

Firetrol MarkIII+ Electric Fire Pump Controller

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. The controller shall be rated for an Ambient Temperature Operating Range of 39ºF (4ºC) to 104ºF (40ºC).

Starting Configuration

The controller shall be designed to use Model and Configuration:

***FTA1000*** - Full Voltage starting intended for use with electric motor driven fire pumps where the capacity of the power source permits full voltage start- ing. Full voltage is applied to the motor as soon as the controller is actuated. Full voltage starting is simple and low cost and is preferred whenever the utility or emergency generator set will permit this type of starting.

***FTA1250*** Part Winding Starting, used where the characteristics of the power source do not permit full voltage starting.

When the controller is actuated via pressure, START push-button, deluge valve contact, etc., the first contactor closes, connecting one of the motor windings to the line. During starting, the motor will draw approximately 65% of its nor- mal locked rotor current and develop approximately 42% of its normal starting torque. After a time delay, the second contactor closes, connecting the sec- ond winding in parallel with the first. The motor then draws its normal running current and develops its rated torque.

***FTA1300*** Wye-Delta, Open Transition Starting, used with delta-wound squirrel cage motors. FTA1300 controllers are of the open circuit transition type in which the motor circuit is opened during the transition from start to run.

Actuating the controller by the pressure switch, START push-button or deluge valve contact closes the start contactor connecting the motor to the line in the wye connection. The motor will draw approximately 33% of its normal in- rush current and develop approximately 33% of its normal starting torque. After a time delay, the motor is automatically reconnected in delta, applying full voltage to the motor windings. These controllers are recommended especially for use with generator sets.

***FTA1350*** Wye-Delta, Closed Transition Starting Fire Pump Controllers are used with delta-wound squirrel cage motors. These controllers are of the closed circuit transition type in which the motor circuit remains closed during the transition from start to run.

Actuating the controller via pressure, START push-button or deluge valve con- tact closes the start contactor connecting the motor to the line in the wye connection. The motor will draw approximately 33% of its normal inrush cur- rent and develop approximately 33% of its normal starting torque. After a time delay, the motor is automatically reconnected in delta, applying full voltage to the motor windings. During this transition, a resistor is connected to each phase, minimizing line disturbances and voltage drop during starting. These controllers are recommended especially for use with generator sets.

1.1



***FTA1800*** Autotransformer Starting Fire Pump Controllers use an autotrans- former to supply reduced voltage when starting the motor. The controller is of the closed circuit type where the motor circuit remains closed during the tran- sition from start to run resulting in minimum line disturbance.

The autotransformer has three taps for selection of starting current and torque; 50% tap for 150% current and 25% torque, 65% tap (factory setting)

for 250% current and 42% torque and the 80% tap for 384% current and 64% torque.

***FTA1930*** Solid State Reduced Current Starting Fire Pump Controllers feature soft start, soft stop and system sensing capabilities that not only provide for reduced current starting, but also offer an improved level of hydro mechanical performance.

1.2 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 Con- trollers* Canadian Standards Association CSA-C22.2, Standard for Industrial Control Equipment (cUL)

CE - Low Voltage Directive

The controller shall be approved by: Factory Mutual (IEC 62091)

The City of New York for fire pump service

1.3

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.

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.

1.4

1.5

Power Components

The controller shall include a combination isolating disconnect switch/circuit breaker, rated for not less than 115% of the motor full load current, mechanically interlocked and operated with a single, externally mounted handle. The isolating disconnect switch/circuit breaker shall be mechanically interlocked so that the

Code

200-208V

5-150 HP

220-240V

5-200 HP

380-415V

5-350 HP

440-480

5-400 HP

550-600

5-500 HP

M - Standard

100kA

100kA

100kA

100kA

N/A

N - Intermediate

150kA

150kA

150kA

150kA

N/A

P - High

200kA

200kA

200kA

200kA

N/A

Q - Intermediate

N/A

N/A

N/A

N/A

100kA

R - Standard

N/A

N/A

N/A

N/A

50kA

Code

200-208V

200 HP

220-240V

250-400 HP

380-415V

400-500 HP

440-480

450-500 HP

M - Standard

50A

50kA

50kA

50kA

N - Intermediate

N/A

N/A

N/A

N/A

P - High

100kA

100kA

100kA

100kA

Q - Intermediate

N/A

N/A

N/A

N/A

R - Standard

N/A

N/A

N/A

N/A

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

Operator Interface (HMI)

The operator interface shall be a 7.0” capacitive type 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 · Ser- vice · 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 Set- tings · 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.

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 De- mand/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
* Phase Unbalance • Check Test Solenoid Valve • Weekly Test Cut-In Not Reached
* Transducer Fault • Control Voltage Not Healthy • Motor Trouble • Pump Room Alarm • Invalid Cut-In • Phase Reversal • Power Loss • Phase Loss L1 / L2 / L3 • 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 • Phase Reversal • Motor Run • Common Pump Room Alarm (Over- voltage, Undervoltage, Phase Unbalance, Low/High Pump Room Temperature) • Common Motor Trouble (Overcurrent, Fail To Start, Undercurrent, Ground Fault)

1.6

1.7



* 1. 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 life- time 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*

* 1. USB Host Controller

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

2.0 Serial Communications

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

2.1 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.

2.2

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.

Manufacturer

The controller shall be a Firetrol brand.

2.3

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