

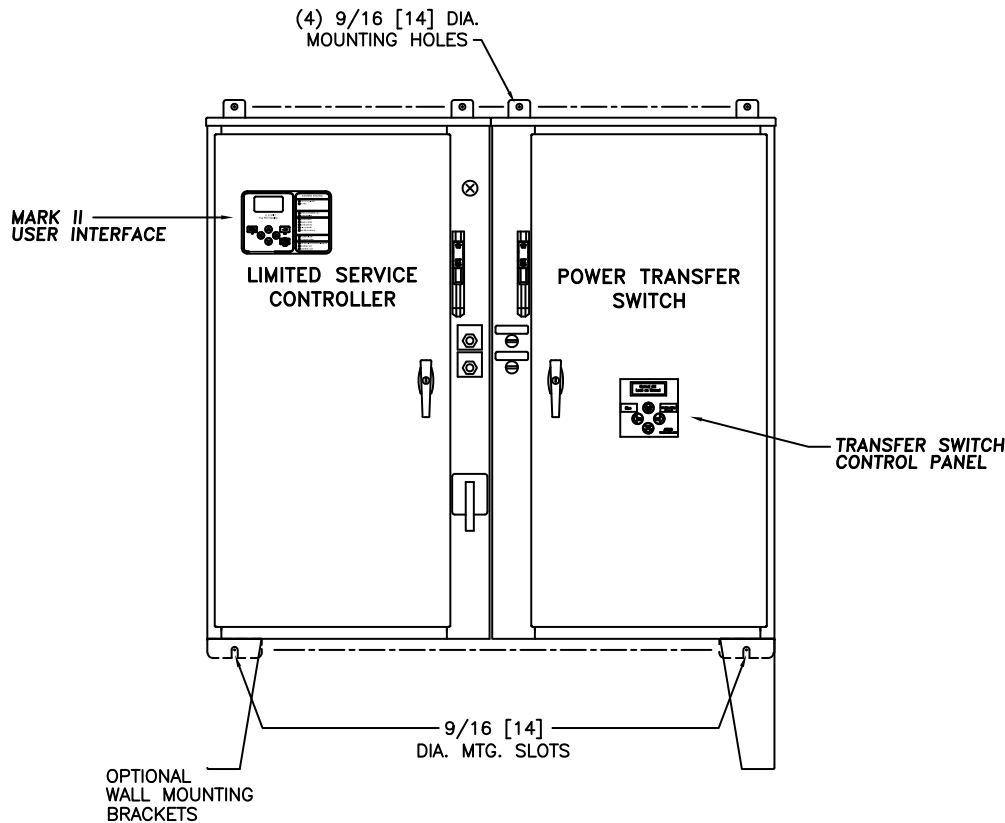


Mark II_{XS} Limited Service
Electric Fire Pump Controllers

Submittal Package

FTA750/FTA976

Across The Line Starting
With Power Transfer Switch



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

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Publication SBP750-61 Rev. F

Firetrol Mark II_{XS} Limited Service Electric Fire Pump Controller

FTA750 – 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:

65,000 Amperes RMS Sym. at 200-240V
25,000 Amperes RMS Sym. at 380-480V
14,000 Amperes RMS Sym. at 550-600V

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

85,000 Amperes RMS Sym. at 200-240V
65,000 Amperes RMS Sym. at 380-480V
25,000 Amperes RMS Sym. at 550-600V

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)
- Start
- Pump Total Run Time
- Last Locked Rotor Current
- Max Run Currents
- Min/Max Voltage per Phase during Run
- Pump Last Run Time
- Last Pump Start
- Last Phase Fail/Reversal
- Min/Max Frequency
- Min Voltage per Phase during

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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Publication SP750-50 Rev. E

Automatic Power Transfer Switch for use with Limited Service Electric Fire Pump Controller

FTA976

Specifications

1.0 Main Fire Pump Controller with Transfer Switch

The limited service fire pump controller with transfer switch shall be a factory assembled, wired and tested as a single 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 with transfer switch 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 with transfer switch 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 power transfer switch shall be housed within the limited service fire pump controller enclosure or in a NEMA Type 2 (IEC IP22) drip-proof enclosure attached directly to the fire pump controller. Where the power transfer switch is provided in an attached enclosure, the enclosures shall be fitted so that the assembly constitutes a single unit. The fire pump controller/power transfer switch shall be factory assembled, wired and tested as a unit prior to shipment.

1.3 Circuit Breaker

The power transfer switch shall include a motor rated combination isolating disconnect switch/circuit breaker, mechanically interlocked and operated with a single, externally mounted handle. When moving the handle from OFF to ON, the interlocking mechanism shall sequence the isolating disconnect switch closed first, and then the circuit breaker. When the handle is moved from ON to OFF, the interlocking mechanism shall sequence the circuit breaker open first, and then the isolating disconnect switch.

The isolating disconnect switch/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 isolating disconnect switch/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 circuit breaker trip curve adjustment shall be factory set, tested and sealed for the connected full load amps of the motor.

The circuit breaker shall be capable of being field tested to verify actual pick up, locked rotor, and instantaneous trip points after field installation without disturbing incoming line and load conductors.

