Trace Elemental
Instruments

// XPLORER-TX/TS

Full aplication range with remarkable accuracy and precision

The TE Instruments **XPLORER** micro coulometric serie is a welcome upgrade for your existing Total Halogens and Total Sulfur analysis.
The TX/TS analyzer blends into every laboratory environment, wheter it is for R&D, Refinery, Chemical or Petrochemical applications. The **XPLORER** serie is able to handle them all without any exception.
Its robustness and precision are ideal for R&D, Refineries, Surveyor testing laboratories and chemical pants.

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Speed & Performance with minimal footprint

Key features include:

- Compact design
- Fast generation of sample queues and application methods with TE Instruments software (TEIS)
- Short start-up time (less than 15 minutes)
- Fast and precise measurement of solids, liquids, LPG and gas.
- Easy to use and intuitive user interface
- Compact, stackable auto sampler for high sample throughput and low cost per analysis
- Ultra low detection limit, high stability and reliability due to the temperature controlled titration cell
- Low maintenance, optimal combustion and conditioning of gases results in near to zero downtime
- Fast and easy switching between TX and TS analysis, resulting in high productivity
- ASTM, ISO, IP and related international standaards compliance

Anything goes

The **XPLORER** serie is capable of handling all sorts of samples and applications.
The TX/TS combustion analyzer handles liquids, solids, liquefied gas and gas samples.
Changing from the liquids & gas mode to solids was never easier. Just push one button and the liquids & gas module is automatically retracted from the hot area. No clamps or manual locking. It will take about 45 seconds to change into the solids mode. Simply choose the pre-loaded sample list and run.

Manual or Robotics

There is still a choice as to how you'd like to run your samples. Just a couple of samples a day or 24/7.
For liquids, there is an integrated automatic syringe driver. It offers full control over the desired volume and speed of injection.
For solids introduction, there is an integrated software controlled boat drive. Both features do come standard with every **XPLORER** .

If the choice is full automation, a robotic XYZ auto sampler handles all liquids. There is even a vertical introduction module, allowing direct liquid injection either by boat or by vaporizer. For LPG's and Gas, there is a revolutionary, fully automated GLS sampler.
It can run as a stand-alone, method driven, gas sampler, using a touch screen as user interface.
Connected to the powerfull TEIS software it simply runs in slave mode to the **XPLORER** .
Handling solid samples can be executed by the Newton auto sampler. It handles sample cups for various applications.
No matter what choice you make: every bench marking design feature, enhances the overall quality, saves time and significantly reduces the need for spare parts.
Did we already mention your bench space savings?
Up to 3 times, compared to other manufactures.

Spot-on Analysis, higher productivity

Coulometric determination of Chlorine and Sulfur is an absolute technique and calibrating the analyzer isn't a requirement.
The accuracy is automatically verified using a control standard. The overall analysis of hydrocarbons at ultra-low concentrations has an unprecedented precision of 1.5%.
In addition to boost the overall productivity, an auto diluter is part of the XYZ sampler offering.
Instead of injecting a smaller volume, auto dilution is an option.
The **XPLORER TX/TS** has it all.

Compliance and Regulations

Our instruments comply with the following international standards for:

TX	ASTM D4929
	ASTM D5808
	UOP 779
TS	ASTM D3120

Precision and simplicity

Meeting the toughest Standards and Regulations

Regulating bodies all over the world has set challenging low levels of allowed Sulfur concentration in organic fuels for the present and near future. Beside the regulations for Sulfur, knowing the exact concentration of Sulfur and Chlorine in certain feeds has always been important for the production processes in the refineries. For example: during the refinery process Organic Chlorines will form Hydrochloric Acid, this formation need to be avoided to minimize corrosion in the refinery process. Hence the refineries need to monitor and control the total Sulfur and total Chlorine content in the feedstock.

Reference Methodology

Microcoulometry is the reference method for the determination of total Sulfur content in light liquid hydrocarbons, gasoline, and diesels and their additives; and the reference method for the determination of total Chlorine in crude oil. The methodology fully complies with the international standards, like
ASTM, ISO, IP, UOP, etc.

Industrial Applications

Chemicals:

- Acetic Acid
- Polypropylene & -ethylene
- Polycarbonate
- Aromatics
- Resins
- Olefins and parafines

Refinery products:

- Crude oil
- Kerosene
- Fuel oil
- Gasoline
- Diesel fuel
- Catalyst
- Naphta
- Lubricants

LPG and gases

Solution provider for the following industries:

- Surveyor laboratories
- Chemical laboratories
- Petrochemical laboratories
- Governmental Institutes and Research Facilities
- Universities

CHLORINE CELL

How does it work?

Samples are introduced, with the appropriate introduction module, into a furnace, where they are oxidized at high temperature.
The combustion gas, carrying halide ions, is led into a sulphuric acid scrubber for rapid water and interference removal. The dried and clean gas is led into the temperature controlled titration cell, where the halide ions react with silver ions, present in the titration cell.
The amount of charge (the integral of the regeneration current over the measuring time) used to regenerate the lost silver ions, is directly related to the Halogen content of the sample.

COMBUSTION:

$R\text{-}X + O_2 \longrightarrow HX + CO_2 + H_2O$

TITRATION CELL:

$HX + Ag^+ \longrightarrow H^+ + AgX$

$Ag \longrightarrow Ag^+ + e$

SULFUR CELL

How does it work?

