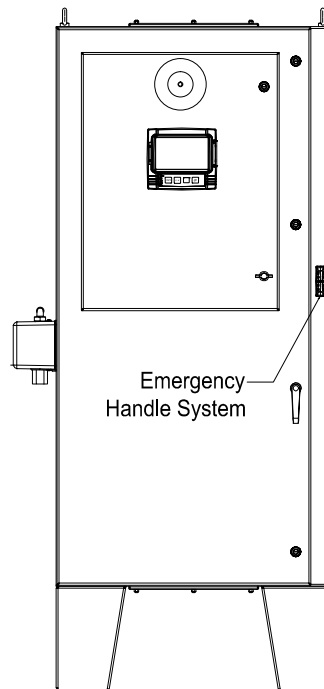


MARK^{III} Medium Voltage Electric Fire Pump Controller – Across The Line Starting

Project Information



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

Firetrol, Inc.

3412 Apex Peakway
Apex, North Carolina 27502
P 919 460 5200
F 919 460 5250
www.firetrol.com

While every precaution has been taken to ensure accuracy and completeness herein, Firetrol, Inc. assumes no responsibility, and disclaims all liability, for damages resulting from use of this information or for any errors or omissions. Specifications and drawings are subject to change without notice. ©2019 Firetrol, Inc., All Rights Reserved.

Firetrol MARK^{III} Electric Fire Pump Controller

FTA2000 – Medium Voltage Across The Line 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)

The controller shall be approved by:

Factory Mutual (IEC 62091)

The City of New York for fire pump service

1.2 Enclosure

The controller components shall be housed in a NEMA Type 2 (IEC IP22) drip-proof enclosure. The enclosure shall consist of 3 compartments with individual doors for the starter, power transformer and control circuits. Back, Top and Bottom removable gland plates shall be provided along with lifting lugs and a lockable handle.

1.3 Isolation Switch

The controller shall be equipped with an isolating switch and shall be operated by an external handle. The operator shall be mechanically interlocked with the medium voltage compartment door and with the contactor so that with the handle in the ON position, the mechanism shall inhibit opening or closing the isolating switch if the contactor is in the CLOSED position.

1.4 Operator Interface

The operator interface shall be a 7.0" LCD color touch screen (HMI technology) powered by an embedded microcomputer with software PLC logic. Included shall be keypad type push-buttons for START, STOP and TEST.

The screen shall include menus for: *Home · Alarms · Configuration · History · Service · Manuals · Language*.

The HMI shall graphically display the following: *Voltage and Amperage of all 3 phases simultaneously using true RMS Technology · Motor Stopped/Running · Starting Cause · Actuation Mode · Controller Type · Shutdown Mode · Date & Time · Pump Room Temp. · System Pressure*

System pressure shall be capable of being displayed as: *PSI, kPa, Bar, Feet of Head or Meters of Water*.

The HMI shall allow programming and display of: *Cut In & Cut Out Pressure Settings* · *Minimum Run Timer* · *Sequential Start Timer* · *Periodic Test Timer*

The HMI allows the user to select the language of the system and download the manual or view the manual on screen.

1.5 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.

1.6 Digital Status/Alarm Messages

The digital display shall indicate text messages for the status and alarm conditions of: Control Voltage Not Healthy · Fail To Start · Invalid Cut-In · Locked Rotor · Loss of Power · Low Ambient Temp. · Low Water Level · Motor Trouble · Phase Reversal · Under/Over current · Under/Over voltage · Phase Loss L1 / L2 / L3 · Phase Unbalanced · Pressure Transducer Fault Detected · Pump Room Alarm · Service Required · Check Test Solenoid · Weekly Test Cut-In Reached

1.7 Visual Indicators

Visual indications shall be provided for:

Power Available · Motor Run · Periodic Test · Manual Start · Deluge Valve Start · Remote Automatic Start · Remote Manual Start · Emergency Start · Pump On Demand (Automatic Start) · Low Discharge Pressure · Pump Room Temp. · Lockout

Audible and visible alarm shall be provided for: Fail To Start

1.8 Remote Alarm Contacts

Remote Alarm contacts shall be provided for:

