

Power Transfer Switches

For Electric Motor Driven Fire Pumps



Series MTS

Automatic Transfer Switch



Metron MTS Automatic Transfer Switch provide operation of electric fire pump motors from a alternate source of power when the normal source fails. They may be used with any Metron electric fire pump controller—across the line, primary resistance, part winding, Wye-Delta, Auto Transformer or Solid State Reduced Voltage Types. These transfer switches are an integral part of the fire pump controller. They are factory assembled, shipped and installed as a part of the controller.

The combination fire pump controller/transfer switch is listed by Underwriters' Laboratories', Factory Mutual, and meets all the latest requirements of Section 7-8 of NFPA Standard for Installation of Centrifugal Fire Pumps.

The MTS Automatic Transfer Switch is a mechanically held double throw switch with a fast acting drive mechanism. Operating coils are momentarily energized from the source to which the load is being transferred. The switch is interlocked electrically and mechanically to prevent both services from feeding the load at the same time. The transfer switch is capable of manual (non-electrical) operation.

Undervoltage sensing devices are supplied which monitor each phase of normal service. When the voltage of any phase falls below the pre-set level the transfer switch automatically transfers to the alternate source. Voltage and frequency sensing devices are provided to monitor one phase of the alternate source and will inhibit transfer to the alternate source until adequate voltage and frequency are available.

The transfer switch provides a special circuit that de-energizes the motor control circuit five (5) second prior to transfer in either direction to prevent high current transients due to an out-of-phase condition between the motor and the source to which it is being connected.

A contact is provided to actuate the engine starting circuit when normal source fails. To prevent false starts, a time delay (factory set a 1/2 to 3 seconds) is provided between normal source failure and actuation of the engine start contact.

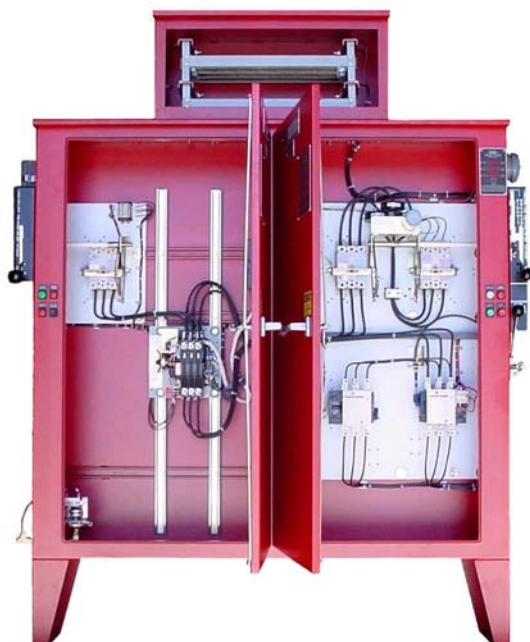
An isolation switch ahead of the alternate source input terminals of the transfer switch is provided. When the switch is opened, auxiliary contacts in the generator start circuit prevent starting if commanded to by the transfer switch. An additional auxiliary contact on the isolation switch is provided for remote annunciation of isolation switch position.

An adjustable time delay (0-30 min.) prevents restoration to normal service for a pre-set period of time to assure normal line stabilization.

An auxiliary N.O. contact is provided for remote annunciation of transfer to emergency. This contact is operated by the transfer mechanism as a direct indication of switch position.

Pilot lights for indication of Switch in Normal position, Switch in Emergency position, and Emergency Isolation Switch in Off. Audible indication of Emergency Isolation Switch in Off is also included.

A test switch is also provided which simulates loss of normal power so that the transfer switch operation can be checked without interrupting normal service to the fire pump controller.



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Electric Motor Fire Pump Controller with Automatic Transfer Switch

Specifications

1.00 References

- A. Factory Mutual System (FM) - Approval Guide.
- B. UL- Fire Protection Equipment Directory.
- C. UL 508 - Industrial Control Equipment.
- D. UL 218- Fire Pump Controllers.
- E. NFPA 20 - Installation of Centrifugal Fire Pumps.
- F. NFPA 70 - National Electrical Code.
- G. UL 1008 - Automatic Transfer Switches

2.00 Quality Assurance

- A. Perform work in accordance with NFPA 20.
- B. Equipment: Bear UL and FM label and marking.
- C. Components: Shall be UL listed or UL recognized.
- D. The controller shall be completely tested at the factory prior to shipment. This test shall verify proper operation of all normal automatic and manual functions along with the continuity of all dry contacts for remote alarms. The test shall also include a high potential voltage test of all primary power circuits equal to twice the rated voltage plus 1000 volts for one minute according to UL 508.

