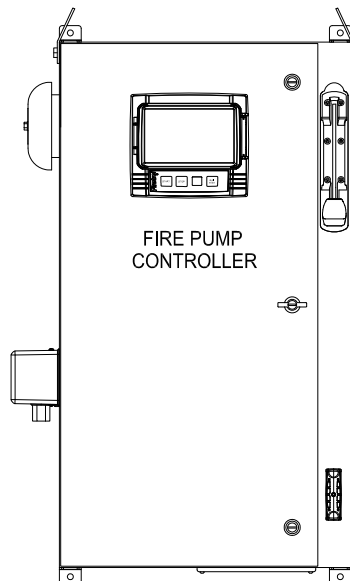

MARK^{III} 1Ø Limited Service Electric Fire Pump Controller – Across The Line Starting

Project Information



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

Firetrol, Inc.

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Publication SBP740-70 Rev. C

Firetrol Mark II_{SG} Single Phase Limited Service Electric Fire Pump Controller

FTA740 – 1 Ø 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 with bottom entry gland plate and lifting lugs.

1.3 Withstand Ratings (Short Circuit Current Ratings)

All controller components shall be front mounted, wired and front accessible for maintenance. The available short circuit current ratings are shown below:

Code	200-208V 1-2 HP	200-208V 3-15 HP	220-240V 1-3 HP	220-240 5-15 HP
D - Standard	65kA	65kA	65kA	65kA

1.4 Power Components

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. The controller shall be suitable for use as service equipment.

The controller will include a voltage surge arrestor and Across the Line motor starter. The controller shall be equipped with a single handle, manually operated, emergency start mechanism capable of being latched in the ON position.

1.5 Operator Interface (HMI)

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 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.

1.6 State and Alarm Indication

Visual indication shall be provided for 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 • Pump Room Temperature • Lockout

The digital display shall visually indicate the following alarms:

• Locked Rotor Current • Fail To Start • Under/Over Current • Under/Over Voltage • Check Test Solenoid Valve • Weekly Test Cut-In Not Reached • Transducer Fault • Control Voltage Not Healthy • Motor Trouble • Pump Room Alarm • Invalid Cut-In • Power Loss • Low Water Level • Pump On Demand • Low Ambient Temp. • Service Required

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

Remote Alarm contacts shall be provided for:

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

1.7 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*

1.8 USB Host Controller

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

1.9 Serial Communications

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

2.0 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.

2.1 Seismic Certification

The controller shall be certified to meet or exceed the requirements of the 2015 International Building Code, the 2016 California Building Code and OSHPD Special Seismic Certification Preapproval - OSP. The controller test criteria shall be per ICC-ES AC156 and the Seismic Parameters per ASCE 7-10 Chapter 13.

2.2 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.

2.3 Manufacturer

The controller shall be a Firetrol brand.

Firetrol, Inc.

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Publication SP740-60

MARK^{III} 1Ø Limited Service Electric Fire Pump Controllers – Across The Line 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
- Circuit Breaker (inverse time non adjustable) rated between 150% and 250% of motor full load current
- Single Handle Circuit Breaker mechanism
- Motor contactor
- 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
- Suitable for use as Service Equipment
- 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 • Lock Rotor Current • Loss of Power • Low Ambient Temp. • Low Water Level • Motor Trouble • Overcurrent • Overvoltage • Pressure Transducer Fault Detected • Pump On Demand • Pump Room Alarm • Service Required • Undercurrent • Undervoltage • 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
 - Motor Run
 - Common Pump Room Alarm (Overvoltage / Undervoltage / 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
- Seismic Certification per IBC 2015, CBC 2016
(Consult Factory for Verification)

