



SPECIFICATIONS FOR **MODEL GPL** ELECTRIC PUMP CONTROLLER LIMITED SERVICE FULL VOLTAGE ACROSS THE LINE STARTER MICRO-PROCESSOR BASED

APPROVAL AND LISTING

The electric pump controller shall meet the latest NFPA 20 and NFPA 70 requirements, be listed with cULus (UL218) and approved by FM (Factory Mutual) and, if applicable, by the City of New York for fire pump service.

STARTING METHOD

The electric pump controller shall be manufactured by Tornatech and shall be a model GPL limited service combined manual and automatic type suitable for across the line full voltage starting of the electric pump motor.

SHORT CIRCUIT WITHSTAND RATING

The short circuit withstand rating of the electric pump controller shall be:

- 25 kA. RMS at 200 - 480V. (standard) or
- 65 kA. RMS at 200 - 480V. (optional)
- 18 kA. RMS at 600V. (standard) or
- 25 kA. RMS at 600V (optional)

ENCLOSURE

The standard enclosure shall be NEMA/UL/CSA type 2 -IP42 or optional

- NEMA/UL/CSA type 3 – IP55
- NEMA/UL/CSA type 4 – IP66
- NEMA/UL/CSA type 4X – IP66
- NEMA/UL/CSA type 12 – IP54

POWER CIRCUIT COMPONENTS

The electric pump controller shall be supplied with the following power components:

- Voltage surge arrestor
- One thermo-magnetic circuit breaker rated at a minimum of not less than 150% of the full load motor current to provide locked rotor, over current and short circuit protection
- One across the line electric motor starter

OPERATIONAL COMPONENTS

The electric pump controller shall be supplied with the following externally mounted components approved to match the NEMA rating of the enclosure:

- One thermo-magnetic circuit breaker operating handle mechanically interlocked with the enclosure door to prohibit access to the interior in the "ON" position. The handle shall have a hidden interlock defeater and be lockable in the "OFF" position.
- One pump "START" pushbutton
- One pump "STOP" pushbutton
- One "Emergency" start and run handle mechanism latchable in the "ON" position

DIGITAL ANNUNCIATOR INTERFACE

The electric pump controller shall be supplied with a digital annunciator interface completely accessible without having to open the controller door. The digital annunciator interface shall be comprised of a 4-line, 20-character and a separate 2-line 20-character continuously back lit digital display screens, keypad type pushbuttons, high luminosity LED's and have the same NEMA rated degree of protection as the enclosure of the electric pump controller. The digital annunciator interface shall numerically display:

- Individual phase to phase incoming voltage and frequency
- Individual phase motor current
- True pump elapsed run time
- Pump start counts
- Time and date
- Cut-In and Cut-Out pressure settings
- System pressure
- Minimum run period timer
- Sequential start timer
- Weekly test timer

The voltage, frequency and amperage readings of all three phases shall be simultaneously and independently displayed with true RMS technology. Measurement of the voltage, frequency and amperage shall be accomplished with the latest technology to provide the most accurate readings. Electric pump controllers with analog meters and selector switches for the selection of the phase being displayed of either the voltage or current shall not be accepted.

Pump starts and elapsed pump run times shall only be considered if amperage is being drawn by the motor. Simple closure of the run contactor shall not be considered as the pump actually running nor should it count as pump elapsed run time.

The cut-in, cut-out and system pressure indication shall be continuously displayed. The ability to change the unit of measurement from Psi to Bar shall be provided through the adjustment of a dipswitch located inside the controller. Electric pump controllers without the capability of digitally displaying the cut-in, cut-out and system pressure shall not be accepted.



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The digital annunciator interface shall digitally indicate:

- Phase loss
- Phase unbalance
- Incoming over voltage
- Incoming under voltage
- Motor over current
- Motor under current
- Motor run
- Fail to start

Phase loss shall be indicated if the voltage of any phase drops below 85% of the nominal voltage. A separate phase unbalance indication shall be displayed if the difference of the minimum and maximum voltage is greater than 3% of the average voltage.

Incoming over voltage shall be indicated if any phases are greater than 110% of the nominal voltage of the controller and incoming under voltage shall be indicated if any of the phases are lower than 85% of the nominal voltage of the controller

Motor over current shall be indicated after 20 seconds if any of the current phases are greater than 130% of the nominal full load amperage of the electric motor and motor under current shall be indicated if any of the phases are lower than 30% of the nominal full load amperage of the electric motor.

