

TRACE

TECHNOLOGY

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4-20 output

EASE OF INSTALLATION AND OPERATION

Operation Valve Panel

Hinged-door Access

Keypad Outside Housing

Word Menu Displays

Flow-through Filter

Latch Block open to
Change Tape

TOTAL SULFUR



TRACE

700/800

Total Sulfur Analysis

PUSH BUTTON CALIBRATION

The power and flexibility of the Trace microprocessor-based analysis system are available at the touch of a button to help operators with one of their most important responsibilities . . . Calibration. The microprocessor, when requested, selects references, performs calculation adjustments, and verifies faster and more precisely than even the most experienced operators. The unique Trace internal calibrator permits push button selection to quickly and easily verify operation.

ASTM REFERENCE METHODS

The field proven Trace microprocessor technology has been combined with ASTM approved analytical methods. The reference methods are:

ASTM D4084-82
ASTM D4468-85
ASTM D4045-81

The detection technology is based on chemically specific density changes. Optical illumination and detection are integrated for maximum resolution accuracy. Microprocessor technology is combined with statistical software algorithms to calculate precision analysis results.

WORD MENU DISPLAYS

Plain language displays with descriptions of operation status support easy use. The 128 x 64 pixel LCD display allows selections to be displayed in plain language: English, Spanish and other languages. The operator can make selections and entries from available menu choices.

DUAL MICROPROCESSORS

Two independently functioning microprocessor systems are embedded in the Trace analyzer architecture. This dual processor structure allows one processor to have uninterrupted dedicated execution of the analysis algorithms. The second processor is dedicated to user friendly interaction and display. Dual processor design ensures continuous precision analysis and dedicated responsive communication with interactive displays. Embedding two microprocessors in the system electronics allows each processor to have a single first priority. One is dedicated to easy, clear, and responsive information display and operator interaction; the other processor is dedicated to precision analysis calculation without interruption for communication requests.

DIGITAL ELECTRONICS

Digital electronics takes full advantage of micro-processor calculation precision. Data is acquired with 18 bit conversion resolution. Signal over sampling is applied for statistical detection processing and accuracy correlation. An extensive set of mathematical algorithms are executed with full floating point precision to calculate the concentration analysis.

FIELD PROVEN

Operator confidence has been earned through exceptional on-line performance. Reliable operation is an absolute requirement for acceptable performance. Field proven performance is your assurance that reliability is built into Trace Technology products at every level from initial design to final calibration. Performance is your assurance of hassle-free compliance certification. Documented verification of accurate, stable results over an extend, uninterrupted period of operation is required to earn certification. Trace Technology systems have earned certification even in the most aggressive environments.

TANGENT SAMPLE FLOW

Sample flow is tangent to the Trace Tape to eliminate effects from porosity variations when sample is passed through the tape. Signal generation is based on H₂S concentration only. Therefore, the sample's volumetric flow rate does not affect accuracy.

LEAD ACETATE DETECTOR

The only detection method that is absolutely specific to hydrogen sulfide. Based on the formation of lead sulfide when lead acetate tape is exposed to the H₂S sample through an aperture in the sample flow system. This system is totally specific to sulfur. It is unaffected by the composition of the carrier or sample gas. Since the product of the reaction of lead acetate and H₂S is colored and the reactants are not, the progress of the reaction is easily monitored. The rate of formation of lead sulfide may be determined by measuring the rate of the tape darkening. Rate of tape darkening is linear with respect to H₂S concentration.

EASY INSTALLATION

User friendly starts with easy installation. Gas line connections on the outside of the analyzers are labeled for easy setup. Straight-forward ease of installation allows operators to start recording accurate readings almost immediately. Easily accessible sub-assemblies and components support user configuration changes, trouble shooting analysis and validation checks.

FAULT TOLERANT OPERATIONS

Fault tolerant diagnostics are your assurance of low stress operation. The Trace Technology system architecture provides extended maintenance tools, such as fault code logging, calibration records and analysis logs, status displays, and many other selections of data. Even after a total power failure, the analysis is fully operational as soon as power is returned to the unit.

SPEED LOOP

The analyzer system includes the valving and bulkhead connections to reduce the sample transport time. This can greatly improve the system response time.

PHOTO DETECTOR

The primary detection sensor is a silicon based photo voltaic device that does not have the performance decay associated with photo resistive detection devices.

STATUS REPORT LOG

At any point in time the operator can select to view current operation status on the analyzer status page.

