

# Fire Pump Controller

For Electric Motor Driven Fire Pumps



## High Voltage Controllers

### Series MV600 - Combined Manual and Automatic

The Metron Series MV600 High Voltage Fire Pump Controllers are a modular concept system, which utilize "state-of-the-art" vacuum bottle technology. The primary control element in the MV600 is a draw out style vacuum bottle contactor. Integral to the contactor are "R" rated current limiting cartridge style fuses. Space is provided for storage of three spare fuses on the rear of the outer door. Two fused potential/control transformers (PTS) are also contained within the contactor. These transformers provide both input signals to the monitor circuits as well as control power for the MV600. For testing purposes, it is possible to supply 120VAC power directly to the control section through a built-in test receptacle and test switch.

The output terminals of the contactor are routed through three current transformers located in the "motor termination" section of the MV600. The customer's motor leads are connected within the motor termination compartment with cable entrance from the top, bottom or left side (viewed from the front).

The MV600 provides both front and rear access, however, only front access is required. Incoming power may enter through the top, bottom or right side of the controller.

Locked rotor motor protection is supplied by a solid state "relay". This "relay" is in accordance with the requirements of NFPA 20, Chapter 7.

A power monitor is supplied to provide contacts for remote alarm of phase reversal, low voltage, single phase, and loss of voltage. A pilot light is provided on the door of the controller to indicate "Phase Reversal." Power to the motor can be monitored by the digital volt/amp meter. This selectable display monitors voltage and amperage on all three phases and will store in nonvolatile memory the highest FLC for recall later.

The standard MV600 is supplied in a NEMA type 2 enclosure which is fabricated from 12 gauge steel. All welded construction is used throughout with removable top and bottom gasket panels to allow stacking of two units (maximum height 91.5 inches). Minimum floor clearance of 12" is provided with allowances for floor anchoring. The entire front of an MV600 is protected with a hinged removable, gasketed door, equipped with a 3-point latch. Access to the vacuum contactor is provided by a lockable and interlocked second door, which requires the contactor to be disengaged from the bus prior to opening. Automatic drop type "shutters" activate providing a barrier between the incoming bus and the vacuum contactor. Control wiring and components are accessible behind their own access door. Access to control components does not require motor de-energization.

A solid copper ground bus is provided through the incoming high voltage, low voltage and motor termination compartments.



MV600 Fire Pump Controller  
in NEMA 4 Enclosure

# Standard and Optional Features

## Standard Features

- Draw out Vacuum Bottle Contactor
- “R” Rated Current Limiting Fuses
- Solid State Motor Protection Relay
- Power/Phase Reversal Monitor
- Digital Display of Volts and Amps
- 0-300 psi Pressure Sensing Elements with Independent High and Low Set Points
- Minimum Run Timer
- Sequential Start Timer
- Emergency Mechanical Start Mechanism
- Rated Voltage 2300-7200
- Rated Current 400A
- NEMA Type 2 Enclosure
- Built-in Spare Fuse Storage
- UL listed to 7.2Kv

## Options

### Option A1: Built-in Alarm Panel

This option supplies an audible alarm with silence pushbutton for PUMP RUNNING and POWER FAILURE. It also provides a visual only indication of SUPERVISORY POWER on. This option requires that a separate reliable source of 120 V.A.C. be connected to the controller. Additional lights and alarm conditions may be added if required. Consult factory for availability.

### Option A2: This Alarm Provides a Visual Indication only of the following:

Low Pressure, Local Start, Remote Start, Deluge Valve Open, Phase Failure, Interlock on, Run Timer On, Pump Running. Can be supplied separately or all eight.

### Option C: Pump Failed to Start

A pilot light and dry contact, N.O./N.C. are furnished to indicate that the pressure switch has signaled a start but the motor contactor has not closed to supply power to the electric motor. An adjustable 0 to 10 second timer is supplied to control the time between the closing of the pressure switch and the activation of the alarm condition.

### Option D: Deluge Valve Start

This option is a remote start function. An external normally closed contact is connected to the controller which, when opened, signals the controller to start as if the pressure switch had sensed a low pressure condition. The Sequential Start timer must time out before the controller will start after the deluge valve contact opens

### Option E: Engine Lockout

A set of normally open dry contact is provided to interconnect to the lockout circuit in a diesel engine fire pump controller. When the electric motor controller starts, the diesel engine controller is prevented from starting on a pressure drop or is stopped if it is already running.

