

TOTAL PHOSPHORUS COLORIMETRIC ANALYZER

Compact online analyzer for measurement of total phosphorus in water

APPLICATION FIELDS

- Waste water treatment plants
- Industrial applications
- Surface water monitoring
- Process control

Phosphorus occurs in several forms: ortho, poly and organically bound. Further classification can be made on whether the phosphorus is dissolved (passing through a 0.45 micron filter). In TP oxidation / digestion, polyphosphates and organic phosphorus are converted into orthophosphate. Organic phosphorus is converted to orthophosphate by UV catalyzed persulfate digestion; polyphosphates are converted to orthophosphate by sulphuric acid digestion. All forms of phosphorus are converted to its ortho form in the TP procedure, in the presence of persulfate and an acid background.

ADVANTAGES / FEATURES

• Different compartments

To ensure complete separation between the electronics (upper case) and the wet part (lower case).

• Low reagents consumption

Minimum operating cost by small reagent consumption, less than 1 L (0.44 US.gal) per month for continuous operation. N° 2 reagents for yellow method, n° 3 reagents for blue method.

• Automatic calibration / validation / cleaning

Validation, cleaning and calibration are standard features which significantly reduce downtime and operator intervention ensuring the most accurate results are obtained. Free selectable validation, cleaning and calibration intervals.

• Wide measuring range

The determination ranges of the TP Analyzer vary from trace ppb to 400 mg/L TP, using external dilution module.



• Large color touchscreen

The colorimeter is equipped with a graphic touchscreen interface showing measured values and status information. Easy access to menus and functions. Integrated datalogger with USB download.

• Factory tested, ready for installation and operation

Just connect the power, sample, and reagent lines and the analyzer is fully operational.

• Measurement principle

The Total Phosphorus concentration can be measured using photochemical oxidation and two different methods depending on the range requested, the blue or the yellow colorimetric method.

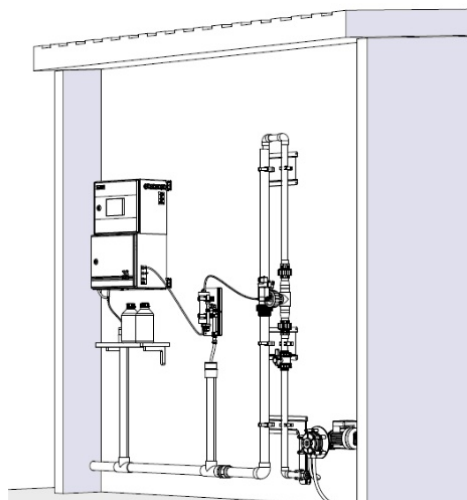
Both methods use advanced photochemical oxidation, sulphuric acid, heat, UV irradiation and a chemical oxidizer (sodium persulfate).

After the complete oxidation of the phosphorus in the sample to PO_4 , then a colorimetric reaction is performed and the intensity of the colour developed is proportional to the phosphate concentration present in the sample.

TECHNICAL SPECIFICATIONS

Measured parameter	TP, PO ₄ , P-PO ₄ (ppb, ppm, mg/l).
Measuring principle	Photochemical oxidation and blue or yellow colorimetric method.
Measuring range	0 - 2 mg/L TP, 0 - 5 mg/L TP 0 - 10 mg/L TP, 0 - 20 mg/L TP Higher range available using external dilution
Reproducibility	Better than ± 2% of full scale for standard test solutions
Analysis Frequency	Freely programmable, batch near-continuous analysis.
Cycle time	30 minutes, including conditioning before analysis cycle, oxidation and rinsing after measuring. Oxidation time is settable by the user.
Reaction cell	Temperature heated
Sample	Pressure-free vessel Temperature: 5 - 50 °C (41 - 122 °F) Flow Rate: 80 to 500 mL/min Connection: 6 mm (¼-in.)
Drain	Pressure-free, atmospheric drain Connection: 12 mm (½-in.)
N° of streams	1, 2 with integrated switching valve 3, 4 with external sequencer
Dimensions (H x W x D)	604 x 380 x 242 mm (23.6 x 14.8 x 9.4 in)
Weight	Approx. 20 Kg (44 lbs)
Power Supply	Voltage: 100 - 240 VAC 50/60 Hz standard or 24 VDC (option) Power consumption: max. 80 VA
Outputs	2 x 4-20 mA outputs for measured data Modbus RTU RS485
Alarms	2 SPDT programmable potential free relays
Digital Input	Remote start/stop, start extra cycle, skip idle time, emergency stop
Working Temperature	5 - 45 °C (41 - 113 °F)
Humidity	10 to 90% RH (indoor use only)
Installation	Wall mount (standard), bench top support or panel mount (options).
Protection Grade	IP54