1.4 Operator Interface

The transfer switch control panel shall have a 4 line, 20 character LCD display and keypad for viewing all available data and setting desired operational parameters. Voltage and frequency on both the normal and emergency sources shall be continuously monitored. The normal source pick up shall be set at 95% of nominal voltage and the

emergency source pick up set at 90% of nominal voltage and 95% nominal frequency. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage, frequency and phase rotation on all phases.

1.5 Automatic Transfer Switch

The automatic transfer switch shall consist of an inherently double throw power transfer switch mechanism and a microprocessor control panel to provide automatic operation. The transfer switch and control panel shall be of the same manufacturer. The automatic transfer switch shall be an ASCO 7000 series with a group 5 control panel. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single solenoid mechanism. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency. Switches having a neutral position shall not be permitted.

The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life. All main contacts shall be silver composition and inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power.

Designs utilizing components of molded case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.

A selector switch shall be supplied to manually test the transfer to emergency and the re-transfer to normal power.

1.6 Remote Alarm Contacts

Remote alarm contacts shall be supplied as standard for the following conditions:

- Emergency Source Isolation Switch Open
- Normal Power Available
- Emergency Power Available
- Transfer Switch Position

1.7 Visual Indicators

Indicators, visible with the door closed, shall indicate:

- Transfer Switch in Normal
- Transfer Switch in Emergency
- Normal Source Accepted
- Emergency Source Accepted
- Emergency Isolation Switch Open

1.8 Audible Alarm Indication

An audible alarm shall sound for the following conditions:

- Emergency Isolation Switch Open
- Transfer Switch in Emergency

A Silence Alarm push-button shall be supplied.

1.9 Manufacturer

The transfer switch shall be a Firetrol brand model FTA976.

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Firetrol, Inc.



Mark IIx6 Limited Service Electric Fire
Pump Controllers

Product Description

FTA750

Across The Line Starting



Description—Firetrol® FTA750 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)
 - PHASE FAILURE
 - PHASE REVERSAL
 - 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 simultaneous 3 Phase 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 configurable 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
85,000 Amperes RMS Sym. at 200-240V
65,000 Amperes RMS Sym. at 380-480V
25,000 Amperes RMS Sym. at 550-600V

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
- BW Alarm Output Contacts, Phase Failure/Phase Reversal
- 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 -EG)
- 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
- P Alarm, Audible/Visible, Built-In 120V Supervisory System
- PE Alarm Output Contacts, Low System Pressure (Pump On Demand)
- PT Alarm, Audible/Visible, Built-In 240V Supervisory System

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
- FZX Rating, Nameplate to be marked 380-400V (Use with voltage code -F or -FZ)
- 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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Publication PD750-50 Rev. K



Power Transfer Switch

Product Description

FTA976

Assembled With Limited Service
Electric Fire Pump Controller



Description—Firetrol® Power Transfer Switches are available completely assembled with Firetrol Limited Service Electric Fire Pump Controllers. The power transfer switches are built for use with generator set or 2nd utility use. The entire package of power transfer switch and controller is completely factory assembled, wired, tested and shipped as a complete unit for easy field connection to the power sources and the fire pump motor. They are available for 3 phase or single phase operation.

Approvals—Firetrol power transfer switches are listed by Underwriters' Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*; UL1008, *Automatic Transfer Switches*; UL508, *Industrial Control Equipment* 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 transfer switch:

- Thermal magnetic circuit breaker
- 3-pole, double throw transfer switch mechanism, electrically operated, mechanically held
- ASCO® Group 5 Control module providing for the following:
 - Door mounted operator interface panel with 4 line LCD display
 - In-phase monitor (3 phase operation)
 - Programmable engine exerciser
 - Transfer switch data logging
 - Differential voltage sensing on all phases of the normal power source
 - Voltage sensing of the emergency power source
 - Frequency sensing of the emergency power source
 - Transfer time delay to compensate for momentary power outages of the normal source
 - Retransfer from emergency to normal source is automatically delayed unless the emergency source fails
 - Cool-down timer for unloaded running of the generator set after retransfer to the normal power source
 - Instantaneous retransfer to normal if the emergency source fails and the normal source is available
 - 3 second transfer restart delay to reduce current surges when transferring to or from the emergency source
 - NO and NC engine control contacts to start the generator set when the normal power source fails
- Transfer Switch Normal LED
- Transfer Switch Emergency LED
- Emergency Isolating Switch Open LED
- Test Selector Switch
- Transfer By-pass Switch
- Silence Alarm Push-button
- Emergency Isolating Switch Open and Transfer Switch in Emergency Audible Alarms
- Output contacts (NO and NC) for Generator Start, Emergency Isolating Switch Open and Transfer Switch position indicators
- NEMA Type 2 enclosure (IEC IP22)

Options—The following are available as options to Power Transfer Switches:

- E Intermediate short circuit rating (3 Phase)
 - 85,000 Amperes RMS SYM at 200-240V
 - 65,000 Amperes RMS SYM at 380-480V
 - 25,000 Amperes RMS SYM at 550-600V
- Intermediate short circuit rating (Single Phase)
 - 65,000 Amperes RMS SYM at 200-240V

