



Configuration: Xplorer with Vectra\*

## // XPLOER-TX/TS

Full application range with remarkable accuracy and precision.

The TE Instruments Xplorer-TX/TS is a microcoulometric combustion analyzer designed for the analysis of total halogens and total sulfur.

The Xplorer-TX/TS seamlessly integrates into any laboratory environment. Whether for

R&D, refinery, (petro)chemical, or industrial applications, this elemental analyzer handles them all without exception.

Its robustness and precision are ideal for activities in, for example, production or surveyor testing labs.

## Speed & Performance with Minimal Footprint



Configuration: Xplorer with Vectra and GLS\*

### Key Features Include:

- Fast and precise measurement of solids, liquids, gases, and LPGs.
- Compact design, smallest footprint in today's market.
- Fast generation of sample queues and application methods with TE Instruments Software (TEIS).
- Short start-up time (less than 15 minutes) due to overnight standby mode.
- Easy to use and intuitive user interface.
- Ultra-low detection limit, high stability, and reliability due to the temperature-controlled titration cell.
- Fast and easy switching between TX and TS analysis, resulting in high productivity and flexibility.
- Compliance with ASTM, ISO, UOP, IP, and related international standards.
- Low maintenance and cost-effective, optimal combustion and conditioning of gases results in near-zero downtime.
- Simple electrolyte solution for fast cell preparation.
- 10 years warranty on the combustion furnace.



Configuration: Xplorer with manual liquids module\*



Configuration: Xplorer with Newton\*



### **Effortless Sample Handling**

The Xplorer-TX/TS combustion analyzer handles solid, liquid, gas, and LPG samples. Changing from the liquids & gas module to the solids module has never been easier. Just push one button and this direct injection module retracts automatically from the hot area. No clamps or manual locking! It will take about 45 seconds to change from the liquids & gas mode to the solids mode. Simply choose the pre-loaded sample list and run your samples.

### **Manual or Robotics**

You can choose how you want to introduce your samples: manually or automated. Just a couple of samples per day or around the clock operation. If the analyzer is operated manually there are two options. For the introduction of liquid samples, there is an integrated automatic syringe driver. It offers full control over the desired volume and speed of injection. For the introduction of solid samples, there is an integrated, software controlled, boat drive.

Both features do come standard with every Xplorer-TX/TS.

If the analyzer operates in full automation, the Vectra robotic autosampler handles all liquid samples up to 250 positions (and 100 conditioned positions optional). It extracts the samples from 2 mL vials and is able to dilute and generate calibration standards automatically.

For the introduction of Gas and LPG samples, we offer the GLS and GBS autosampler. They can run as a stand-alone, method-driven, gas sampler, using a touch screen as user interface. Connected to the powerful TEIS software it simply runs in slave mode to the Xplorer-TX/TS.

Solid samples can be introduced using the stackable Newton autosampler, which allows for high sample throughput (up to 60 sample cups) and offers a low cost per analysis. A variety of sample cup sizes are available to cater to any application.

Working with an autosampler improves the throughput & repeatability, saves time and significantly reduces the need for spare parts.

### **Spot-on Analysis, Higher Productivity**

Coulometric determination of chlorine and sulfur is an absolute technique and calibrating the analyzer is not required.

The accuracy is automatically verified using a control standard. The overall analysis of TX/TS at ultra-low concentrations has an unprecedented precision of 1.5%. The Xplorer-TX/TS has it all.

### **Meeting the Toughest Standards and Regulations**

Regulating bodies all over the world have set challenging low levels of allowed sulfur and chlorine concentration in organic fuels for the present and near future. Besides the regulations, knowing the exact concentration of sulfur and chlorine in certain feeds has always been important for the production processes in refineries. For example: during the refinery process organic chlorine 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 & chlorine content in light liquid hydrocarbons, gasoline, 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: ASTM, ISO, IP, UOP, etc.

## Compliance and Regulations

Our instrument complies with, but is not limited to, the following international standards for:

<b>TX</b>	ASTM D4929
	ASTM D5808
	ASTM D7457
	UOP 779

<b>TS</b>	ASTM D3120
	ASTM D3246
	ASTM D3961

For a complete overview of regulations & compliance, please visit our website [www.teinstruments.com](http://www.teinstruments.com).

## TE Instruments Software (TEIS)

TE Instruments considers software as one of the most important tools of an elemental analyzer. TEIS analytical software™ enables smooth instrument control and application handling. The intuitive user interface hardly needs any explanation. Modify sample lists, evaluate data and create calibration lines (if required by method) in a few clicks. Results can be displayed in customized reports or exported in a variety of data formats. The intelligent sensor readings and generated log files help the user to handle day-to-day operation in the most convenient and efficient way.

**Method Manager**  
**Visual Devices**  
**Sample Manager**  
**Task Manager**  
**Database Manager**  
**Dashboards**  
**Auto-Cal Function**

**Use default methods or create perfect application settings**  
**Status overview of every device**  
**Drag & drop the columns you want to see**  
**Prepare sample queues easily**  
**Import and export your data**  
**All important parameters at a glance**  
**Calibration out of a single standard**

## 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
- Biofuels

### LPG and gases

### Solution Provider for the Following Industries:

- Surveyor laboratories
- (Petro)Chemical laboratories
- Governmental institutes and R&D facilities
- Universities
- Production sites



## How does it work?

Samples are introduced, with the appropriate introduction module, into a furnace, where they are oxidized at high temperature.