For Model # information see Publication SD740-60

For Options and Modifications see Publication OP740-61

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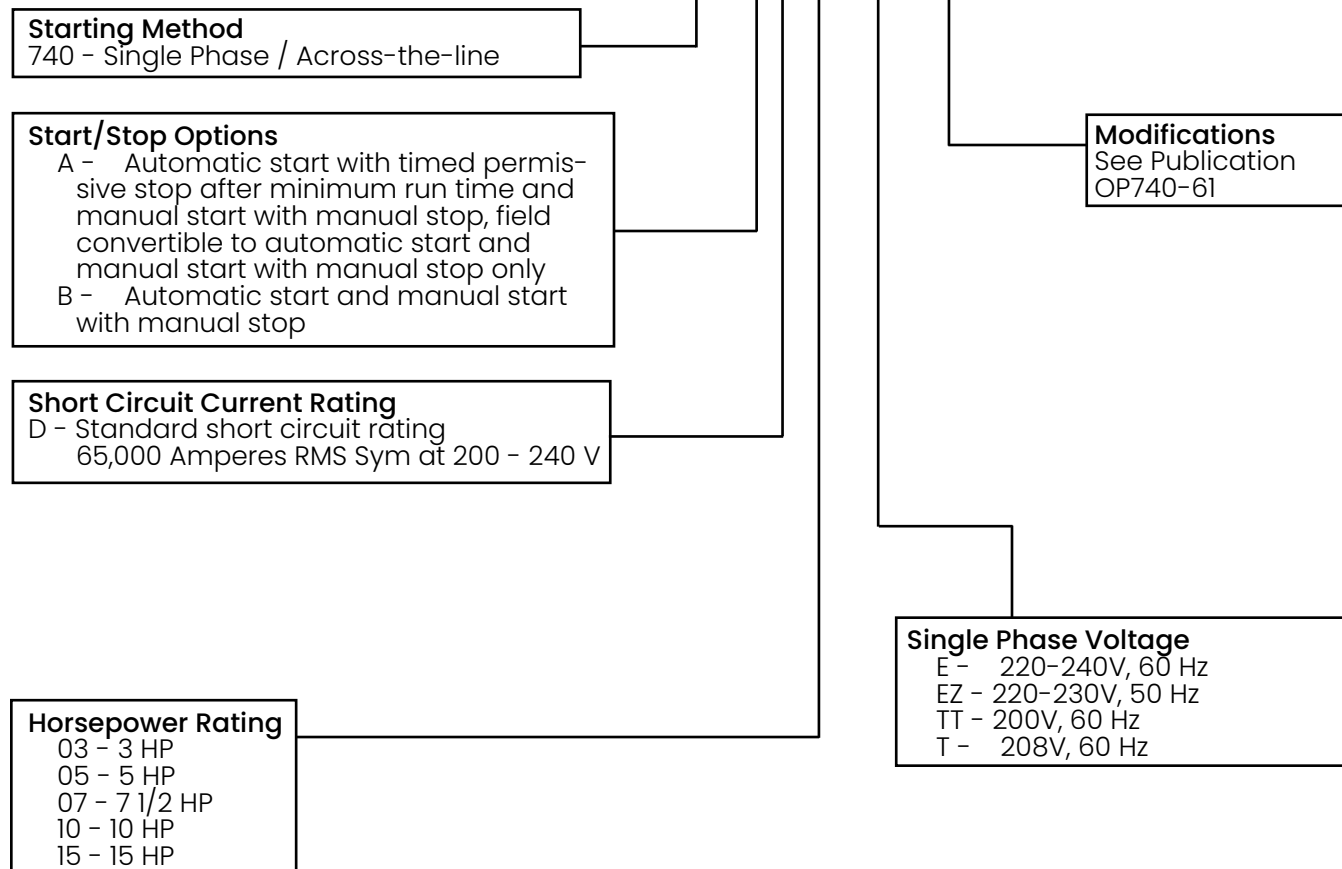
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Publication PD740-60 Rev. A

Mark IIxG 1Ø Limited Service Electric Fire Pump Controller – Across The Line Starting

SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLERS

Example: FTA740-AD15 EZ- xx



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Publication SD740-60 Rev. A

MARK^{III} 1Ø Limited Service Electric Fire Pump Controllers – Across The Line Starting

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
-B1	Wetted Parts including Pressure Sensor and Test Solenoid, 500 PSI (34.5 Bar) Fresh Water (For Factory Calibration Purposes Only)
-C1	Wetted Parts including Pressure Sensor and Test Solenoid, 300 PSI (20.4 Bar), Sea Water
-D1	Wetted Parts including Pressure Sensor and Test Solenoid, 500 PSI (34.5 Bar), Sea Water
-SP1	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
-AY1	Configurable Low Suction Pressure, Visible/Output Contacts with External Digital Input
-BY1	Alarm Output Contacts, Overcurrent
-CTSI	Configurable Low Suction Pressure, Visible/Output Contacts with Suction Pressure Transducer
-EH1	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
-KH	Alarm Output Contacts, Common Alarm
-PE	Alarm Output Contacts, Low System Pressure (Pump on Demand)

