Bid Submittal
BR124073EN

Eaton EPCT Fire

Touchscreen based electric medium voltage controllers

Powering Business Worldwide

Product Description

The EPCT Fire features an advanced, 7" color touchscreen that incorporates both the foam additive controller (FPC) and automatic transfer switch (ATS) functionality into one, intuitive display.

Designed solely with the consumer in mind, the EPCT Fire enables technicians to commission the foam additive controller faster; troubleshooting is made easier and is more effective through the use on-screen history filtering and diagnostic monitoring.

For over 50 years, Eaton has been the industry leader in Medium Voltage Motor Control. The FDM Medium Voltage Fire Pump Controller is based on the AMPGARD® controller design which incorporates Eaton's industry leading TRITON™ SL Series Medium Voltage Vacuum Contactor. The SL Contactor utilizes Eaton's vacuum interrupters that exhibit both a long electrical life and a high interruption capacity.

Product Features

Touchscreen Display

General

Speed of commissioning, configuration and troubleshooting are more critical to businesses today more than ever. Through the use of a 7" touchscreen, users can easily program all site specific setpoints through an intuitive menu structure, view all critical system information, and troubleshoot quickly and accurately via on-screen diagnostics.

Automatic Transfer Switch Integration

Going away from the multiple screen approach, the EPCT Fire touchscreen integrates both the Foam Additive Controller and Automatic Transfer Switch into one display enabling the user to effectively manage programming and operation from one source.

Commissioning Simplified

The Startup tab features all controller related commissioning tasks such as: Quick Setup, Setup Phase Reversal, Flow Test, Manual/Automatic Starts, and Test Alarms.

UL Type Rating

The touchscreen display has been tested in accordance with UL and achieves a type 4X rating.

Programming Menu

Startup tab

This tab system enables the user to complete all controller related commissioning tasks. Each sub-menu within the Startup tab guides the user through step-by-step, intuitive screens to quickly and effectively complete the startup and commissioning process.

Panel Setup tab

All variables relating to the panel, such as language, date and time, nominal voltage, etc., are located in the Panel Setup tab. For all programming points within the Panel Setup tab, refer to the instruction manual: MN124016EN.

Help tab

The help tab provides end users service contact information from the company that commissioned the unit (if programmed), factory contact information, and a QR code to download the instruction manual onto a mobile device.

Pressure Settings tab

Contains a variety of pressure settings that may be programmed to suit site requirements. Some key settings include: Start Pressure, Stop Pressure, Low Pressure Alarm, High Pressure Alarm, Low Suction Shutdown, Low Foam Shutdown, Pressure Units, and the ability to calibrate the transducer.

Timer Values tab

This tab system contains the programming point for all foam additive controller related timers. These timers are: Minimum Run Time, Acceleration Time, Sequential Start Time, Fail to Start Time, Fail to Stop Time, and Weekly Motor Test Timer.

Alarm Setpoints tab

There are seven (7) programmable alarm points within this tab system: Phase Reversal, Phase Failure Alarm Setpoint, Motor Overload Setpoint, Transducer Fail Pump Start, Abort Motor Test on Low Voltage, Voltage Alarm Settings, and Frequency Alarm Settings.

Inputs/Outputs tab

The I/O board is capable of accepting ten (10) custom inputs that can be programmed for seventeen (17) predefined conditions. The output relays can be programmed for sixty-one (61) separate conditions. Additional relays can be added through the use of a single or multiple optional relay boards.

History/Statistics/Diagnostics tab

This tab system allows the customer/technician to view historical data, controller statistics, controller diagnostics, and startup information. To assist, the controller can filter for specific events or between certain dates to speed up troubleshooting.

I/O Board

Customer Input Connections

Connection terminals are provided at the top of the I/O board for external customer connections that can be programmed through the touchscreen display.

Output Relays

The I/O board features four (4), 250VAC, 8A, 2 Form-C relays designated for the following: Common Alarm, Power/Phase Failure, Phase Reversal, and Pump Run. Each relay socket has a surface mount LED to indicate the relay's coil status.

Optional Boards

The controller can accept up to four (4) additional option boards: optional relay board, MODBUS communication board, secondary 4-20mA device board, and an alarm board. The controller has provisions to allow future optional boards to be added with plug-and-play functionality.

Other Components

Drain Valve Solenoid

All full-service EPCT Fire controllers are equipped with a drain valve solenoid used for manual or automatic motor tests.

External USB Port

The USB port allows the user to download historical messages, statistics, diagnostic information, startup file, and current controller configuration to any USB device with FAT16 or FAT 32 formatting.

Enclosures

The EPCT Fire controllers come standard with UL type 2 (drip-proof) enclosures. Optional enclosures are available and include: type, 3, 3R, 4, 4X, and 12.

