

Couple's FTIR Analyzer with Heated FID

Heated FID 3-700

Add technically correct THC/TVOC capabilities to any self extracting FTIR multi component Gas Analyzers. Couple the 3-700 FID directly to the sample output of an FTIR Analyzer.

To measure THC/TVOC in Steam, connect the 3-700 analyzer via our available heated sample transfer line with the steam outlet.



Analytical circuit fully complies with EN 14181 / EN ISO 14956, EN 12619:2013, EN 13526 in the EU and with EPA Method 25A and Method 503 in the USA.

Especially designed in cooperation with a well known FTIR manufacturer to be directly coupled with the existing sample outlet of a FTIR multi gas emissions analyzer. Our model 3-700 fully heated FID analyzer is a very compact 19" rack mount heated total hydrocarbon analyzer for high accuracy, sensitivity and stability.

General:

The Model 3-700 uses a hydrogen flame ionization detector (FID) in a heated oven to prevent the loss of high molecular weight hydrocarbons and to provide reliable performance in the analysis of trace level of contaminants in high purity gases, air and other gases. All sample wetted components are integrated into the heated chamber. Separate inlet fittings for zero and calibration gas.

The FTIR sample is automatically routed to waste during FID calibration. A Miniature protective 2 micron filter disk is housed in sample splitting "T".

Equipped with our proprietary built in combustion air supply which reduces maintenance and overall operating cost. No synthetic cylinder air needed! While the 3-700 is a self extracting, open bypass based instrument which extracts the sample from its internal bypass system. It fits any application, where a heated dry or wet sample stream with a flow of max. 4 liters per minute is made available.

The 3-700 may also be applied to a hot steam source via a heated sample transfer line to measure total VOC in hot steam.



Analyzer Features

- x Made in Germany
- x Couple directly to the sample outlet of any kind of heated multi gas emissions analyzer (Heated FTIR)
- x No restricted sample flow for FTIR
- x All components in contact with sample are fully heated and controlled at 190° C
- x Built-In sample pump
- x Built-in combustion air supply, no extra burner air bottle needed
- x Permanent 2 micron stainless mesh sample filter in transfer "T"
- x "Overflow" calibration system for safe zero and span calibration
- x Automatic flame out control with alarm and optional fuel shut off valve
- x Fast response less than 1 second
- x Low fuel consumption
- x Very selective to hydrocarbons
- x Microprocessor PID type temperature controller
- x Remote control for sample, zero gas, span gas and back purge is standard
- x Automatic or remote range change optional

Applications

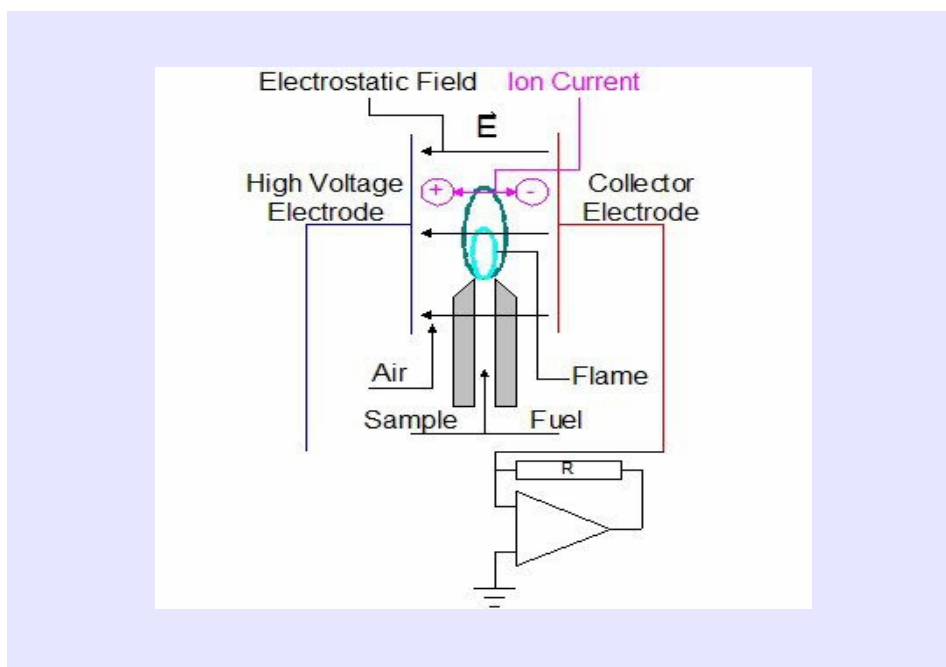
- x EPA Method 25A compliance monitoring of source hydrocarbons
- x Fence line (perimeter) monitoring
- x Solvent recovery monitor for carbon bed break through
- x Catalytic converter testing
- x Carbon adsorption regeneration control
- x Measuring engine combustion efficiency
- x Raw exhaust vehicle emissions analysis
- x Hydrocarbon contamination monitoring in air and other gases
- x Carbon adsorption regeneration control
- x Detection of trace hydrocarbons in purity gases used in the semi conductor industry

- x VOC in hot steam (Requires additional components)

