

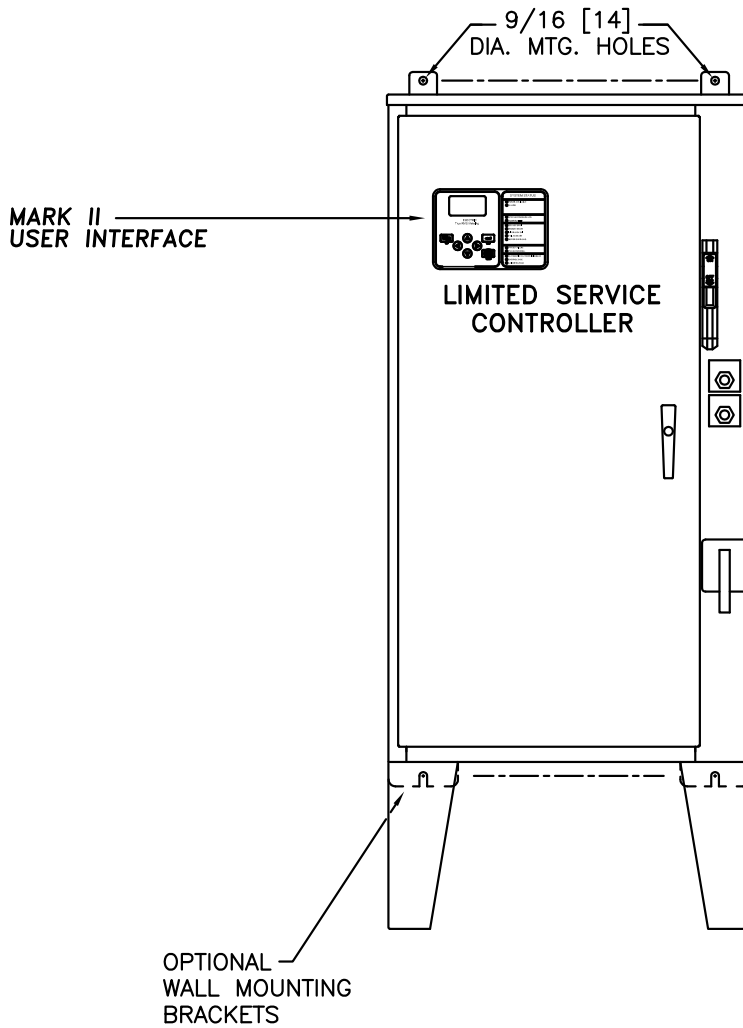


Mark II_{XE} IØ Limited Service
Electric Fire Pump Controllers

Submittal Package

FTA740

Single Phase Starting



(DRAWINGS INCLUDED IN THIS PACKAGE ARE FOR STANDARD
CONTROLLERS. ACTUAL "AS BUILT" DRAWINGS MAY DIFFER
FROM THOSE SEEN HERE).

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Publication SBP740-51 Rev. C

Firetrol Mark II_{XG} Single Phase Limited Service Electric Fire Pump Controller FTA740 – Full Voltage Starting Specifications

1.0 Main Fire Pump Controller

The main fire pump controller shall be a factory assembled, wired and tested unit. The controller shall be of the combined manual and automatic type designed for full voltage starting of the fire pump motor having the horsepower, voltage, phase and frequency rating shown on the plans and drawings.

1.1 Standards, Listings & Approvals

The controller shall conform to all the requirements of the latest editions of:
NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*
NFPA 70, *National Electrical Code*.

The controller shall be listed by:

Underwriters Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers* Canadian Standards Association CSA-C22.2, *Standard for Industrial Control Equipment* (cUL)

1.2 Enclosure

The controller components shall be housed in a NEMA Type 2 (IEC IP22) drip-proof, wall mounted enclosure.

1.3 Withstand Ratings (Short Circuit Current Ratings)

All controller components shall be front mounted, wired and front accessible for maintenance. The minimum withstand rating of the controller shall not be less than:
10,000 Amperes RMS Sym. at 200-240V

If the available fault current of the system exceeds these ratings, the controller shall be available with a withstand rating as shown below:

65,000 Amperes RMS Sym. at 200-240V

1.4 Circuit Breaker

The controller shall include a thermal magnetic circuit breaker. The circuit breaker shall be mechanically interlocked so that the enclosure door cannot be opened with the handle in the ON position except by a hidden tool operated bypass mechanism. The circuit breaker shall be capable of being padlocked in the OFF position for installation and maintenance safety, and shall also be capable of being locked in the ON position without affecting the tripping characteristics of the circuit breaker. The controller door shall have a locking type handle and three point cam and roller vault type hardware. The controller shall be suitable for use as service equipment.