Modifications—The following are available as modifications to all transfer switches:

Special Enclosures

- T NEMA Type 3R (IEC IP22)
- E NEMA Type 4 (painted steel) (IEC IP66)
- F NEMA Type 4X (#304 stainless steel) (IEC IP66)
- G NEMA Type 12 (IEC IP54)
 - Special finish paint—consult factory
 - Special finish color—consult factory

Anti-condensation Space Heaters

- H 120 Volt space heater
- J 120 Volt space heater with thermostat
- K 120 Volt space heater with humidistat
- L 240 Volt space heater
- M 240 Volt space heater with thermostat
- N 240 Volt space heater with humidistat

Alarms

- EC Extra contacts for remote indication, transfer switch position
- BX Contacts for remote indication, second utility source phase failure/phase reversal (3 Phase only)

Miscellaneous

- ED Load shed circuits
- TN As standard with serial communications port
- S Tropicalization

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Publication PD976-50 Rev. F



Mark IIxg Limited Service Electric Fire
Pump Controller

Model Number Selection Guide

FTA750

Across The Line Starting

LIMITED SERVICE FIRE PUMP CONTROLLERS

Example: FTA750-AD30HH-xx

Starting Method

750 - 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
- C - Manual start and stop

Short Circuit Current Rating

- D - Standard short circuit rating
 - 65,000 Amperes RMS Sym at 200 - 240 V
 - 25,000 Amperes RMS Sym at 380 - 480 V
 - 14,000 Amperes RMS Sym at 550 - 600 V
- E - Intermediate short circuit rating
 - 85,000 Amperes RMS Sym at 200 - 240 V
 - 65,000 Amperes RMS Sym at 380 - 480 V
 - 25,000 Amperes RMS Sym at 550 - 600 V

Horsepower Rating

- 03 - 3 HP
- 05 - 5 HP
- 07 - 7 1/2 HP
- 10 - 10 HP
- 15 - 15 HP
- 20 - 20 HP
- 25 - 25 HP
- 30 - 30 HP

Modifications

See Back

Three Phase Voltage

- A - 220-240 Volt, 60 Hertz (230 V)
- AZ - 220-230 Volt, 50 Hertz
- B - 440-480 Volt, 60 Hertz (460 V)
- BZ - 415 Volt, 50 Hertz
- C - 550-600 Volt, 60 Hertz (575 V)
- F - 380 Volt, 60 Hertz
- FZ - 380 Volt, 50 Hertz
- H - 208 Volt, 60 Hertz
- HH - 200 Volt, 60 Hertz

Model Number Selection Guide – 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:
85,000 Amperes RMS Sym. at 200–240V
65,000 Amperes RMS Sym. at 380–480V
25,000 Amperes RMS Sym. at 550–600V

ANTI-CONDENSATION SPACE HEATERS

- H 120 Volt Space Heater
- J 120 Volt Space Heater With Thermostat
- K 120 Volt Space Heater With Humidistat
- L 240 Volt Space Heater
- M 240 Volt Space Heater With Thermostat
- N 240 Volt Space Heater With Humidistat

PRESSURE TRANSDUCERS

- B 0–600 psi (0–42.25 bar) Pressure Transducer for Fresh Water Service
- C 0–300 psi (0–21.1 bar) Pressure Transducer for Copper Corrosive Service
- D 0–600 psi (0–42.25 bar) Pressure Transducer for Copper Corrosive Service

AUTOMATIC POWER TRANSFER SWITCHES

FTA976 – For use with secondary power supply

ALARMS

- AC Extra contacts (normally open & normally closed) for remote indication, pump operating
- AF Audible and Visible low pump room temperature alarm
- AG Audible and Visible reservoir low alarm
- AH Audible and Visible low suction pressure alarm
- AM Contacts for remote indication, pump fail to start
- AV Contacts for remote indication, low pump room temperature (Requires option -AF)
- AW Contacts for remote indication, reservoir low (Requires option -AG)
- AY Contacts for remote indication, low suction pressure (Requires option -AH)
- AZ Low pump room temperature switch, mounted and wired
- BW Extra contacts for remote indication, phase failure/phase reversal

- BY Contacts for remote indication, pump overload
- COM Low Suction Pressure Alarm, (Includes selectable auto/manual reset, audible, visible and remote alarms, initiating pressure switch NOT included)
- CTS Built-in Low Suction Pressure Alarm Panel (Includes selectable auto/manual reset, audible, visible and remote alarms and wired and mounted pressure switch)
- EG Audible and Visible relief valve discharge alarm
- EH Contacts for remote indication, relief valve discharge (Requires option -EG)
- EJ Audible and Visible flow meter on alarm
- EK Contacts for remote indication, flow meter on (Requires option -EJ)
- KH Contacts for remote indication, common output for any alarm
- JR Visible jockey pump running indication
- JT Audible and Visible jockey pump trouble indication
- P Built-in alarm system (Includes visible supervisory voltage normal indication and audible pump operating, phase failure and phase reversal indication)
- PE Contacts for remote indication, low system pressure (pump on demand)
- PT Built-in alarm system, 220 VAC supervisory power (Includes visible supervisory voltage normal indication and audible pump operating, phase failure and phase reversal indication)

