APPLICATION NOTE
LD20-09

Trace hydrocarbons (THCs/VOCs)
with MultiDetek2 and FID

▲ MultiDetek2

Measuring hydrocarbons using a flame ionization detector (FID) with the MultiDetek2 gas chromatograph instrument.

Combining our FID with our high performance adjustable amplification system, the measure of organics in low ppb up to high ppm becomes an easy task. Our high performance sub femto amp. current amplifier with its filtrering stages ensure to achieve low sensitivity by keeping the stability of the unit at the best level. Our module is built in a shielded encapsulated environment to offer the best robustness and leaving the interferences away from the signal.

The FID/amplifier modules are mounted in our MultiDetek2 rackmount analyzer which is constructed for the industrial market.

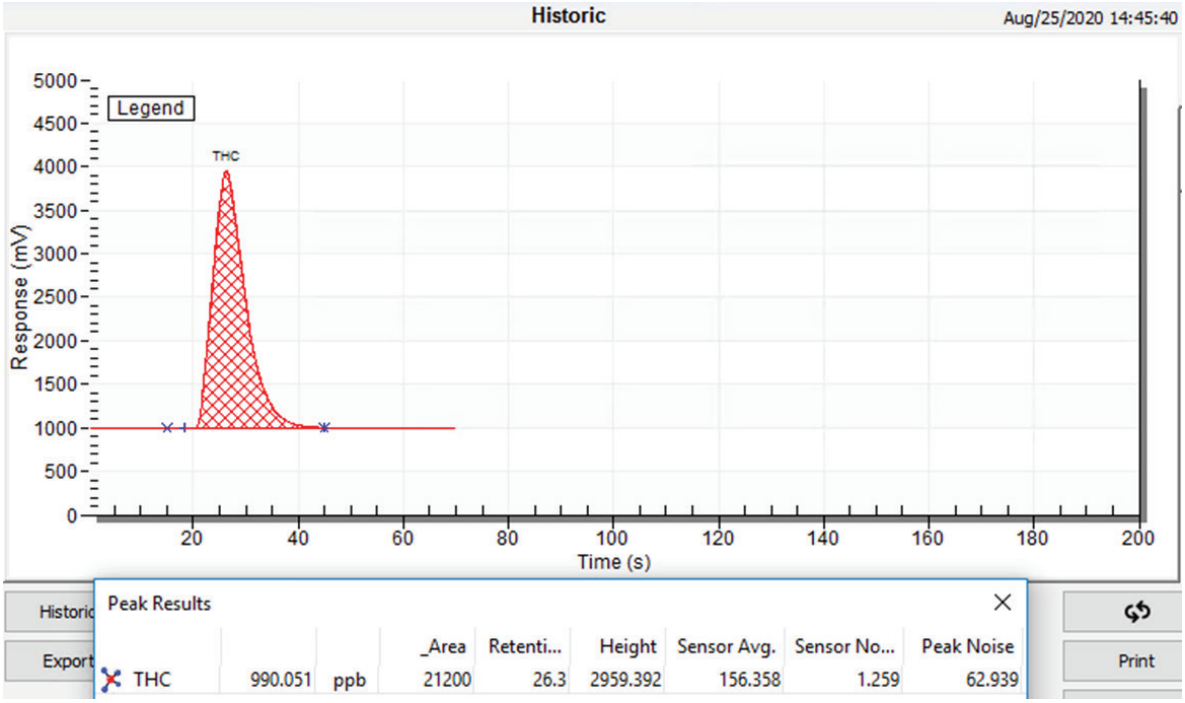
The range of application can go from ASU for monitoring hydrocarbons in bulk gases to environmental applications for measuring VOCs for indoor/outdoor ambient polluated air and industrial stacks.

The Multidetek 2 is providing all communication protocols used in the industry (Modbus, Profibus, RS-485, 4-20 mA, etc) to ensure compatibility with any acquisition system.