1.5 Operator Interface

The fire pump controller shall feature an operator interface with user keypad. The interface shall monitor and display motor operating conditions, including all alarms, events, and pressure conditions. All alarms, events, and pressure conditions shall be displayed with a time and date stamp. The display shall be a 128x64 Backlit LCD capable of customized graphics. The display and interface shall be NEMA rated for Type 2,

3R, 4, 4X, and 12 protection and shall be fully accessible without opening the controller door. The display and user interface shall utilize multiple levels of password protection for system security. A minimum of 3 password levels shall be provided.

1.6 Ammeter/Voltmeter

The fire pump controller operator interface shall be capable of displaying true RMS digital motor voltage and current measurements for all three phases simultaneously. Displays requiring push-button and selector switches to toggle between phases or current and voltage shall not be accepted.

Voltage and current shall be measured by True RMS technology to provide the most accurate measurement for all sine waves, including non-sinusoidal waveforms. Average responding meters will not be accepted.

1.7 Digital Status/Alarm Messages

The digital display shall indicate text messages for the status and alarm conditions of:

- Motor On
- Local Start / Off Delay Time
- Fail to Start
- Over Voltage
- Emergency Start
- Motor Overload
- Disk Near Full
- Sequential Start Time
- System Battery Low
- Locked Rotor Trip
- Motor Over 320%
- Disk Error
- Pressure Error
- Minimum Run Time
- Remote Start
- Under Voltage
- Over Frequency
- Drive Not Installed
- Printer Error

The Sequential Start Timer and Minimum Run Timer/Off Delay Timer shall be displayed as numeric values reflecting the value of the remaining time.

1.8 LED Visual Indicators

LED indicators, visible with the door closed, shall indicate:

- Power Available
- Remote Start
- Transfer Switch Emergency
- Phase Reversal
- Motor Overload
- Overvoltage
- Alarm
- Pump Running
- Transfer Switch Normal
- Interlock On
- Emerg. Iso. Switch Off
- Undervoltage
- System Pressure Low
- Deluge Open
- Phase Failure
- Fail To Start
- Automatic Shutdown Disabled

1.9 Data Logging

The digital display shall monitor the system and log the following data:

- Motor Calls/Starts
- Total Controller Pwr On Time
- Min/Max System Pressure
- Last Locked Rotor Trip
- Max Starting Currents
- Min/Max Voltage per Phase while idle (not running)
- Min/Max Voltage per Phase during Run
- Pump Total Run Time
- Pump Last Run Time
- Last Pump Start
- Last Phase Fail/Reversal
- Min/Max Frequency
- Min Voltage per Phase during Start

2.0 Event Recording

Memory - The controller shall record all operational and alarm events to system memory. All events shall be time and date stamped and include an index number. The system memory shall have the capability of storing 3000 events and allow the user access to the event log via the user interface. The user shall have the ability to scroll through the stored messages in groups of 1 or 10.

2.1 USB Host Controller

The controller shall have a built-in USB Host Controller. A USB port capable of accepting a USB Flash Memory Disk shall be provided. The controller shall save all operational and alarm events to the flash memory on a daily basis. Each saved event shall be time and date stamped. The total amount of historical data saved shall solely depend on the size of the flash disk utilized. The controller shall have the capability to save settings and values to the flash disk on demand via the user interface.

2.2 Serial Communications

The controller shall feature a RS485 serial communications port for use with 2 or 4 wire Modbus RTU communications.

2.3 Solid State Pressure Transducer

The controller shall be supplied with a solid state pressure transducer with a range of 0-300 psi (0-20.7 bar) ± 1 psi. The solid state pressure switch shall be used for both display of the system pressure and control of the fire pump controller. Systems using analog pressure devices or mercury switches for operational control will not be accepted.

The START, STOP and SYSTEM PRESSURE shall be digitally displayed and adjustable through the user interface. The pressure transducer shall be mounted inside the controller to prevent accidental damage. The pressure transducer shall be directly pipe mounted to a bulkhead pipe coupling without any other supporting members. Field connections shall be made externally at the controller coupling to prevent distortion of the pressure switch element and mechanism.