MISCELLANEOUS

- ED Load shed circuits (Selectable power source and adjustable time delay to remove non-critical loads before starting)
- EL Series pumping, high zone controller
- EM Series pumping, mid zone controller(s)
- EN Series pumping, low zone controller
- FZX Rating, Nameplate to be marked 380–400V (Use with voltage code -F or -FZ)
- IEC CE Marking with Externally Mounted Wet Parts (Requires NEMA Type 12 (IP54) Enclosure as a minimum)
- IECI CE Marking with Internally Mounted Wet Parts (Requires NEMA Type 12 (IP54) Enclosure as a minimum)
- OSP OSHPD Seismic Certification (State of California) (Requires Option -SEI)
- PY Motor space heater output contacts
- S Tropicalization
- SEI Seismic Certification (in accordance with IBC) (Note: Not available on model FTA1500)
- USBX External USB Port
- ZPA Customized, annual service display message (when factory programmed or programmed by Firetrol representative during start-up)
- ZPN Serial Modbus RTU over Ethernet TCP/IP using 5150 Connectivity Module
- ZPM Serial Modbus RTU over 2-wire or 4-wire RS485

Export packaging (Wooden crating to conform to IPPC Standards)

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Publication SD750–50 Rev. J



Power Transfer Switches

Model Number Selection Guide FTA976

Assembled With Limited Service
Electric Fire Pump Controller

FTA976 AUTOMATIC POWER TRANSFER SWITCHES FOR LIMITED SERVICE FIRE PUMP CONTROLLERS

Example: FTA976-AD100HH-xx

Transfer Switch Type

976 - Standard for alternate source

Modifications

See Back

Short Circuit Current Rating FTA976

- D - Standard short circuit rating (3 Phase)
65,000 Amperes RMS Sym. at 200 - 240 V
25,000 Amperes RMS Sym. at 380 - 480 V
14,000 Amperes RMS Sym. at 550 - 600 V
Standard short circuit rating (1 Phase)
10,000 Amperes RMS Sym. at 200 - 240 V
- E - Intermediate short circuit rating (3 Phase)
85,000 Amperes RMS Sym. at 200 - 240 V
65,000 Amperes RMS Sym. at 380 - 480 V
25,000 Amperes RMS Sym. at 550 - 600 V
Intermediate short circuit rating (1 Phase)
65,000 Amperes RMS Sym. at 200 - 240 V

Three Phase Voltage

- A - 220-240 Volt, 60 Hertz (230 V)
AZ - 220-230 Volt, 50 Hertz
B - 440-480 Volt, 60 Hertz (460 V)
BZ - 415 Volt, 50 Hertz
C - 550-600 Volt, 60 Hertz (575 V)
F - 380 Volt, 60 Hertz
FZ - 380 Volt, 50 Hertz
H - 208 Volt, 60 Hertz
HH - 200 Volt, 60 Hertz

Single Phase Voltage

- E - 220-240 Volt, 60 Hertz
EZ - 220-230 Volt, 50 Hertz
TT - 200 Volt, 60 Hertz
T - 208 Volt, 60 Hertz

Transfer switch single motor continous current rating

- 100 - 100A, 3 - 25 HP, 200-600 V
150 - 150A, 30 HP, 200-208V
100 - 100A, 30 HP, 220-600V

FTA976

Options—

The following are available as options to the power transfer switches:

Circuit Breaker Option

- E Intermediate withstand rating (3 Phase)
85,000 Amperes RMS Sym. at 200-240 VAC
65,000 Amperes RMS Sym. at 380-480 VAC
25,000 Amperes RMS Sym. at 550-600 VAC

Intermediate withstand rating (1 Phase)
65,000 Amperes RMS Sym. at 200-240 VAC

Modifications—

The following are available as modifications to all power transfer switches:

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

Anti-condensation Space Heaters

- H 120 Volt space heater
- J 120 Volt space heater with thermostat
- K 120 Volt space heater with humidistat
- L 240 Volt space heater
- M 240 Volt space heater with thermostat
- N 240 Volt space heater with humidistat

Miscellaneous

- EC Extra contacts for remote indication, transfer switch position
- ED Load shed circuits
- TN As standard with serial communications port
- BX Contacts for remote indication, second utility source phase failure/phase reversal
- S Tropicalization

INFORMATION REQUIRED WITH ORDER

- 1) Catalog number
- 2) Motor horsepower
- 3) Line voltage, phase and frequency
- 4) Maximum operating pressure
- 5) Options and Modifications, if any (give complete description)

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Mark IIx6 Limited Service Electric
Fire Pump Controllers

