

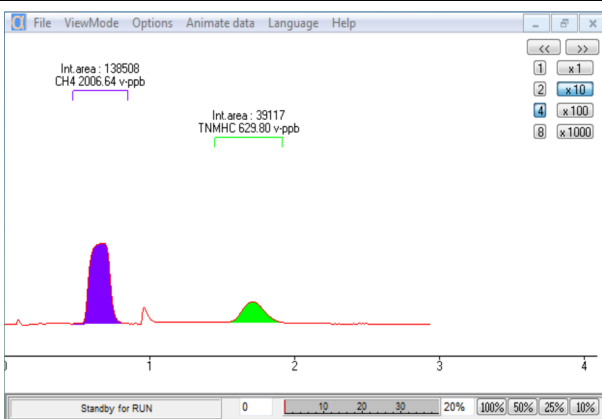
# SYNSPEC METHANE / TNMHC ANALYSERS



**Measurement of Methane and the sum of all other hydrocarbons (TNMHC) in air to know the concentration of the greenhouse gas Methane and of the general load of all other hydrocarbons.**

The greenhouse gas methane is measured by a true GC measurement principle, no interference of other molecules. Applications are: general greenhouse gas monitoring, industrial site or city kerb site monitoring, waste dump sites monitoring, etc.

In the same measurement cycle the sum of all other hydrocarbons is determined. This is a good way to quantify the general air pollution by hydrocarbons. These can come from all kind of sources: nature, industry, traffic, households. The method covers hydrocarbons that will not be seen by standard GC technology, like oxygenated hydrocarbons.

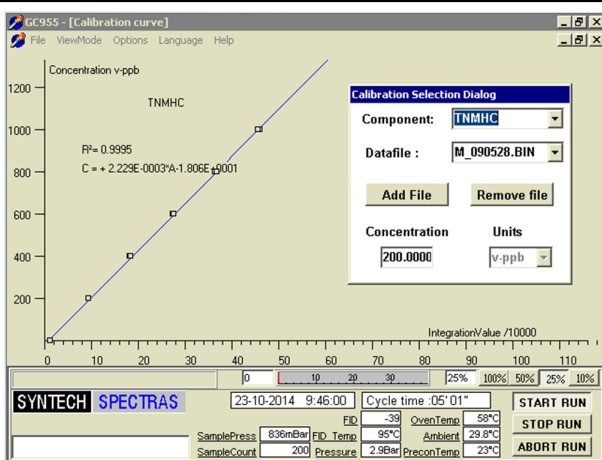


Measurement of ambient air with an Alpha 115

## Application

Synspec produces 4 different versions of Methane/TNMHC analysers:

- **Synspec Alpha 115 for ambient air measurements**, in cities or near industries.
- **Synspec Alpha 116** has a higher range and is suitable for stack measurement up to 1000 ppm.
- **Synspec Delta 116 CEMS** for stack measurements and runs according to US EPA 25A.
- **Syntech Spectras GC955 114 analyser for background measurement** is designed for measuring low concentrations of TNMHC.



Calibration of TNMHC on a Syntech Spectras GC955

**Measuring principle:** The analyser is a real gas chromatograph. It contains a compact oven with a column that separates methane from total non-methane hydrocarbons. The detector is an FID.

The gas sample passes through a Special layered packed column. The methane ( $\text{CH}_4$ ) passes through and is first injected into the detector.

A second after this, the column is "back-flushed" and all other hydrocarbons pass to the detector. This results in two peaks generated by the FID: a methane and a TNMHC-peak.

The measurements are done using true gas chromatographic separation. This prevents potential problems with catalytical conversion used in other indirect measurements

The FID detector starts very easily, provided the available gases are of good quality.

### Methane measurement in ambient air

In ambient air the background methane concentration is now as a yearly mean 1.7 ppm. The seasonal, regional and yearly variation means that values from around 1.5 ppm up to over 5 ppm can be expected from natural sources. From human activities, like waste dump sites, natural gas heating etc. these values can be higher.

For the proper running of the system a good source of methane-free zero-air is required. Any zero air generator must run with a catalytic methane scrubber and working at a temperature of at least 400 °C. An alternative is to use nitrogen as carrier gas and the zero air only for the detector air supply.

SYNSPEC	115	116	DELTA 116 CEMS	GC 955 114
DETECTOR	FID	FID	FID	FID
CYCLE TIME	3 minutes	3 minutes	3 minutes	15 minutes
GAS CONSUMPTION	FID : Zero air, quality 5.0, dry and clean, <b>methane free</b> , 2.5 bar, 250 ml/min, Hydrogen, quality 5.0, 3.5 bar 25 ml/min No nitrogen required, but if zero air may contain methane, use of nitrogen as carrier gas is advised			
LDL—RANGE METHANE (PPM)	0.05 –50	1—1000	2—2000	0.01—10
LDL— RANGE TNMHC (PPM-C)	0.05—50	1—1000	1—1000	0.01—10
REPEATABILITY	<1% of FS			
SPANDRIFT	<2% of FS in 24 hrs			
LINEARITY	<1% of FS			

HARDWARE AND COMMUNICATION OPTIONS	
INCLUDED HARDWARE	Industrial x86 based computer, hard disk, full colour touch screen
INCLUDED SOFTWARE	Windows Embedded Standard, GC Software
COMMUNICATION	Direct control via touchscreen, keyboard or mouse. External data communication via RS232, analog and digital outputs, via TCP-IP.
GC SPECIFICATIONS	Column cage with special application column, 10 port valve Loop depending on required concentration range, flame ionization detector (FID)
CALIBRATION	Internal calibration switch for calibration zero and span gas, gas stream required 25 mL at 1 atm pressure. The Delta 116 CEMS has an option to have this functionality.
PHYSICAL DATA	
DIMENSIONS	19" rack, 3 standard Height Units for the 115 and 116, 5 standard Height Units for the Delta 116 CEMS and GC955-114
POWER DEMAND	230 V AC, 200 VA (115 V AC available) 50/60 Hz
CONDITIONS	5 °C TO 40 °C, 20 TO 95% RH
GENERAL	
APPROVALS	CE approval for EMC conformity: EN 55022, EN 61000-4-2, EN 61000-4-3, EN 61000-6-2, EN 61000-6-3, EN 61010, EN 61326
EXTRA FUNCTIONS	Combination with Multi Channel Selector: <ul style="list-style-type: none"> <li>• type VICI dead end or flow through, 6 to 16 streams, pump 5 L/min (internal) or on demand external.</li> <li>• Combination with RS232 alarm out puts 4-20 mA up to 15 streams.</li> </ul>

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