Samples are introduced, with the appropriate introduction module, into a furnace, where they are oxidized at high temperature.
The combustion gas, carrying Sulfur dioxide (SO2), is led into a sulphuric acid scrubber for rapid water and interference removal. The dried and clean gas is led into the temperature controlled titration cell, where the Sulfur dioxide react with Tri-iodine, present in the titration cell.
The amount of charge (the integral of the regeneration current over the measuring time) used to regenerate the lost Tri-iodine, is directly related to the Sulfur content of the sample.

COMBUSTION:

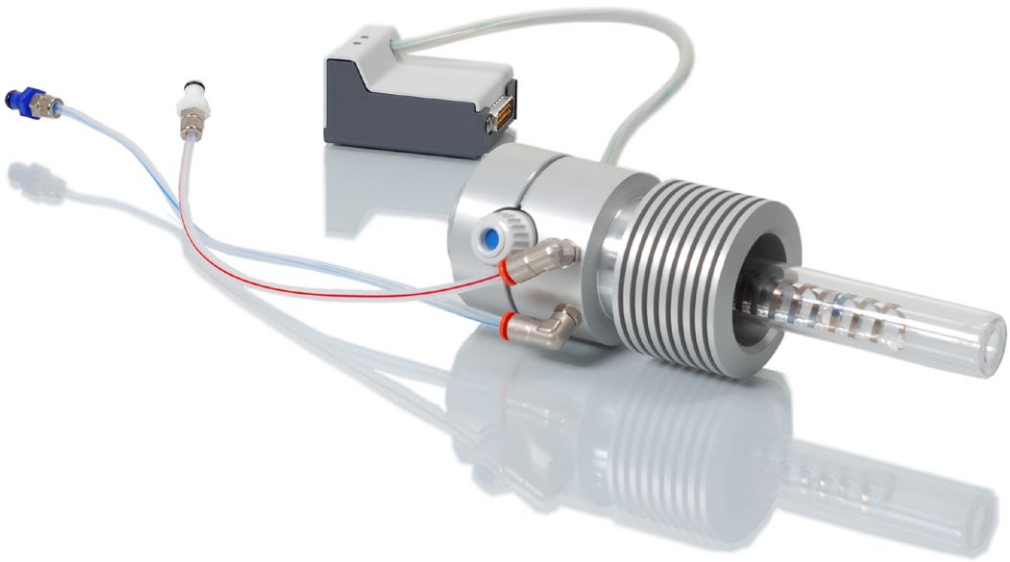
$R\text{-}S + O_2 \longrightarrow SO_2 + SO_2 + H_2O$

TITRATION CELL:

$SO_2 + I_3^- + H_2O \longrightarrow SO_4^{2-} + 3\ I^- + 4\ H_3O^+$

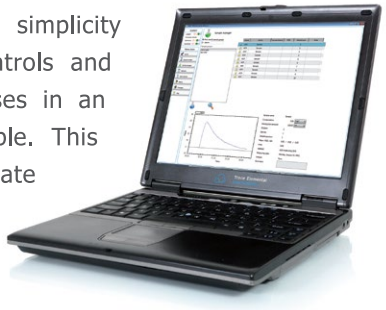
$2\ I^- \longrightarrow I_2 + 2e$

$I_2 + I^- \longrightarrow I_3^-$



Good research needs good analyzing.

TE Instruments Analytical Software (TEIS):



Ensuring intuitive and smooth control of your analysis. The user interface of the TE Instruments Software (TEIS) hardly needs any explanation. Its simplicity ensures smooth operation of the Xplorer series, with intuitive controls and operation features. TEIS assists the user to achieve routine analyses in an efficient, fast and reliable way. Instrument operation remains simple. This resourceful software makes it possible to modify sample queues, evaluate data and calibration lines, completely independent. Results can be presented in customized print reports or exported in a variety of data formats. Sensor readings and generated Log files help the user to handle daily matters and plan service intervention ahead in time. No suprises!

FEATURES	BENEFITS
One software solution for all TEI analyzers	Reduces complexity and improves productivity
Real time measurement curves	Maximal analysis control, compare samples at a glimpse
Multi-Elemental analysis	Optimal analysis control and time saving procedure
Selectable user and service levels	Security and data integrity
Customized application and analysis methods	Full and flexible control of the analysis/system
Fully multi-tasking	Efficient, user friendly and time saving

XPLORER System Specification

Dimensions (W x H x D)	40 x 28 x 70cm (15.7 x 11 x 27.6 inch)
Weight	29kg (64lbs)
Voltage	100-240 V, 50-60 Hz
Power requirement (max)	1150 W
Gas connector	⅛" Swagelok
Gases	Oxygen 99.6 % (2.6), Argon 99.998 % (4.8)
Input gas pressure	3-10 bar
Internal gas pressure	1.8 bar, adjustable
Furnace voltage	Dual zone, low voltage
Furnace temp. (max)	1150 °C (2102 °F)
Furnace cooling	Pulling Fan, auto control
Sample introduction	Quartz boat
Liquids injection	10µL-100µL
Measuring range	25ppb-500ppm
Solids injection	5-1000 mg
Measuring range	500ppb-10000ppm
Boat driver	Software controlled, adjustable
Detector	SMD, Digital Coulometer
Detector accuracy	Better than 2% CV
Titration cell conditioning	Temperature controlled, adjustable
Software	dot.NET-based, TEIS 2 software
Ambient temperature	5-35 °C (41-95 °F) non condensing