Field Connections

FTA750/FTA976

Across The Line Starting
With Power Transfer Switch

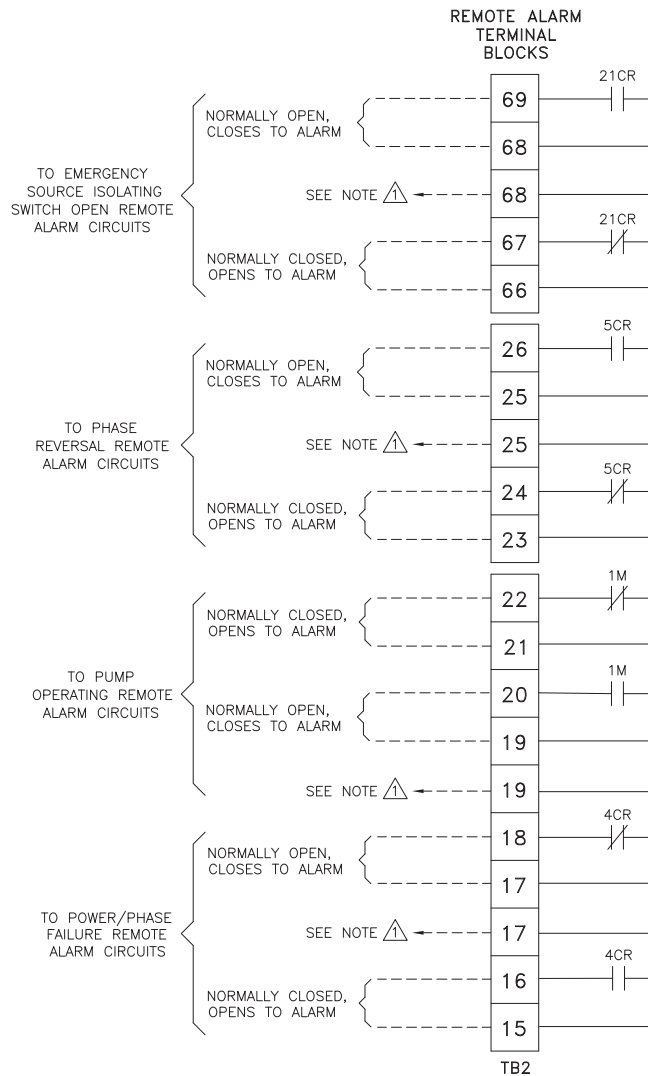
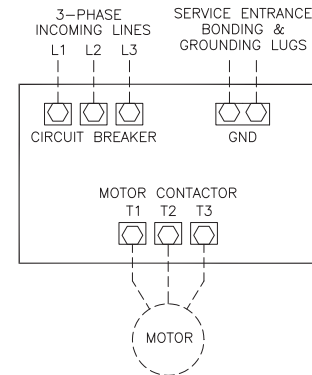
LINE TERMINALS—WIRE CAPACITY AND QUANTITY (CU) ①

MAXIMUM MOTOR HORSEPOWER	WIRE SIZE (CU) PER PHASE	WIRE SIZE SERVICE ENTRANCE GROUND LUG (CU) ②
25	(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
30	(1) #2 AWG—#4/0 AWG (1) 35 MM ² — 100 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	WIRE SIZE (CU) PER PHASE
30	(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.
② WHEN REQUIRED BY AUTHORITY HAVING JURISDICTION.



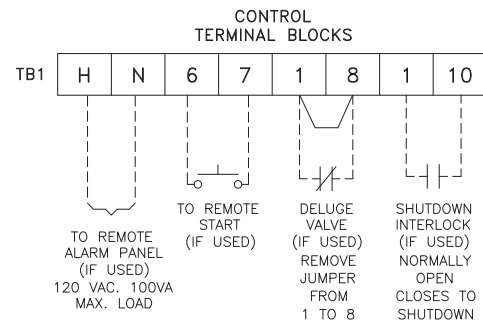
NOTES

- Incoming line terminals are provided to accommodate wire sizes at 125% of motor full load current per NFPA 70-2002, **National Electrical Code**, Table 430-150, Section 695.6(c), and Table 310-16, 75° rated Copper conductors.
- Controller is phase rotation sensitive. Incoming lines L1, L2 and L3 must be in ABC, right hand rotation sequence for proper operation of the phase monitor.
- Motor connections shown are typical. Since motor connections vary widely, refer to the motor connection diagram for specific wiring arrangement.

△ 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]



PRESSURE SYSTEM
CONNECTION
1/2" FNPT

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

 THIRD ANGLE PROJECTION	SIZE	A	BY	DATE
	DRAWN BY	TEF	09-16-04	
	FINAL APPROVAL	TEF	09-16-04	



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UPDATED TITLE BLOCK		A	280928	JMW	TEF	09-19-19
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
FIELD CONNECTIONS		FTA750		DRAWING NUMBER		
LIMITED SERVICE FIRE PUMP CONTROLLER		FTA750		FC750-55		
WITH POWER TRANSFER SWITCH		DWG REV A	ECN NO 280928	SHEET 1 OF 1		

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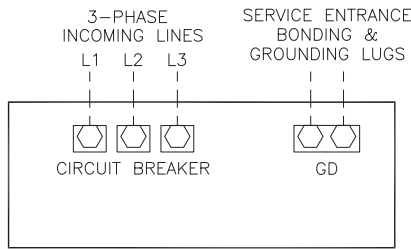