Power Available · Phase Reversal · Motor Run · Common Pump Room Alarm (Overvoltage, Undervoltage, Phase Unbalance, Low/High Pump Room Temperature) · Common Motor Trouble (Overcurrent, Fail To Start, Undercurrent, Ground Fault)

1.9 Pressure and Event Recording

The system shall be capable of logging pressure data and operational events with time/date stamp. The system shall display operational events for the lifetime of the controller and display the pressure data in text or graphical form. The controller shall log the Date/Time of the first start-up and the controller total power on time from that date. The controller shall log first and last statistics for:

First Setup · *On Time* · *Start Count* · *Last Start Time* · *Min/Max/Average System Pressure* · *Min/Max/Average Pump Room Temp.* · *Jockey Pump On Time/Start Count/Last Start Time* · *Phase to Phase Voltages with Date Stamp* · *Amps Per Phase with Date Stamp*

2.0 USB Host Controller

A USB port capable of accepting a USB Flash Memory Disk shall be provided for downloading pressure and event logs.

2.1 Serial Communications

The controller shall feature Modbus with TCP/IP frame format and shielded female RJ45 connector

2.2 Pressure Sensing / Wet Parts

The controller shall be supplied with a solid state pressure transducer with a range of 0-500 psi calibrated for 0-300 psi (0-20.7 bar) and a run test solenoid valve. The wet parts shall be externally mounted and include a protective cover. The pressure sensing line connection to the transducer shall be 1/2-inch FNPT. Provisions for a redundant pressure transducer shall be provided.

2.3 Controller Operation

The controller shall be capable of automatic starting via pressure drop, remote start signal from an automatic device or a deluge valve. The controller can be manually started via the START push-button, the RUN TEST push-button, or a remote signal from a manual device. Stopping can be achieved manually with the STOP push-button or automatically after expiration of minimum run timer or test timer. The minimum run timer (off delay), sequential start timer (on delay) and periodic test timer shall be field adjustable and include a visual countdown on the display. A 240V test connection shall be provided with a Normal/Test selector switch for testing of the controller control circuit.

2.4 Manufacturer

The controller shall be a Firetrol brand.

MARK^{III} Medium Voltage Electric Fire Pump Controllers – Across The Line Starting



Firetrol® FTA2000 combined automatic and manual class E2 medium voltage controllers are intended for starting of squirrel cage motors driving listed fire pumps. Maximum ratings are as follows:

Voltage	Maximum Horsepower
2200-2300	1000
3000-3300	1500
4000-4160	2000
4800-5500	2500
6000	3500
6300-6900	4000
7200	4500

Approvals – Firetrol fire pump controllers are listed by Underwriters' Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*, CSA, *Standard for Industrial Control Equipment*, and approved by Factory Mutual. 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:

- Current Limiting Fuses designed to hold 600% of motor full load current for minimum 100 sec.
- Locked Rotor Protection set at 600% of motor full load current designed to trip between 8 and 20 seconds
- Vacuum Type Motor Contactor
- Flange Mounted Single Handle 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
- Daylight Savings Time Option
- Elapsed Time Meter
- 7.0" LCD color touch screen (HMI technology) software upgradeable operator interface powered by an embedded microcomputer with software PLC logic.
- 500 PSI Pressure Transducer (calibrated for 300 PSI (20.7 Bar)) and Test Solenoid for fresh water applications, externally mounted with protective cover
- Audible Alarm Bell
- Pump Room Ambient Temperature Switch, Display and Alarms
- Pressure and Event Recording with Date Stamp to System Memory Accessible VIA The User Interface and Downloadable to a USB Flash Drive
- Modbus Communications with TCP/IP frame format and a shielded female RJ45 connector
- NEMA Type 2 (IEC IP22) enclosure with back, top and bottom removable gland plates, lockable handle and controller lifting lugs
- The controller supplies visual indication of the following: Power Available • Motor Run • Periodic Test • Manual Start • Deluge Valve Start • Remote Automatic Start • Remote Manual Start • Emergency Start • Pump On Demand (Automatic Start) • Low Discharge Pressure • Pump Room Temp. • Lockout