2.4 Seismic Certification

The controller shall be certified to meet or exceed the requirements of the 2006 International Building Code and the 2010 California Building Code for Importance Factor 1.5 Electrical Equipment for Sds equal to 1.88 or less severe seismic regions. Qualifications shall be based upon successful tri-axial shake-table testing in accordance with ICC-ES AC-156. Certification without testing shall be unacceptable. Controller shall be clearly labeled as rated for installation in seismic areas and a Certificate of Conformance shall be provided with the controller.

NOTE: Not available on Model FTA1500 Controllers

2.5 Controller Operation

A digitally set On Delay (Sequential Start) timer shall be provided as standard. Upon a call to start, the user interface shall display a message indicating the remaining time value of the On Delay timer.

The controller shall be field programmable for manual stop or automatic stop. If set for automatic stopping, the controller shall allow the user to select either a Minimum Run Timer or an Off Delay Timer. Both timers shall be programmable through the user interface.

A nonadjustable restart delay timer shall be provided to allow the residual voltage of the motor to decay prior to restarting the motor. At least 2 seconds, but no more than 3 seconds, shall elapse between stopping and restarting the pump motor.

A weekly test timer shall be provided as standard. The controller shall have the ability to program the time, date, and frequency of the weekly test. In addition, the controller shall have the capability to display a preventative maintenance message for a service inspection. The message text and frequency of occurrence shall be programmable through the user interface.

A Lamp Test feature shall be included. The user interface shall also have the ability to display the status of the system inputs and outputs.

An Audible Test feature shall be included to test the operation of the audible alarm device.

The controller shall not start the fire pump motor under a single-phase condition. If the motor is already running when a phase loss occurs, the controller shall continue to run the motor, but still display a Phase Failure alarm.

The fire pump controller software shall be automatically upgraded through the USB port by simply inserting a flash disk with the new software. Fire pump controllers that require laptop computers, handheld equipment or specialized devices for software upgrades shall be prohibited.

2.6 Manufacturer

The controller shall be a Firetrol brand.

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Firetrol, Inc.

Publication SP740-50 Rev. C



Mark IIx6 IØ Limited Service Electric
Fire Pump Controllers

Product Description

FTA740

Single Phase Starting



Description—Firetrol® FTA740 Single Phase Limited Service Controllers are intended for use with small electric motor driven fire pumps where the capacity of the power source permits full voltage starting. Full voltage is applied to the motor as soon as the controller is actuated. The controller monitors, displays and records fire pump system information.

Limited Service Controllers may be used where they are acceptable to the authority having jurisdiction.

Approvals – Firetrol® fire pump controllers are listed by Underwriters' Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*, and CSA, *Standard for Industrial Control Equipment*. They are built to meet or exceed the requirements of the approving authorities as well as NEMA and the latest editions of NFPA 20, *Installation of Centrifugal Fire Pumps*, and NFPA 70, *National Electrical Code*.

Standard Features—The following are included as standard with each controller:

- Voltage surge protector
- Main Thermal-Magnetic circuit breaker for assigned horsepower and voltage
- Motor contactor
- Emergency Manual Run Mechanism to mechanically close motor contactor contacts in an emergency condition
- Built-in Start and Stop push-buttons to bypass automatic start circuits
- Minimum Run Timer / Off Delay Timer
- Daylight Savings Time Option
- Weekly Test Timer

- Elapsed Time Meter
- Door mounted display/interface panel featuring a 128 x 64 pixel backlit LCD Graphical Display, Membrane Type User Control Push-buttons and easy to read LED Indicators for:
 - POWER AVAILABLE
 - ALARM
 - TRANSFER SWITCH NORMAL (If unit ordered with Automatic Power Transfer Switch)
 - TRANSFER SWITCH EMERGENCY (If unit ordered with Automatic Power Transfer Switch)
 - SYSTEM PRESSURE LOW
 - PUMP RUNNING
 - DELUGE OPEN
 - REMOTE START
 - INTERLOCK ON
 - FAIL TO START
 - MOTOR OVERLOAD
 - EMERGENCY ISO SWITCH OFF (If unit ordered with Automatic Power Transfer Switch)
 - AUTOMATIC SHUTDOWN DISABLED
 - OVERVOLTAGE
 - UNDERVOLTAGE
- Digital Pressure Display
- USB Host Controller and Port
- Solid State Pressure Transducer
- Data Log
- Event Log (3000 Events)
- True RMS Metering with Display of Amps, Volts, Frequency, Pressure and Alarm Messages
- Disk Error message
- Disk Near Full message
- Pressure Error message
- Motor Over 320% message
- Local Start message
- Remote Start message
- Emergency Start message
- Fail To Start message
- Undervoltage message
- Overvoltage message
- NEMA Type 2 enclosure (IEC IP22)
- Suitable for use as Service Equipment
- Each standard controller comes with user set options for:
 - Interlock Alarm
 - Low Pressure Audible
 - Low Suction
 - Pump Run
 - User Defined Input
 - Weekly Test