Power Transfer Switches

Field Connections

FTA976

Assembled With Limited Service Electric Fire Pump Controllers



NOTE

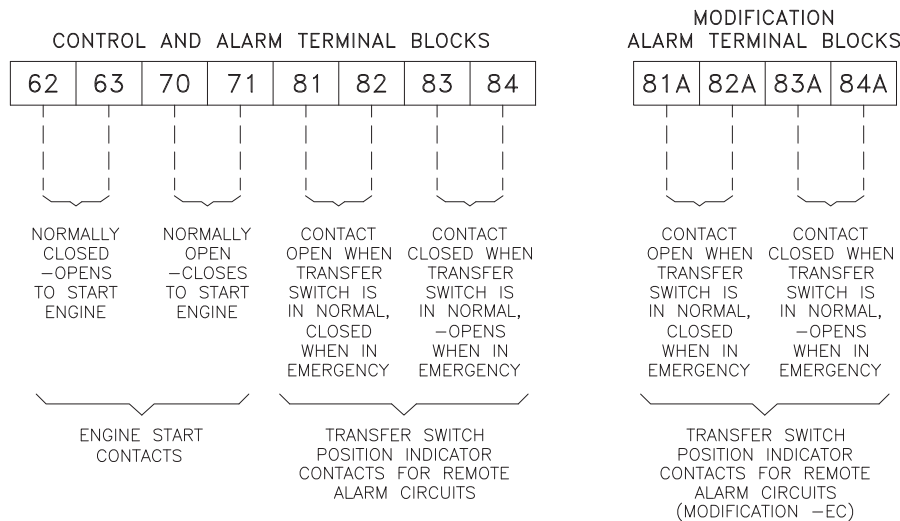
Incoming line terminals are provided to accommodate wire sizes at 125% of motor full load current per NFPA 70-2008, *National Electrical Code*, Table 430-250, Section 695.6(c), and Table 310-16, 75° rated Copper conductors.

LINE TERMINALS—WIRE CAPACITY AND QUANTITY (CU) ⁽¹⁾

MAXIMUM MOTOR HORSEPOWER 200-208V	220-600V	WIRE SIZE (CU) PER PHASE	WIRE SIZE SERVICE ENTRANCE GROUND LUG (CU) ⁽²⁾
25	30	(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
30	---	(1) #2 AWG—#4/0 AWG (1) 35 MM ² — 100 MM ²	(2) #14 AWG—#2/0 AWG (2) 2.5 MM ² — 70 MM ²

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

⁽²⁾ WHEN REQUIRED BY AUTHORITY HAVING
JURISDICTION.





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

—NOTE—
ENGINE START
CONTACT RATING
1/2 AMP, 30VDC

TERMINAL TIGHTENING TORQUE		
TERMINAL TYPE	WIRE SIZE	TIGHTENING TORQUE
CONTROL AND ALARM TERMINALS	#14-12 AWG [2.5-4 MM ²]	7.1 lb-in [.8 Nm]

—NOTE—
ALARM CONTACT
RATING
PILOT DUTY
240 VAC, 28 VDC
5 AMP MAX. LOAD

<div> THIRD ANGLE PROJECTION</div>	SIZE A	BY	DATE	UPDATED TITLE BLOCK				A	281357	JMW	TEF	10-16-19
	DRAWN BY	TEF	11-19-10	RELEASED				-	229706	TEF	TEF	11-19-10
	FINAL APPROVAL	TEF	11-19-10	REVISION DESCRIPTION				REV	ECN NO	BY	APP	DATE
	<div> Firetrol, Inc.</div> <p>© Firetrol, Inc. Not for construction. Subject to change without notice.</p>			FIELD CONNECTIONS		FTA976		DRAWING NUMBER				
						FC976-55						
				LIMITED SERVICE CONTROLLER POWER TRANSFER SWITCH FOR GEN-SET AND SECOND UTILITY POWER SOURCE				DWG REV	A	ECN NO	281357	SHEET 1 OF 1