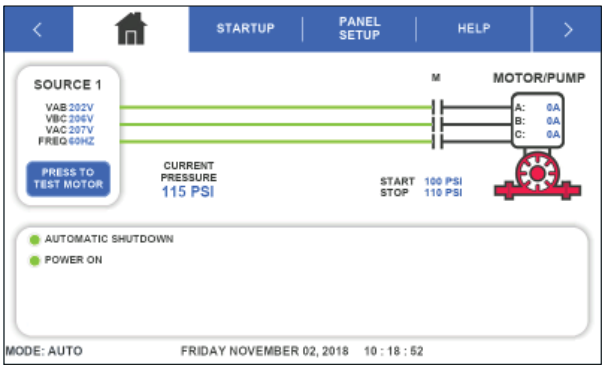
Emergency Start Operator

A mechanically operated emergency start handle (ESH) will mechanically activate the motor contactor(s) independently from any electrical control circuits.

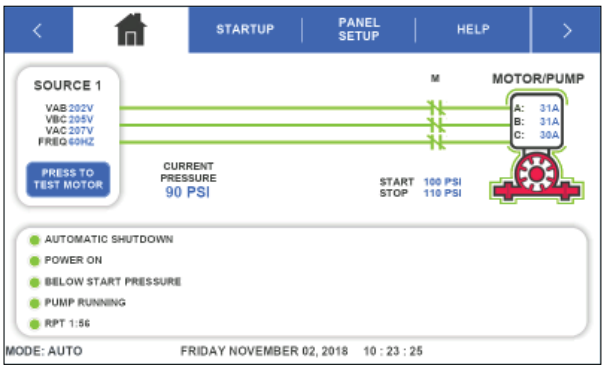
Standards & Certifications

All EPCT Fire medium voltage controllers meet or exceed the requirements of Underwriters Laboratories and Underwriters Laboratories Canada [UL218], Factory Mutual, the Canadian Standards Association, New York City building code, CE mark, U.B.C./C.B.C. seismic requirements, and are built to the latest edition of NFPA 20 standards.

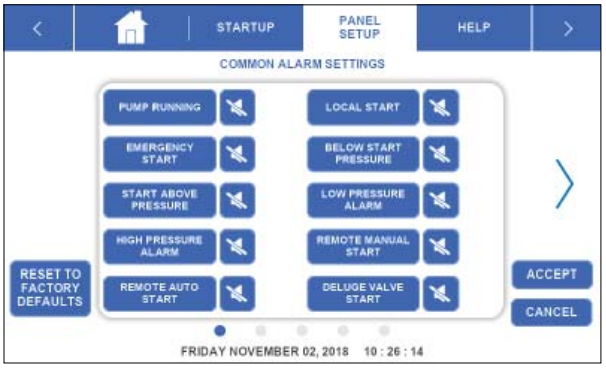
Display Screens



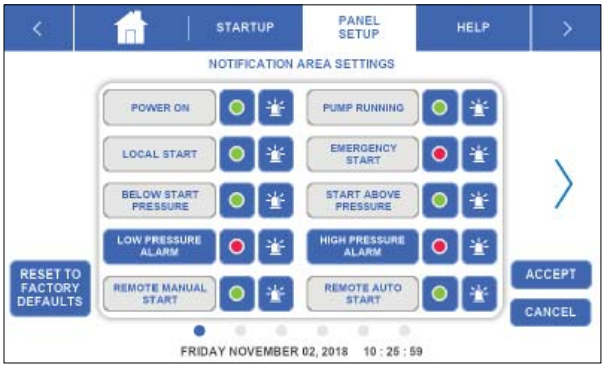
Home tab



Home tab - pump run



Common Alarm Settings



Notification Area Settings

Message History

Customer Service Contact

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

Electrical Sector
Canadian Operations
5050 Mainway
Burlington, ON L7L 5Z1
Canada
EatonCanada.ca
CHFire.com