### Option G1: Pressure Switch Auxiliary Contacts

One set of N.O./N.C. dry contacts for indication of pressure switch position.

### Option G2: Contacts for High Zone/Low Zone Operation

A relay with N.O. contacts wired to the

field wiring terminal block closes upon the operation of the pressure switch on a low pressure condition. It remains closed as long as the electric motor is running. This option along with option “S” Sequential Start is normally furnished on a High Zone controller to provide a signal to the Low Zone controller causing it to start and provide pressure to the suction side of the High Zone pump. The Low Zone controller must be supplied with option “D” (deluge valve start) for proper operation of the two controllers.

### Option G3: Low/Low Pressure Indication

A set of N.O./N.C. dry contacts are furnished via a second pressure switch which will activate an alarm if the pressure drops below the preset starting pressure of the controller.

### Option H: Space Heater

If the ambient atmosphere is especially damp, a space heater rated at 100 watts may be supplied to reduce moisture in the cabinet. A thermostat is supplied as standard with this option. A humidistat may be substituted if specified.

### Option J: Loss of Control Power Dry Contacts

A relay is wired across the secondary side of the control power transformer. Dry contacts, N.O./N.C. are wired to the field terminal strip to provide a remote signal if the control power transformer fails. This relay will also be activated if there is a complete loss of power to the fire pump controller; i.e., the circuit breaker/isolation switch is turned off.



### Option K: Pump Room Temperature Alarm

Provides visual indication, an audible alarm, thermostat, and dry N.O./N.C. contacts which operate from the externally mounted thermostat to indicate a LOW PUMP ROOM TEMPERATURE condition.

### Option L: Local Pump Running Light

An externally mounted pilot light is supplied which illuminates when the motor contactor is closed and supplies power to the electric motor.

### Option M: Motor Lockout

This option is used with multiple pump installations when only one pump should be running. Upon receipt of an external signal (may be from another fire pump controller if it is compatible), this option will prevent the motor from starting or will stop it if running. It is also used with Low Suction Cutoff Panels when authorized. When used for this purpose, power to the Low Suction Cutoff Panel is provided by the controller.

### Option P: Supervisory Power Failure Start

This option provides a start of the electric motor if there is a loss of an external source of 120 V.A.C. A relay is provided that is energized when the external 120 V.A.C. is present. Upon loss of the 120 V.A.C. the relay drops out and a contact closes and starts the electric motor.

### Option Q: Loss of Supervisory Power Light

A pilot light is provided which illuminates if there is a loss of the 120 V.A.C. external source.

### Option R: Audible Alarm

An externally mounted bell is supplied which sounds when an alarm condition occurs in the fire pump controller. An example would be if the controller activates into a PUMP RUNNING condition. Other conditions can be supplied if specified, i.e. SUPERVISORY POWER FAILURE (Option "P"), PUMP FAILED TO START (Option "C") etc. The condition(s) must be specified.

### Option T1 and T2: Weekly Test Start

In some cases it may be desirable to have the electric motor run at a preset time each week for approximately 30 minutes. A program clock is provided to control the time of day, day of week, and the running time for the test period. The start can be accomplished by the activation of a relay or through an externally mounted solenoid valve. The solenoid valve is opened to begin the start by dropping pressure to the controller pressure switch. This option can be provided with a test pushbutton (T1) or without (T2).

### Option U: Local Motor Stopped Light

An externally mounted pilot light is supplied which illuminates when the

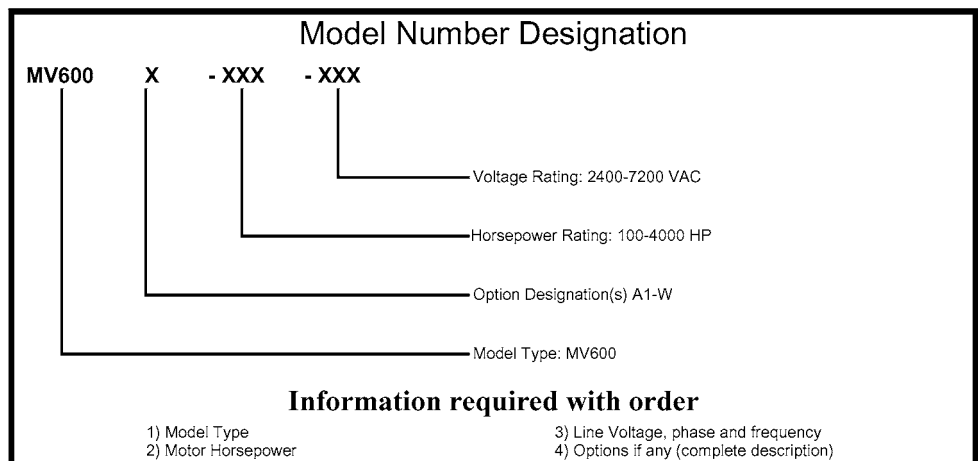
motor contactor is open, and the electric motor is not energized.

