

## Technical Note

# Micro GC Fusion® JP-100 for Ambient Temperature Stability

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## Overview

Wide changes in ambient temperature can impact TCD response. This is important in applications such as natural gas or chemical process control/monitoring because these types of measurements are made at instrument locations that are subjected to wide temperature ranges. To address this issue, INFICON has developed new technology to increase the temperature stability of Micro GC Fusion. This technology, called the JP-100, provides temperature control of the TCDs and shows excellent performance when exposed to varying ambient temperatures.

## Introduction

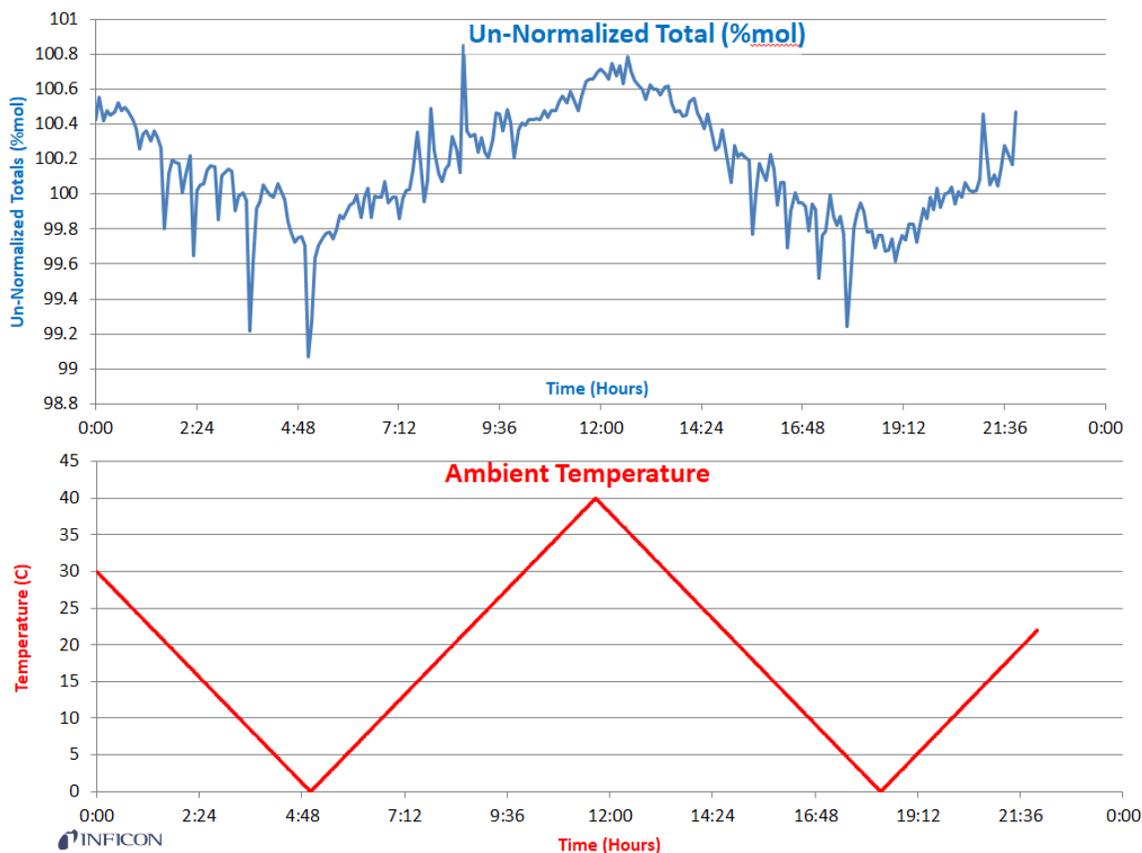
The Micro GC Fusion JP-100 is a 3D printed device that is installed at the back of the Micro GC Fusion modules. For a 1- or 2-module chassis, a single JP-100 controls both modules. For a 3- or 4-module chassis, two JP-100 are installed.

This device provides temperature control and stability over the ambient air surrounding the TCD. Having a consistent TCD temperature allows for accurate and repeatable area counts, even when the Micro GC Fusion is subjected to a wide ambient temperature range.



## TCD Temperature Stability

A natural gas standard was run on a Micro GC Fusion equipped with a RT-Q-Bond module and a JP-100. Data was collected for 250 runs over 24 hours at ambient temperatures ranging from 0°C (32°F) to 40°C (113°F). The total un-normalized total was within 1% of the calibrated value of 100% over the course of the experiment.



Area counts remained stable over the course of the experiment and met the <1% RSD specification for area stability.

Compound	Mol%	Area %RSD
nitrogen	1.50	0.502
methane	75.4	0.522
carbon dioxide	9.00	0.394
ethane	1.50	0.485
propane	6.00	0.593
isobutane	3.00	0.421
n-butane	2.00	0.393
isopentane	1.00	0.371
n-pentane	0.50	0.394
hexanes plus	0.15	0.667

## Method Parameters

Two new method parameters are included with the v1.8 software update. These parameters can be found in the Method Editor window.

- **TCD** - Controls the temperature of the TCD external heater
- **TCD Delta** - the range that the TCD external temperature can fluctuate before the method becomes **Ready**

The screenshot shows the Method Editor interface with the following sections and parameters:

- Module A**
  - Injector**
    - Duration: Inject Time (ms) = 30
    - Enhanced Injection:
    - Injection Pressure:
  - Heaters**
    - Temperature (°C)
      - Injector: 90
      - TCD: 70**
      - TCD Delta: 2**
  - Pressure Controllers**
    - Pressure (psi)
      - Column Pressure: 25
  - TCD**
    - Data Rate: 50Hz
- Module B**
  - Column Temperature Profile**

Run Time (s)	Ramp Rate (°C/s)	Ramp Time (s)	Temperature	Hold Time (s)
0			60	50
50	2	80	220	85

Total Time: 215
  - Sample Pump**
    - Time (s): 15
  - Sample Inlet Heater**
    - Disabled:
    - Temperature (°C): 90
  - Column Fan**
    - Low Start:
    - Temperature:

## Conclusion

The Micro GC Fusion JP-100 provides TCD temperature stability when the instrument is exposed to varying ambient temperatures. Using new 3D printing technology, Micro GC Fusion offers more control of TCD settings, allowing for accurate and repeatable results in the field.