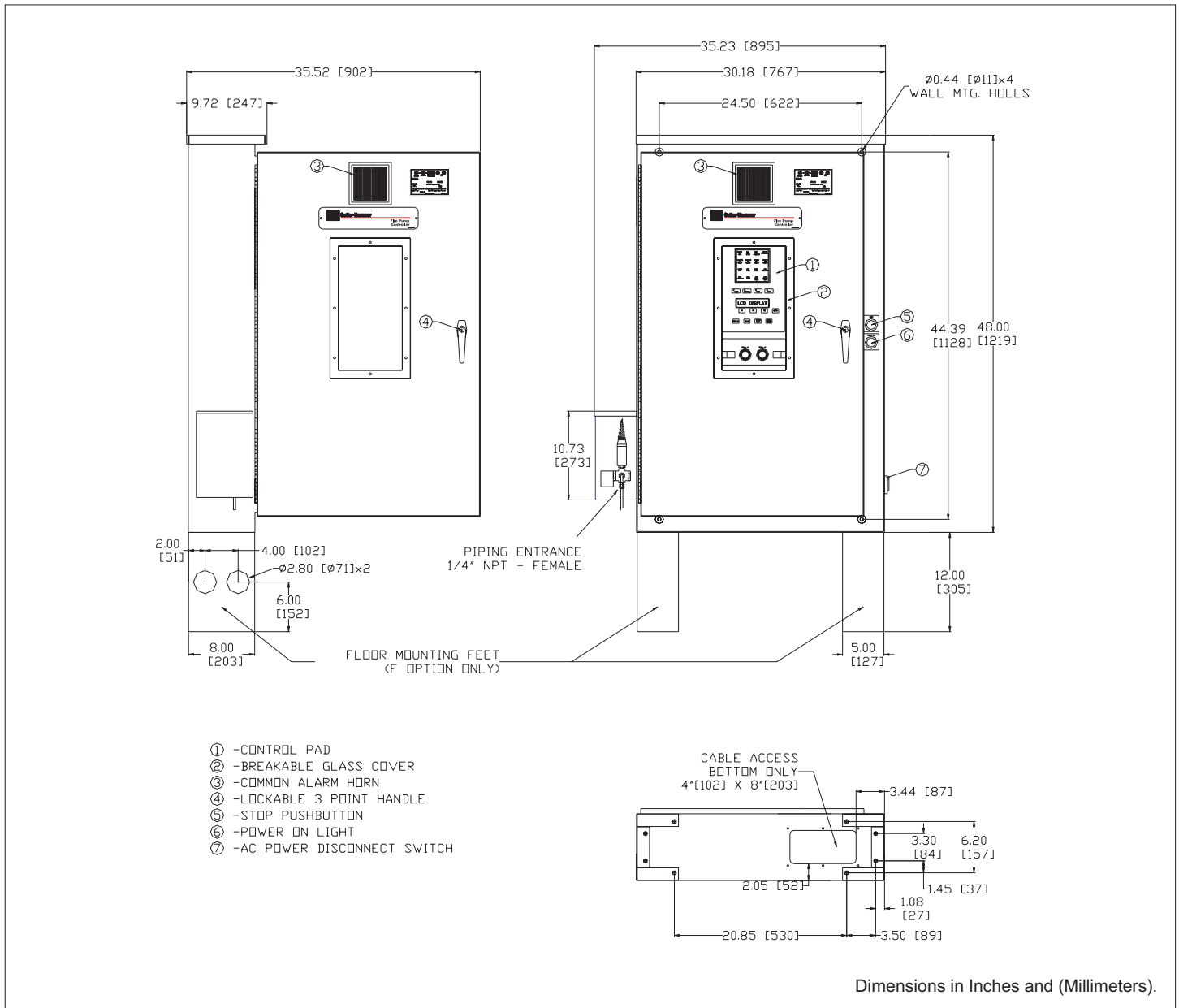
**N. Y. C.**  
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**FD100 Diesel Engine Controllers**

**Dimensions**

**Standard Enclosure - Type CE Approved CE**



Approx. Weight Lbs. (Kg)
250 (113)

