

FTOC analyzer for MBR system specifications and requirements

1. GENERAL SPECIFICATION

1.1. INTRODUCTION.

This specification covers the requirements for the supply of a Total Organic Carbon (TOC) analyzer. This analyzer will continuously monitor the effluent disposal stream from water treatment facility at Energy Infrastructure Ltd. installation, Israel, into the Port of Haifa seawater. The analyzer will be connected to two separate streams, and be able to analyze each stream at a time according to operator's demand.

The system shall comprise the following abilities:

- Continuous report on the analyses results.
- Alerts on deviations from the allowed set points.
- Alerts on failures of the system followed by detailed description of the faults.
- All the information that the system collects should be available to Energy Infrastructure Ltd. control room through a standard protocol.
- SMS massaging in case of TOC above 100 mg/l

1.2 SCOPE OF SUPPLY

The supply of the TOC analyzer shall include a complete system comprising the reactor, the detector, the electronics, and sampling system including the acid additions and CO₂ removal system (for TOC measurements). The analyzer shall be supplied with 2 years operational spare parts.

Further shall the supply include:

- Vendor drawings clearly showing the various parts of the supplied equipment as well as overall and specific parts dimensions
- Operation manuals

- Maintenance manuals
- A complete specification (data sheet)
- Vendor shall prove his capability to provide local services for maintenance and repair
- Vendor shall provide a list of required utilities for the operation of the analyzer (power, water, air, etc)
- Vendor shall state the approval(s) which the proposed analyzer carries (EPA methods 9060 and 415.1 etc).
- Detailed and accurate description of the communication interface including detailed explanation of the communication list' communication hardware and communication parameters.

1.3. SPECIAL REQUIREMENTS

The vendor shall provide:

- Assistance during installation of the analyzer and the auxiliary systems
- Assistance in the commissioning of the analyzer
- Training of Energy Infrastructures personnel
- Special hardware or software tools for maintenance and programming of the analyzer.
- Technical support of software engineer that shall assist Energy Infrastructure Ltd. engineers to develop the interface to existing control system, this could be done through e-mail and phone.
- List of recommended spare parts for one year of operation.

1.4. TESTS AND GUARANTEES

After completion of the installation and commissioning, a test shall be carried out by the vendor for the approval of Energy Infrastructure Ltd..

If Energy Infrastructure Ltd. shall determine that the test has failed he shall be entitled to:

- Request the performance of a re-test

- Reject the supplied system or a part thereof and order the vendor to replace it at the vendor's cost.

After a successful performance of the Performance Test vendor shall provide a guarantee period of 18 months.

2. TECHNICAL SPECIFICATIONS

2.1. GENERAL

Tag no.:	AC-3200
Service:	outdoors inatalation at oil dock close to the sea.
Area classification:	Hazardous (Class 1, Div.2) at point of sampling; non-hazardous at the location of the analyzer
Ambient temperature:	0 – 50 ⁰ C
Relative humidity:	80% (max 95%)
Line:	
Customer:	Energy Infrastructures
Manufacturer:	
Model:	

2.2. PROCESS

Fluid & phase:	waste water, effluent
Pressure min / norm / max:	0.7 bar A. /1.1 bar A. /1.5 bar A.
Design pressure:	N/A
Temperature min / norm / max:	0 / 30 / 50 ° C
Main component measured:	TOC
Other components which can be measured:	by vendor
Calibrated measured range:	0 – 50 ppm Carbon
Total Dissolved solids:	500 - 3000 mg/l

2.3 ANALYZER DESCRIPTION

Quantity	1
Principle of measurement:	**
Electronics:	microprocessor based
Range of analyzer	0 – 50 as C
Permissible range of dissolved solids:	** %
Response time (cycle time):	**
Sensitivity:	**
Repeatability:	**
Linearity:	**
Drift:	**
Auto Zero:	**
Sample dilution possibility:	**
Reading (display):	** type of scale and units
Wetted materials:	**
Alarms:	** (single/dual/adjustable/contacts rating)
Alarm local indication:	** (LED)
Power:	230 VAC, 50 Hz
Output signal(s): analoge:	4-20 mA isolated
Alarms:	SPDT contacts 5A; 24 VDC
Process connection:	**
Communication ports:	**
Enclosure :	Cabinet IP65 or better

** by vendor

2.4 SAMPLING

The sampling point is about 10 meter from the location of the analyzer. The sampling point elevation is at –1.5 meter and the sample pump has to be provided for conveying the waste water sample stream from that point to the analyzer.

The sample system including the pump, the piping, necessary fittings and accessories are part of the analyzer scope of supply.

The pump will likely be installed in the hazardous area.

The analyzer will be mounted in an open shelter. The shelter is not part of this supply.

2.5. SAMPLE AND UTILITY REQUIREMENTS

Required min÷max flow rate: **

Sample temperature

(allowed min/max): **

Suspended solids (allowed

max. concentration): **

Carrier gas: consumption,

conditions, purity (see note)**

Water: consumption, quality: **

Acid: type, concentration,

consumption: **

** by vendor

2.6. WASTE WATER COMPOSITION.

pH	5.5 – 9.0
Chlorides (mg/L)	500 – 10,000
Organic Matter as TOC (mg/L)	1 – 50
Mineral Oil (mg/L)	0.5 – 30
Sulfides (mg/L)	0.1 – 1
Ammonia (mg/L as N)	0.2 – 10
Total Hardness (mg/L as CaCO ₃)	300 – 1,500

2.7. INSTALLATION

Installation of the analyzer and sampling system, calibration start-up and commissioning are part of the requested proposal. Installation includes all

necessary hardware for the sample handling as described above (2.4) as well as the electrical connections (supply of power cables, signal cables, etc.)

2.8. DOCUMENTATION

2.8.1 With Offer:

Catalogs, data sheet, power requirements, dimensions, weight etc.

2.8.2 Before Construction:

All drawings including outline and installation, wiring and port location, per Customers' schedule of Vendor drawings and Data Requirements.

2.8.3 With Dispatch:

As-Made drawings.

2.9. REFERENCES

Vendor shall provide a list of existing installations for similar applications of the proposed make and model in Israel.

2.10. AIR SUPPLY/OXYGEN GENERATOR – Oxygen tanks

Vendor shall offer, as an option, an air supply or oxygen generator unit which shall supply the necessary air/oxygen flow at the required conditions (pressure, quality, etc) for the performance of TOC analysis.

2.11. ACCESSORIES & OPTIONS

Vendor shall include the following accessories as an option to the client, this should include any adaptation required in the electronics or PLC system:

- Auto-calibration valve – for external analyzing.
- Cleaning Cycle valve – for self cleaning of the analyzer.
- 2 Streams splitter (multi-stream selector) – for analyzing each stream by demand.
- Data communication to central control system & control room by means of standard communication protocols (Modbus..) to Modicon Quantum Plc.