- The controller displays visual indication for the following alarm conditions: Control Voltage Not Healthy • Fail To Start • Invalid Cut-In • Locked Rotor • Loss of Power • Low Ambient Temp. • Low Water Level • Motor Trouble • Phase Reversal • Under/Over current • Under/Over voltage • Phase Loss L1 / L2 / L3 • Phase Unbalanced • Pressure Transducer Fault Detected • Pump Room Alarm • Service Required • Check Test Solenoid • Weekly Test Cut-In Reached
- Audible and Visible Indication for Fail To Start.
- DPDT 8A, 250VAC remote alarm contacts are provided for: Power Available • Phase Reversal • Motor Run • Common Pump Room Alarm (Overvoltage / Undervoltage / Phase Unbalance / Low Pump Room Temp. / High Pump Room Temp) • Common Motor Trouble (Overcurrent / Fail To Start / Undercurrent / Ground Fault)
- Field Adjustable Timers with Visual Countdown for Minimum Run (Off Delay), Sequential Start (On Delay) and Weekly Test

For Model # Information see Publication SD2000-60

For Controller Options and Modifications, see publication OP2000-71

Firetrol, Inc.

3412 Apex Peakway
Apex, North Carolina 27502
P +1 919 460 5200
F +1 919 460 5250
www.firetrol.com

While every precaution has been taken to ensure accuracy and completeness herein, Firetrol, Inc. assumes no responsibility, and disclaims all liability, for damages resulting from use of this information or for any errors or omissions. Specifications and drawings are subject to change without notice. ©2019 Firetrol, Inc., All Rights Reserved.

Publication PD2000-60 Rev. A

Model Number Selection Guide



FTA2000

MARK^{III} Medium Voltage Electric Fire Pump Controllers - Across The Line Starting

FTA2000- L

(Example: FTA2000-AL500P-P)

FTA NUMBER

FTA2000

TIMER OPTION

- A With minimum run timer
- C Manual Start-Stop only

HORSEPOWER

(See chart for available HP/Voltage combinations)

Horsepower Rating

03 - 3 HP	600 - 600 HP
05 - 5 HP	700 - 700 HP
07 - 7 1/2 HP	800 - 800 HP
10 - 10 HP	900 - 900 HP
15 - 15 HP	1000 - 1000 HP
20 - 20 HP	1250 - 1250 HP
25 - 25 HP	1500 - 1500 HP
30 - 30 HP	1750 - 1750 HP
40 - 40 HP	2000 - 2000 HP
50 - 50 HP	2250 - 2250 HP
60 - 60 HP	2500 - 2500 HP
75 - 75 HP	2750 - 2750 HP
100 - 100 HP	3000 - 3000 HP
125 - 125 HP	3500 - 3500 HP
150 - 150 HP	4000 - 4000 HP
200 - 200 HP	4500 - 4500 HP
250 - 250 HP	
300 - 300 HP	
350 - 350 HP	
400 - 400 HP	
450 - 450 HP	
500 - 500 HP	

Options & Modifications

See publication OP2000-71 for
Options and Modifications

VOLTAGE (50/60 Hertz)

J	2300V
G	3000V
L	3300V
K	4160V
N	5500V
P	6000V
Q	6300V
R	6600V
M	6900V
Z	7200V

Voltage	Maximum Horsepower
2200-2300	1000
3000-3300	1500
4000-4160	2000
4800-5500	2500
6000	3500
6300-6900	4000
7200	4500

Firetrol, Inc.

3412 Apex Peakway
Apex, North Carolina 27502
P +1 919 460 5200
F +1 919 460 5250
www.firetrol.com

While every precaution has been taken to ensure accuracy and completeness herein, Firetrol, Inc. assumes no responsibility, and disclaims all liability, for damages resulting from use of this information or for any errors or omissions. Specifications and drawings are subject to change without notice. ©2019 Firetrol, Inc., All Rights Reserved.

