



Description

Water Analytics manufactures four models of liquid level controllers to satisfy most industrial applications. These controllers operate on the principle of electrolytic conductivity in liquids. A built-in sensitivity adjustment permits field tuning the instrument so that one model is suitable for most conductivity liquids. For instance the LL4 or LL7 may be adjusted to respond to either foam or liquid. Some controllers may be as far as 300 meters from the electrodes, and connections are made with unshielded cable.

The AquaMetrix design limits the voltage at the electrodes to 18 volts, and also limits the current even if electrodes are shorted. Some competitive controllers may require as much as 500 volts across the electrodes.

MODEL LL4

This model has one relay for a pump with normally open or normally closed operation.

MODEL LL7 and LL7H

These units have the added feature of an auxiliary pair of normally open contacts for use with an annunciator or other device. The LL7 version is suitable for most industrial applications. The LL7H has much greater sensitivity and is specifically designed for use with low conductivity liquids.

MODEL LL3

This model is the most versatile of the four LL Series controllers. It contains two relays, for pump and auxiliary use, each with normal open or normal closed operation. An indicator LED light in the unit can be used for very accurate sensitivity adjustments. All LL Series controllers are suitable for single level service or differential service. Single level service allows for high or low alarm, while differential service provides a pump up/pump down region between two electrode heights. All units are housed in a NEMA 1 black ABS plastic enclosure which plugs in to a standard 12-pin relay socket with durable screw terminals. The pins and terminals are nickel plated brass.

Features

- Ideal for applications where the controller is mounted remotely, up to 300' from the electrodes
- Built-in sensitivity adjustment for foam or liquid applications
- Safe Low voltage at the electrodes
- Custom electrode length and material available
- Model LL7H for use with low conductivity liquids

Applications

- Waste water flow accumulation
- Water Treatment systems
- Irrigation
- Chemical Mixing
- Process cooling systems
- Neutralization Systems
- Process flow control
- Filtration systems

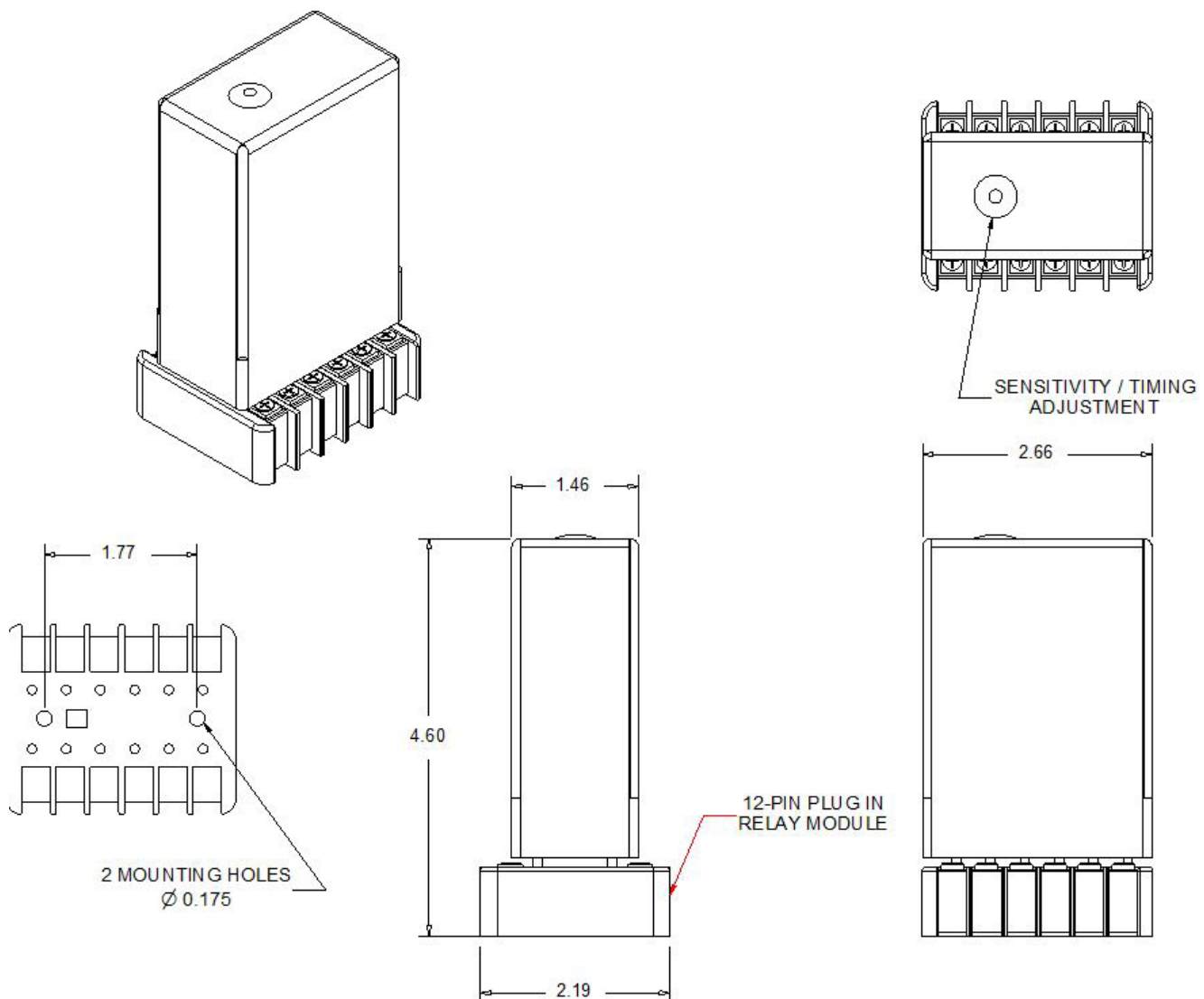
Model LL4, LL7 and LLW Liquid Level Controllers