A fail to start indication shall appear after 20 seconds of the motor run contactor being closed and the amperage drawn is lower than 5% of the electric motor full load amps

The digital annunciator interface shall high luminosity LED's for:

- Power available
- Phase reversal
- Pump on demand
- Weekly test

Electric pump controllers supplied with traditional neon or incandescent bulb pilot lights with coloured lens shall not be accepted.

The digital annunciator interface shall have keypad type pushbuttons for:

- Alarm reset
- Cut-in pressure setting
- Cut-out pressure setting
- Run test
- Print

The cut-in and cut-out adjustments shall have independent pushbuttons accessible without having to open the controller door which will raise the setting one unit (Psi or Bar) at a time and also raise the setting by 10 units if held pressed for more than one second. The logic of adjustment shall be so that the cut-out setting must be set before the cut-in setting and that the cut-in setting cannot be raised above the cut-out setting. The adjustment of the cut-out and cut-in shall be tamper proof through the setting of a dipswitch installed inside the controller.

PRESSURE AND EVENT RECORDING

The electric pump controller shall be equipped with a pressure and event recorder. The recorder will register and keep in memory general system information, pressure fluctuations over time that have occurred over the previous seven (7) days and events and alarms that have occurred over the previous fifteen (15) days. General system information, events and alarms include the following:

- Time and date of retrieval of data
- Cut-in and Cut-out setting
- Date of the last change of the cut-in and cut-out setting
- Date, time and pressure readings of the minimum and maximum pressure registered over the previous 7 days
- Weekly test information
- Minimum run period timer information
- Pump start time and date
- Pump stop time and date
- Pump on demand time and date
- Pump room alarm time and date
- Motor trouble time and date
- Power On date and time
- Power Off date and time

The information shall be retrievable through a USB slave communication port accessible without having to open the controller door.

PRESSURE SENSING DEVICE

The electric pump controller shall be supplied with a 304 stainless steel pressure transducer rated for fresh water operation between 0 and 300psi with $\pm 2\%$ accuracy and a minimum burst pressure of 420psi. The pressure transducer shall be used to display the pressure in the sprinkler system and also control the automatic start circuit. The pressure transducer shall be



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installed inside the controller directly mounted to a bulkhead allowing for an external connection to the sprinkler system sensing line. Controllers supplied with mechanical pressure sensing devices with or without mercury shall not be accepted.

FIELD ADJUSTMENTS AND OPERATION

The manual START and STOP control circuit of the electric pump controller shall not be electrically linked to the micro-processor. An anti-jogging system which shall prevent the manually rapid starting and stopping of the electric motor shall be supplied.

The electric pump controller shall ship from the factory set for manual stop and shall be field adjustable for automatic stop if required by adjusting a minimum run period timer. The minimum run period timer shall be accessed through the digital annunciator interface which shall display both a text indication and the remaining time of the timer.

A sequential start on delay timer shall be supplied and shall be field adjustable. The sequential start on delay timer shall be accessed through the digital annunciator interface and shall display the remaining time of the timer.

A weekly test timer shall be supplied as standard equipment. The timer shall allow for the setting of the date and start and stop times of the weekly test. This timer shall be field adjustable and accessed through the digital annunciator interface and shall display the remaining time of the timer.

A RUN TEST pushbutton shall be provided to electrically start the electric pump motor and hold it running automatically for 10 minutes. If the weekly test with solenoid valve option is requested, the RUN TEST pushbutton will energize the solenoid valve to create an artificial pressure drop which will be sensed by the pressure transducer starting the electric pump motor and hold it running for 10 minutes.

Separate remote start and deluge valve start contacts shall be provided.

A field simulation phase reversal system shall be provided in order to verify this alarm condition. The correction of the phase reversal shall be accomplished by the adjustment of a dipswitch mounted inside the controller.

The ability of simultaneously verifying all inputs and outputs on the digital display screen shall be provided

ALARM CONTACTS FOR REMOTE INDICATION

Dry alarm contacts rated at 8A – 250VAC for remote indication shall be provided for the following conditions

- Power or phase failure and/or circuit breaker in open position (DPDT)
- Phase reversal (DPDT)
- Pump run (1N/0 - 1N/C)

OPTIONAL MODIFICATIONS

The electric pump controller shall be supplied with the following optional modifications:

- Flow switch provision
- Concentrate foam pump application
- Low suction pressure switch rated at 0-300psig for fresh water application
- Mounting feet
- Low suction pressure digital text indication
- Weekly exercise cycle alarm contacts
- Low ambient temperature digital text indication
- Low suction pressure alarm contacts
- Printer
- CE listing
- French labels
- Spanish labels
- Labels in other language other than English, French or Spanish