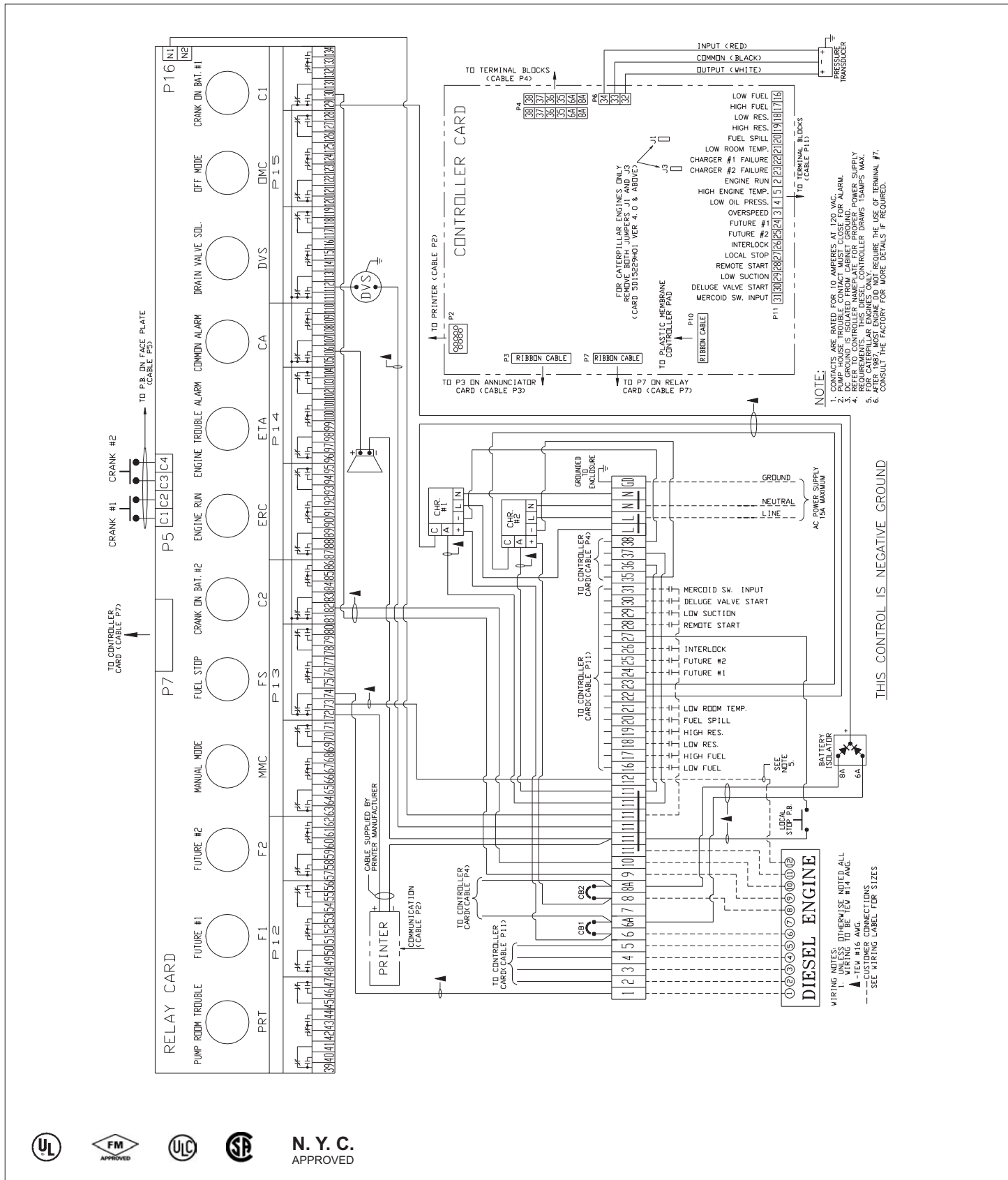


**NOTES:**

1. All enclosures finished in FirePump red.
2. Cable Entrance either top or bottom.
3. Standard Enclosure type NEMA 2.