### CHLORINE CELL

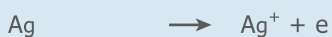
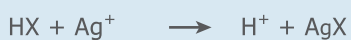
The combustion gas, carrying halide ions, is led through a sulfuric acid scrubber for conditioning and removal of moisture. The dried and clean gas is led into the temperature controlled titration cell, where the halide ions react with silver ions, present in the titration cell.

The amount of charge (the integral of the regeneration current over the measuring time) used to regenerate the consumed silver ions, is directly related to the halogen content of the sample.

#### COMBUSTION:



#### TITRATION CELL:



### SULFUR CELL

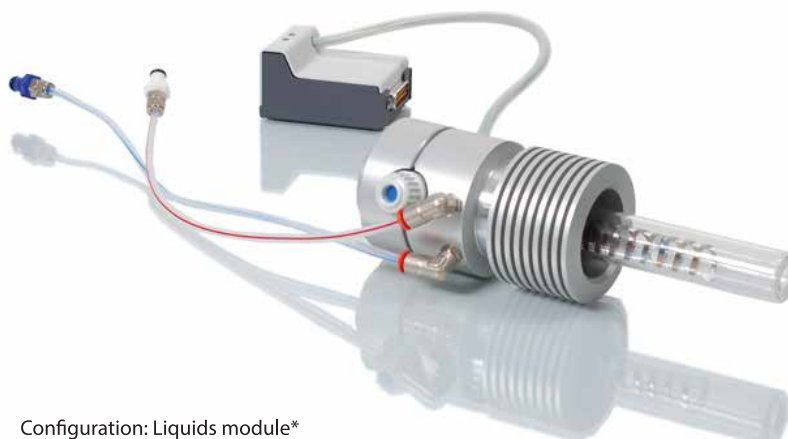
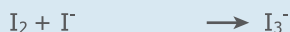
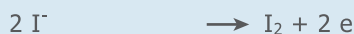
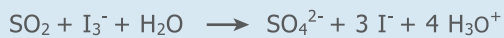
The combustion gas, carrying Sulfur dioxide ( $\text{SO}_2$ ), is led into a sulfuric acid scrubber for rapid water and interference removal. The dried and clean gas is led into the temperature controlled titration cell, where the sulfur dioxide reacts with Tri-iodine, present in the titration cell.

The amount of charge (the integral of the regeneration current over the measuring time) used to regenerate the consumed Tri-iodine, is directly related to the sulfur content of the sample.

#### COMBUSTION:



#### TITRATION CELL:



Configuration: Liquids module\*

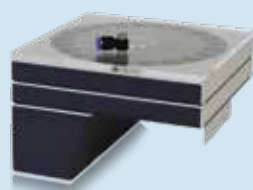
### Option: Vectra Autosampler



**TE Instruments is proud to present its robotic liquids autosampler, Vectra.**

The Vectra has versatile syringe compatibility with volumes ranging from 10 to 250  $\mu\text{L}$  and is able to inject the sample with utmost precision into a vertical liquids module, or boat introduction module at a controlled speed, forming a perfect match with the Xplorer analyzer.

### Option: Newton Autosampler



**Newton autosampler, for absolute sample control, measuring up to 60 samples unattended.**

TE Instruments' Newton is a stackable solids autosampler, designed for accurate and fast introduction of samples into the Xplorer. It is a simple and user-friendly system capable of running up to 60 samples (one, two, or three sample trays) in a row unattended!

### Option: GLS Autosampler



**The next generation Gas & LPG sampling system.**

TE Instruments has developed the GLS, designed to handle all types of gases and LPGs for the analysis of total chlorine, nitrogen, and sulfur. The GLS pairs exceptionally well with the Xplorer combustion analyzer and is equipped with advanced safety features.

Additionally, the GBS autosampler is available for automated analysis of non-pressurized gas samples.

### Xplorer System Specifications

Dimensions (W x H x D)	36 x 27.2 x 69 cm (14.2 x 10.7 x 27.2 inch)
Weight	27kg (59.5 lbs)
Voltage	100-240 V, 50-60 Hz
Power requirement (max)	1150 W
Gas connector	1/8" 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	Solid by boat, liquid direct injection, gases and LPGs by GLS/GBS
Sample size	Solids: 5-1000 mg; liquids: 10-250 $\mu\text{L}$ ; gas: 10 mL; LPG: 50 $\mu\text{L}$
Semi-automatic boat/syringe driver	Software-controlled, method driven
Slider/shutter driver	Software-controlled, adjustable
Detector	Micro Coulometric Titration (MCT), Digital Coulometer
Detector accuracy	Better than 2% CV
Titration cell conditioning	Temperature-controlled, adjustable
Software	TEIS software
Ambient temperature	5-35 °C (41-95 °F) non condensing

\*Used images are examples of configurations which may deviate from ordered configurations.