MANUAL CALIBRATION PORT

The system provides bulkhead connection tubing and valving that allow connection of calibration gas sources without disconnecting the on-line streams being analyzed.

LED LIGHT SOURCE

The analysis illumination light source is a high efficiency LED which does not have the stability and aging problems associated with incandescent light sources.

TEMPERATURE COMPENSATION

Trace information processing algorithms completely eliminate the effect of parameter offsets commonly referred to as drift. Any effect of temperature on the system amplifier gain is compensated by the use of internal reference measurements made at the beginning of each tape advance cycle. These reference measurements are used to normalize signal processing.

SWEPT VOLUME HUMIDIFIER

The humidification contact chamber is a 1/8" tube path that is continuously swept as the sample flows. This eliminates any dead volume which would affect reading accuracy and system response.

OPERATOR KEYPAD

A directly accessible six-function operator keypad allows configuration selection, maintenance control, and operation setup to be quickly and easily executed.

18 BIT A/D CONVERSION

Allows the detection and resolution of smaller signal values. This means that lower levels of H₂S can be detected. The greater dynamic range of counts up to 262,144 means a wider range of H₂S concentration can be measured without recalibration.

STATUS DISPLAY PAGES

Menu selection that displays current operating status of the unit.

POWER SWITCH

Convenient on/off control for the analyzer.

PRESSURE REGULATOR

This device is used to reduce a high pressure, supply pressure or inlet pressure in one stage to a low pressure. The pressure reducing regulator is designed to meet the stringent requirements of a process analyzer sample conditioning system. The low internal volume reduces lag time thus more nearly approaching real-time analysis.

SAMPLE FILTER

This device is used to remove unwanted contamination in a system. Bypass filters allow a continuous sweeping action across the surface of the filter element. This sweeping action prolongs the life of the filter element and also insures the sample that passes through the element is representative of the current system condition.

CAL TAP

The calibration tap point includes the connection fittings and tubing together with a three-way ball valve to easily connect calibration gas to the analyzer.

TOTAL SULFUR ANALYSIS

The outstanding characteristics of the Trace Technology hydrogen sulfide detector can be utilized for total sulfur measurement by means of converting

all of the sulfur in a sample to hydrogen sulfide. The sample is blended with an excess of hydrogen and the blend passes through a heated quartz or ceramic tube. In doing so, the sulfur bonds are broken and hydrogen sulfide is formed. The outlet is connected to the Trace Tape hydrogen sulfide analyzer, resulting in an analyzer which is totally sulfur specific.

REDUCING FURNACE

The Trace Technology total sulfur instrumentation combines unique design and performance features with the basic reducing furnace. The structure combines concentric tubes that are used in the reducing process. The sample is injected through the center tube into an oxidizing tube where the carbon compounds are oxidized to carbon dioxide and the sulfur compounds are oxidized to sulfur dioxide. The oxidized compounds then reverse flow into the reducing tube with an excess of hydrogen. The process of reducing the SO₂ to H₂S is further enhanced by oxidation and flow contact with the catalyst. This combination eliminates carbon-carbon bonding which can cause increased system maintenance.

SAMPLE INJECTION CONTROL

The Model 800 series of total sulfur analyzers use micro liter injection valves to inject an exact amount of sample into the carrier gas stream. The injected volume and rate of injection are selected to meet the requirements for the stream being monitored.

SPECIFICATIONS

DISPLAY

- Alpha Numeric LCD
- 128 x 64 pixels

TEMPERATURE RANGES

- -10°C to 50°C (operating)
- 0°C to 70°C (storage)

ANALOG - Isolated 4-20mA

ANALYTICAL PERFORMANCE

- Resolution: 1ppb
- Accuracy: ±2%
- Repeatability: ±1%
- Linearity: ±1%
- Drift: Nil
- Temp. Coefficient: 0.01% / °C
- Analysis Time: 0.6 Second
- Detection Ranges: 0-1ppm or
0-50ppm or
0-500ppm or
0-100%

AREA CLASSIFICATION

- Models 700/800 General Purpose
- Models 720/820 Division II
- Models 710/810 Division I

WEIGHT - Approx. 200 lbs; 90 kg

DIMENSIONS (all models)

- 30" x 50" x 12"
- 76.2 cm x 127 cm x 30.5 cm

POWER REQUIRED

- 110VAC, 60 Hz, or
- 220VAC, 50Hz, or
- 12VDC, or
- 24VDC

TRACE
TECHNOLOGY

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