Product Description – Options & Modifications

SPECIAL ENCLOSURES

- E Enclosure, NEMA Type 4 (IP66), Painted Steel
- F Enclosure, NEMA Type 4X (IP66), #304 Stainless Steel, Brushed Finish
- FD Enclosure, NEMA Type 4X (IP66), #316 Stainless Steel, Brushed Finish
- FDB Enclosure, NEMA Type 4X (IP66), #316 Stainless Steel, 12 Gauge, Seam Welded, Brushed Finish
- FDP Enclosure, NEMA Type 4X, (IP66), #316 Stainless Steel, Painted Finish
- FXP Enclosure, NEMA Type 4X (IP66), #304 Stainless Steel, Painted Finish
- G Enclosure, NEMA Type 12 (IP54), Painted Steel
- T Enclosure, NEMA Type 3R (IP24), Painted Steel

CIRCUIT BREAKER OPTION

- E Intermediate withstand rating
65,000 Amperes RMS Sym. at 200-240V

ANTI-CONDENSATION SPACE HEATERS

- H Space Heater, 120V Externally Powered with Circuit Breaker
- J Space Heater, 120V Externally Powered with Circuit Breaker and Thermostat
- K Space Heater, 120V Externally Powered with Circuit Breaker and Humidistat
- L Space Heater, 240V Externally Powered with Circuit Breaker
- M Space Heater, 240V Externally Powered with Circuit Breaker and Thermostat
- N Space Heater, 240V Externally Powered with Circuit Breaker and Humidistat

PRESSURE TRANSDUCERS

- B Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Fresh Water
- C Wetted Parts Including Pressure Sensor, 300 PSI (21 Bar), Sea Water
- D Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Sea Water

COMBINED AUTOMATIC POWER TRANSFER SWITCHES

FTA976 – For use with generator set/second utility emergency source

ALARMS

- AC Alarm Output Contacts Extra, Pump Operating (1 Set)
- AF Alarm, Audible/Visible, Low Pump Room Temperature
- AG Alarm, Audible/Visible, Reservoir Low
- AH Alarm, Audible/Visible, Low Suction Pressure
- AM Alarm Output Contacts, Fail To Start
- AV Alarm Output Contacts, Low Pump Room Temperature (Requires option -AF)
- AW Alarm Output Contacts, Reservoir Low (Requires option -AG)
- AY Alarm Output Contacts, Low Suction Pressure (Requires option -AH)
- AZ Thermostat, Low Pump Room Temperature, Mounted and Wired
- BY Alarm Output Contacts, Pump Overload
- COM Alarm, Audible/Visible/Output Contacts, Low Suction Pressure with Manual Reset Option. Pressure Switch Not Included
- CTS Alarm, Audible/Visible/Output Contacts, Low Suction Pressure Shutdown with Manual Reset Option and Pressure Switch
- EG Alarm, Audible/Visible, Relief Valve Discharge
- EH Alarm Output Contacts, Relief Valve Discharge (Requires Option -AG)
- EJ Alarm, Audible/Visible, Flow Meter On
- EK Alarm Output Contacts, Flow Meter On (Requires option -EJ)
- JR Visible Indicator, Jockey Pump Operating (Requires Jockey Pump To Be Ordered With Option (-AC))
- JT Alarm, Visible, Jockey Pump Trouble (Requires Jockey Pump To Be Ordered With Option (-KH))
- KH Alarm Output Contacts, Common Alarm
- PE Alarm Output Contacts, Low System Pressure (Pump On Demand)

MISCELLANEOUS

- ED Output Contacts, Load Shed
- EL Series Pumping Operation, High Zone Controller
- EM Series Pumping Operation, Mid Zone Controller
- EN Series Pumping Operation, Low Zone Controller
- IEC Marking, CE with External Wet Parts (Requires NEMA Type 12 (IP54) Enclosure as a minimum)
- IECI Marking, CE with Internal Wet Parts (Requires NEMA Type 12 (IP54) Enclosure as a minimum)
- OSP Marking, OSHPD Seismic Certification (State of California) (Requires Option -SEI)
- PY Output Contacts, Motor Space Heater Circuit
- S Tropicalization
- SEI Marking, Seismic Certified
- USBX Data Port, External USB
- ZPA Scheduled Service Message
- ZPM Data Port, Serial Modbus RTU Over 2-Wire or 4-Wire RS485
- ZPN Data Port, Serial Modbus RTU Over Ethernet TCP/IP