FOAM PUMP APPLICATIONS

Option

Description

Required For Foam

- LR1 Low Foam Level External Input, Visible Indications and Alarm Contacts, Additive with Provisions for Proof Pressure Switch Connection, With Lockout and Remote Alarm Indication For Interlock On (Locked Out)

Required For Foam

- LK1 Foam Pump Application With Pressure Transducer and Run Test Solenoid Valve
- LK2 Foam Pump Application With Pressure Transducer and Run Test Solenoid Valve, Stainless Steel
- LK3 Foam Pump Application Without Pressure Transducer and Run Test Solenoid Valve

Optional For Foam

- DVC Operation, Dump Valve Control

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
- IEC Marking, CE with External Wet Parts (Requires NEMA Type 12 (IP54) Enclosure as Minimum)
- 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
- YCR Export Packaging (Wooden Crating to Conform to IPPC Standards)

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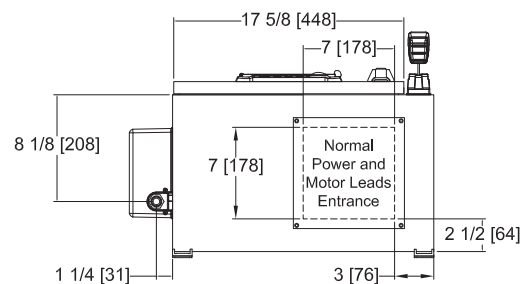
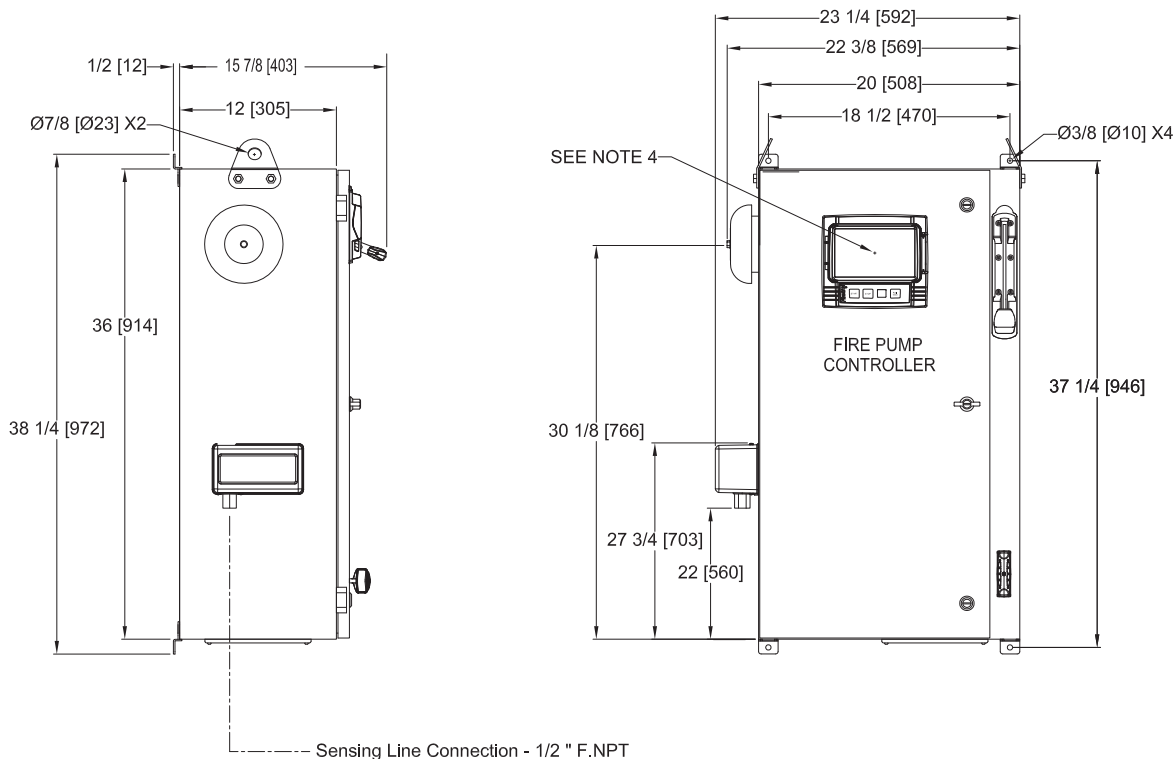
Publication OP740-61 Rev. A

Dimensions and Shipping Weight



FTA740

MARK^{III} 1Ø Limited Service Electric Fire Pump Controllers - Across The Line Starting





