HYDROMETRICS GW50FC SENSOR – FLOW CELL

Product details and applications

Introduction

Occasionally there are situations where a suitable bore is not available to install a GW50 or GW50PC nitrate sensor. We do not recommend the installation of a sensor into a production bore, particularly if it is using a submersible pump to extract water as it can impair the HydroMetrics sensor. We also understand that installing a new standalone bore can be cost prohibitive. To circumnavigate these issues, the GW50FC nitrate sensor model has been created *Figure 1*. Water can be pumped from the groundwater well and piped through to the GW50FC sensor. The HydroMetrics sensor can then be automated to read the nitrate levels at regular time intervals.
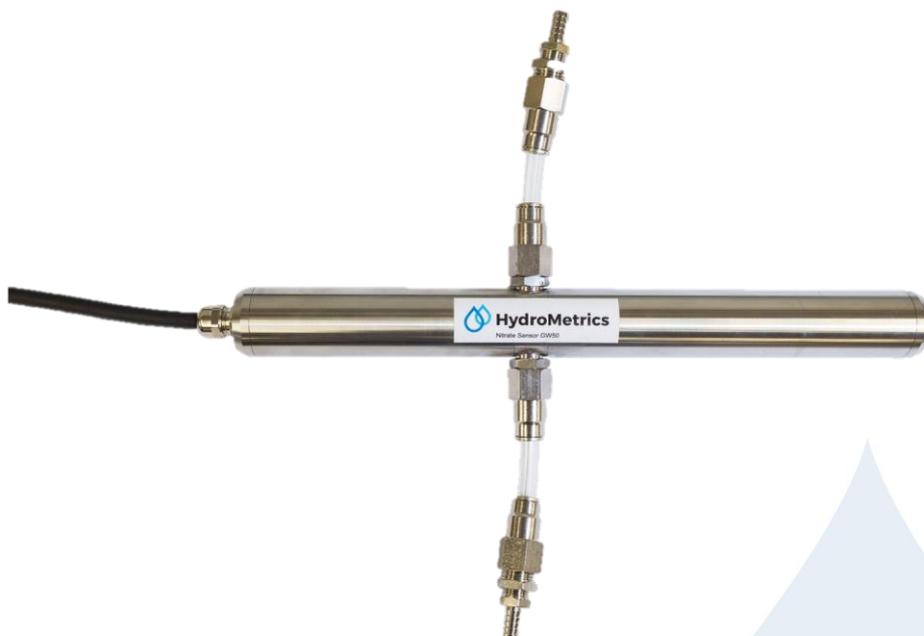
Figure 1: HydroMetrics GW50FC Sensor

Possible HydroMetrics GW50FC applications

- Drinking water and stock water monitoring.

- Monitoring of waste water streams before discharge to land or trade waste; for example, treated wash water from a milk processing plant.

- Influent streams to carbon based bioreactors.

  Note: Due to the likelihood of increased dissolved organic carbon the GW50FC sensor is unlikely to be suitable for outflow from the bioreactors without appropriate pre-filtering.

- Regional groundwater monitoring relying on existing production bores.

Nitrate Sensors for Research, Agriculture and Industry.

HydroMetrics™

Installation

For the GW50FC sensor to operate successfully without damage to the unit, the source of water pressure must be less than 1 Bar. The water must be pressurised either by gravity feed or by pumped supply. If the pressure exceeds 1 Bar, a pressure reduction valve should be utilised to reduce pressure.

The sensor comes with ½ inch BSP push lock fitting and a standard fitted 13mm hose tail. Other size hose tails can be supplied if required.

The flow direction of water does not matter, but the inlet side should be lower than the outlet side to ensure any air bubbles move through the sensor and do not create long term issues for the measurement.

Above ground temperature conditions can vary rapidly during the day, we recommend the sensor is installed in a thermal enclosure with some additional thermal mass to reduce temperature swings. See *Figure 2* as an example.

Figure 1: An installation of a HydroMetrics GW50FC on a New Zealand farm that monitors domestic drinking water for staff.

If the water flow source is continuous, the sensor can use its internal logger to record NO_3-N readings at predetermined intervals. To reduce wastage of water (assuming it cannot be recycled into the system supplying the sample) the installed unit can use the sensor internal timer and signal wire with the appropriate interface to turn water flow on and off to the sensor. Usually this would be done with an electronic solenoid valve with a suitable control circuit that can be controlled from the sensor's trigger wire. We recommend that the sensor opens the valve for an allocated time pre-measurement that allows for the line to be well flushed.

If the water supply is intermittent (e.g. a well pumping to a surface tank that only runs occasionally) utilising the internal data logger to record NO_3-N readings may not be the best approach as the GW50FC sensor is not able to determine when the pump is running. In this situation, a third party device can be installed. This device should be configured to communicate with the sensor (via SDI-12) and have the ability to monitor pump operation and request a reading when the water source is running. This monitoring device can then monitor the pressure sensor/flow sensor or a pump run signal to determine system operation.

Maintenance

Maintenance requirements for the GW50FC sensor are minimal. As the sample is flowing, biofilm or other contaminant build up are often reduced. Only occasional manual cleaning is required.

If cleaning is required, the hose attached to the push lock fitting can be removed to allow for a quick brush with Isopropyl Alcohol or 70% Ethanol to clean the measurement cell.

Nitrate Sensors for Research, Agriculture and Industry.