Specifications and Ordering Information

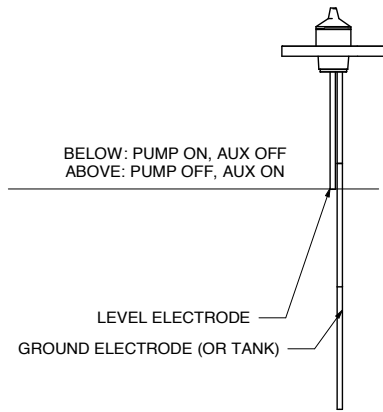
Controllers

	Model LL3	Model LL4	Model LL7	Model LL7H
Power Supply	120 or 240 VAC depending on model			
Standard Housing	Plug-In Encapsulated Black ABS Enclosure, 12-pin Relay Socket			
Contacts	DPDT Form C 10A resistive 120 Vac 1/3 HP			
Pump Terminals	Normal Open and Normal Closed			
Auxilliary Terminals	Normal Open and Normal Closed	None	Normal Open	Normal Open
Max. Conn. Length	300 feet			
Sensing Circuit Resistance	10 kΩ maximum			1 MΩ maximum
Fully Encapsulated	Yes			
Operating Temp	-17.8 degree C to 55 degree C			
Humidity	Up to 85% RH			
Pressure	Atmospheric			
Max Cable Length	300m tested (only on model LL7H)			

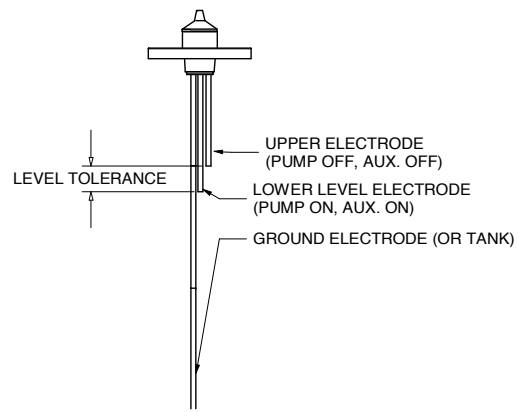
Dimensions



Model LL3, LL4, LL7 and LL7H Operation and Wiring



Single Level Configuration



Differential Level Configuration

LL4

Single Level Service High Alarm or Low Level Cutoff

Attach electrical ground to terminal 1, attach power to terminals 2 and 3. Attach tank ground or always submersed electrode to terminal 12, and single level electrode to terminal 11. Terminal 10 is not in use. Attach one pump lead to terminal 6, and the other to normally open terminal 5. Terminal 5 will close when liquid reaches level electrode.

Single Level Service Low Alarm or High Level Cutoff

Attach electrical ground to terminal 1, attach power to terminals 2 and 3. Attach tank ground or always submersed electrode to terminal 12, and single level electrode to terminal 11. Terminal 10 is not in use. Attach one pump lead to terminal 6, and the other to normally closed terminal 4. Terminal 4 will open when liquid reaches level electrode.

Differential Level Service Pump Down

Attach electrical ground to terminal 1, attach power to terminals 2 and 3. Attach tank ground or always submersed electrode to terminal 12, short electrode to terminal 11, and long electrode to terminal 10. Attach one pump lead to terminal 6, and the other to normally open terminal 5. If liquid rises above short electrode, terminal 5 will close, and re-open after the liquid falls under the long electrode.

Differential Level Service Pump Up

Attach electrical ground to terminal 1, attach power to terminals 2 and 3. Attach tank ground or always submersed electrode to terminal 12, short electrode to terminal 11, and long electrode to terminal 10. Attach one pump lead to terminal 6, and the other to normally closed terminal 4. If liquid rises above short electrode, terminal 4 will open, and close again after the liquid falls under the long electrode.