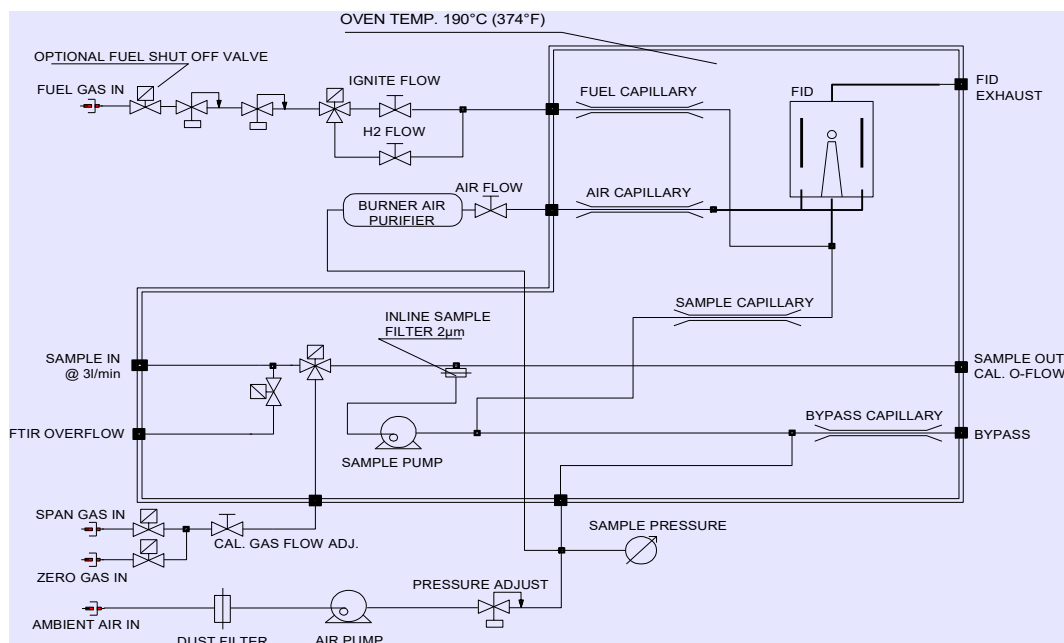
Principle of Operation

The Heated Flame Ionization Detection (HFID) method is used to determine the presence of total hydrocarbon concentrations in gaseous samples. Burning hydrocarbon-free hydrogen in hydrocarbon-free air produces a negligible number of ions in the detector. Once a sample which contains any organic carbon matter is introduced into this flame, a very complex ionization process is started. This process creates a large number of ions. A high polarizing voltage is applied between the two electrodes around the burner nozzle and produces an electrostatic field. Now negative carbon ions migrate to the collector electrode and positive hydrogen ions migrate to the high voltage electrode. The so generated ionization current between the two electrodes is directly proportional to the hydrocarbon concentration in the sample that is burned by the flame. This signal is measured and amplified by a highly sensitive and stable electrometer amplifier unit.

Our proprietary sample pressure regulator provides a controlled sample pressure and flow which gives admittance of a constant sample flow rate to the FID burner. This technique of using our non sample contact regulator is time proven for over 45 years by J.U.M. Engineering to provide the highest possible sample low flow rate stability at the lowest maintenance. Our compactly designed flow control module for fuel, ignition and air flow rates via low thermal mass needle valves use high precision pressure regulators. The needle valves are factory adjusted and sealed to ensure the optimization of the burner.



3-700 HFID Total Gaseous Organic Carbon Analyzer



Standard flow diagram shown

Available Options	
AMU 37	Automatic controlled range change
AZM 37	Automatic flame ignition and re-ignition
DCC 37	Dual concentration alarm w. individual adjustable thresholds and alarm outputs
FOAS 37	Flame out control with automatic fuel shut off valve
LTO 37	Measurement of low trace hydrocarbon levels. Requires external, zero grade combustion air supply
PDA 37	Sample pressure monitor with alarm
RCA 37	0-20mA analog output instead of 4-20mA
RCC 37	Remote controlled range change
RCI0 37	0-20 mA analog output, galvanic isolated
RCI4 37	4-20 mA analog output, galvanic isolated
TPR 37	External temperature controller for heated sample lines, e.g. Model TJ 100



Technical Specifications

Method	Heated Flame Ionization Detector (HFID)
Sensitivity	Max. 1 ppm CH ₄ full scale
Response time	@ sample inlet <0.5 seconds
t₉₀ time	@ sample inlet <1.2 seconds
t₉₀ time including 4X6mm heated sample line	Including heated sample line (7.5m) and sample probe filter filter: less than 8 seconds
Zero drift	<2% full scale / 24h
Span drift	<2% full scale / 24h
Linearity	Up to 10.000 ppm full scale within 1.5%
Oxygen synergism	< 2% FSD
Measuring ranges (ppm)	0-10, 100, 1.000, 10.000, 100.000, others on request. Front panel turn switch. Automatic or remote range change optional
Display	6- digit direct reading ppm units. High resolution of 24 bit. Capability to measure 3 overlapping ranges without range change
Signal outputs	0-10 VDC, 4-20 mA, including RS-232 data output
Display	6- digit direct reading ppm units capability to measure 2 to 3 overlapping measuring ranges without range change
Total sample flow through	From FTIR max 3 L/min, Internal pump 2.0 to 2.5 l/min capacity @ operating temp.
Sample filter	2 micron mesh filter, Permanently installed in split fitting to protect internal sampling circuit.
Zero and Span gas	Front panel turn switch select and remote control, gas inlets on rear panel
Zero and span adjust	Manual duo dial on front panel
Fuel gas choice	<ul style="list-style-type: none"> x Standard 100% H₂, consumption approx. 20 ml/min x Optional 40%H₂/60%He, consumption approximately 90 ml/min x Optional 40%N₂/60%He, consumption approximately 90 ml/min
Burner air consumption	Built in burner air supply. No external cylinder air needed. consumption optimized for fuel choice
Oven temperature	190°C (374°F)
Temperature control	micro-processor PID controller
Power requirements	230VAC/50Hz, 850 W. 120 VAC/60Hz optional
Ambient temperature	5-43°C (41-110°F)
Dimensions (W x D x H)	19" (483 mm) x 460 mm x 132 mm
Weight	approx. 22 kg (50 lbs)

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