Applications Uniques

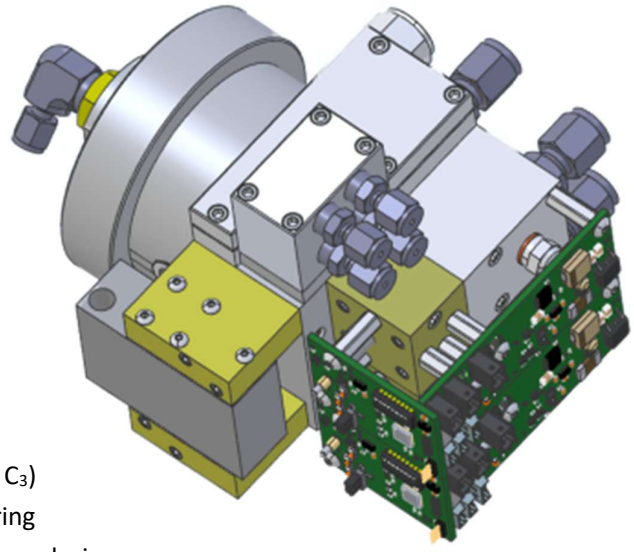
TRUCULENCE™ - AM II

Real-Time Total Non-Methane Hydrocarbon Analytical Module

High Performance - Ready for Your Design

TNMHC Analytical Module for OEM Designs

- Real-Time direct readings of THC and CH_4
- For Real-Time TNMHC analysis



Features

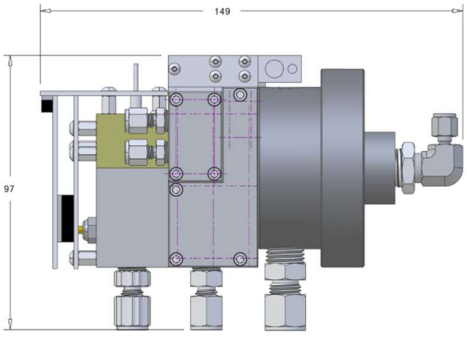
- Two (2) flame ionization detectors (FIDs)
- Selective oxidizer for CH_4 measurement
- Communications via RS-232/48 or I^2C
- Integrated high temperature sample filter
- Compact design (< 1100 cm^3)
- Automatic ignition and flame monitoring
- Extended NMHC option (up to 10% by Vol as C_3)
- Easily allows EPC/EFC or simple flow monitoring
- Sensitivity to 20 ppb (by Vol) or less with proper design
- Heated manifold (up to 200 Deg C) – with optional temperature control

Applications

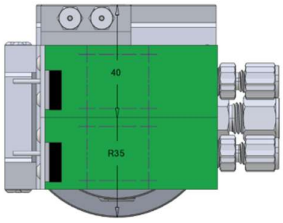
- AAQM - Continuous Environmental Monitoring for Non-Methane Hydrocarbons in Air
- VOC - High Temperature Stack Monitoring (CEMs) for CH4, THC and TNMHC
- Air and O_2 Purity for Air Separation Processes
- Semiconductor/Medical Clean Room Monitoring (AMC)
- Real-Time Monitoring of Methane in Air and Total Hydrocarbon including VOCs

