HERON ELECTRIC COMPANY LTD

Installation Manual

EC / pH CONTROLLER INLINE (Feedback)

MPD9 InLine Install (Feedback)

1. System Considerations

Your system has been fully tested before it left the factory. However it is recommended that the system is thoroughly tested in **your application** using the chemicals you intend to use before you use it on your crop. **Allow sufficient time to carry out these tests.**

Every effort has been made to make your EC/pH controller as reliable as possible. However components, especially mechanical components will wear out. You need to decide what backup systems you need to employ and spare parts you should hold. The type of backup system you employ will be dependent upon how long that your crop can be without water and how long you crop can be without water treated to the correct EC and or pH**.**

Control of EC

The system controls the EC by injecting fertiliser in every 5 seconds. Fertiliser is injected with a venturi and fertiliser valve. The controller varies the pulse length depending on whether the EC is to high or low (the pulse length can vary from 0.02 seconds to 4.9 seconds).

Maximum Fertilizer Flow Rate

The maximum fertiliser flow rate will vary depending upon the number of injectors you have and the size of the fertilizer valves and venturis. If you are using a standard valve and venturi each venturi will suck a maximum of 3 litres per minute per injector.

Up to 8 injectors can be connected in variety of configurations. Appendix 1 shows typical configurations using between 1 and 4 injectors with 1 or 2 stock tanks.

When you are using multiple stock tanks the system can be configured to suck from both stock tanks or just from one. '.

IMPORTANT

Valve seals will need replacing after approximately 1,000,000 operations. But this will be dependent upon chemicals used and temperature. Check regularly.

No chemicals should be included in the fertiliser that may react over time and effect the ion concentration. This will cause unstable results in measurement and control of the EC. For example you cannot make the fertiliser mix too acidic.

The fertiliser must be compatible with the material used in the fertiliser valves, the fertiliser valve seals, the venturis, filters and connecting pipe work.

Fertilizer Tube Connection

A 12mm tube should be connected to the both fertiliser venturis. Filters should be pushed on the end of this tube. It is advisable to keep the filters off the bottom of the stock tanks. When the system is operating you must check no air is leaking into the tubes.

Control of Acid (pH)

The system controls the pH by pulsing acid every 5 seconds. The controller varies the pulse length depending on whether the pH is high or low.

The pH pot is used to provide a good average and allow time for the acid to react. The pH probe should be fitted into this pot. Because acid takes time to react the system can only respond slowly to any changes in the water flow rate. For this reason it is strongly recommended that a flow meter is used to speed up the control system response.

Control of Acid flow into premix pot

The concentrated acid is automatically diluted in the premix pot. Acid is sucked into the acid premix pot whenever the level in the premix pot falls. If there is a fault with the sensor or the brass valve controlling the premix filling the pot may over flow. To this end you will need to connect a drain tube to the over flow of premix pot.

Note The dosing system will shut down if the premix pot does not fill in certain time. In this situation 'Alarm 28' will be displayed

The acid and concentration of acid must be compatible with the material used in the acid valves, the acid seals, the venturis, filters and connecting pipe work.

Valve seals will need replacing after approximately 1,000,000 operations. But this number of operations will be dependent upon chemicals used and temperature. Check regularly for ware.

The minimum pH level that can be used which will achieve stable results is pH 6.0

