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## ENGINEER'S SPECIFICATION

## EPG Series L900LO PumpMaster™ Controller Simplex 1Ø Control Panel

Furnish one EPG Companies Inc., UL listed 508A/698A, Series L900LO loadout controller to operate a pump motor and auxiliary equipment in manual or automatic mode. The control panel enclosure shall be NEMA type \_\_\_\_.

The enclosure shall be equipped with a window in the outer door, an inner door, a stainless steel drip shield, and a tamper resistant latch. The NEMA 4 (standard) enclosure is finished with polyester urethane paint. The NEMA 4X (optional) enclosure can be either stainless steel or non-metallic.

The control system will operate from a \_\_\_\_ Volt, 60 Hertz, single phase power supply. Pump control components will be sized to operate a pump motor of specified horsepower.

The control panel shall include the following as standard features:

**Main Disconnect Switch:** The main disconnect switch shall be \_\_\_\_ Amp rated and will prevent opening of the control panel while the power is on, and includes \_\_\_\_ Volt, \_\_\_\_ Amp dual element fuses.

**"Hand-Off-Auto" Selector Switch:** Allows manual or automatic operation of the pump motor. The selector switch shall be a heavy duty, oil tight, NEMA 4 rated switch mounted on the inner door. The hand position shall be momentary with a spring return.

**Motor Contactor:** The motor contactor shall be sized to the pump motor horsepower.

**Motor Start Winding Control with Start Capacitor and Start Winding Relay:** A capacitor is used to start the motor, and a relay is used to remove the start winding from the circuit when the motor reaches operating speed.

**Control Transformer:** A transformer with fused primary and secondary shall isolate the control circuit from the power circuit and provide easier and safer field wiring of accessories. It shall lower incoming voltage to 120 Volts.

**Run Light:** Indicates energization of motor circuit. It shall be heavy duty, oil tight, NEMA 4 rated and shall have an LED lamp with 100,000 hour life. The light shall be mounted on the inner door and will be green in color.

**Alarm Light:** Indicates high level in truck storage tank and will shut off the pump. It shall be heavy duty, oil tight, NEMA 4 rated and shall have an LED lamp with 100,000 hour life. The light shall be mounted on the inner door and will be red in color.

**Intrinsically Safe Barriers:** The level sensor circuits shall be protected by intrinsically safe barriers.

**Heater with Adjustable Thermostat:** A heater with adjustable thermostat shall promote even distribution of heat and elimination of hot spots and condensation. It shall also maintain the minimum temperature required for the operation of the LevelMaster™ level control meter. The heater element shall be mounted in space between the sub-panel and the back of the enclosure and provide a minimum of 100 inches square of heating area.

**Lightning Arrestor:** Shall be grounded, metal-to-metal, to water strata. When properly grounded, the lightning arrestor will protect electrical equipment against lightning induced surges.

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**Terminal Strip:** A labeled and numbered terminal strip provides easy connection of external components.  
**Corrosion Inhibitor Emitter:** Inclusion of an industrial corrosion inhibitor emitter shall protect internal components of control panel from corrosion for up to one year and shall be replaceable.  
**Options are available to meet specific needs.**

## SYSTEM LOGIC AND FUNCTION

The controller is designed for use at leachate transport truck loading facilities. It combines a storage tank level sensor, volume batch controller, flow sensor, remote start/stop pendant, and transport truck overfill protection to provide easy, worry free loading of leachate transport trucks. The operator enters the number of gallons to be pumped using the flow meter keypad and presses the run (start) button. The meter has a backlit LCD display of values. When the desired number of gallons has been pumped, the pump stops. The controller is reset and ready for the next loading operation. A stainless steel truck tank high level sensor with bracket easily attaches to the top of the transport truck to prevent overfilling.

The L900LO PumpMaster has the flexibility to accept a variety of level and flow sensors. Some examples are listed below:

### 1. FLOW SENSOR

**A. Paddlewheel:** Flowing liquid turns a paddlewheel, which sends out a pulse proportionate to flow rate. It can be used with pipes sized 1" to 72" with flow rates of 2 to 25,000 gpm.

**B. Magnetic:** The magnetic sensor measures flow by passing the liquid through a magnetic field and measuring the voltage produced. Since the induced voltage is proportional to the average flow velocity and the inside diameter of the pipe is known, the volumetric flow rate can be calculated. It can be used with any pipe size.

**C. Ultrasonic:** This sensor is attached to the outside of the pipe. It operates by transmitting a high frequency signal off of solids entrained in the liquid and reading the return signal. The detected frequency shift is proportional to the liquid velocity (Doppler Effect). It can be used with any pipe size.

### 2. LEVEL SENSOR

**A. Mercury Float Switches:** A high level pump disable float and a pump start/stop float are used to control the loadout pump. Each float is attached via a tether cord. Set points are determined by the tether length. Each float contains a single pole switch in a normally open or normally closed circuit configuration that activates or deactivates with changes in fluid level.

**B. Submersible Pressure Transmitter:** Provides digital display of level with LevelMaster meter along with ability to set alarm and pump stop point. The transmitter outputs a 4-20mA signal, which is scaleable in feet, inches, meters, centimeters, or any other engineering standard. A level simulator provides a built-in test circuit designed to simulate a 4-20 mA load to assist in level meter setup and troubleshooting.