Export packaging (Wooden crating to conform to IPPC Standards)

*Weekly Test Timer – Standard

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Mark IIx6 IØ Limited Service Electric
Fire Pump Controller

Model Number Selection Guide

FTA740

Single Phase Starting

SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLERS

Example: **FTA740-AD15 EZ-xx**

Starting Method
740 - Single Phase / Across-the-line

Start/Stop Options
A - Automatic start with timed permissive stop after minimum run time and manual start with manual stop, field convertible to automatic start and manual start with manual stop only
B - Automatic start and manual start with manual stop

Short Circuit Current Rating
D - Standard short circuit rating
10,000 Amperes RMS Sym at 200 - 240 V
E - Intermediate short circuit rating
65,000 Amperes RMS Sym at 200 - 240 V

Horsepower Rating
03 - 3 HP
05 - 5 HP
07 - 7 1/2 HP
10 - 10 HP
15 - 15 HP

Modifications
See Back

Single Phase Voltage
E - 220-240V, 60 Hz
EZ - 220-230V, 50 Hz
TT - 200V, 60 Hz
T - 208V, 60 Hz

Model Number Selection Guide – Options & Modifications

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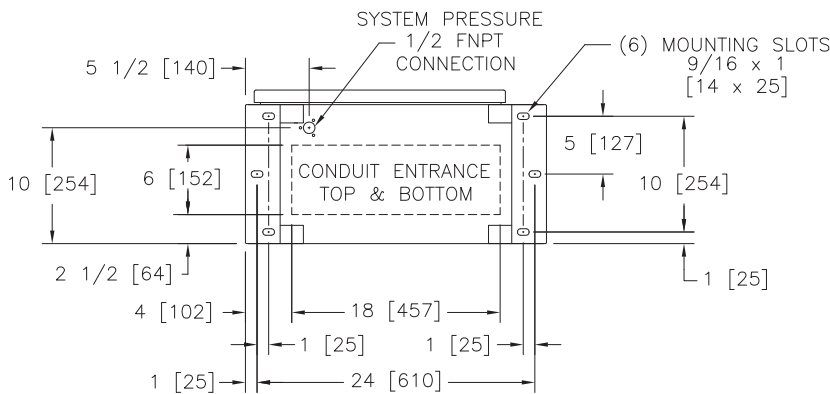
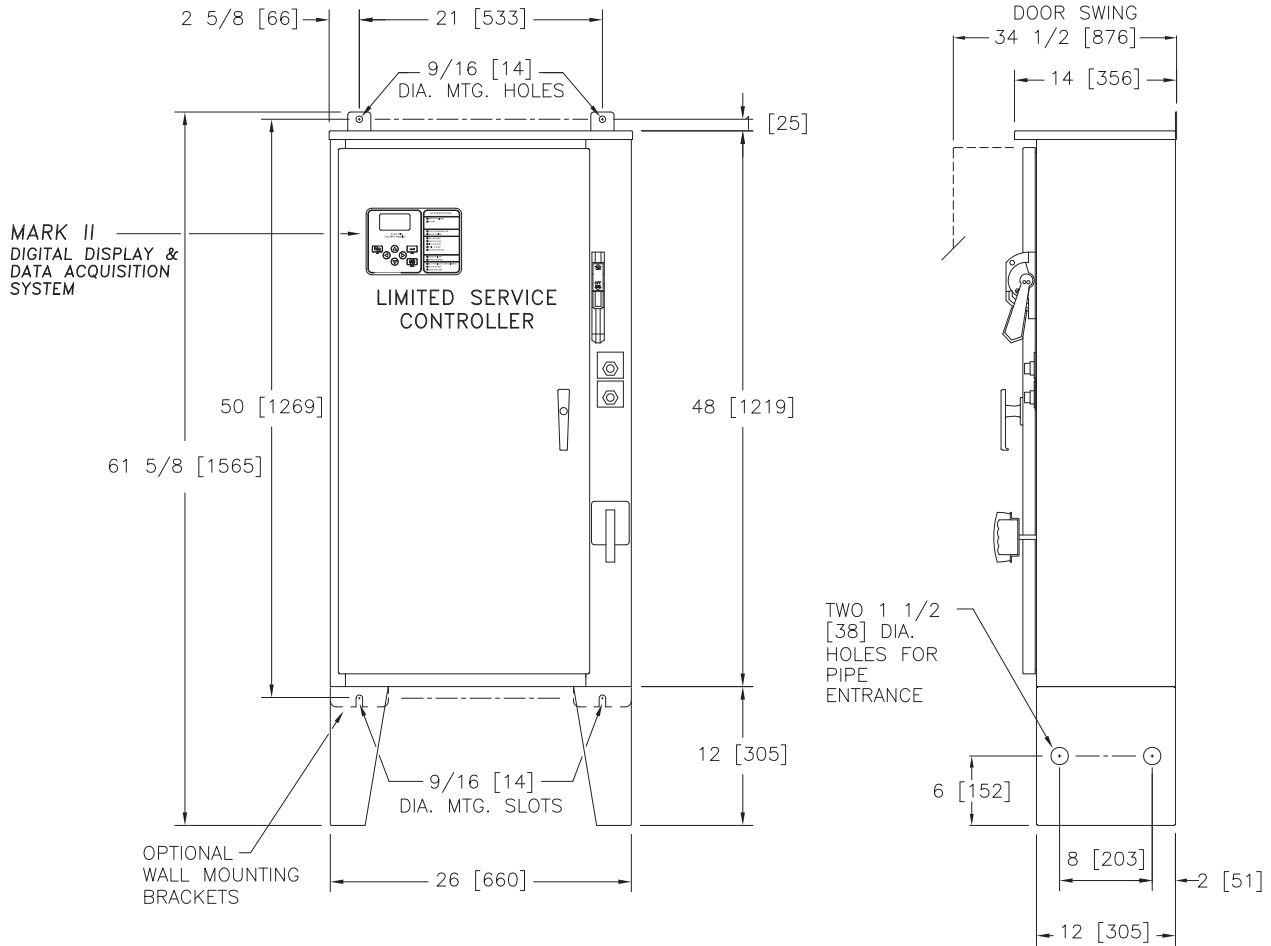
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Publication SD740-50 Rev. E