2. Electrical Installation of Dose Controller

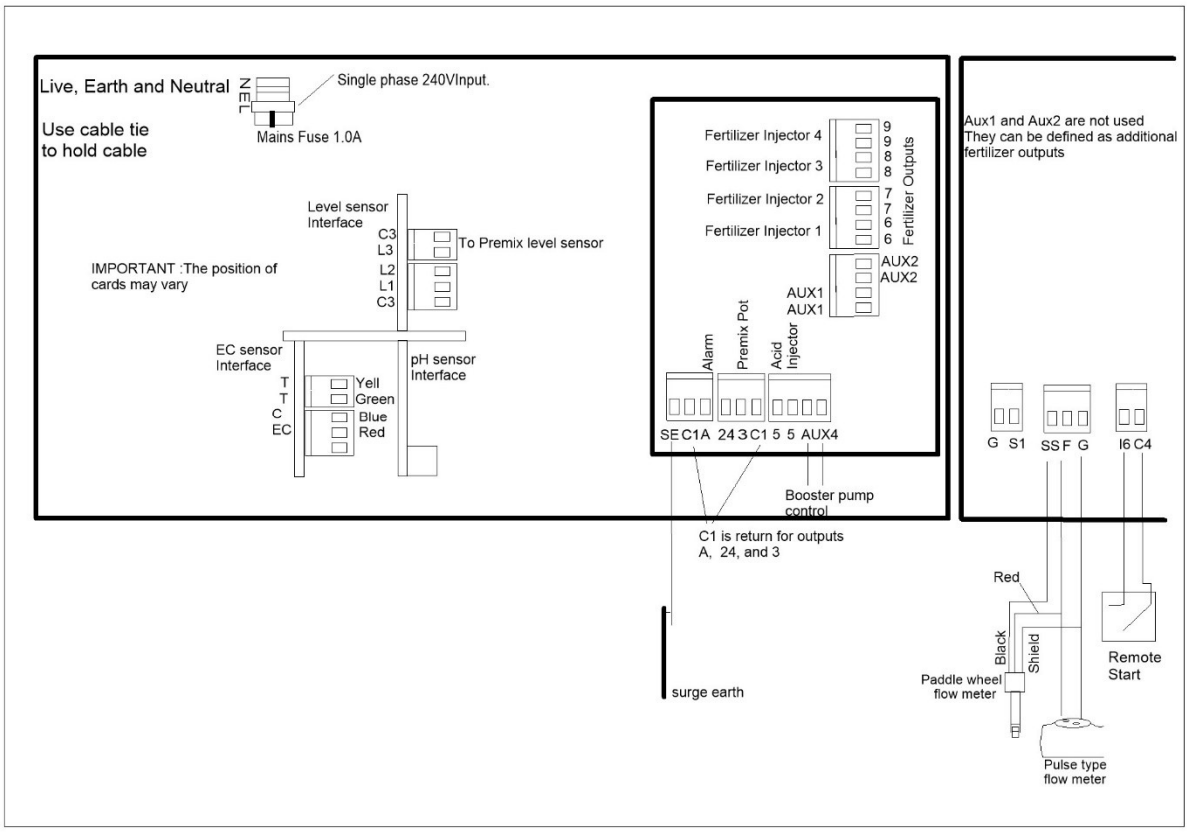
Connect the mains supply to the controller as shown in Fig 1.

Star wire the mains supply to the dose controller electronics back to the main electrical distribution panel. Do not connect any motors, pumps or other high power equipment to this circuit.

You will need to connect either the remote start circuit to initiate dosing system or the 4- wire digital link to a Heron irrigation controller. If you are using the remote start the circuit, this should be wired such that a closed

contact will appear on the input terminals when dosing should start. When the contact opens EC/pH controller will switch off.

Fig 1 Connection Diagram



Flow Meter Connection

Either a paddle wheel flow meter or a pulse type flow meter can be connected.

Pulse Type Flow Meter

A pulse flow meter can be connected across G and F. Pulse type flow meters which provide a pulse out every Litre, 10 Litres or 100 Litres can be used. You will need to set Option 60.

Paddle Wheel Flow Meter

A paddle wheel flow meter with an Open Collector Output can be connected SS, G and F. You will need to set Option 60 to 5 and Option 61 to the K value of the flow meter.

Alarm Circuit

The controller provides an alarm output across on the A, C1 terminals. The alarm circuit should be wired to disable irrigation.

Digital Connection to Mi or Ti Controllers

If you intend to start the dosing controller from an HM or HT controller you need to fit the 4 wire digital link between the irrigation ontroller and dose controller. The wiring is shown in the following table. Use signal cable for this purpose.

	Wiring
Direct Connection using ‘Short Distance Card’	T to T, R to R, V to V and G to G.