Publication SD2000-60 Rev. B

MARK^{III} Medium Voltage Electric Fire Pump Controllers

SPECIAL ENCLOSURES

Option	Description
---	Enclosure, NEMA Type 2 (IEC IP22), Painted Steel (Standard)
-E	Enclosure, NEMA Type 4 (IEC IP66), Painted Steel
-F	Enclosure, NEMA Type 4X (IEC IP66), #304 Stainless Steel, Brushed Finish
-FD	Enclosure, NEMA Type 4X (IEC IP66), #316 Stainless Steel, Brushed Finish
-FDB	Enclosure, NEMA Type 4X (IEC IP66), #316 Stainless Steel, Seam Welded, Brushed Finish
-FDP	Enclosure, NEMA Type 4X (IEC IP66), #316 Stainless Steel, Painted Finish
-FXP	Enclosure, NEMA Type 4X (IEC IP66), #304 Stainless Steel, Painted Finish
-G	Enclosure, NEMA Type 12 (IEC IP54), Painted Steel
-T	Enclosure, NEMA Type 3R (IEC IP24), Painted Steel
-U	Enclosure, NEMA Type 3 (IEC IP54), Painted Steel

ANTI-CONDENSATION SPACE HEATERS

Option	Description
None	
-J	Space Heater, 120V Externally Powered with Circuit Breaker & Thermostat
-K	Space Heater, 120V Externally Powered with Circuit Breaker & Humidistat
-M	Space Heater, 240V Externally Powered with Circuit Breaker & Thermostat
-N	Space Heater, 240V Externally Powered with Circuit Breaker & Humidistat
-JKP	Space Heater, 120V Externally Powered with Circuit Breaker, Thermostat and Humidistat in Parallel
-MNP	Space Heater, 240V Externally Powered with Circuit Breaker, Thermostat and Humidistat in Parallel

PRESSURE TRANSDUCERS, SOLENOID VALVES, PLUMBING

Option	Description
---	Wetted Parts including Pressure Sensor and Test Solenoid, 300 PSI (20.4 Bar) Fresh Water
-BI	Wetted Parts including Pressure Sensor and Test Solenoid, 500 PSI (34.5 Bar) Fresh Water (For Factory Calibration Purposes Only)
-CI	Wetted Parts including Pressure Sensor and Test Solenoid, 300 PSI (20.4 Bar), Sea Water
-DI	Wetted Parts including Pressure Sensor and Test Solenoid, 500 PSI (34.5 Bar), Sea Water
-SPI	Low Suction Pressure Transducer, Fresh Water, 0-300 PSI (20.4 Bar) with Visible Indication and Output Contacts
-SP2	Low Suction Pressure Transducer, Sea Water, 0-300 PSI (20.4 Bar) with Visible Indication and Output Contacts

ALARMS

Option	Description
-AC	Extra Alarm Output Contacts, Pump Operating (2 Form-C)
-AM	Alarm Output Contacts, Fail to Start
-AV	Alarm Output Contacts, Low Pump Room Temperature
-AW	Alarm Output Contacts, Reservoir Low
-AYI	Configurable Low Suction Pressure, Visible/Output Contacts with External Digital Input
-BWI	Extra Alarm Output Contacts, Phase Failure/Phase Reversal
-BYI	Alarm Output Contacts, Overcurrent
-CTSI	Configurable Low Suction Pressure, Visible/Output Contacts with Suction Pressure Transducer
-EHI	Alarm Output Contacts, Main Relief Valve Open

-EK	Alarm Output Contacts, Flow Meter Open
-JR	Visible Indicator, Jockey Pump Operating
-JT	Alarm, Audible/Visible, Jockey Pump Trouble
-PI	Alarm, Audible/Visible, Built-In 120V Supervisory System (Includes Visible Supervisory Voltage Normal Indication and Audible Pump Operating, Phase Failure and Phase Reversal Indication)
-PT	Alarm, Audible/Visible, Built-In 240V Supervisory System (Includes Visible Supervisory Voltage Normal Indication and Audible Pump Operating, Phase Failure and Phase Reversal Indication)