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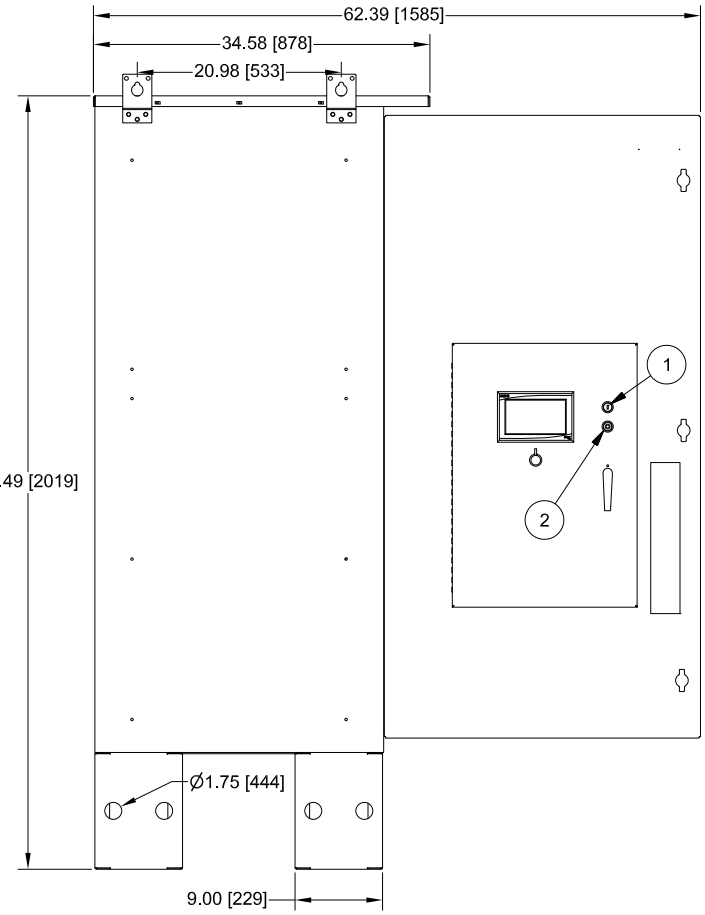
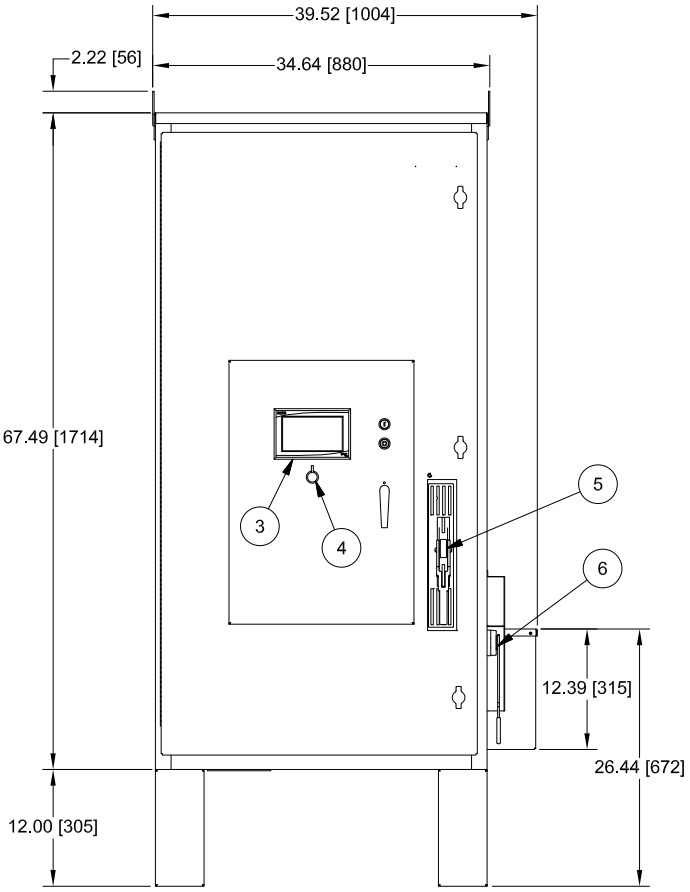
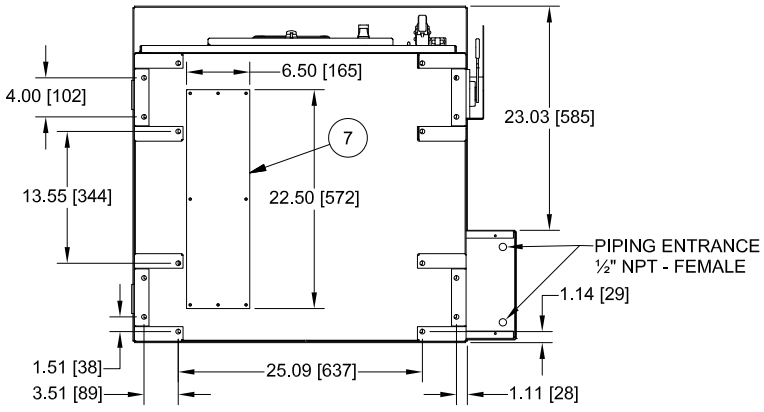
EPCT FIRE - FDM30
DIMENSIONAL DRAWING - TYPE 2, 3R, 12





