

NGC/PGC1000

THT in Natural Gas



The NGC/PGC1000 is a field proven, state of the art, process gas chromatograph. The flexible architecture allows it to be used in a variety of applications in the oil and gas market segment. One of these applications is THT in natural gas.

Measurement made easy

Introduction

Natural gas is colorless, odorless, and combustible. Undetected natural gas leaks could have fatal consequences. For this reason, natural gas suppliers and transporters inject an “odorant” into the gas to alert individuals of a potential gas leak.

An odorant is a chemical compound with a pungent smell, so when injected into the natural gas stream, individuals will now be able to smell the gas and any possible leak. In general, it is mandated that natural gas contains enough odorant so that it can be detected by any person with a normal “sense of smell” when gas is present at $\frac{1}{5}$ of the lower explosive limit.

It is the odorant which gives the natural gas that typical “rotten eggs” smell. Some of the most common odorants are listed below:

- Tetrahydrothiophene (THT)
- Dimethyl sulfide (DMS)
- Diethyl sulfide (DES)
- Methylethyl sulfide (MES)
- Ethyl Mercaptan (EM)
- Sec-butyl Mercaptan (SBM)
- Tert-butyl Mercaptan (TBM)
- N-Propyl Mercaptan (NPM)
- Isopropyl Mercaptan (IPM)
- Methyl Acrylate (MA)
- Ethyl Acrylate (EA)

THT application description

The specific odorants used vary widely by geographic locations and the operating requirements of the pipeline or distribution network. It is not uncommon for odorants to consist of a blend of different odorants to meet individual requirements. In the US, a common odorant is a mixture of mercaptans, while in Europe tetrahydrothiophene or THT is commonly used.

As an odorant, THT has numerous advantages over other odorants. It is non-corrosive to pipeline infrastructure. It does not incapacitate the sense of smell over time, and does not cause adverse reactions such as coughing, tears, or headaches for individuals who sense it.

Typically, gas suppliers inject enough THT into the natural gas stream to keep the THT levels between 2-10ppm. Too little THT can create a safety hazard by allowing the levels of a potential leak to get too high before being detected. While too much THT produces operational waste and can lead to false positives and undue concerns over potential gas leaks.

The levels of THT must be monitored to maintain optimal levels in the gas network. Gas chromatography is the best solution to reliably and accurately measure the THT concentration in natural gas.

The NGC/PGC1000

The NGC/PGC1000 is a field proven, state of the art process gas chromatograph capable of measuring THT in natural gas. The NGC/PGC1000 yields reliable measurement of THT in under 8 minutes per analysis. The small footprint allows the analyzer to be mounted as close to the sample point as possible, in many cases, without a shelter. With an installed base of over 10,000 units, the NGC/PGC1000 has proven to be a low maintenance design even in the most rugged field conditions.