MISCELLANEOUS

Option	Description
-ED2	Normal Source Load Shedding with Adjustable Time Delay to Remove Non-Critical Loads Before Starting
-EL	Series Pumping Operation, High Zone Controller
-EM	Series Pumping Operation, Mid Zone Controller
-EN	Series Pumping Operation, Low Zone Controller
-GZ	Rating, 50 HZ Operation
-IEC	Marking, CE with External Wet Parts (Requires NEMA Type 12 (IP54) Enclosure as Minimum)
-MZN	Neutral Lug, Service Entrance, Non-Insulated Bonded to Enclosure
-PK	Terminal Blocks, Extra Remote Start
-PY	Output Contacts, Motor Space Heater, Externally Powered
-S	Tropicalization
-USBX	Data Port, External USB
-Y55	Controller Temperature Rating, 55°C (131°F) Ambient Temperature
-ZPM1	Data Port, RS-485 Modbus RTU
-XCR	Export Packaging (Wooden Crating to Conform to IPPC Standards)

Firetrol, Inc.

3412 Apex Peakway
Apex, North Carolina 27502
P +1 919 460 5200
F +1 919 460 5250
www.firetrol.com

While every precaution has been taken to ensure accuracy and completeness herein, Firetrol, Inc. assumes no responsibility, and disclaims all liability, for damages resulting from use of this information or for any errors or omissions. Specifications and drawings are subject to change without notice. ©2019 Firetrol, Inc., All Rights Reserved.