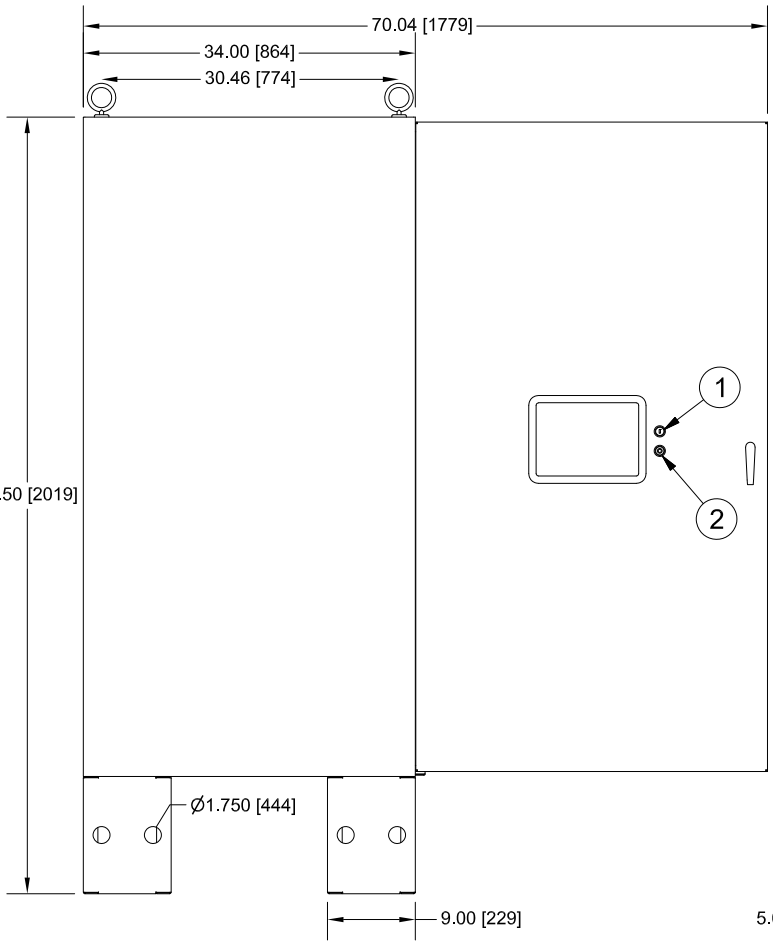


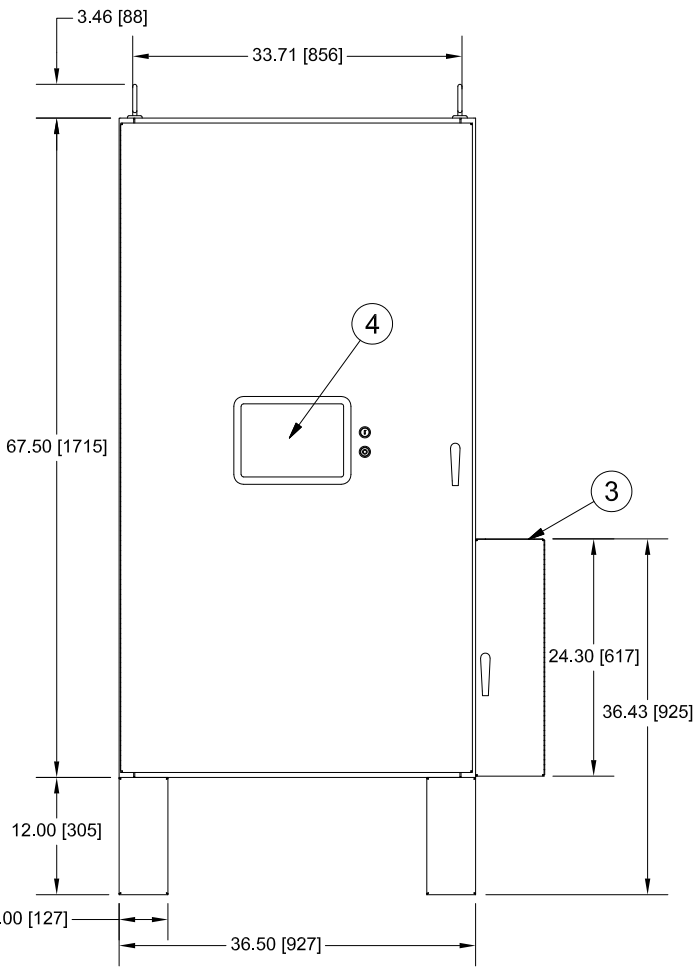
1 - START PUSHBUTOTN
2 - STOP PUSHBUTTON
3 - EPCT FIRE TOUCH SCREEN CONTROLLER
4 - USB PORT
5 - MAIN POWER SWITCH
6 - MSH EMERGENCY START HANDLE
7 - RECOMMENDED CABLE ACCESS BOTTOM ONLY

NOTES:
1 - DIMENSIONS: in[mm]
2 - ALL ENCLOSURE FINISHED IN RED

REVISION	DATE	DRAWING NO.
001	06/13/19	CE16546G01

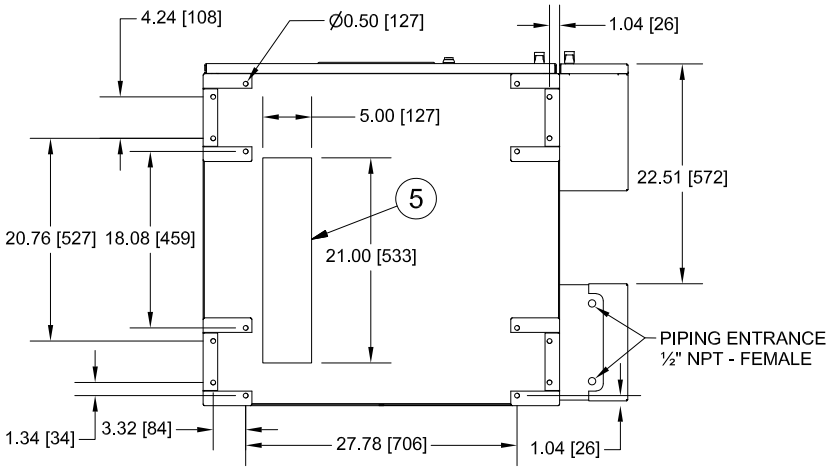
EPCT FIRE - FDM 30
DIMENSIONAL DRAWING - TYPE 4/4X





