PROTOC *300* TOC Analyser

An automated microprocessor controlled instrument for the on-line measurement of either Total Organic Carbon (TOC) or Total Carbon (TC). Typical application include:-

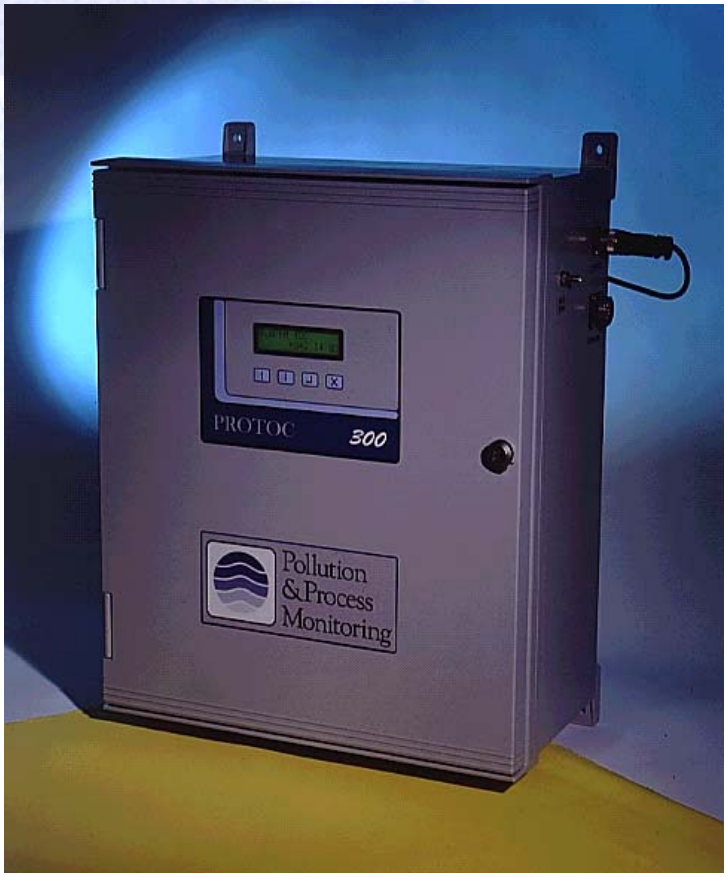
- Final effluent discharge to river, Environment Agency compliance
- Surface water from hard standing areas picking up chemical spillages on site
- Potable water production or use within a dinks manufacturing facility
- Cooling/condensate monitoring for break-through of harmful containments
- Integrated Pollution Prevention & Control (IPPC) measurement for European directive waste minimisation particularly in the food and beverage industries.

Features:

- On-line continuous measurement of sample
- Auto zero and auto calibration
- Variable sequence timings to suit application
- Automatic wash system for periodic cleaning with variable timing to suit application
- Large 16x2 dot matrix Liquid Crystal Display
- Integrated key pad and easy menu navigation
- User friendly layout for ease of maintenance
- Long life components reducing cost of ownership

Outputs:

- Isolated 4-20 mA (max 500 ohms load).
- 2 alarm relay set points, non latching for level alarm.
- Utility alarm relay for loss of carrier gas pressure, reagent, or power.
- No sample (or off line) alarm relay.
- All relay contacts rated at 1 Amp 230 volts AC.
- RS232 / RS485 digital.
- ProfiBus (option).



Operating Options:

- Non continuous (periodic) sampling. The instrument can be set to measure for a specific period of time and then enter a “sleep” mode for a set time and then repeats the sequence
- “Sleep” mode from a triggered signal. For example a float switch from a tank will give a signal to start measuring when the level is sufficient for sampling.

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Measuring Principle

The PROTOC measures a sample stream continuously for organic carbon content. Sample is mixed with an acidified reagent containing sodium persulfate. The mixture of sample and reagent is sparged with a carrier gas (usually compressed air) to remove inorganic carbon and dissolved carbon dioxide. The remaining liquid, which now contains only organic carbon compounds, is pumped into the reaction vessel. A strong source of ultra-violet light promotes an oxidation reaction between the organics and persulfate, producing carbon dioxide. A stream of carrier gas diffusing at the bottom of the reaction vessel, transfers the carbon dioxide through a gas drying system into a non-dispersive infrared detector. The amount of carbon dioxide produced is directly proportional to the organic carbon content of the sample over a specific measuring range determined by the application.

The analyser may be set up to measure total organic carbon (TOC) or total carbon (TC). In the latter case the sparging of the sample is omitted.

The analyser is calibrated by passing a standard test solution through the analyser. The standard contains a known level of carbon and the detector is adjusted to display the correct reading. Solenoids are used to switch either the sample or the standard solution through the analyser.

The installation configuration of the Protoc depends upon the measurement objective, the physical arrangement of the plant and the nature of the sample. The instrument will typically consume between 1 to 10ml of sample depending on the range. The sample pressure to the analyser should be less than 3psi (0.2 bar) and a temperature less than 80 ^{o}C.

The particle size in the sample to be analysed should be less than 100 micron. Appropriate filtration should be employed. A full range of sample acquisition systems is available to suit most applications.

Specification

- **Measured range chosen from 0-10ppm up to 50,00ppm (user specified) for ranges of 10,00ppm and above an automatic dilution is required**
- **Automatic Zero and Calibration**
- **Response time from 2 to 6 minutes T90 depending on application**
- **Accuracy, better than +/- 2% of the instrument range relative to the calibration solution**
- **Detection limit better than 1% of the calibrated range**
- **Reagent, acidified Sodium Persulfate typically 5% strength at 1 mil/min consumption**
- **Carrier gas typically compressed air at 2.2bar 800mil/min**
- **Power requirements from 100 volts to 240 volts 50/60 Hz <150 watts**
- **Analyser Height 62cm Width 50cm Depth 28cm Weight 35Kg**
- **GRP case protected to IP55**

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