Compact Design

Top View - 149 mm x 97 mm



Side View - 75 mm x 97 mm



*Total Volume

14.9 x 9.7 x 7.4 = 1070 CC

*Includes Optional Fittings

Note:
Heating options customized upon request

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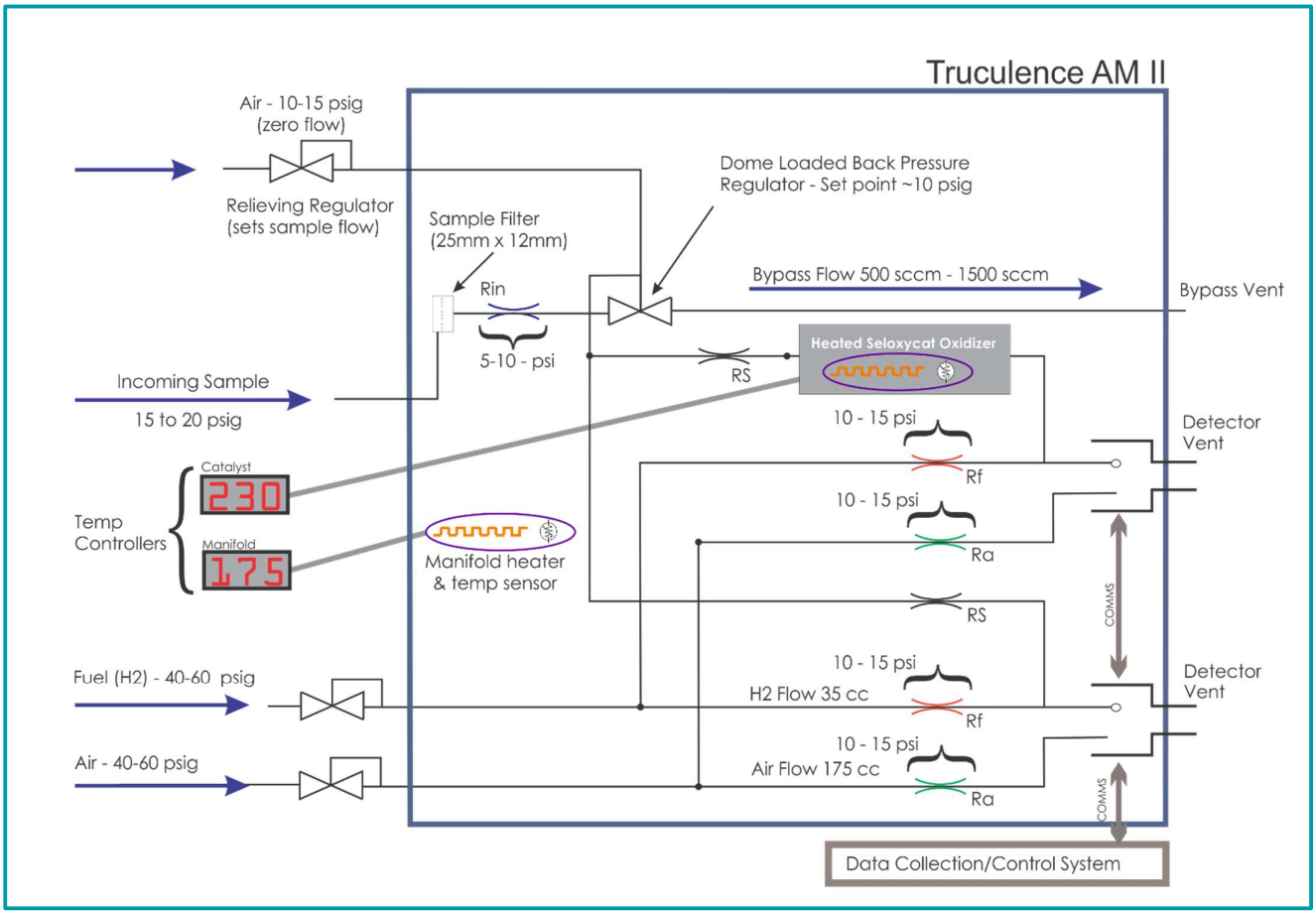
General Description

Truculence AM II is a state of the art analytical module that provides the pneumatic system, selective oxidation catalyst and organic compound detection functions necessary to produce a heated (up to190 Deg C) dual FID based, continuous, real time, total non-methane hydrocarbon analyser.

Physical Design

Truculence AM II provides critical analytical functions that allow instrument designers to quickly design and produce high performance analytical instrumentation for heated TNMHC monitoring applications. The module is highly compact and is ready for quick and easy system integration.