3.00 Electric Fire Pump Controller

- A. The controller shall be housed in a UL Environmental type 2 Drip-proof enclosure, fabricated from heavy gauge cold rolled steel per the requirements of UL 508. The controller shall be designed for Across-The-Line, Primary Resistance (reduced voltage), Part Winding (reduced current), Wye-Delta (open transition), Wye-Delta (closed transition), Autotransformer (reduced voltage), and Solid Sate (reduced voltage) starting and include the following:

- 1. Isolation switch: Externally operable, quick break type sized at least 115% of motor full load current.
- 2. Circuit breaker: Externally operable sized at least 115% of the motor full load current.
- 3. The locked rotor overcurrent protection shall be provided by a separate overcurrent monitor of the microprocessor type, set at 300 percent of motor full load current and shall have a trip time between 8 and 20 seconds at 600 percent of motor full load current. The overcurrent monitor shall also have as standard a set of dry contacts and LED visual indication that activates when the motor current exceeds 125% of normal.
- 4. The isolation switch and circuit breaker shall be operable via a single operating handle. When

moving the handle from the OFF to ON position, the handle shall sequence the isolating switch on first and then the circuit breaker. When the handle is moved from the ON to the OFF position, the handle shall sequence the circuit breaker off first and then the isolating switch. This sequencing operation shall prevent the isolating switch from interrupting motor current. The operating handle shall be capable of being padlocked in either the ON or OFF position for installation and maintenance safety. The operating handle shall permit normal tripping operation of the circuit breaker.

- 5. Controllers utilizing a 100-600 amp circuit breaker shall be suitable for use on a circuit capable of delivering 100,000 Amps Symmetrical short circuit current. Controllers utilizing a 800-1200 amp circuit breaker shall be suitable for use on a circuit capable of delivering 50,000 Amps Symmetrical short circuit current.
- 6. Provisions shall be made to display the amps/volts of each phase on the face of the enclosure. Display shall automatically store the highest ampere reading. Display of amps/volts and retrieval of highest current reading shall be accessed via a push-button on digital display. In addition to the digital display, provisions shall be made between the circuit breaker and the isolation switch for using a clamp-on type ammeter to measure motor current draw.
- 7. Motor contactor: IEC rated, UL listed, capable of being operated by an external emergency operating handle. The contactor shall be horsepower rated as determined in UL 218 for the applicable horsepower and voltage.
- 8. Pressure switch: With adjustable independent high and low set points. The switch shall be mounted inside the controller cabinet and plumbed to an external coupling for field connection.
- 9. Pressure Recorder: A DC Powered Seven (7) Day Pressure Recorder mounted on exterior of enclosure shall be provided.
- 10. Externally mounted pilot lights: To indicate controller primary power is available and phase reversal of normal power. Primary power on light to be wired in true power on configuration. Loss of any phase or control power will cause light to turn off. Pilot lights for indication of Switch in Normal position, Switch in Emergency position, and Emergency Isolation Switch in Off shall be provided. Audible indication of Emergency Isolation Switch in Off is required.
- 11. Solid state running period timer: Set for a minimum of ten (10) minutes, per NFPA 20, shall be provided to keep the motor running when started automatically. The timer shall have

a pilot light to indicate when the timer is in the timing mode. The controller shall be factory set for manual stop with terminals provided to allow field conversion to automatic stop.

- 12. Control circuit transformer: Heavy duty type with a minimum rating of 150 VA without integral overcurrent protection per the requirements of NFPA 20.
- 13. Dry alarm contacts for remote alarm of PUMP RUNNING, PHASE REVERSAL, MOTOR OVERLOAD and CONTROLLER POWER AVAILABLE shall be supplied. One normally open and one normally closed contact for each alarm shall be supplied. Controller power shall be monitored by a three phase power monitor. The monitor shall trip on either LOW VOLTAGE, SINGLE PHASE, LOSS OF POWER, or PHASE REVERSAL. Normal power shall be indicated by a Green LED on the power monitor and a tripped condition shall be indicated by a Red LED.
- 14. A circuit for manual remote starting of the controller shall be supplied requiring only a contact closure to initiate. This circuit shall not be capable of stopping the controller remotely per NFPA 20.
- 15. Automatic Transfer Switch: UL Listed for Fire Pump Service, sized at least 115% of motor full load current and shall conform to all requirements of NFPA 20 chapter 7, section 7-8. It shall be installed in a barnered compartment of the fire pump controller. The complete assembly, controller and transfer switch, shall be shipped as a single unit.
- 16. The Transfer Switch shall be supplied with a special circuit to prevent higher than normal starting currents when transferring from one source to the other. This circuit shall deactivate the fire pump motor five (5) seconds prior to transfer in either direction.
- 17. Alternate Source Isolation Switch: Externally operable, quick break type sized at least 115% of motor full load current. Auxiliary contacts on the isolation switch shall be interwired with the engine start contacts to prevent starting of the engine should the isolation switch be in the open position. Shall be front mounted and wired for ease of maintenance and allowing the unit to be mounted flush against a wall.
- B. All components shall be front mounted and wired for ease of maintenance and allowing the unit to be mounted flush against a wall.
- C. The controller shall be capable of the addition of optional control features.
- D. The controller shall be manufactured by Metron, Inc.