## FD100 Diesel Engine Controllers

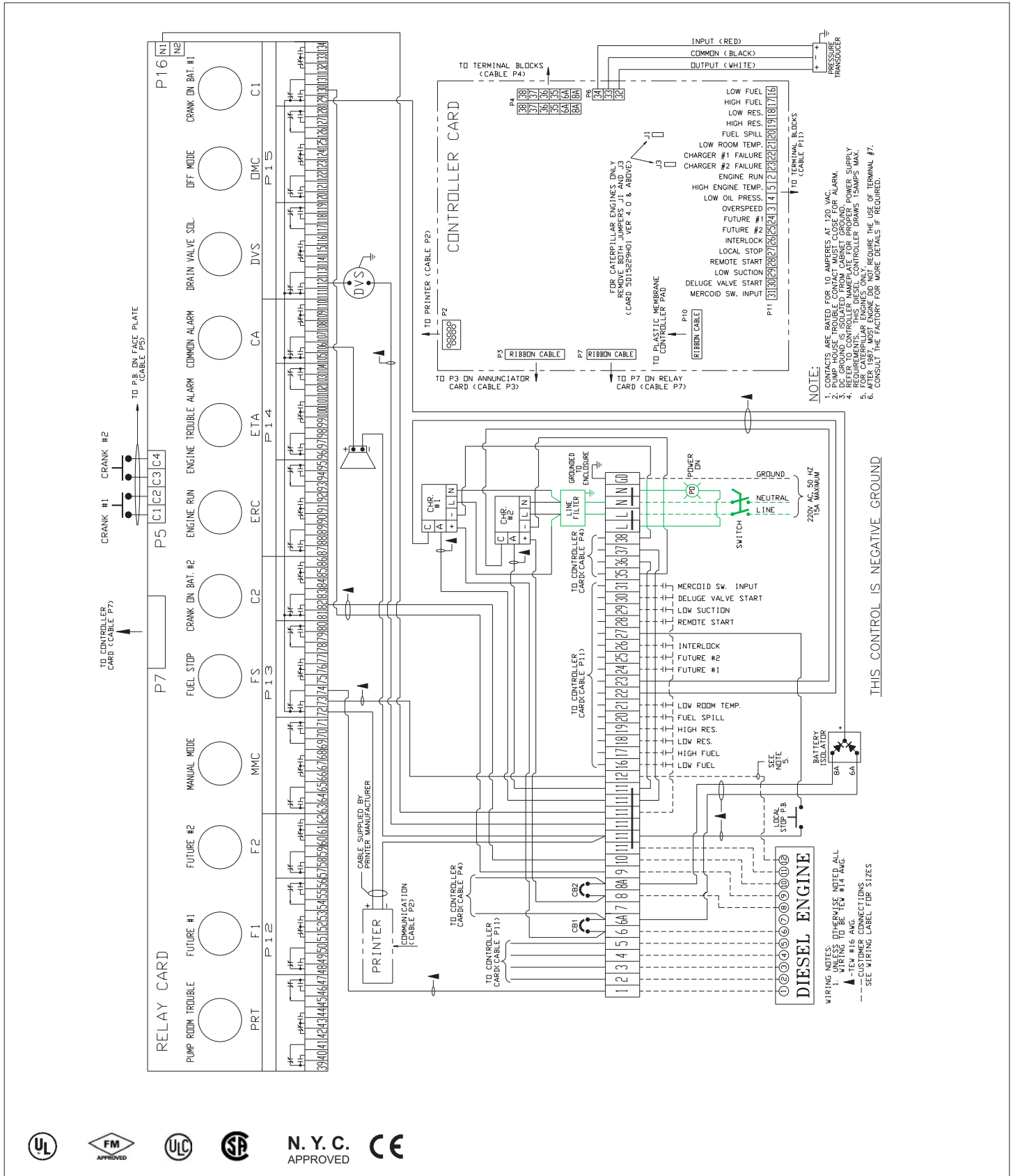
### Electrical Wiring Schematic FD100 Diesel Engine Controllers



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**FD100 Diesel Engine Controllers**