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: 29 5/8 [751] FROM BOTTOM OF ENCLOSURE
5. BOTTOM CONDUIT ENTRANCE THROUGH REMOVABLE GLAND PLATE RECOMMENDED
6. USE WATERTIGHT CONDUIT AND CONNECTOR ONLY
7. PROTECT EQUIPMENT AGAINST DRILLING CHIPS
8. DOOR SWING EQUAL TO DOOR WIDTH
9. DRAWINGS FOR CONSTRUCTION PURPOSES MUST BE OBTAINED FROM FIRETROL OR THE LOCAL FIRETROL REPRESENTATIVE

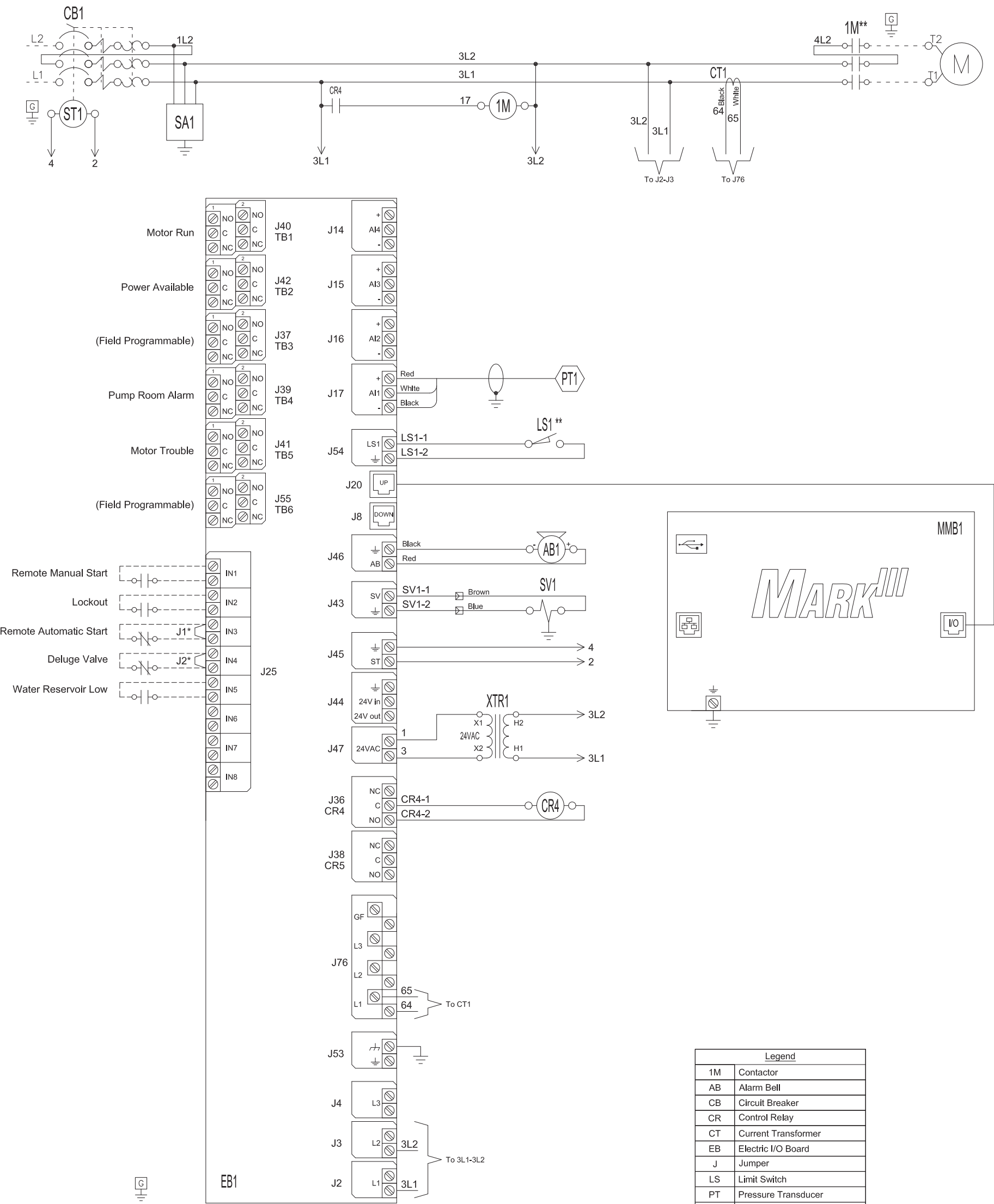
VOLTAGE/POWER TABLE

LINE VOLTAGE/HZ	MOTOR HORSEPOWER
110-120/60	1-7.5
200-208/50-60	3-15
230-240/50-60	3-15
APPROX SHIPPING WT: 80 [36]	