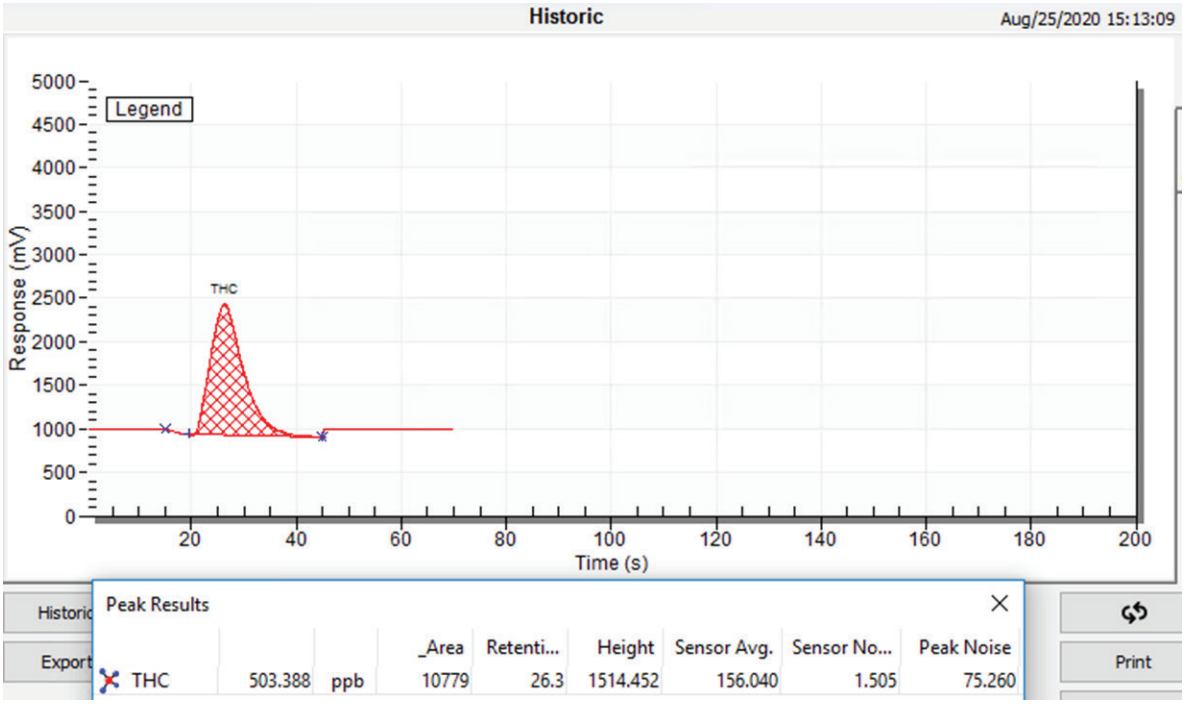
RESULTS:

Chromatograms:

