METHANE/TNMHC ANALYSERS

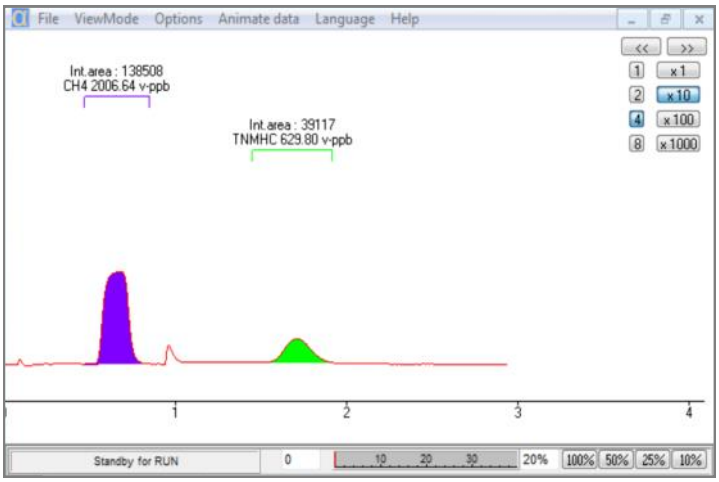
SYNSPEC
Shaping a cleaner, safer future. With you.

Background

Measurement in air must be done 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 direct 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 to quantify the general air pollution. These hydrocarbons can come from all kinds of sources like nature, industry, traffic and households. This method covers hydrocarbons that will not be seen by standard GC technology, like oxygenated hydrocarbons.

In ambient air the background Methane concentration holds a yearly mean of 1.86 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 and natural gas heating, these values can be higher.



Measurement of ambient air with an Alpha 115

Measuring Principle

The analyser is a gas chromatograph. It contains a compact oven with a column that separates Methane from total non-Methane hydrocarbons. The detector is the FID. The gas sample passes through a special layered packed column. The Methane (CH_4) passes through and is first injected into the detector.

A short moment after this, the column is “back-flushed” and all other hydrocarbons pass to the detector. This results in two peaks generated by the FID: Methane and TNMHC peaks.

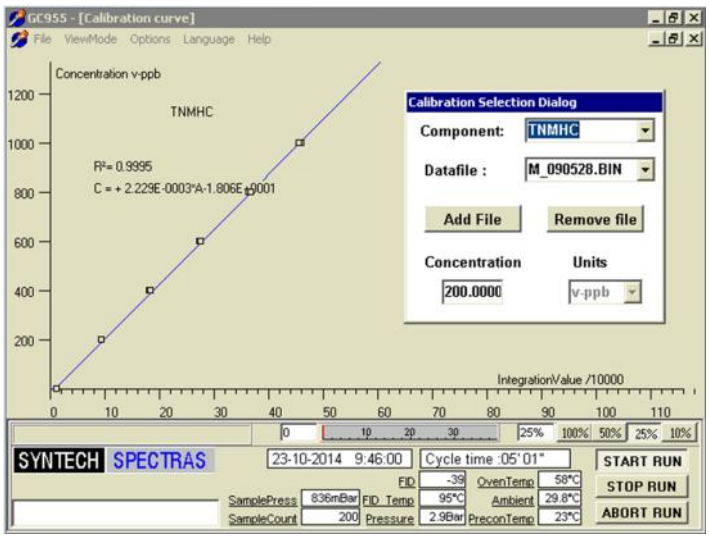
The measurements are done using true gas chromatographic separation. This prevents potential problems with catalytical conversion used in other indirect measurements. The FID detector starts very easily, provided the available gases are of good quality.

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 work 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.

Application

Synspec produces 5 different versions of Methane/TNMHC analysers:

- **Synspec Alpha 115**
  Mid range for ambient air measurements in cities or near industries
- **Synspec Alpha 116**
  High range for stack measurements up to 1000 ppm
- **Synspec Delta 116 CEMS**
  High range for stack measurements according to US EPA 25A
- **Synspec GC955 114**
  Low range for background measurement
- **Synspec GC955 118**
  Fast mid range ambient air measurements in cities or near industries



Calibration of TNMHC on a Syntech Spectras GC955

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, *Methane free, 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	<0.25% of FS /week			
ZERODRIFT	<0.01 ppmc/week			
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 by 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 ^{o}C TO 40 ^{o}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: • type VICI dead end or flow through, 6 to 16 streams, pump 5 L/min (internal) or on demand external. • Combination with RS232 alarm out puts 4-20 mA up to 15 streams.

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Zernike Campus | De Deimten 1 | 9747 AV Groningen
| The Netherlands | info@synspec.nl | www.synspec.nl | +31505266454