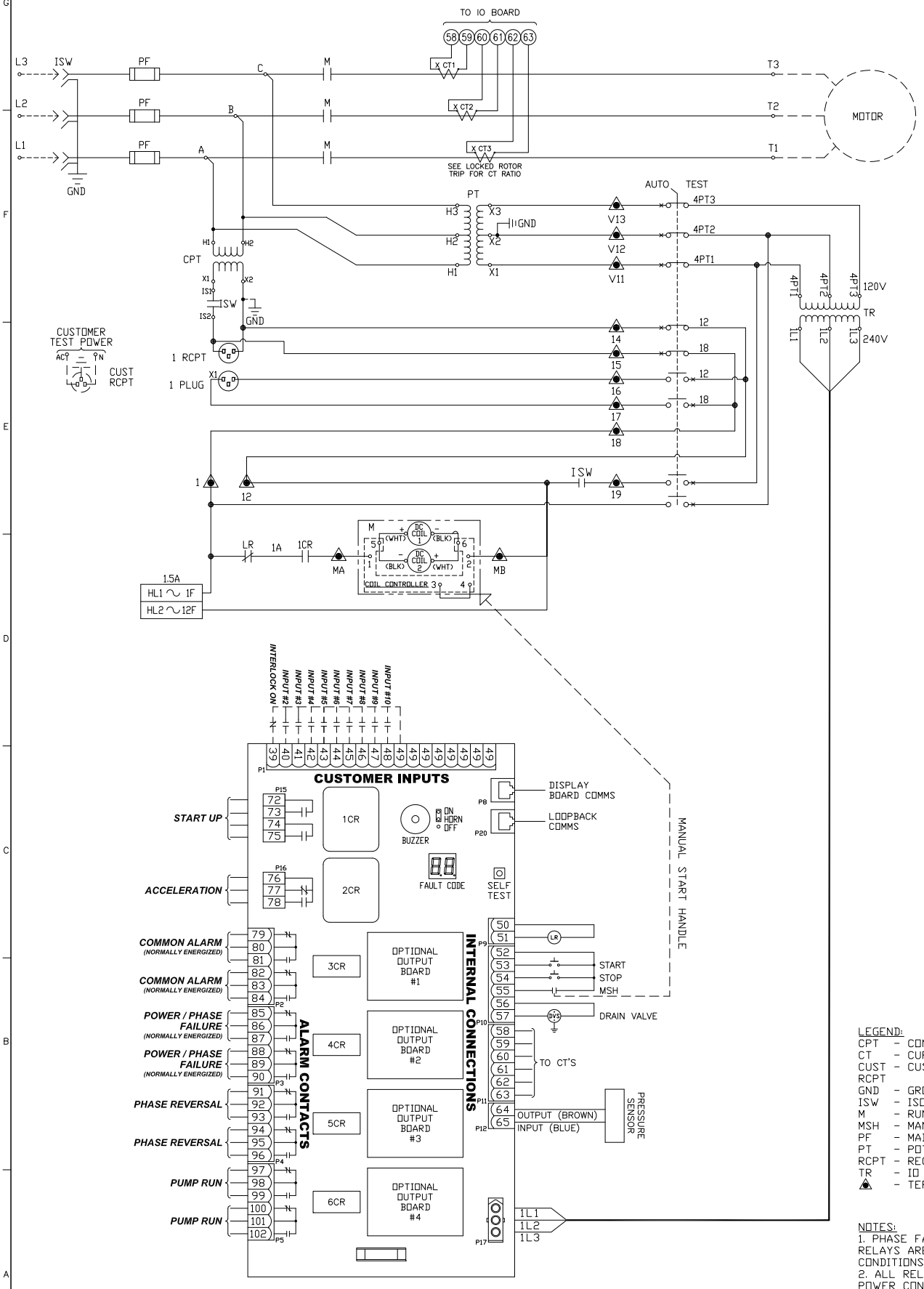
1 - START PUSHBUTOTN
2 - STOP PUSHBUTTON
3 - MSH EMERGENCY START HANDLE
4 - EPCT FIRE TOUCH SCREEN CONTROLLER
5 - RECOMMENDED CABLE ACCESS BOTTOM ONLY

NOTES:
1 - DIMENSIONS: in[mm]
2 - ALL ENCLOSURES FINISHED IN RED



REVISION	DATE	DRAWING NO.
001	06/13/19	CE16546G11

EPCT FIRE - FDM30 THREE PHASE WIRING SCHEMATIC



LEGEND:

CPT - CONTROL POWER TRANSFORMER
CT - CURRENT TRANSFORMER
CUST RCPT - CUSTOMER RECEPTACLE
GND - GROUND
ISW - ISOLATING SWITCH
M - RUN CONTACTOR
MSH - MANUAL START HANDLE MICRO SWITCH
PF - MAIN POWER FUSE
PT - POTENTIAL TRANSFORMER
RCPT - RECEPTACLE
TR - IO BOARD TRANSFORMER
▲ - TERMINAL BLOCK

NOTES:

1. PHASE FAILURE AND COMMON ALARM RELAYS ARE ENERGIZED UNDER NORMAL CONDITIONS.
2. ALL RELAY CONTACTS ARE SHOWN IN NO POWER CONDITION.