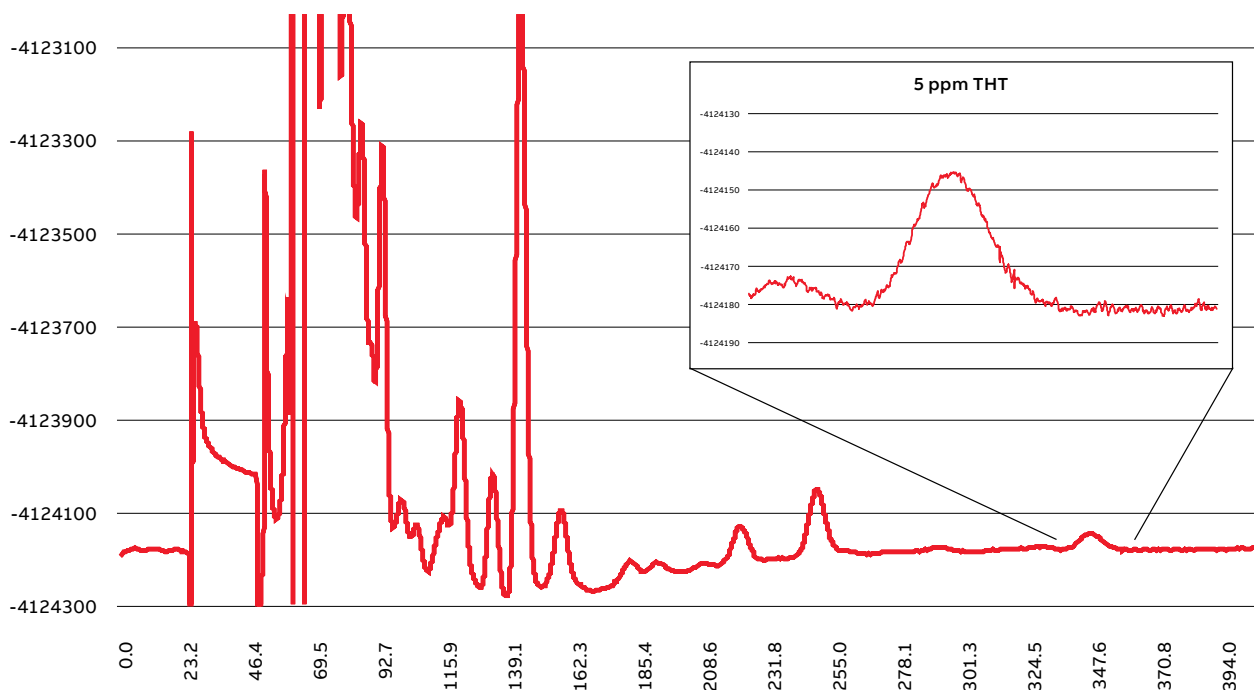
Analysis specifications

Component	Symbol
Tetrahydrothiophene	THT

Measurement range
3-500 ppm

RSD	MDL
4%	2 ppm

THT analysis chromatogram



Analyzer specifications

NGC/PGC1000 specifications	
Dimensions	6.75" diameter x 16" long x 9.00" tall 17.1 cm x 40.6 cm x 22.9 cm
Weight	Approximately 28 lb. / 12.7 Kg
Shipping weight	Approximately 47 lb. / 21.3 Kg
Weatherproof construction	CSA Type 4X, IECEx IP56, ATEX Type 4X (IP66 Equivalent), aluminum alloy with white polyester powder coating
Carrier gas	Helium (1 large helium bottle should last between 9 months and 1 year)
Analysis time	Approximately eight (8) minutes; cycles may be scheduled by user
Repeatability	4% RSD
Temperature range (storage)	-22°F to +140°F (-30°C to 60°C)
Temperature range (normal)	0°F to 130°F (-18°C to 55°C)
Temperature range (cold weather enclosure)	-40°F to +130°F (-40°C to 55°C)
Moisture	95% relative humidity non-condensing
Supply voltage	10.5 to 16 V DC (Optional: 21 to 28 V DC)
Power consumption	@ 0°F (-18°C) Nominal: 7 Watts @ 15 V DC; 650 mA Start up: 45 Watts @ 15 V DC; less than 3 A
Certifications	NEC & CEC Class I, Div. 1, Groups B, C and D, T6: CFR 47, Part 15 CE: ATEX Ⓢ II 2G : Ex d, IIB+H2 T6; Class I, Zone 1 EMC - EMI/RFI: EN 55022, EN 61000-6-1, EN 61000-4-2, 4-3, 4-4, 4-6, 4-8, CISPR 22-2004 IECEX Exd IIB + H2 T6; Class I, Zone 1 INMETRO Exd 11B + H2 T6; Class 1 Zone 1
Communications supported	Two serial digital ports, software selectable for RS-232, RS-485, or RS-422. One USB MMI (RS-232 or USB). Optional USB hub (host and client) and Ethernet ports.
Protocols supported	Totalflow Remote / Local MMI Totalflow / TCP Modbus / TCP Server Modbus / TCP Client Modbus ASCII or RTU (Modicon, WordSwap, or Danalyzer)
Memory	Up to a total 2.052 GB of RAM. CPU RAM Memory 20 MB. Nand Flash 32 MB. Data storage 128 MB to 2 GB

Typical repeatability

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Typical THT
repeatability
5.5 ppm 24 Hr

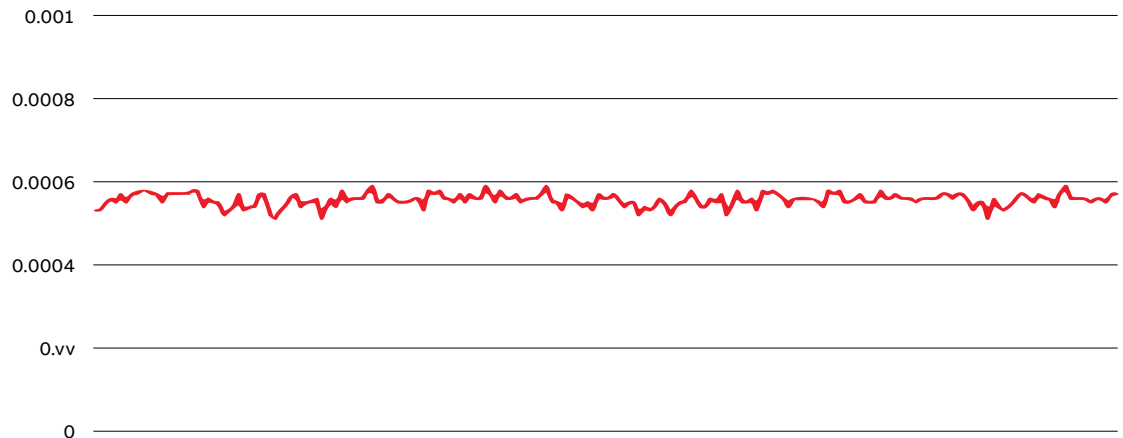


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