### Option W: Omit Legs

For systems where the controller is mounted on a common skid with the pump and motor, the legs of the controller may be omitted, and 3" mounting channels or wall mounting brackets can be supplied. If specified, lifting eyes may also be supplied.

### Enclosure

The following NEMA type enclosures are also available: 3R, 4, 4X (Painted Cold Rolled Steel), 4X (Unpainted 304 or 316 Stainless Steel), and 12



# Fire Pump Controller

## For Electric Motor Driven Fire Pumps



### Model MV600 Across-the-line Start Electric Motor Fire Pump Controller

#### Specifications

The fire pump controller shall be listed by Underwriter's Laboratories and approved for fire pump service. The fire pump shall be completely factory wired, assembled, and tested prior to shipment.

The controller shall be of the combined manual automatic type and designed for Across-the-Line starting. The controller shall be housed in a NEMA Type 2 Drip-proof enclosure, fabricated from heavy gauge cold rolled steel per the requirements of UL 508.

The motor contactor shall be rated at least 400 amps, 7200 VAC, be of the vacuum type, and shall be suitable for use on a circuit capable of delivering not more than 50 KA short circuit current. The contactor shall be interlocked with the controller door to prohibit the door from being opened while the contactor is racked in. In addition, the contactor shall not be capable of being racked in or out when the contacts of the vacuum unit are closed. The contactor shall contain integral fuse clips capable of holding "R" rated motor protection type fuses. Suitable high voltage fuses shall be supplied and sized to hold motor locked rotor current as per NFPA 20. Internal space shall be provided for spare fuse storage.

An overload relay shall be supplied, calibrated up to and set at 300 percent of the motor full load current. The overload relay shall trip between 8 and 20 seconds at 600 percent of motor full load current.

A selectable LED readout indicating motor voltage and amperage on all three phases shall be supplied. The display unit shall be capable of displaying the FLC at time of motor

tripping once power is restored to the controller and display unit.

A pressure switch shall also be furnished. The pressure switch shall have adjustable independent high and low set points.

Pilot lights shall be furnished to indicate controller primary power is available, phase reversal of primary power, and motor tripped.

A minimum run period timer 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. This timer shall be set for a minimum of ten minutes per NFPA 20. The controller shall be factory set for manual stop with terminals provided to allow field conversion to automatic stop.

The control circuit transformers shall be supplied from the High-voltage source and be protected by suitable high voltage fuses. The transformer shall be rated at least 300 volt-amps.

Dry alarm contacts for remote alarm of PUMP RUNNING, CONTROLLER POWER AVAILABLE, PHASE REVERSAL, and MOTOR OVERLOAD shall be supplied. One normally open and one normally closed contact for each alarm shall also be supplied.

Controller power shall be monitored through the control power transformers secondary via a phase reversal/power monitor capable of monitoring all three phases of power.

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 the requirements of NFPA 20.

The controller shall be factory tested 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 2.5 times the rated voltage plus 2000 volts for one minute.

The controller shall include the following standard features.

- Digital display of Volts and Amps
- Power Monitor
- Pressure Switch
- Stop Pushbutton
- 3CT's & 2 PT's
- Built-in Test Receptacle
- Minimum Run Timer
- Sequential Start Timer
- Phase Reversal Monitor
- Motor Protection Relay
- Emergency Start Handle
- NEMA Type 2 Enclosure
- Capable of Stacking Units
- Drawout Vacuum Contactor
- Phase Reversal Indicator Lamp
- Silver Plated Copper Buss Bars
- "R" Rated Current Limiting Fuses
- Removable Top, Back, and Doors
- Front/Rear Access for Installation and Maintenance

The controller shall be manufactured by Metron, Inc.