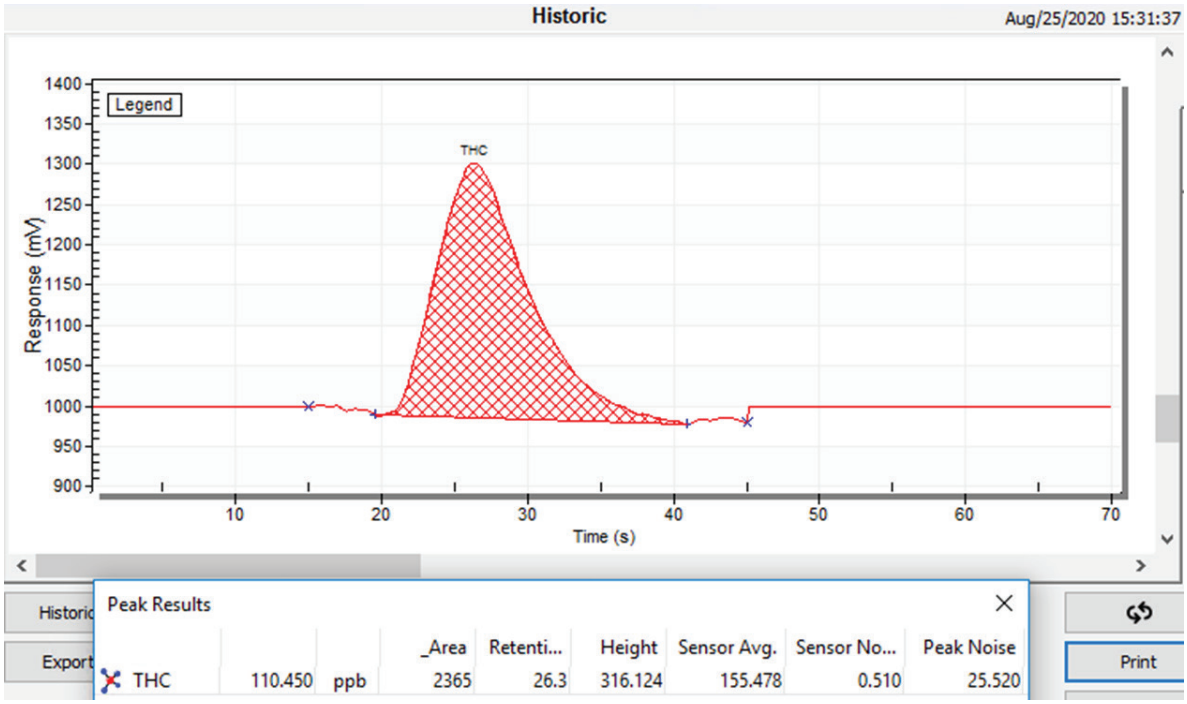
Sample: 1000ppb CH4 Balance air



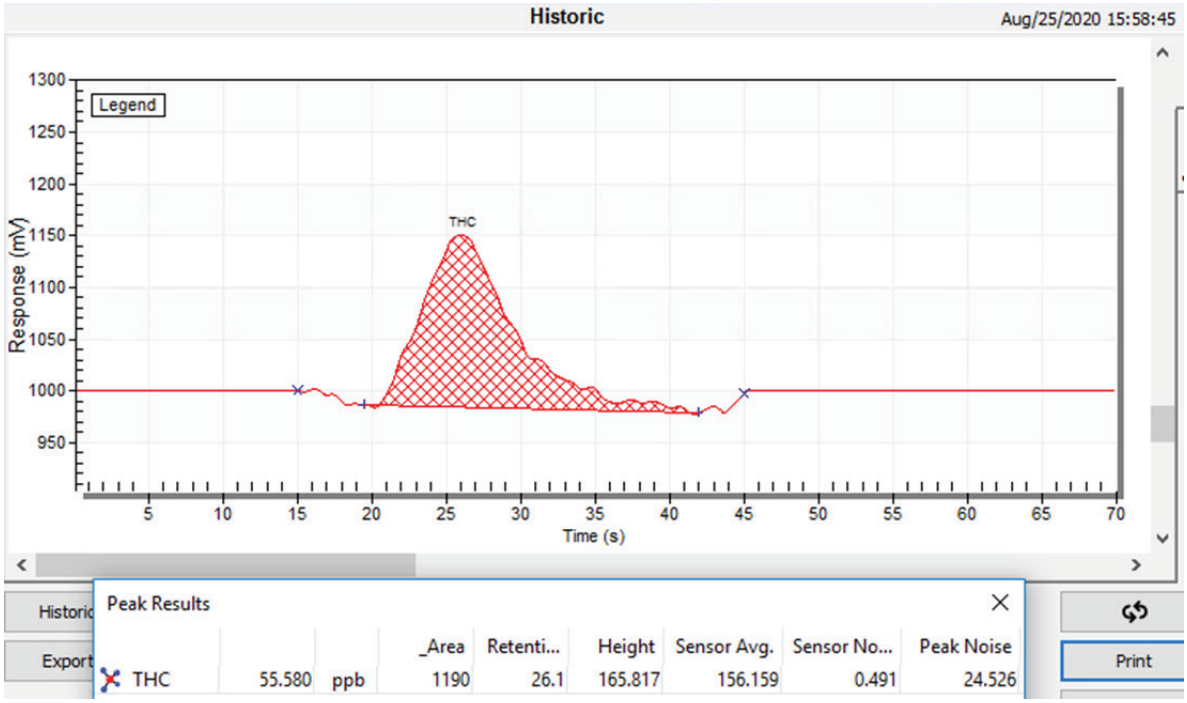
Sample: 500ppb CH4 Balance air