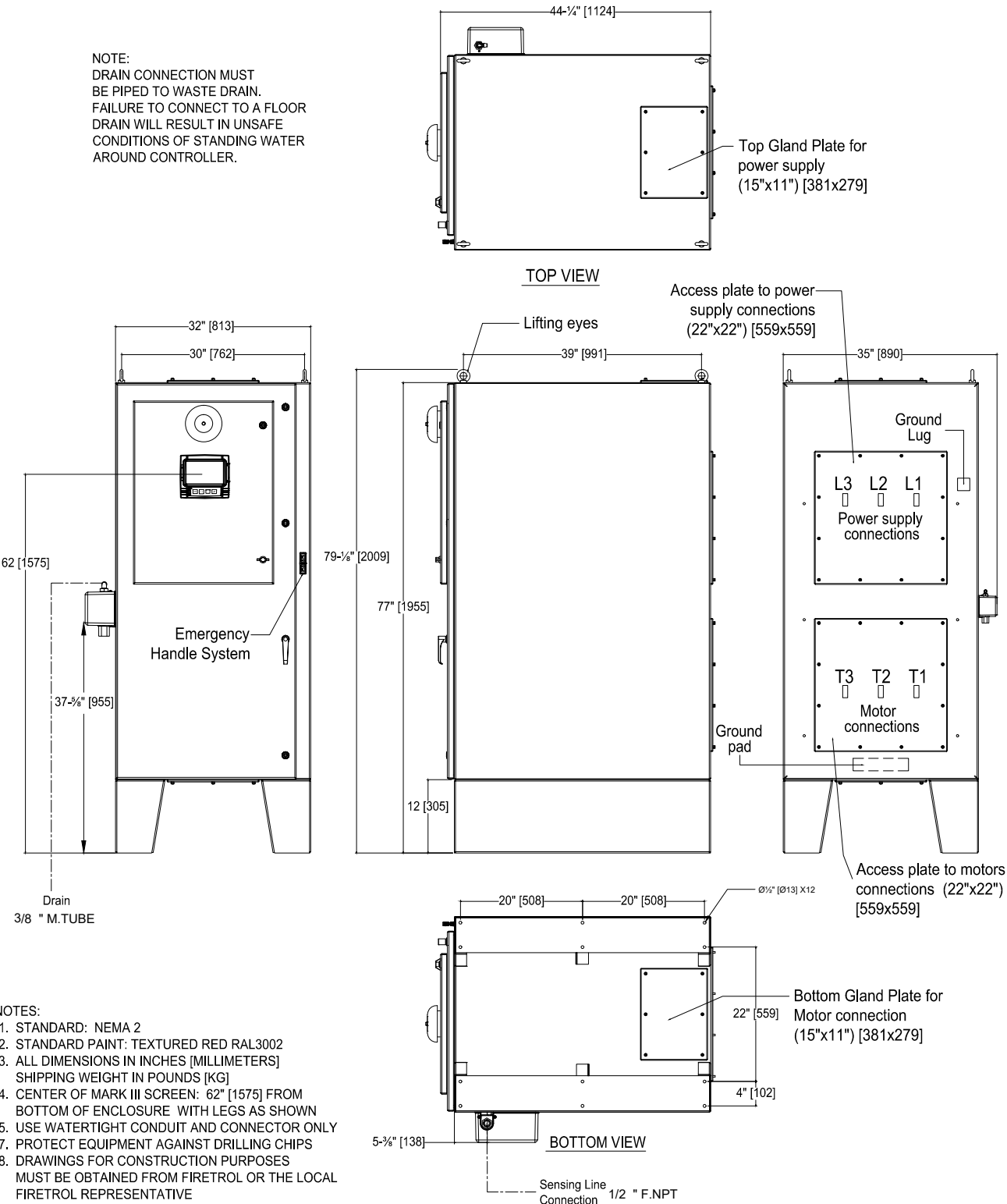
Dimensions and Shipping Weight



FTA2000

MARK^{III} Medium Voltage Electric Fire Pump Controllers - Across The Line Starting

NOTE:
DRAIN CONNECTION MUST
BE PIPED TO WASTE DRAIN.
FAILURE TO CONNECT TO A FLOOR
DRAIN WILL RESULT IN UNSAFE
CONDITIONS OF STANDING WATER
AROUND CONTROLLER.



- NOTES:
1. STANDARD: NEMA 2
 2. STANDARD PAINT: TEXTURED RED RAL3002
 3. ALL DIMENSIONS IN INCHES [MILLIMETERS]
SHIPPING WEIGHT IN POUNDS [KG]
 4. CENTER OF MARK III SCREEN: 62" [1575] FROM
BOTTOM OF ENCLOSURE WITH LEGS AS SHOWN
 5. USE WATERTIGHT CONDUIT AND CONNECTOR ONLY
 7. PROTECT EQUIPMENT AGAINST DRILLING CHIPS
 8. DRAWINGS FOR CONSTRUCTION PURPOSES
MUST BE OBTAINED FROM FIRETROL OR THE LOCAL
FIRETROL REPRESENTATIVE

APPROX SHIPPING WT: 1000 [454]				RELEASED				-	-	CIR	CIR	11-5-19
				REVISION DESCRIPTION				REV	ECN NO	BY	APP	DATE
				DIMENSIONS & SHIPPING WEIGHT				DRAWING NUMBER				
				5/7.2KV CLASS ELECTRIC FIRE PUMP CONTROLLER				DD2000-30				
								DWG REV	ECN NO	SHEET 1 OF 1		