<div> THIRD ANGLE PROJECTION</div>	SIZE	A	BY	DATE	<div>Firetrol, Inc. © Firetrol, Inc. Not for construction. Subject to change without notice.</div>	RELEASED		-	-	CIR	CIR	11-5-19
	DRAWN BY	CIR	11-5-19	REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE		
	FINAL APPROVAL	CIR	11-5-19	DIMENSIONS AND SHIPPING WEIGHT		FTA740		DRAWING NUMBER				
				SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLER		DD740-70						
						DWG REV	-	ECN NO	-	SHEET 1 OF 1		

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
MARK^{III} 1Ø Limited Service Electric Fire Pump Controllers – Across The Line Starting



* Remove jumper to use this feature
** Contact closes when emergency start is in "ON" position

Legend	
1M	Contactor
AB	Alarm Bell
CB	Circuit Breaker
CR	Control Relay
CT	Current Transformer
EB	Electric I/O Board
J	Jumper
LS	Limit Switch
PT	Pressure Transducer
SA	Surge Arrester
ST	Shunt Trip
SV	Solenoid Valve
MMB	Mark III Main Board
XTR	Transformer

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 THIRD ANGLE PROJECTION	SIZE B	BY	DATE	 Firetrol, Inc. © Firetrol, Inc. Not for construction. Subject to change without notice.	REVISION DESCRIPTION			REV	ECN NO	BY	APP	DATE	
	DRAWN BY	JMW	12-2-19		WIRING SCHEMATIC		FTA740		DRAWING NUMBER WS740-70				
	FINAL APPROVAL	CIR	12-2-19		SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLER				DWG REV -		ECN NO -	SHEET 1 OF 1	
													

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Field Connections

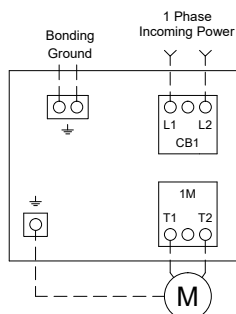
Line & Motor Wire Terminal Capacity



FTA740

MARK^{III} 1Ø Limited Service Electric Fire Pump Controllers – Across The Line Starting

Line Terminals



Notes:

- 1 - For proper wire sizing, refer to NFPA70 and NEC (USA) or CEC (Canada) or local code.
- 2 - Controller suitable for service entrance in USA.
- 3 - For more accurate motor connections refer to motor manufacturer or motor nameplate.
- 4 - Controller is phase sensitive. Incoming lines must be connected in ABC sequence.
- 5 - Field wiring and lug sizes are based on copper conductors only. Do not use aluminium conductors.

Circuit breaker (CB) Field Wiring according to Bending Space (AWG or MCM). TERMINALS L1 - L2


Bending Space	3 " (76 mm)					
HP Voltage	1	3	5	7.5	10	15
110 to 120	1x (10 to 1)	1x (8 to 1)	1x (6 to 1)	1x (4 to 1)	N/A	N/A
200 to 208	N/A	1x (10 to 1)	1x (8 to 1)	1x (6 to 1)	1x (4 to 1)	1x (3 to 1)
220 to 240	N/A	1x (10 to 1)	1x (8 to 1)	1x (8 to 1)	1x (6 to 1)	1x (3 to 1)


(Use Copper Conductors Only)

Wiring Size for motor connection for FTA740 Models (AWG or MCM). TERMINALS T1 - T2

HP Voltage	1	3	5	7.5	10	15
110 to 120	1x (10 to 1)	1x (8 to 1)	1x (6 to 1)	1x (4 to 1)	N/A	N/A
200 to 208	N/A	1x (10 to 1)	1x (8 to 1)	1x (6 to 1)	1x (4 to 1)	1x (3 to 1)
220 to 240	N/A	1x (10 to 1)	1x (8 to 1)	1x (8 to 1)	1x (6 to 1)	1x (3 to 1)

(Use Copper Conductors Only)

