DELTA-PHASE ELECTRNICS, INC.

TA-5 Online Titration Analyzer

VFA (volatile fatty acids) and Alkalinity Analyzing

Simple	Measuring the substrate concentration by easy analytical devices User Friendly Menu Structure Touch-screen Interface
Reliable	Epoxy Powder Coated Rugged Cabinet Two separate Compartments (Electronics. Hydraulics)
Cost Effective	Low Maintenance Affordable solution and Reagent usage

Description

The TA-5 Analyzer is an on-line sequential sampling analyzer that involves multiple points PH measurements based on Titration technologies to perform an analysis. The analyzers can be configured to perform *VFA (volatile fatty acids) and Total Alkalinity* analysis by using only two reagents.

Anaerobic digestion treatment of municipal and industrial waste water has gained considerable importance in the last few years. In terms of process stability, anaerobic digestion still lags behind aerobic biological treatment or physic-chemical processes. *VFA (volatile fatty acids also called short-chain fatty acid)* and *Alkalinity are both very important* parameters to assess the anaerobic digestion stability. The main alkalinity components in a digester are bicarbonate and VFA which are consumed and produced through the process steps. Bicarbonate buffers the system in the optimum pH range for the process to run efficiently. VFA buffers the system at low pH that is inhibitory to the biomass matrix in the digester.

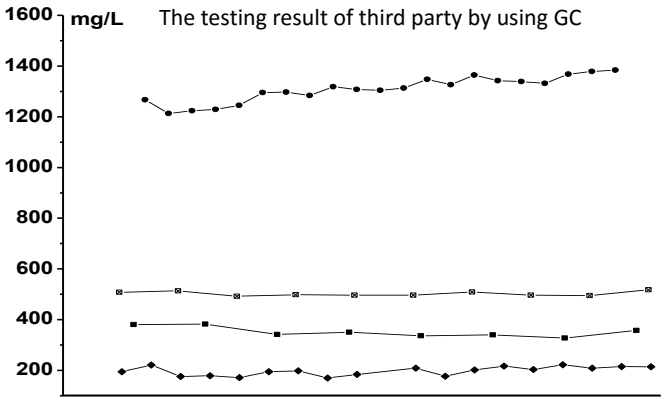
Artificial distillation measuring VFA is low efficiency with unknown inspection error. Many investigated and established control systems depend on sophisticated equipment (e.g. GC-MS) for the measurement of substrate and metabolite (VFA) concentrations in the bioreactor. However, the use of such expensive systems is mainly limited to facility operators or research organizations. Therefore, there is a gap between largely uncontrolled operation and complex process control using precious equipment. On-line titration of the VFA concentration is a promising method to bridge this gap.

The TA-5 Analyzers are easy to start up and use, simply connect the sample, waste and reagent lines and then power up the Factory Calibrated analyzer. Wall mounting hardware is standard but an optional bench-top stand with reagent holder is also available. Accessing information or customizing an analysis routine is easily accomplished with the simple, user friendly menu structure and touch-screen interface.

The analyzer has two separated enclosures with two lockable doors. The Top enclosure, called the ELECTRICAL enclosure, includes the main power supply, the controller PCB assembly and the touch-screen interface. The Bottom enclosure, called the LIQUIDS enclosure, includes all the components involved in the sample and reagent flow, mixing and measuring stage (sampling pump, reagent Micro Pumps and measuring cell).

The TA-5 Analyzer home screen displays the measured parameter, the status, % reagent volumes, time and menu choices. The on screen HELP menu includes information on Start Up, Shut Down, Start/Stop Commands, Calibration, Function List, Programing, Maintenance and Troubleshooting. Outputs include 4 Alarm Relays and two 4-20 mA channels. Standard USB port is convenient for customers to access data and optional built-in wifi has the potential ability to connect internet or any intelligent terminals like iPhone, iPad or PC so make the remote calibration/configuration easily.

The TA-5 Analyzer can be used for municipal or industrial waste water treatments, bio-gasification, Biopharming and brewing. Alkalinity is valuable parameter for raw water in water supply plants, also for boiler water monitoring.

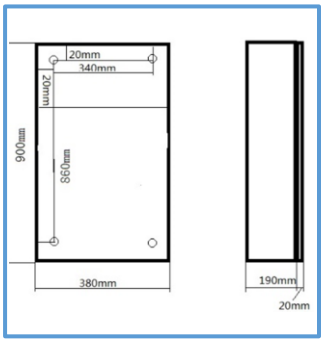


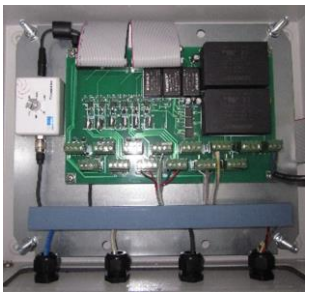
	Average	RSD
kitchen waste water Acidification	1300.6mg/l	3.9%

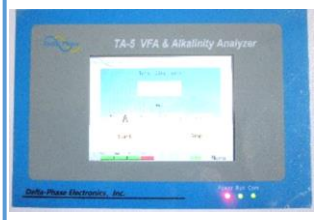
1# influent of WWTP	498.0mg/l	8.8%
2# influent of WWTP	351.3mg/l	5.3%
Anaerobic process of WWTP	197.6mg/l	8.9%

Specifications

Method	Acid-base titration	**Analog outputs**	4~20mA × 2, optional HART
Measuring range	VFA (Acetic acid): 0~100ppm, 500, 2000ppm Total Alkalinity($CaCO_3$): 0~500ppm, 5000ppm Units: ppm, mg/L	**Digital outputs**	RS485 Modbus USB 2.0 wifi
Accuracy	±10% of reading	**Alarms**	2 configurable relays
Repeatability	±5%	**Dimension**	900mm×380mm×210mm
Zero drift	<5% of reading per Month	**IP rate**	IP55
Range drift	<10% of reading per Month	**Sample requirement**	
Measuring cycle	10min	**Normal Flow**	60mL/min
Operating Temp.	5~50°C	**Quick Flow**	100~500mL/min
Display	LCD Touch screen Parameters, value and the state of analyzing	**Inlet Pressure**	<1Bar with peristaltic pump
Power	110-220VAC, 50/60Hz, 80VA	**Outlet Pressure**	Atmospheric
Connections	1/4" for sample, cleaning/calibrating and reagents, 3/8" for discharge and overflow		







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