**Electric Motor Connections  
FD110 CE Approved Diesel Engine Controllers**



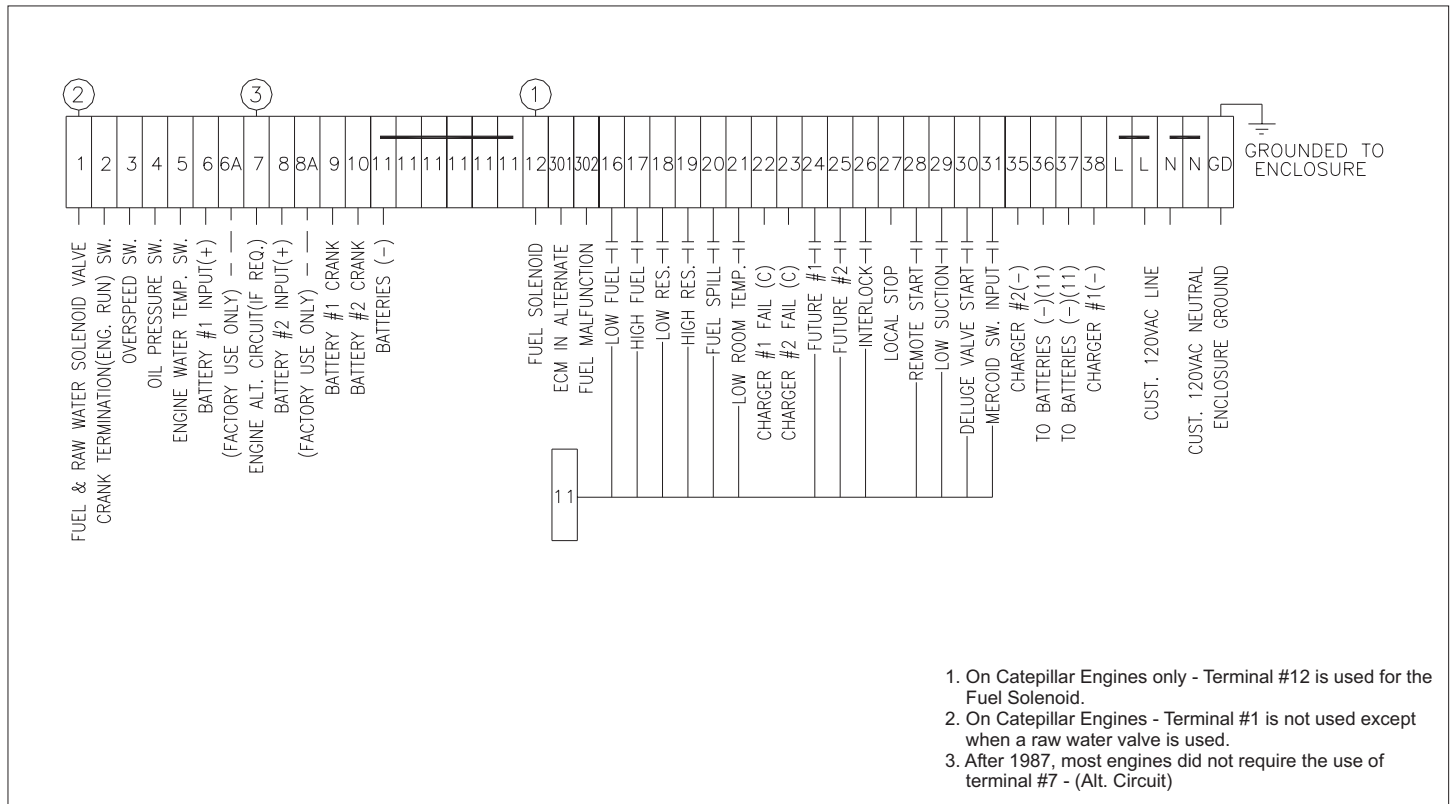