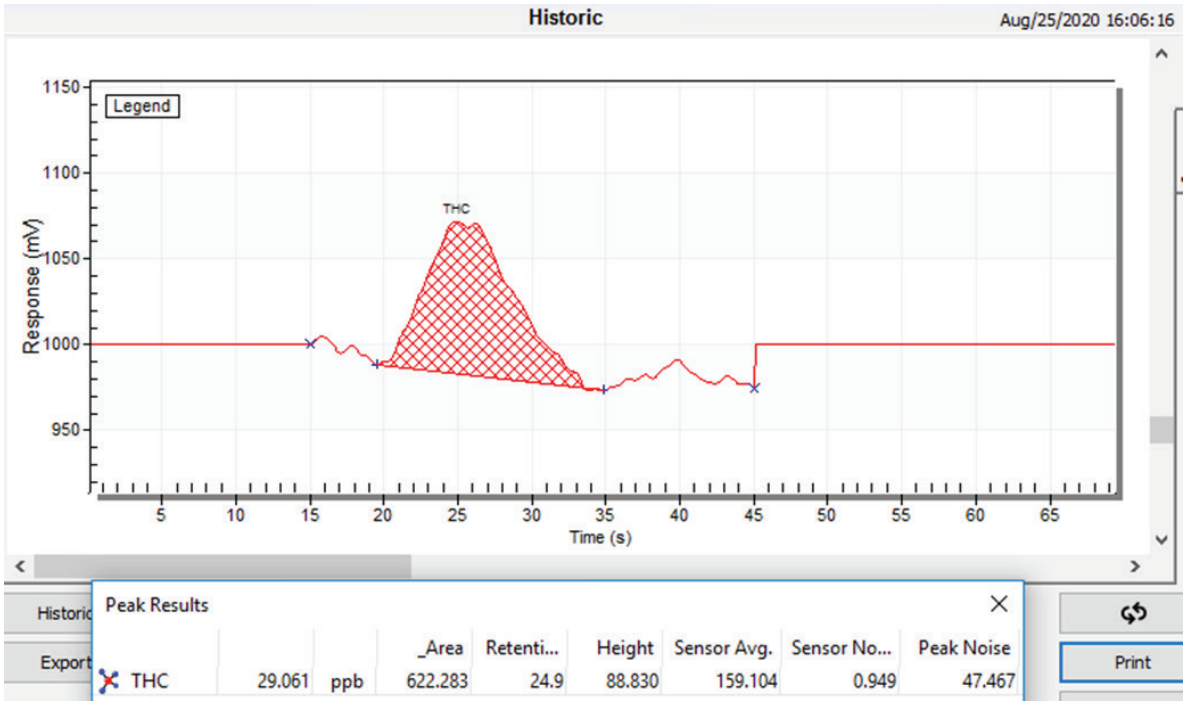
Sample: 100ppb CH4 Balance air



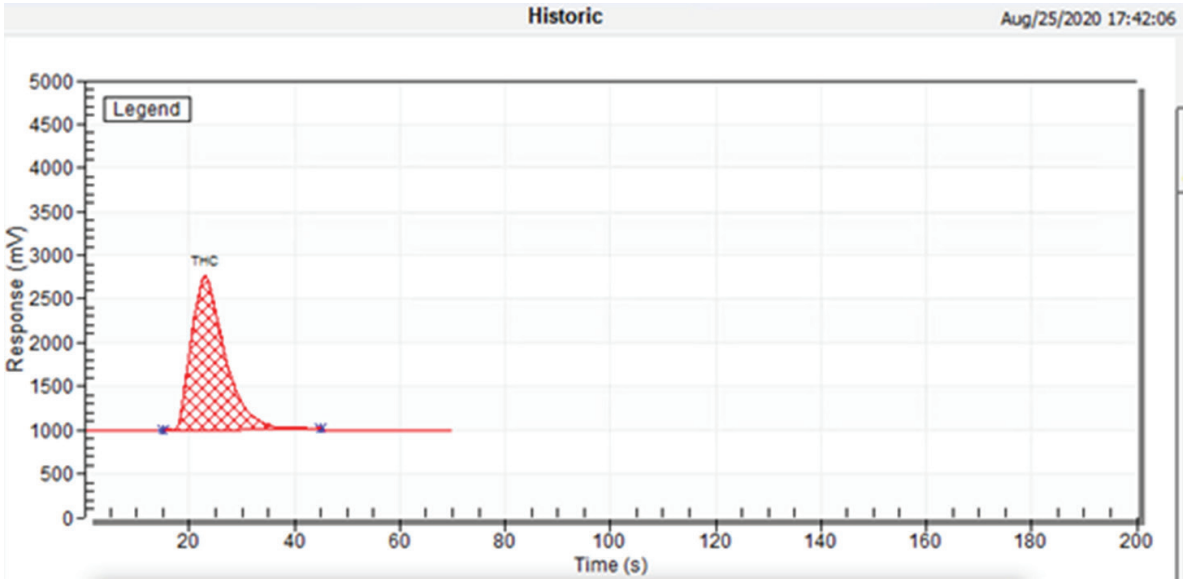
Sample: 50ppb CH4 Balance air