INSTALLATION EXAMPLE



The analyzer is easily installed in a minimum amount of wall space.

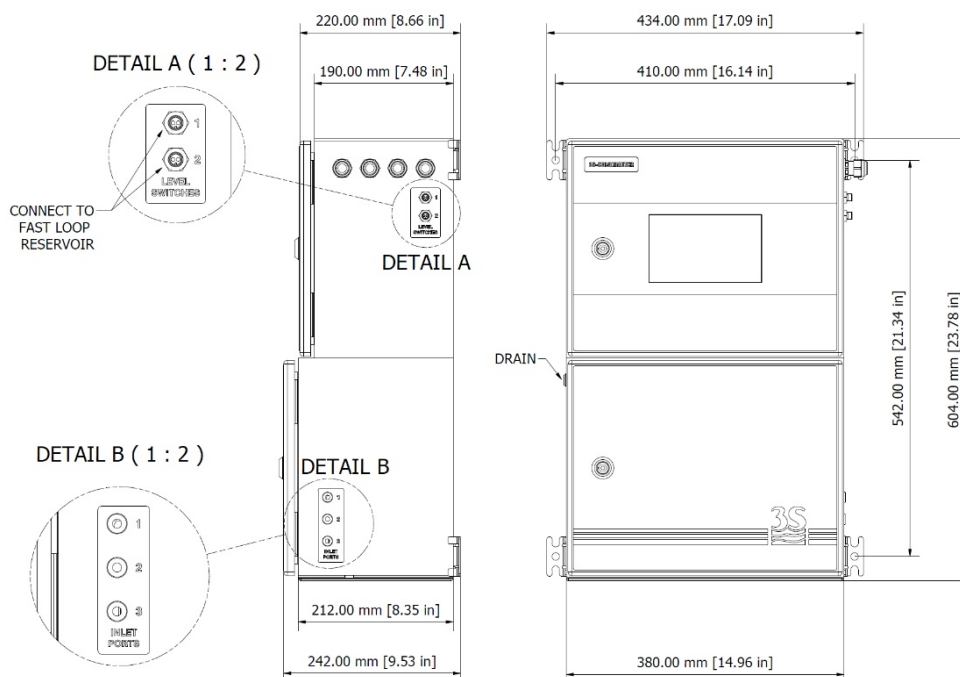
In the picture are included the optional accessories:

- a) A46ERLS000 - Fast Loop external reservoir with level switch
- b) A46SF10020 - Filtration unit 100 micron 230 VAC (other mesh size and input voltages available)
- c) A46SPP0000 - Sampling Pump