Mark IIx6 IØ Limited Service Electric Fire Pump Controllers

Dimensions and Shipping Weight
FTA740
 Single Phase Starting



APPROXIMATE SHIPPING WEIGHT
 200 [91]

DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F [5°C].

ALL DIMENSIONS - INCHES [MM]
 SHIPPING WEIGHT - POUNDS [KG]

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

	SIZE	A	BY	DATE
	DRAWN BY	TEF	06-04-13	
	FINAL APPROVAL	TEF	06-04-13	



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UPDATED TITLE BLOCK		A	280889	JMW	TEF	09-16-19
NEW ISSUE		-	242752	YEF	TEF	06-04-13
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
DIMENSIONS & SHIPPING WEIGHT		FTA740		DRAWING NUMBER		
SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLER		DD740-51				
DWG REV	A	ECN NO	280889	SHEET 1 OF 1		

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Mark IIx6 IØ Limited Service Electric Fire Pump Controllers

Field Connections

FTA740

Single Phase Starting

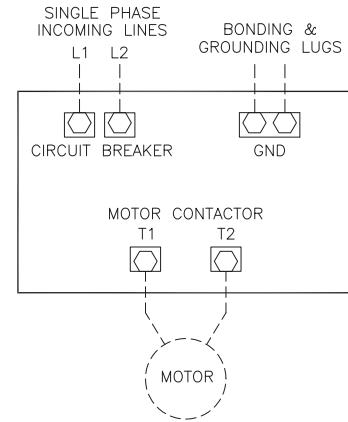
LINE TERMINALS—WIRE CAPACITY AND QUANTITY (CU) ①

MAXIMUM MOTOR HORSEPOWER 200–240V	WIRE SIZE (CU) PER PHASE	WIRE SIZE GROUND LUG (CU)
15	(1) #14 AWG—#1/0 AWG (1) 2.5 MM ² – 50 MM ²	(2) #14 AWG—#2/0 AWG (2) 2.5 MM ² – 70 MM ²