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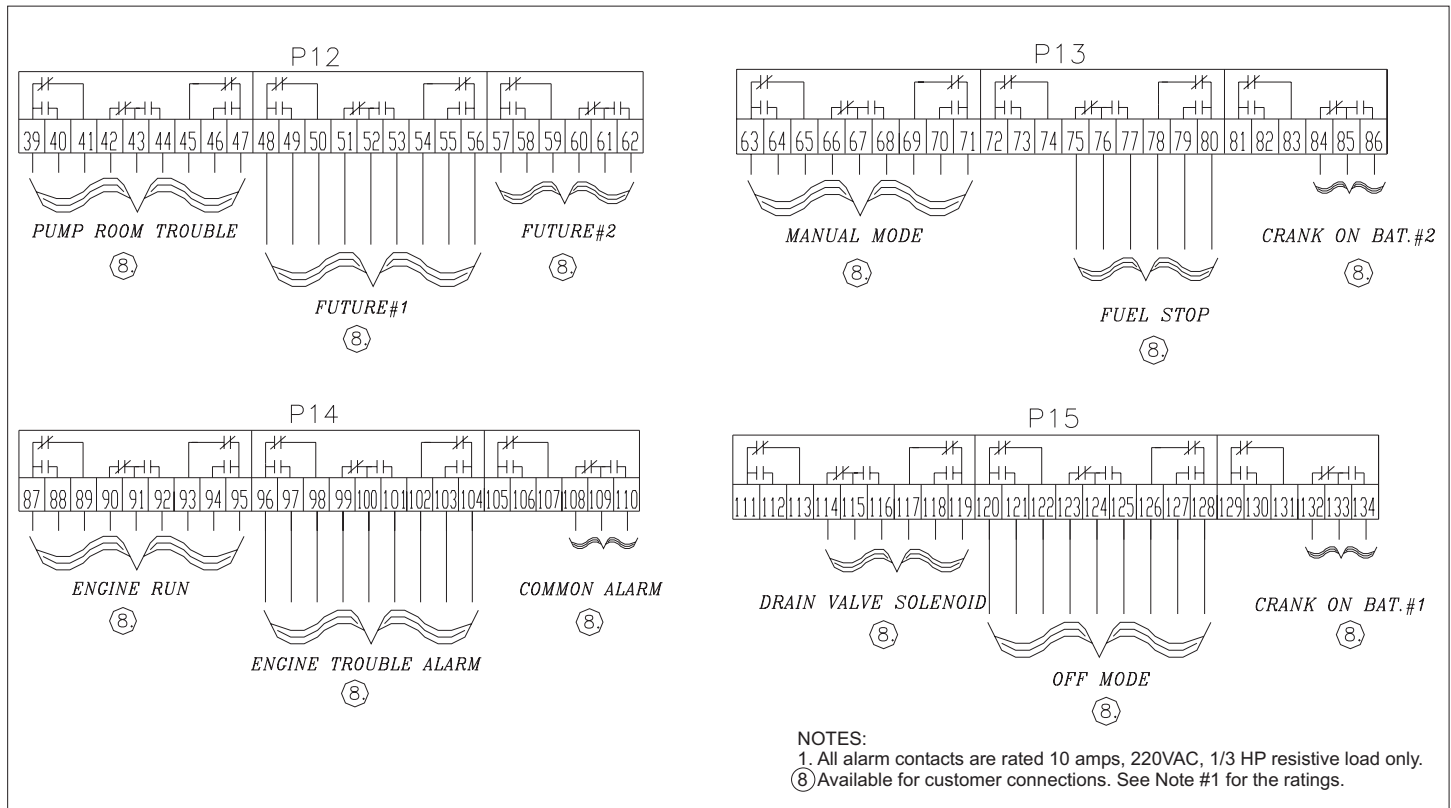
**FD100 Diesel Engine Controllers**