THIRD ANGLE PROJECTION

SIZE **A**

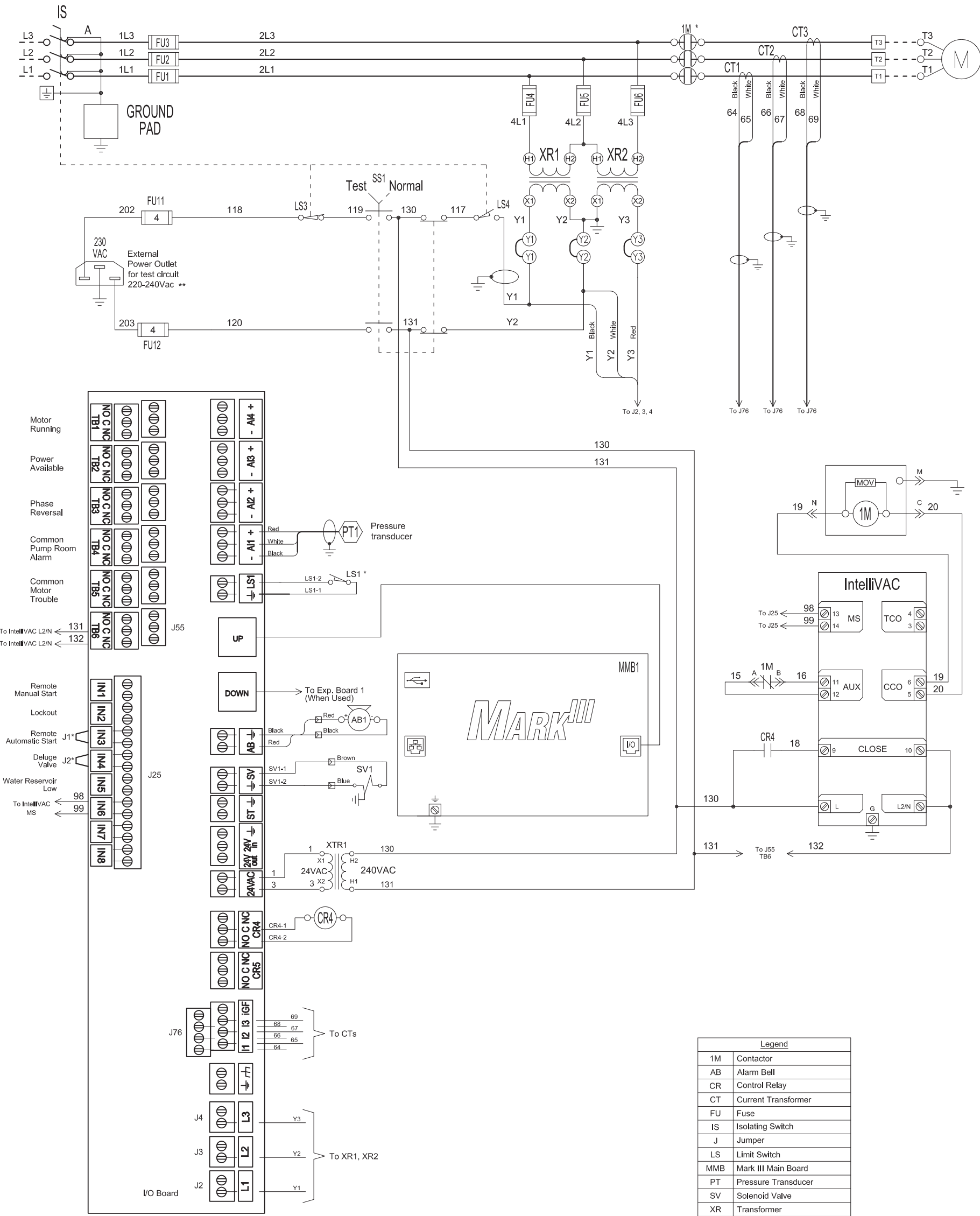
DRAWN BY **CIR** 11-5-19

FINAL APPROVAL **CIR** 11-5-19

Firetrol, Inc.

© Firetrol, Inc. Not for construction.
Subject to change without notice.

MARK^{III} Medium Voltage Electric Fire Pump Controllers – Across The Line Starting



Drawing for information only.
Manufacturer reserves the right to modify this
drawing without notice.
For drawing for approval or installation, please
contact manufacturer.

* Contact closed when Emergency Start is in ON position
** For 110-120Vac Test Circuit order Controller option -Y231



SIZE	B	BY	DATE
DRAWN BY	JMW	12-2-19	
FINAL APPROVAL	CIR	12-2-19	



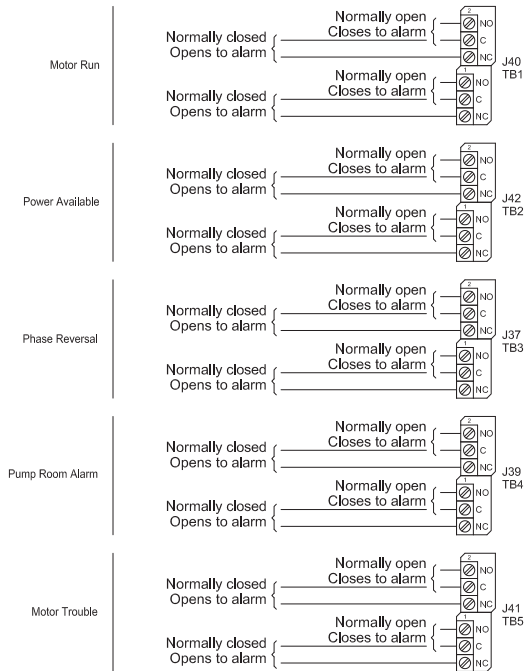
© Firetrol, Inc. Not for construction.
Subject to change without notice.