MOTOR TERMINALS—WIRE CAPACITY AND QUANTITY (CU) ①

MAXIMUM MOTOR HORSEPOWER 200–240V	WIRE SIZE (CU) PER PHASE
15	(1) #6 AWG—#2/0 AWG (1) 16 MM ² – 70 MM ²

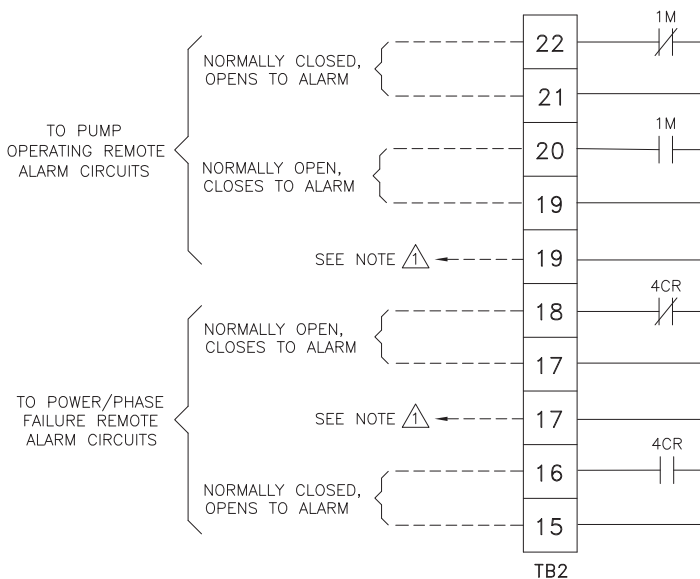
① FOR CORRECT WIRE SIZING, REFER TO NATIONAL ELECTRICAL CODE, NFPA 70.



NOTES

- 1— Incoming line terminals are provided to accommodate wire sizes at 125% of motor full load current per NFPA 70, *National Electrical Code*, Table 430–248, Section 695.6(c), and Table 310–16, 75° rated Copper conductors.
- 2— Motor connections shown are typical. Since motor connections vary widely, refer to the motor connection diagram for specific wiring arrangement.

REMOTE ALARM TERMINAL BLOCKS



PRESSURE SYSTEM CONNECTION
1/2" FNPT

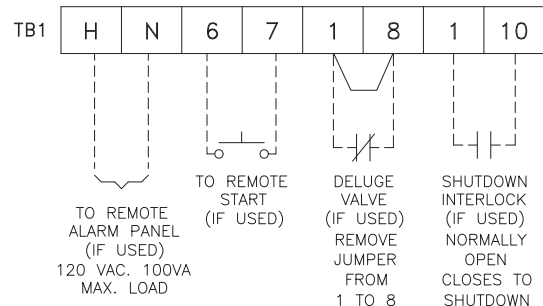
—NOTE—
ALARM CONTACT RATING PILOT DUTY
250 VAC, 30 VDC
10 A. MAX. LOAD

△ SPARE TERMINALS PROVIDED FOR PARALLEL CONNECTION OF REMOTE ALARMS (IF REQUIRED)

NOTE: TERMINALS FOR CUSTOMER CONNECTIONS REQUIRE 3.5MM SLOTTED SCREW DRIVER

TERMINAL TIGHTENING TORQUE		
TERMINAL TYPE	WIRE SIZE	TIGHTENING TORQUE
CONTROL AND ALARM TERMINALS	#14–12 AWG [2.5–4 MM ²]	5.6 lb-in [.6 Nm]

CONTROL TERMINAL BLOCKS



UPDATED TITLE BLOCK		A	280889	JMW	TEF	09-16-19
NEW ISSUE		-	242752	TEF	TEF	06-04-13
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
FIELD CONNECTIONS		FTA740		DRAWING NUMBER		
SINGLE PHASE LIMITED SERVICE CONTROLLER				FC740-50		
DWG REV A		ECN NO 280889		SHEET 1 OF 1		