LL7 and LL7H

Single Level Service

Refer to LL4 for standard wiring instructions. The LL7 includes the additional feature of an auxiliary open contact. Attach one auxiliary lead to common terminal 7, and the other lead to normally open terminal 8. Terminal 10 is not in use. When liquid reaches level electrode, terminal 8 will close, and will re-open when liquid again goes below electrode. This may be used for an alarm or annunciator.

Differential Level Service

Refer to LL4 for standard wiring instructions. The LL7 includes the additional feature of an auxiliary open contact. Attach one auxiliary lead to common terminal 7, and the other lead to normally open terminal 8. Terminal 9 is not in use. When liquid reaches short electrode, terminal 8 will close, and will re-open when liquid again goes below long electrode. This may be used for an alarm or annunciator.

LL3

Single Level Service

Refer to LL4 for standard wiring instructions. The LL3 includes two auxiliary contacts, normal open and normal closed. Attach one auxiliary lead to common terminal 7. For direct operation, connect second lead to normally open terminal 8. For inverse operation, connect to normally closed terminal 9. When liquid reaches level electrode, auxiliary relay will either open or close depending on which terminal is used.

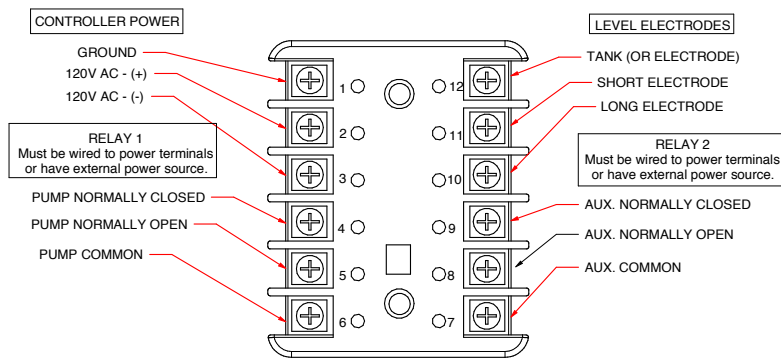
Differential Level Service

Refer to LL4 for standard wiring instructions. The LL3 includes two auxiliary contacts, normal open and normal closed. Attach one auxiliary lead to common terminal 7. For direct operation, connect second lead to normally open terminal 8. For inverse operation, connect to normally closed terminal 9. When liquid rises above short electrode or falls below long electrode, auxiliary relay will either open or close depending on which terminal is used.

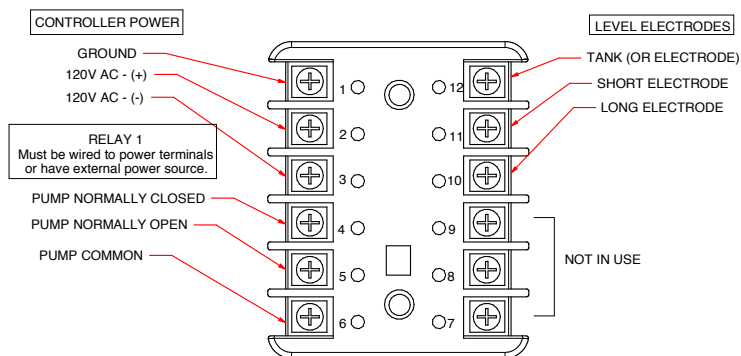
Connect terminal 12 to tank if metallic and grounded. For ungrounded tank connect an additional electrode, which must always be immersed in liquid, to terminal 12. Single level requires one level electrode plus a tank ground. Differential level requires two electrodes for the tank level to remain between.

LL7H ONLY; Terminal 10 is used to neutralize capacitance effect of cable. If controller is more than 20 meters from tank use a three conductor cable and connect a one wire to NW and leave unconnected at tank. Do not use the shield for this purpose.

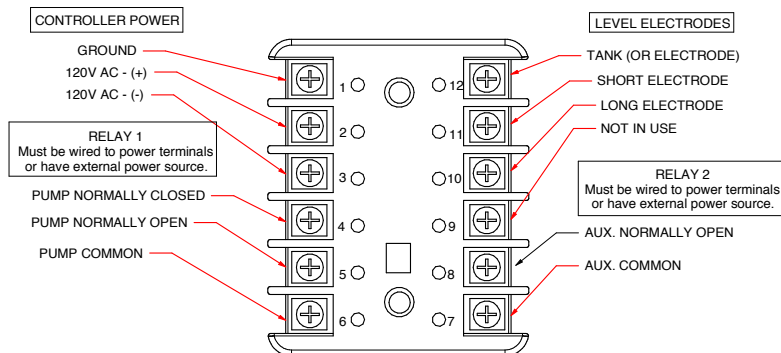
Model LL3, LL4, LL7 and LL7H External Wiring Diagrams



LL3 Plug in Relay Base



LL4 Plug in Relay Base



LL7 Plug in Relay Base

LL7H - Terminal 9 is used for NW, the neutralizing wire.

Accessories and Electrodes

AM-LL-CE3 Contacting electrode for LL controllers