REVISED TEST CIRCUIT		B	-	TEF	TEF	05/28/21
ADDED CHART		A	-	CIR	CIR	2-18-20
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
WIRING SCHEMATIC		FTA2000		DRAWING NUMBER		
5/7.2KV CLASS ELECTRIC FIRE PUMP CONTROLLER				WS2000-30		
				CDL		
DWG REV		B	ECN NO	-	SHEET 1 OF 1	

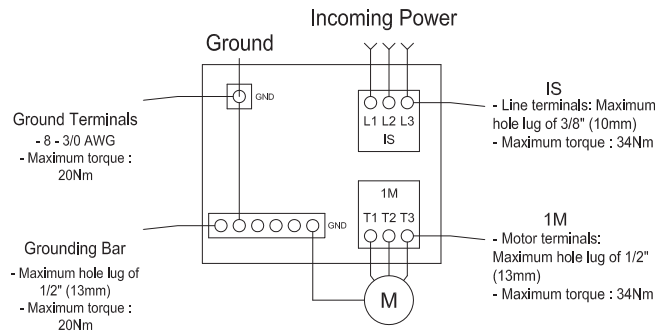
MARK^{III} Medium Voltage Electric Fire Pump Controllers – Across The Line Starting

Remote Alarm Terminals (I/O board)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Power Terminals



Network Connection (VMB1)

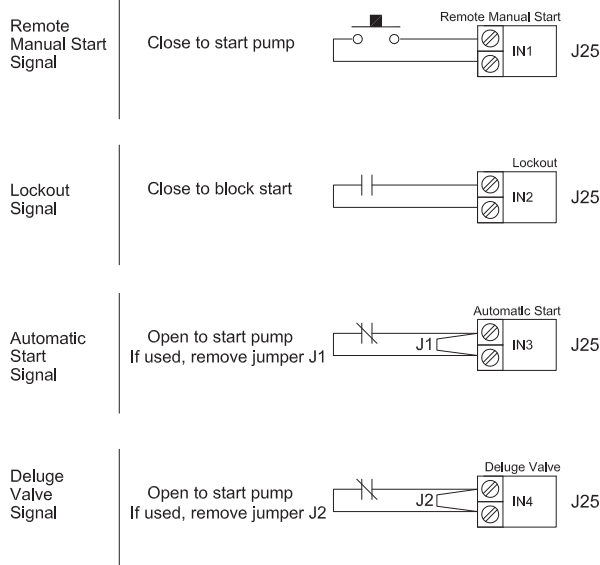
Shielded Female Connector RJ45

Modbus TCP/IP



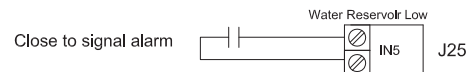
Control Terminals (I/O board)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Alarms Inputs (I/O board)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
For drawing for approval or installation, please contact manufacturer.

SIZE	A	BY	DATE
DRAWN BY	CIR	11-5-19	
FINAL APPROVAL	CIR	11-5-19	



© Firetrol, Inc. Not for construction.
Subject to change without notice.

REVISED TO CURRENT MANUFACTURING		A	-	TEF	TEF	5-28-21
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
FIELD CONNECTIONS		FTA2000				
5/7KV ELECTRIC FIRE PUMP CONTROLLER		DRAWING NUMBER				
		WS2000-30				
		DWG REV	A	ECN NO	-	SHEET 1 OF 1

All rights reserved. The drawing and the information contained or depicted herein are the sole property of Firetrol, Inc. Copies are communicated to the recipient in strict confidence and may not be retransmitted, published, reproduced, copied or used in any manner, including as the basis for the manufacture or sale of any products, without the express prior written consent of Firetrol, Inc.