**Field Connections**

**Main Terminal Block**



**Relay Card Terminal Blocks**



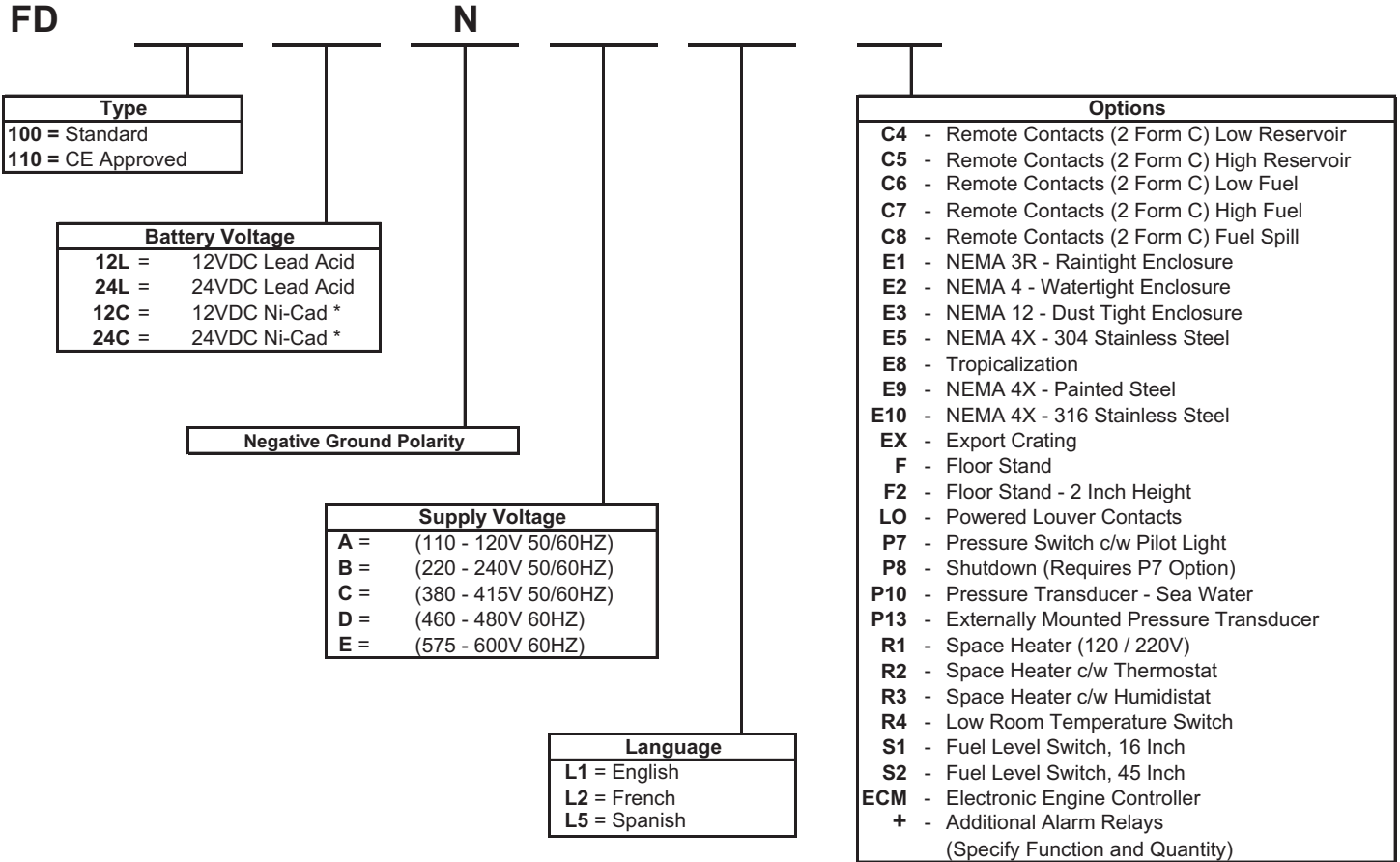


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**FD100 Diesel Engine Controllers**

**Catalog Number Selection**

**FD100 Diesel Engine Controller Catalog Numbering System**



\* Specify No. of Cells:  Voltage of each cell in the battery:

FD100 Diesel Engine Controllers

**Product Selection**

**FD100 Diesel Engine Controller Catalog Numbering System**

**Catalog Number Selection Chart**

Catalog Number	Voltage	Price
<b>FD100-12L-N-A</b>	110 - 120V	\$6,290
<b>FD100-24L-N-A</b>	50 / 60 HZ	\$6,410
<b>FD100-12C-N-A</b>		\$6,290
<b>FD100-24C-N-A</b>		\$6,410
<b>FD100-12L-N-B</b>	220 - 240V	\$6,290
<b>FD100-24L-N-B</b>	50 / 60 HZ	\$6,410
<b>FD100-12C-N-B</b>		\$6,290
<b>FD100-24C-N-B</b>		\$6,410
<b>FD100-12L-N-C</b>	380 - 415V	\$6,890
<b>FD100-24L-N-C</b>	50 / 60 HZ	\$7,010
<b>FD100-12C-N-C</b>		\$6,890
<b>FD100-24C-N-C</b>		\$7,010