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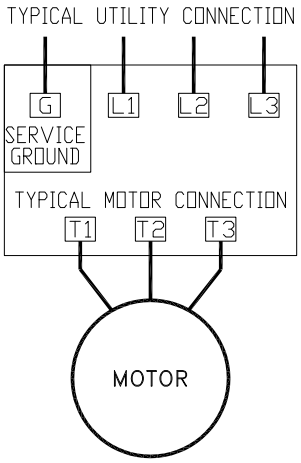
Field Connections

Line Voltage	Motor Horsepower	Interupting Ratings 3-Phase Symmetrical (MVA)	Approximate Weight - Lbs. (Kg)
2200 - 2400	100 - 1000	200	850 (386)
3000	100 - 1250	400	
3300 - 3600	100 - 1500	400	
4160	100 - 2000	400	
4800	100 - 2250	570	
5500	100 - 2750	570	
6000 - 6300	100 - 3000	570	
6600 - 6900	100 - 3250	570	

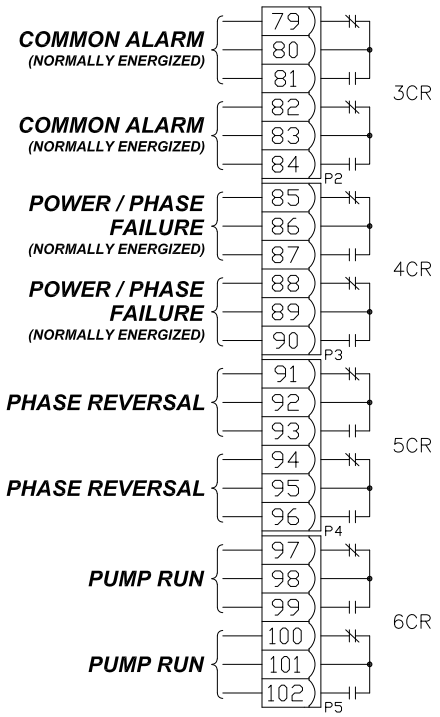
Altitude Ratings	Fuse Interupting Rating	Contactor Short Circuit Rating	Impule Voltage Crest Line to Ground
Low -3500 to -1001 meters	50KA Symmetrical 80KA Symmetrical	6000A - 1 second 63KA Peak 8.7ms (0.5 cycles)	60KV 2200 - 6900V
Standard -1000 to +2000 meters			
High +2001 to +4000 meters			

CONTROLLER CONNECTIONS

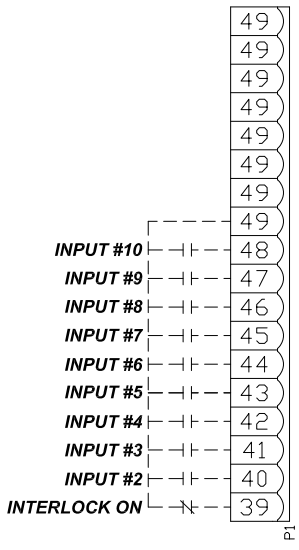


NOTES:
1. MOTOR CONNECTIONS VARY. REFER TO THE SPECIFIC MOTOR CONNECTION DIAGRAM.
2. OBSERVE PROPER PHASE ROTATION A-L1, B-L2, C-L3.
3. CABLE SIZE TO BE 125% OF FULL LOAD CURRENT. REFER TO NEC (NFPA 70)

ALARM CONTACTS



CUSTOMER INPUTS



REVISION	DATE	DRAWING NO.
001	06/10/19	CE16493H10

EPCT Fire option selection matrix

FDM Medium Voltage - Part Number Selection

FDM ____ - ____ - ____ - ____ - ____

Medium Voltage F.P. Controllers

Starting Type
30 = Across the Line

Horsepower			
100	400	1000	2400
125	450	1200	2500
150	500	1250	2750
175	600	1500	3000
200	700	1750	3250
250	750	1900	
300	800	2000	
350	900	2250	

Voltage			
	60 Hz		**50 Hz**
A =	2200 - 2400V	**M** =	2200 - 2400V
B =	3000V	**N** =	3000V
C =	3300V	**P** =	3300V
D =	3600V	**Q** =	3600V
E =	4160V	**R** =	4160V
F =	4800V	**S** =	4800V
G =	5500V	**T** =	5500V
H =	6000V	**U** =	6000V
J =	6300V	**V** =	6300V
K =	6600V	**W** =	6600V
L =	6900V	**X** =	6900V

Language		
L1	=	English
L2	=	French
L4	=	Italian
L5	=	Spanish
L6	=	Portuguese
L7	=	Chinese
L8	=	Polish
L9	=	Dutch
L11	=	Turkish

Options		
A	-	Built-in Alarm System
B	-	Alarm Bell
C1	-	Extra Contacts "Pump Run" (Two Form-C)
C2	-	Extra Contacts "AC Power Failure" (Two Form-C)
C3	-	Extra Contacts "Phase Rev." (Two Form-C)
C4	-	Remote Contacts (Two Form-C) Low Reservoir
C5	-	Remote Contacts (Two Form-C) High Reservoir
COM	-	Communications Option
E2	-	NEMA 4 - Watertight Enclosure
E5	-	NEMA 4X -304 Stainless Steel Enclosure
E8	-	Tropicalization
E9	-	NEMA 4X - Painted Steel
E10	-	NEMA 4X - 316 Stainless Steel Enclosure
EX	-	Export Crating
F2	-	Floor Stand - 2 Inch Height *
P7	-	Low Suction Pressure Switch c/w Pilot Light
P8	-	Low Suction Shutdown (Requires P7)
P10	-	Pressure Transducer - Sea Water Rated
R1	-	Space Heater (120 / 240V)
R2	-	Space Heater c/w Thermostat
R3	-	Space Heater c/w Humidistat
R4	-	Low Pump Room Temperature Switch and Pilot Light ***
R5	-	Space Heater (Internally powered - 120V)
R6	-	Space Heater c/w Thermostat (Internally powered - 120V / 240V)
R7	-	Space Heater c/w Humidistat (Internally powered - 120V / 240V)
TBE	-	Terminal Block Enclosure **
USB	-	External Mounted USB Port

* Not available for NEMA 4 or NEMA 4X units.