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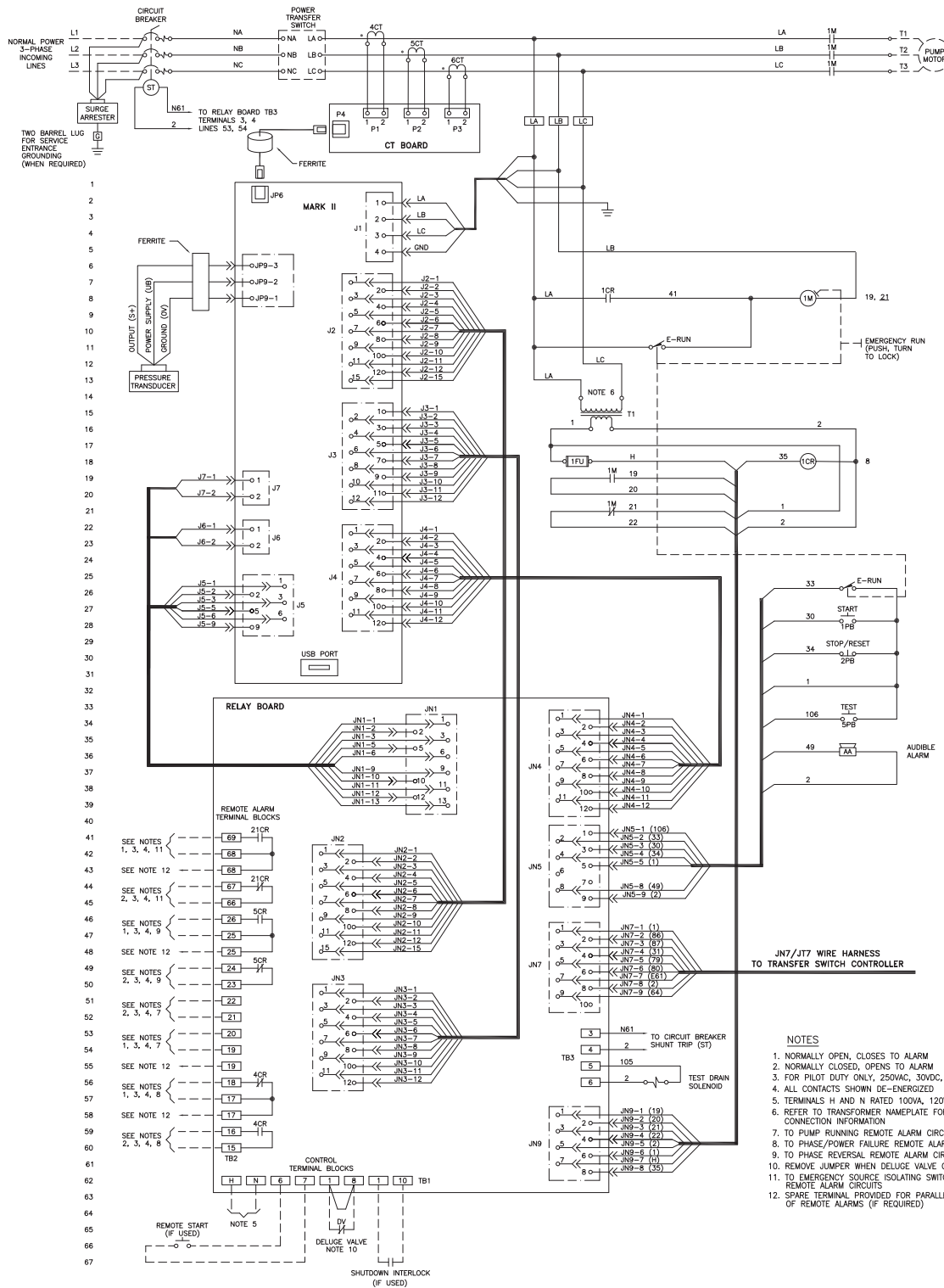


Mark IIx6 Limited Service Electric Fire Pump Controllers

Wiring Schematic

FTA750/FTA976

Across The Line Starting
With Power Transfer Switch



NOTES

1. NORMALLY OPEN, CLOSING 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 PHASE/POWER FAILURE REMOTE ALARM CIRCUITS
9. TO PHASE REVERSAL REMOTE ALARM CIRCUITS
10. REMOVE JUMPER WHEN DELUGE VALVE CONTACT IS USED
11. TO EMERGENCY SOURCE ISOLATING SWITCH OPEN REMOTE ALARM CIRCUITS
12. SPARE TERMINAL PROVIDED FOR PARALLEL CONNECTION OF REMOTE ALARMS (IF REQUIRED)

	SIZE	A	BY	DATE
	DRAWN BY	TEF	09-16-04	
	FINAL APPROVAL	TEF	09-16-04	



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UPDATED TITLE BLOCK		E	280928	JMW	TEF	09-18-19
REVISED TO BE IN COMPLIANCE WITH UL218 THIRD EDITION		D	270053	GFD	GFD	11/30/17
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
WIRING SCHEMATIC		FTA750 WITH FTA976				
LIMITED SERVICE FIRE PUMP CONTROLLER WITH POWER TRANSFER SWITCH		DRAWING NUMBER WS750-55				
DWG REV E		ECN NO	280928	SHEET 1 OF 1		