**Catalog Number Selection Chart**

Catalog Number	Voltage	Price
<b>FD100-12L-N-D</b>	460 - 480V	\$6,780
<b>FD100-24L-N-D</b>	60 HZ	\$6,900
<b>FD100-12C-N-D</b>		\$6,780
<b>FD100-24C-N-D</b>		\$6,900
<b>FD100-12L-N-E</b>	575 - 600V	\$6,780
<b>FD100-24L-N-E</b>	60 HZ	\$6,900
<b>FD100-12C-N-E</b>		\$6,780
<b>FD100-24C-N-E</b>		\$6,900

**Options**

**Catalog Number Option Selection**

Designation	Description	Price
<b>C4</b>	Remote Contacts (2 Form C) Low Reservoir	\$75
<b>C5</b>	Remote Contacts (2 Form C) High Reservoir	\$75
<b>C6</b>	Remote Contacts (2 Form C) Low Fuel	\$75
<b>C7</b>	Remote Contacts (2 Form C) High Fuel	\$75
<b>C8</b>	Remote Contacts (2 Form C) Fuel Spill	\$75
<b>E1</b>	NEMA 3R - Raintight Enclosure	\$380
<b>E2</b>	NEMA 4 - Watertight Enclosure	\$700
<b>E3</b>	NEMA 12 - Dust Tight Enclosure	\$25
<b>E5</b>	NEMA 4X - 304 Stainless Steel	\$1900
<b>E8</b>	Tropicalization	\$275
<b>E9</b>	NEMA 4X - Painted Steel	\$1400
<b>E10</b>	NEMA 4X - 316 Stainless Steel	\$3000
<b>EX</b>	Export Crating	\$525
<b>F</b>	Floor Stand	Std.
<b>F2</b>	Floor Stand - 2 Inch Height	\$25
<b>L1</b>	English Language	Std.
<b>L2</b>	French Language	Std.
<b>L5</b>	Spanish Language	\$200
<b>LO</b>	Powered Louver Contacts	\$175
<b>P7</b>	Pressure Switch c/w Pilot Light	\$570
<b>P8</b>	Shutdown (Requires P7 Option)	Std.
<b>P10</b>	Pressure Transducer - Sea Water	\$600
<b>P13</b>	Externally Mounted Pressure Transducer	\$250
<b>R1</b>	Space Heater (120 / 220V)	\$185
<b>R2</b>	Space Heater c/w Thermostat	\$250
<b>R3</b>	Space Heater c/w Humidistat	\$250
<b>R4</b>	Low Room Temperature Switch	\$145
<b>S1</b>	Fuel Level Switch, 16 Inch	\$180
<b>S2</b>	Fuel Level Switch, 45 Inch	\$200
<b>ECM</b>	Electronic Engine Controller	N/C
<b>+</b>	Additional Alarm Relays (Each)	\$75

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**FD100 Diesel Engine Controllers**

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**FD20**

Limited Service Controller



**FD30**

Across-the-Line



**FD40**

Part Winding



**FD50**

Primary Resistor



**FD60**

Autotransformer



**FD70**

WYE DELTA (Star-Delta)  
Open Transition



**FD80**

WYE DELTA (Star-Delta)  
Closed Transition



**FD90**

Soft Start



**FT SERIES**

Transfer Switches



**FD100 / 110**

Diesel Engine  
Controllers



**FDM**

Medium Voltage  
Controllers



**FDF**

Foam Pump  
Controllers



**FDC**

Compact  
Controllers



**FDR**

Residential  
Controllers



**FDJP / JY**

Jockey Pump  
Controllers



**FDAP-M**

Remote Alarm  
Panels



For more information on Eaton Cutler-Hammer Fire Pump Controllers, email us at [chcfirepump@eaton.com](mailto:chcfirepump@eaton.com) or call us at 1-877-860-7955.

**EATON**

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