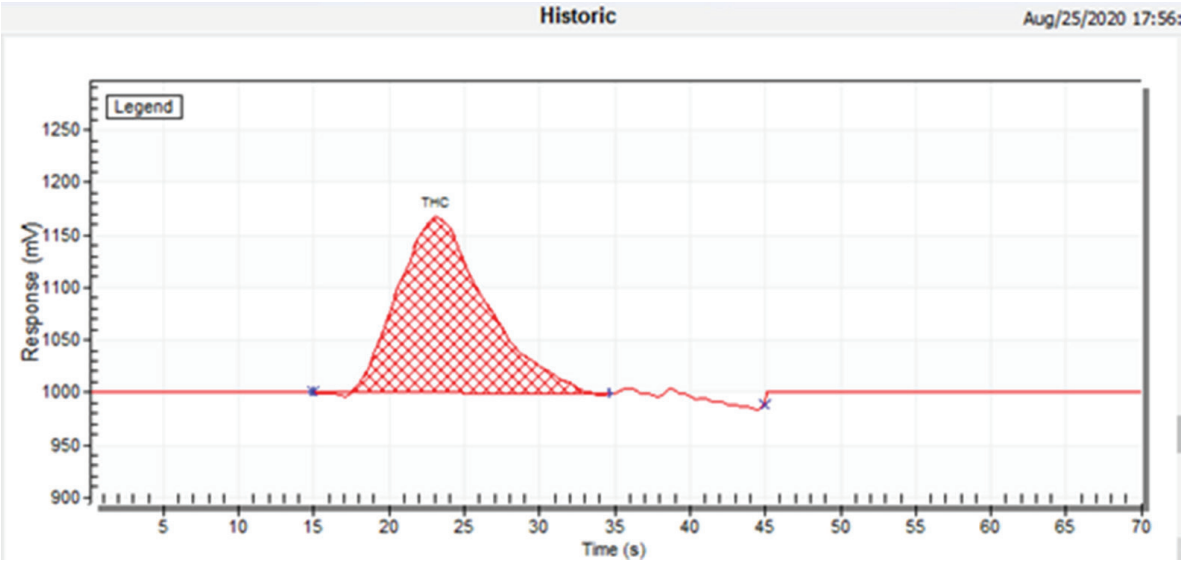
Sample: 25ppb CH4 Balance air



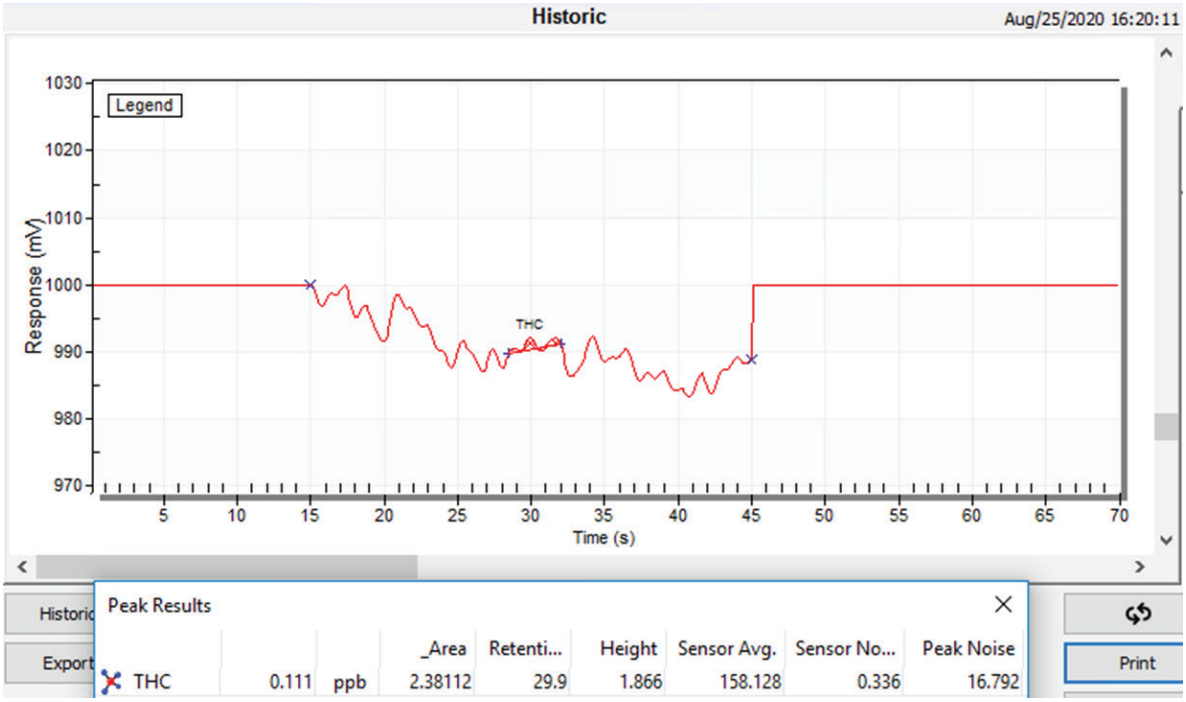
Sample : 100ppb Benzene (C6H6) Balance air