3. Pipe Connections where Venturis Driven by Main Irrigation Pump

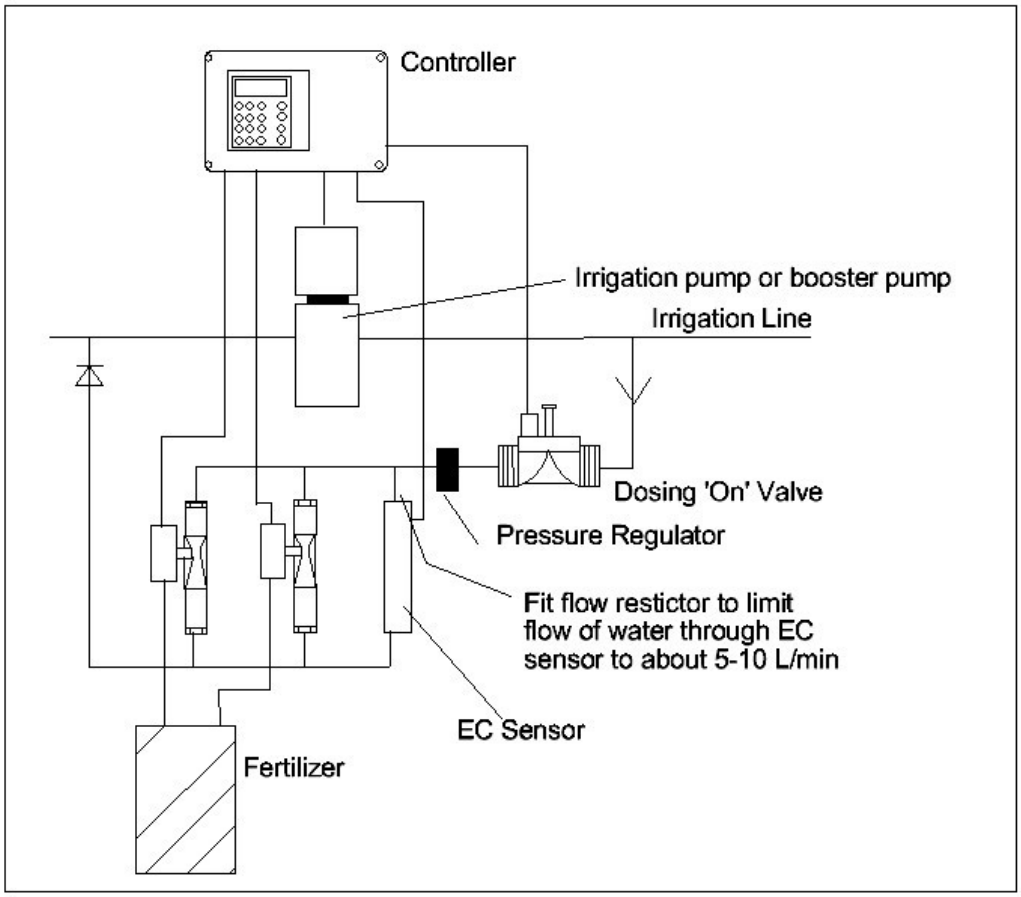
A schematic diagram of the system is shown below.

Pipe Connections

Connect the in-let to the dosing rig (bottom left) to the delivery side of the pump as shown in Fig 3. Use 40 or 50 mm pipe for this connection.

Connect the out-let of the dosing rig (top right) to the In-let of the irrigation pump. It is desirable to fit a non-return valve here to prevent water flowing back in failure condition. Use 40 or 50 mm pipe for this connection.

`Fig 3 Pipe Connections



Adjusting Pressure Regulating Valve

With the system is installed you may need adjust the pressure regulating valve to create 1.25 bar at the inlet to the venturi injectors.

ELECTRICAL CONFORMITY

USA This product has been certified as an FCC **Class B** device.

Declaration of Conformity

We herewith declare that all products manufactured by the company below meet the requirements of EC directives.

Applied Standards Are:

EN 50081-1 EMC Generic Emission

EN 50082-2 EMC Generic Immunity

To comply the product must be permanently installed in accordance with the installation instructions provided and the electrical supply must be sinusoidal.

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Parts Check List

	Check
Connectors plugs and IEC connector	
Filter for each fertilizer valve	
2 x Screwed Unions	
2 x Manual	