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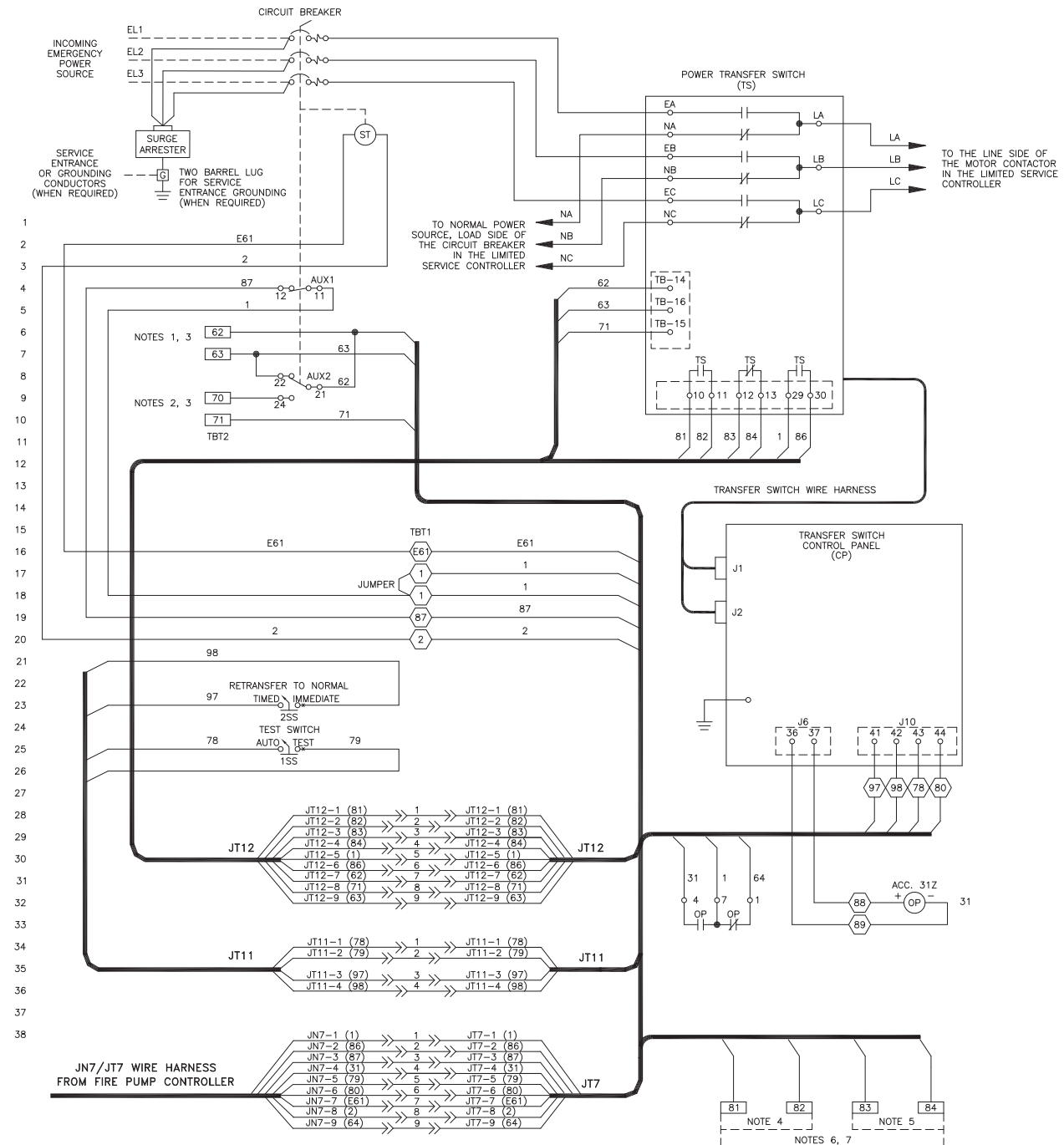


Power Transfer Switches

Wiring Schematic

FTA976

Assembled With Limited Service
Electric Fire Pump Controllers



- COMPONENT LOCATION**
- AUX1 - AUXILIARY SWITCH 1, CLOSURES WHEN EMERGENCY ISOLATING IS OPENED - LINE 4
AUX2 - AUXILIARY SWITCH 2, INHIBITS GEN-SET FROM STARTING IF EMERGENCY ISOLATING SWITCH IS OPENED - LINES 8, 9

- - FIELD CONNECTION TERMINAL BLOCK
○ - INTERCONNECTION TERMINAL BLOCK (FOR FACTORY USE ONLY)

- NOTES:**
- 1 - NORMALLY CLOSED, OPENS TO START GENERATOR
2 - NORMALLY OPEN, CLOSURES TO START GENERATOR
3 - GEN-SET START CONTACTS RATED 1/2AMP, 30VDC
4 - NORMALLY OPEN, CLOSURES IN EMERGENCY
5 - NORMALLY CLOSED, OPENS IN EMERGENCY
6 - TRANSFER SWITCH POSITION REMOTE ALARM CONTACTS
7 - CONTACT RATING 5AMP MAX, 240VAC, 28VDC

SIZE	A	BY	DATE
DRAWN BY	TEF	07-13-16	
FINAL APPROVAL	TEF	07-13-06	



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UPDATED TITLE BLOCK		C	281357	JMW	TEF	10-16-19
REVISED TO BE IN COMPLIANCE WITH UL218 THIRD EDITION		B	271029	JMW	TEF	02-08-18
REVISION DESCRIPTION		REV	ECN NO	BY	APP	DATE
WIRING SCHEMATIC		FTA976		DRAWING NUMBER		
LIMITED SERVICE CONTROLLER POWER TRANSFER SWITCH FOR GEN-SET AND SECOND UTILITY POWER SOURCE				WS976-55		
DWG REV		C	ECN NO	281357	SHEET 1 OF 1	

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