Sample : 10ppb Benzene (C6H6) Balance air



Sample (blank) : Raw noise analysis



LDL:

COMPONENT	CONCENTATION (ppb)	PEAK HEIGHT (mV)	NOISE (mV)	LDL (3x Noise) (ppb)
THC/VOC by CH4 reference	100	316	16.79	15
THC/VOC by C6H6 reference	100	1788	16.79	3

Note: other LDL could be obtained with different injection volume and chromatographic condition

REPEATABILITY:

	Description	THC
⊟Historic		
⊟Tue, Aug-25-2020		
11:21:07		126.137
11:20:01		126.258
11:18:56		125.468
11:17:51		124.010
11:16:46		123.230
11:15:41		126.643

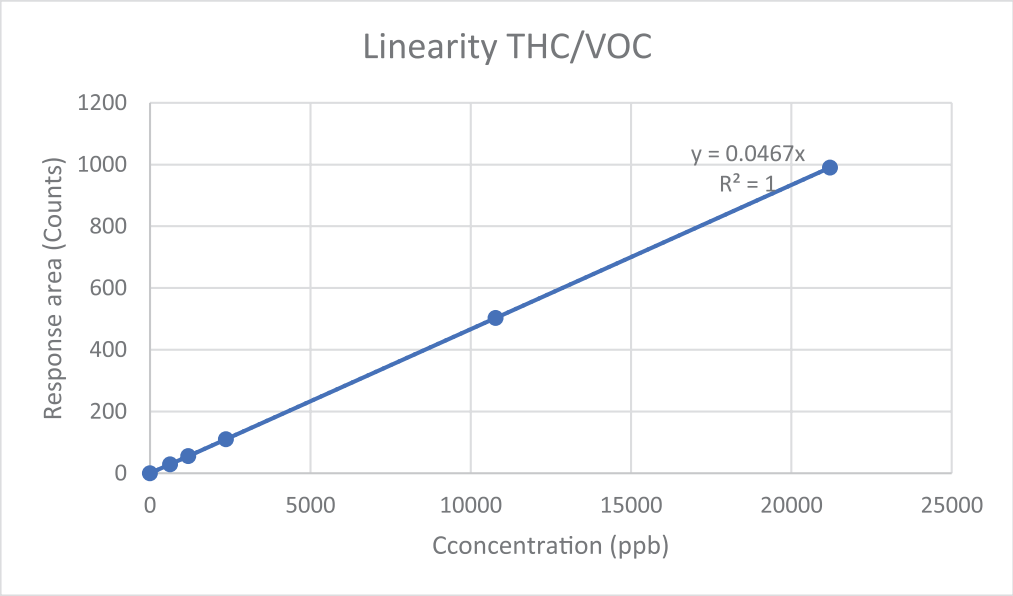
Impurities	THC/VOC
Average (ppb)	125,291
Sigma σ (ppb)	1.37
CV (%)	1.09
CV x 3 (%)	3.28
Status	pass
Repeatability (%)	1

Using a series of 6 consecutive analysis, the repeatability conformity test must be below 5% considering a value of 3 times the coeficient of variation (CV) to be accepted.

The repeatability % is obtained by applying the sigma of the 6 consecutive analysis on the average of these 6 same analysis.

LINEARITY:

Response area (counts)	**Concentration** (ppb)
0	0
622	29
1190	55
2365	110
10779	503
21200	990



CONCLUSION:

The MultiDetek2 gas analyzer configured with its FID/amplification modules is a solution for a quick analysis (less than a minute) for trace THC/VOCs in air. This type of instrument is simple and reliable. The equipment comes with a touchscreen panel PC interface with all the standard industrial communication protocols. The unit can cover a wide range of analysis from low ppb up to high ppm what is generally required for the analysis of the volatile organics(VOCs) in air for pollution monitoring. Different organics can be measured depending of your application. Don't hesitate to contact our experts to know more about it.

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