The following is a diagram of the Truculence AM II pneumatic configuration:



Description of Operation:

- Heated and pressurized sample is introduced at approximately 15 to 20 psig. The temperature should be at or higher than the minimum temperature required to meet local regulations and to ensure that all components of interest will remain in gas phase as they pass through the internal system plumbing to arrive at the detectors.
- Upon entry, the sample passes through a standard sample filter (12 mm x 25 mm borosilicate glass microfibre). This sample filter is NOT intended to be the primary filter of the sample but rather only included to provide protection for sensitive internal flow control components. The sample, upon entry, should be filtered externally and delivered entirely in gas phase and free of particulates that are no greater than 1 µm in size.

- Once the sample passes through the internal filter, it passes a restrictor that drops the inlet pressure down to about 10 psig. This pressure is regulated by the dome loaded back pressure regulator. Excess flow of about 1 Liter/min is sent to the bypass vent.
- Sample that is held at the regulated back pressure of 10 psig splits into two further flows. One flow is metered (pressure dropped across fixed restrictor) and sent directly to one of the Fireworks™ FID modules where the results are reported as Total Hydrocarbon. The other flow is metered and directed through the heated Seloxycat™ oxidation catalyst module and then to the second Fireworks™ FID module where the signal is reported as total methane.
- The signals from the two Fireworks FID modules are collected by an external data system (either local or remote) where the difference of the two signals is continuously calculated in real time and reported as TNMHC.
- Fuel (typically pure H2) and HC free combustion air are also supplied to the manifold at controlled pressure. These support gases must be well filtered, to < 1 µm, and provided at stable pressures to ensure proper flows for correct operation.

Pneumatic Connections:

- **Sample In – 1/8" FNPT** – The sample must be an air balance gas, pre-filtered to < 1 µm, heated to meet the needs of the application and pressurized to a stable 15 to 20 psig with a flow rate capability of about 1.5 L/m.
- **Dome Loaded BP Reg Port – 1/4" FNPT** – The pressure at the dome load port of the back-pressure regulator sets the sample pressure and controls sample flow. A higher pressure setting results in a higher sample flow and a lower sample bypass flow. This is a static pressurized gas (no flow) and will typically be set between 10 and 15 psig. The gas media used for this function is not critical. It can be any non-corrosive gas and this gas supply will not be consumed in normal operation.
- **Fuel In – 1/16"FNPT** – Fuel is normally compressed pure H_2 at approximately 30 – 40 psig. The inlet pressure sets flow of fuel on both Fireworks™ sensor modules (matched flow restrictors) and as such, must be carefully adjusted and held constant during operation.
- **Combustion Air In – 1/16"FNPT** – Compressed hydrocarbon free air at approximately 30 – 40 psig is supplied to support the detector flames. The inlet pressure sets flow of air on both Fireworks™ sensor modules (matched flow restrictors) and as such, must be carefully adjusted and held constant during operation.
- **Detector Vent x 2 – 1/8" FNPT** – The detector vents will be moisture laden waste effluent at about 250 sccm and should be carefully routed to avoid condensation build-up which could produce back pressure and possibly flow back to flood the detectors. Hydrocarbons will be converted to innocuous CO_2 and H_20 in the combustion process but sulphur containing or chlorinated compounds may produce corrosive components that may need special consideration.
- **Sample Bypass – 1/4" FNPT** – The excess sample will be vented from this port at between 0.5 and 1.5 L/m. This flow should be vented to ambient pressure and treated with the same care as the incoming sample. It will not be chemically changed in the path through the internal plumbing.

Electrical Connections:

- The connections to each of the Fireworks modules include power (+12VDC & GND) in addition to choice of communications cables (I^2C/RS232/RS485).
- The manifold and Catalyst chambers require heaters and temperature sensors along with thermostatic control. Details of heater types & sizes and temperature sensors are determined by specifics of the target products.