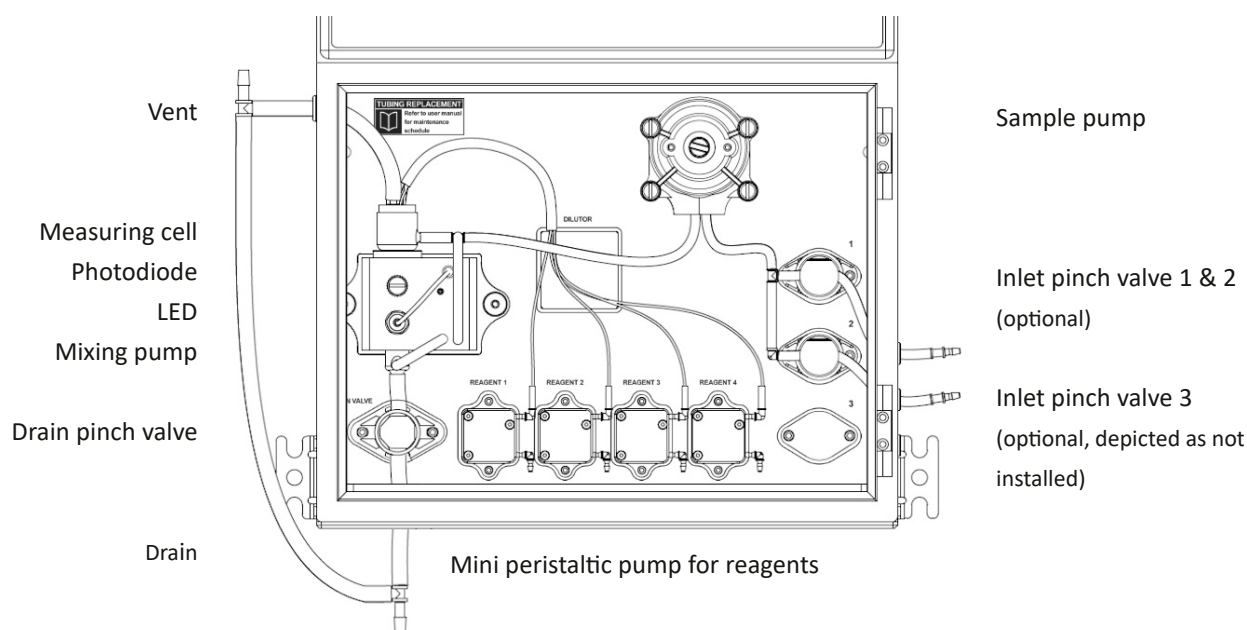
Other accessories, including external dilutors to increase the analyzer range and different kind of sample reservoirs are also available. See our website for more info.



TECHNICAL DRAWING



HYDRAULIC COMPARTMENT VIEW



PRODUCT CODES

Total Phosphorus, Blue Method

CL-3-850-0-16-TP	TP, one inlet port, 16 mm cell
CL-3-850-2-16-TP	TP, two inlet ports, 16 mm cell
CL-3-850-3-16-TP	TP, three inlet ports, 16 mm cell
CL-3-850-0-26-TP	TP, one inlet port, 26 mm cell
CL-3-850-2-26-TP	TP, two inlet ports, 26 mm cell
CL-3-850-3-26-TP	TP, three inlet ports, 26 mm cell

Total Phosphorus, Yellow Method

CL-2-430-0-16-TP	TP, one inlet port, 16 mm cell
CL-2-430-2-16-TP	TP, two inlet ports, 16 mm cell
CL-2-430-3-16-TP	TP, three inlet ports, 16 mm cell
CL-2-430-0-26-TP	TP, one inlet port, 26 mm cell
CL-2-430-2-26-TP	TP, two inlet ports, 26 mm cell
CL-2-430-3-26-TP	TP, three inlet ports, 26 mm cell

Total Phosphorus and Phosphates, Blue Method

CL-3-850-0-16-TPO4	TP + PO ₄ , one inlet port, 16 mm cell
CL-3-850-2-16-TPO4	TP + PO ₄ , two inlet ports, 16 mm cell
CL-3-850-3-16-TPO4	TP + PO ₄ , three inlet ports, 16 mm cell
CL-3-850-0-26-TPO4	TP + PO ₄ , one inlet port, 26 mm cell
CL-3-850-2-26-TPO4	TP + PO ₄ , two inlet ports, 26 mm cell
CL-3-850-3-26-TPO4	TP + PO ₄ , three inlet ports, 26 mm cell

Total Phosphorus and Phosphates, Yellow Method

CL-2-430-0-16-TPO4	TP + PO ₄ , one inlet port, 16 mm cell
CL-2-430-2-16-TPO4	TP + PO ₄ , two inlet ports, 16 mm cell
CL-2-430-3-16-TPO4	TP + PO ₄ , three inlet ports, 16 mm cell
CL-2-430-0-26-TPO4	TP + PO ₄ , one inlet port, 26 mm cell
CL-2-430-2-26-TPO4	TP + PO ₄ , two inlet ports, 26 mm cell
CL-2-430-3-26-TPO4	TP + PO ₄ , three inlet ports, 26 mm cell