*** When ordered with a NEMA4 / 4X enclosure, the temperature switch is shipped loose with 20 feet of wire.

Powering Business Worldwide

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EPCT Fire electric fire pump controllers - medium voltage

Typical specifications

1. Approvals
   - A. The Fire Pump Controller shall meet the requirements of the latest edition of NFPA 20 and shall be listed by [Underwriters Laboratories (UL)] and approved by [Factory Mutual Research (FM)] [Canadian Standards Association (CSA)] [New York Department of Buildings (NYSB)] and carry the CE marking for fire pump service.

2. Ratings
   - A. The Controller shall have integral interrupting raing with current limiting fuses of 200MVA @ 2400, 400MVA @ 3000V-4160V, and 570MVA @ 4800V-6900V.
   - B. Temperature:
     4 to +50 deg. C (39 to +122 deg. F)
   - C. The controller shall have a low altitude rating of -3500 to -1001 meters, a standard rating of -1000 to +2000 meters, and a high rating of +2001 to +4000 meters.

3. Construction
   - A. Isolating switch and contactor assemblies, including current limiting fuses, shall be of the component-to-component design without any interconnecting cables or flexible shunts. The isolating switch shall be easily removed from the front of the enclosure by loosening two bolts. Line and load cable terminations shall be completely accessible from the front.
   - B. B. The isolating switch shall be an externally operated manual three-pole draw-out type, such that in the open position it completely grounds and isolates the starter from the line connectors with a technically driven isolating shutter leaving no exposed high-voltage components. Integral mechanical interlocks shall prevent entry into the high-voltage areas while the starter is energized and shall block accidental opening or closing of the isolating switch when the door is open and the contactor is closed. The isolating switch handle shall have provisions for three (3) padlocks in the off position.
   - C. C. Current limiting power fuses shall be of the self protecting type with visible fuse condition indicators. The power fuses shall be vertically mounted permitting easy inspection and replacement without starter disassembly. A fuse puller shall be provided with each controller. The controller manufacturer shall manufacture the power fuses.
   - D. D. The vacuum contactor shall be of the slide-out design, rated 400 amperes with single- peak high-pressure type main contacts with weld resistant alloy contact faces. The vacuum contactor contact wear shall be easily checked with the use of a "go/no-go" feeler gauge, included with each contactor. The controller manufacturer shall manufacture the contactor.
   - E. E. A built-in test circuit shall be included to permit checking of the start control and pilot circuit, with the high-voltage de-energized and isolated, and the contactor in its normal position or in the draw out position. The control circuit shall be capable of being energized through a polarized plug connector from an external [115-volt] [220-volt] supply while in the test mode.
   - F. F. The low-voltage control compartment shall be isolated and barriered from the high-voltage area with a separate low-voltage access door.
   - G. G. All components and connections in the low voltage and high-voltage compartments shall be accessible from the front. Side or rear access is not permitted.
   - H. H. As per NFPA 20, there shall be provisions to store an extra set of fuses inside the enclosure. The spare fuses shall be accessible from the front and not from a side door.

5. Enclosure
   - A. The controller shall be housed in a Type 2 (IEC IP11) drip-proof, powder baked finish, freestanding enclosure.

B. Optional enclosures:
   1. Type 3R (IEC IP14) rain-tight enclosure
   2. Type 3 (IEC IP55) water-resistant enclosure
   3. Type 4 (IEC IP66) watertight enclosure
   4. Type 4X (IEC IP66) watertight 304 stainless steel enclosure
   5. Type 4X (IEC IP66) watertight 316 stainless steel enclosure
   6. Type 4X (IEC IP66) watertight corrosion resistant enclosure
   7. Type 12 (IEC IP52) dust-tight enclosure