 THIRD ANGLE PROJECTION	SIZE	A	BY	DATE					REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE	
	DRAWN BY	CIR	11-12-19					FIELD CONNECTIONS		FTA740		DRAWING NUMBER				
	FINAL APPROVAL	CIR	11-12-19					SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLER				FC740-70				
							DWG REV -			ECN NO -		SHEET 1 OF 1				

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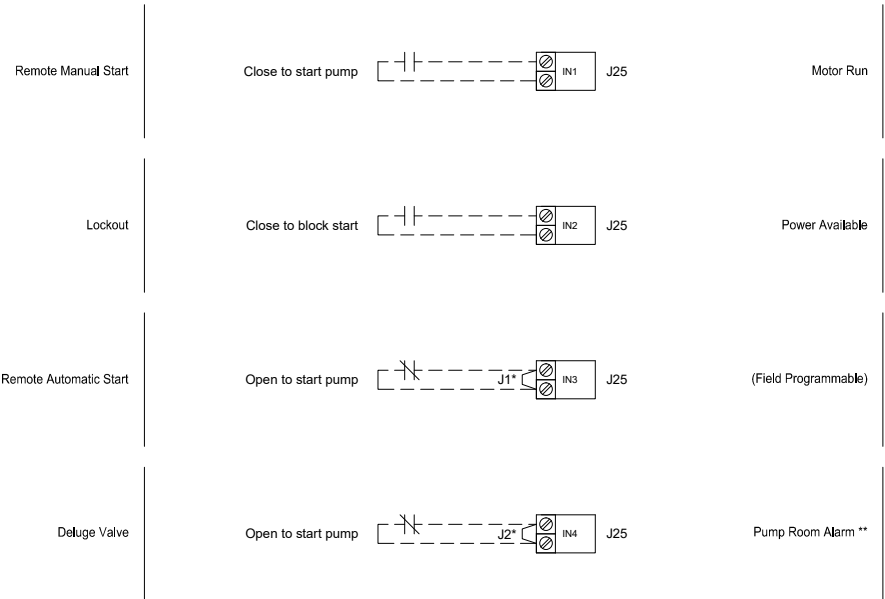
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MARK^{III} 1Ø Limited Service Electric Fire Pump Controllers – Across The Line Starting

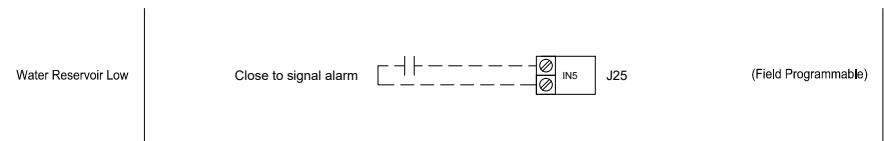
Control Terminals (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



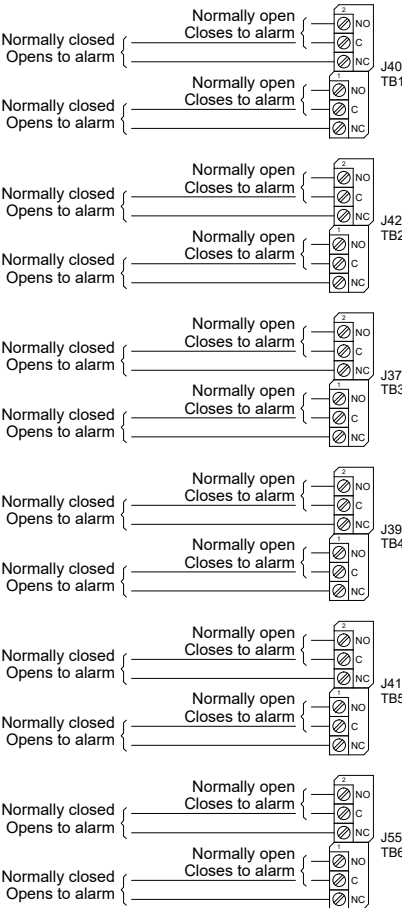
Alarm Inputs (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Remote Alarm Terminals (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm





Network Connection (VMB1)

Shielded Female Connector RJ45



* Remove jumper to use this feature
** Re-assignable

Drawing for information only.
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	DRAWN BY	CIR	11-12-19	REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE			
	FINAL APPROVAL	CIR	11-12-19	FIELD CONNECTIONS		FTA740		DRAWING NUMBER					
						SINGLE PHASE LIMITED SERVICE FIRE PUMP CONTROLLER				FC740-71			
								DWG REV -		ECN NO -		SHEET 1 OF 1	

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