SIZE	A	BY	DATE
DRAWN BY	TEF	06-04-13	
FINAL APPROVAL	TEF	06-04-13	



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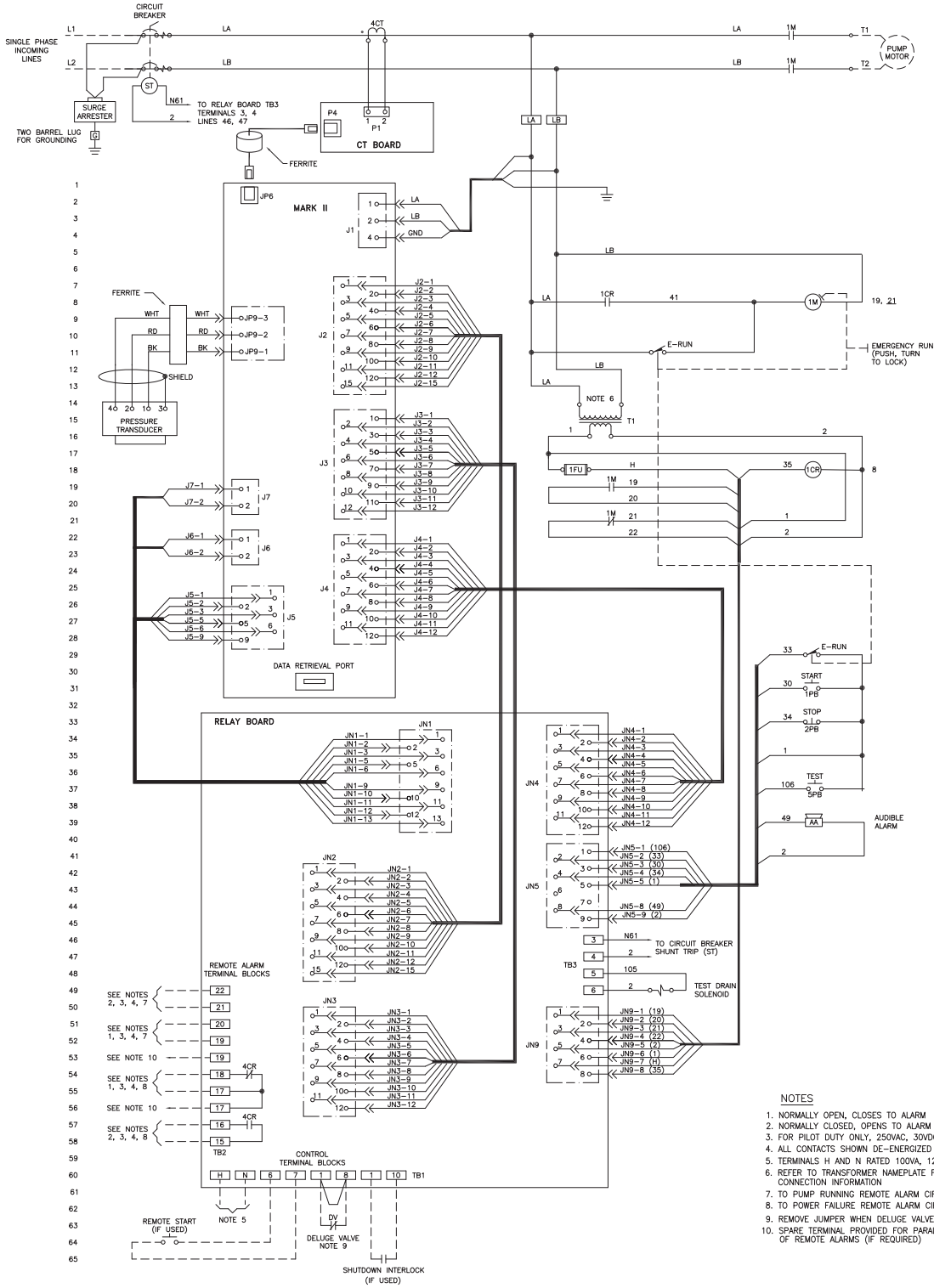


Mark IIx6 IØ Limited Service Electric Fire Pump Controllers

Wiring Schematic

FTA740

Single Phase Starting



- NOTES**
1. NORMALLY OPEN, CLOSSES TO ALARM
 2. NORMALLY CLOSED, OPENS TO ALARM
 3. FOR PILOT DUTY ONLY, 250VAC, 30VDC, 10A. MAX. LOAD
 4. ALL CONTACTS SHOWN DE-ENERGIZED
 5. TERMINALS H AND N RATED 100VA, 120VAC MAX. LOAD
 6. REFER TO TRANSFORMER NAMEPLATE FOR CONNECTION INFORMATION
 7. TO PUMP RUNNING REMOTE ALARM CIRCUITS
 8. TO POWER FAILURE REMOTE ALARM CIRCUITS
 9. REMOVE JUMPER WHEN DELUGE VALVE CONTACT IS USED
 10. SPARE TERMINAL PROVIDED FOR PARALLEL CONNECTION OF REMOTE ALARMS (IF REQUIRED)

UPDATED TITLE BLOCK		B	280889	JMW	TEF	09-16-19
REVISED TO BE IN COMPLIANCE WITH UL218 THIRD EDITION		A	271029	JMW	TEF	02-07-18
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
WIRING SCHEMATIC		FTA740		DRAWING NUMBER		
SINGLE PHASE LIMITED SERVICE CONTROLLER				WS740-50		
DWG REV B		ECN NO 280889		SHEET 1 OF 1		

THIRD ANGLE PROJECTION	SIZE	A	BY	DATE
	DRAWN BY	TEF	06-04-13	
	FINAL APPROVAL	TEF	06-04-13	



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