6. Microprocessor control
   A. The controller shall come complete with a 7", 800x480, color touchscreen. The touchscreen shall be type 4X rated.
      1. Home tab capable of displaying system pressure, three phase voltage and amperage readings for both sources, system frequency, date, and time, configurable notifications in the notification area, displaying current start and stop set points, and visual representation of the transfer switch position, source 2 disconnect handle, and contactor.
      2. Virtual buttons to manually test the pump motor and/or the backup power supply engine.
      3. Controller statistics screen, including:
         A. Total Powered Time
         B. Total Motor Run Time
         C. Last Motor Run Time
         D. Calls to Start
         E. Motor Starts
         F. Maximum Starting Current A
         G. Maximum Starting Current B
         H. Maximum Starting Current C
         I. Maximum Run Current A
         J. Maximum Run Current B
         K. Maximum Run Current C
         L. Last LR Current A
         M. Last LR Current B
         N. Last LR Current C
         O. Minimum System Pressure
         P. Maximum System Pressure
         Q. Minimum S1 Voltage AB
         R. Minimum S1 Voltage BC
         S. Minimum S1 Voltage CA
         T. Maximum S1 Voltage AB
         U. Maximum S1 Voltage BC
         V. Maximum S1 Voltage CA
         W. Minimum S1 Frequency
         X. Maximum S1 Frequency
         Y. Last System Startup
         Z. Last Motor Start
         AA. Last Low Pressure Start
         AB. Last Locked Rotor Trip
         AC. Last S1 Phase Failure
         AD. Last S1 Undervoltage
         AE. Last S1 Overvoltage
         AF. Last S1 Under Frequency
         AG. Last S1 Over Frequency
      4. Controller diagnostics screen, including:
         A. Controller Serial Number
         B. Logic Board Firmware Version
         C. I/O Board Firmware Version
         D. I/O Board Supply Voltage
         E. I/O Board Communication
         F. CT1 Secondary Amperage
         G. CT2 Secondary Amperage
         H. CT3 Secondary Amperage
         I. Transducer Input Voltage
         J. Transducer Output Current
         K. Transducer Setpoint Current 2
         L. Transducer Setpoint Current 1
         M. All Input Status (Open or Closed) (Can be selected to override for one minute and manually change the state of the input)
         N. All Output Relay Status (Energized or De-energized) (Can be selected to override for one minute and manually energize or de-energize the relay)
         O. Test the display board's communication.
      5. Archive message screen that will display up to 65,000 alarms/messages stored in the controllers' memory
   B. The microprocessor logic board shall be available with a USB port for transference of message history, controller status, diagnostics, startup and statistic files and the ability to update firmware.
   C. A Fail-to-Start alarm shall occur if the motor controller sees less than 20% of the motor full load amps after an adjustable time delay of 1-99 seconds.
   D. Locked rotor protection shall be provided. After a trip condition and restoration of power, the display shall indicate the voltage, current, and date and time at the moment that the controller tripped.
   E. A sequential start timer and weekly test timer shall be provided as standard.
   F. A restart time delay of one (1) second shall be provided to allow the residual voltage of the motor to decay prior to re-starting the motor. In the event that the pump motor continues to run after a request to stop, then the controller must display a fail to stop message to indicate this condition.
   G. Overvoltage (0-100%) and undervoltage (0-100%) sensing and alarming shall be provided as standard.
   H. The controller shall be supplied with interlock and

shutdown circuits as standard. A green LED in the notification area shall indicate an interlock on condition.

I. Where shutdown of the pump(s) due to low suction pressure is required, it shall be accomplished without the addition of a separate panel or enclosure. The display shall indicate low suction shutdown. Resetting of the condition shall be automatic or manual as selected by the user.

7. Programming Menu
   A. The programming menu shall have the ability to enable an entry password.
   B. The controller shall have nine (9) languages as a standard: English, French, Spanish, Portuguese, Turkish, Italian, Dutch, Chinese, and Polish.
   C. The programming menu shall be grouped into ten (10) tabs as follows:
      1. Home
      2. Startup
      3. Panel Setup
      4. Help
      5. Pressure Settings
      6. Timer Values
      7. Alarm Setpoints
      8. Inputs/Outputs
      9. History/Statistics/Diagnostics
8. Pressure sensor
   A. A solid-state 4-20mA pressure sensor shall be provided. The pressure Start and Stop points shall be adjustable in increments of one (1) PSI.

9. Custom inputs/outputs
   A. The controller shall come standard with ten (10) programmable inputs, four (4) programmed outputs with the ability to add up to another sixteen (16) outputs via optional relay boards.
   B. The user shall be able to program the inputs/outputs through the main programming menu.
   C. The inputs shall be selectable based on the following criteria:
      1. User selected message or seventeen (17) predetermined messages
      2. Link to a future relay and/or LED indicator
      3. Alarm latched until reset
      4. Normally open or closed input
      5. On and/or off-delay timer
   D. The future relays shall be selectable based on the following criteria:
      1. Output based on a minimum of sixty-one (61) predetermined alarms, controller status or a custom input
      2. Latched until reset
      3. Energized under normal conditions
      4. On and/or off delay timer on the output

10. Alarm relays
   A. All relays shall be soldered on the PCB. An LED on the relay panel shall indicate the energized state of the relay. All relay contacts shall be rated @ 8A, 277VAC/30VDC. Two (2) sets of Form-C contacts shall be provided for each of the following:
      1. Common Alarm
      2. Power/Phase Failure
      3. Phase Reversal
      4. Pump Run
   B. The Common Alarm and Power/Phase Failure relays shall be energized under normal conditions.

11. Audible alarm buzzer
   An audible alarm buzzer, capable of being heard while the motor is operating, shall operate if Fail to Start, Hardware Malfunction or any Common Alarm condition exists.

12. Manufacturer
   A. The controller shall be of the EPCT Fire type as manufactured by Eaton Corporation.

Powering Business Worldwide

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