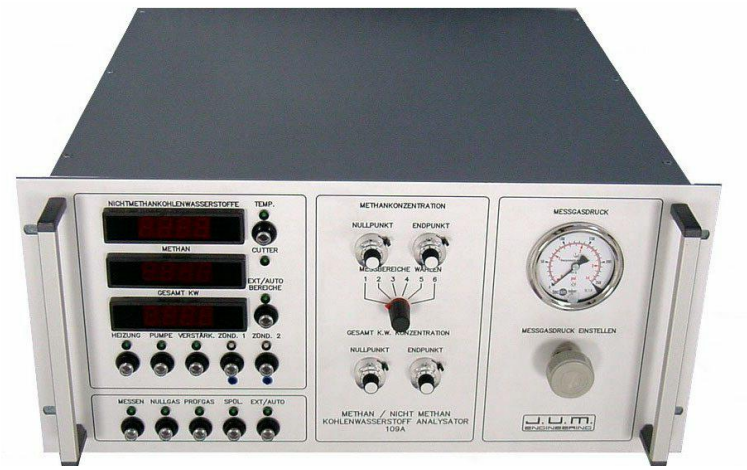
# CONTINUOUS TOTAL CARBON/ METHANE CARBON/ NON METHANE CARBON ANALYZER
# HEATED FID 109A




**Fully complies with EN 12619 and EN 13526 (EU)
2.BImSchV, 13.BImSchV and 17 BImSchV (DE)
and EPA Method 25A and
Method 503 (USA)**

The J.U.M. Engineering HFID Model 109A is a compact 19" rack mount heated total hydrocarbon analyzer for the measurement of non methane hydrocarbons (NMHC) in air and other gases.

The Model 109A uses two hydrogen flame ionization detectors (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.

The permanent heated sample filter is cleaned by backpurging and additionally has a replaceable stainless steel 2µm mesh filter disc. The burner air supply is built in. Therefore no extra bottles for burner air are needed.

Our special rear adapter plate system eliminates HC condensation on the sample inlet. It allows the cold-spot free coupling of a heated sample line inside the heated oven without the need of special tools. The fittings can be accessed through the right side panel.

**Features**

- Continuous, simultaneous signals of:
  a) Total-HC (Total Carbon)
  b) Methane-Only (Methane Carbon)
  c) Total-HC less Methane (Non Methane Carbon) NMHC
- Dual detector/ dual electrometer design for simultaneous and continuous measurement of all 3 concentrations
- Built in heated sample pump
- Built in burner air supply, no extra air cylinder needed
- Maintenance free sample filter back purge system allows filter to be cleaned without dismantling, always cleans the sample line too (automatic purge optional)
- Permanent heated 2 µm stainless steel mesh filter
- "Overflow"-calibration system for pressureless zero- and span calibration
- Automatic flame out control
- Fast response for 90% FSD within <1 sec. for THC and > 45 sec. for $CH_4$
- Low fuel consumption
- Very selective to hydrocarbons
- All heated components
- Cold spot free coupling of a heated sample line inside the heated oven (optional)
- Remote control for sample, calibrate and backpurge is standard

**Applications**

- Stack gas emissions monitoring
- Ambient air monitoring to low concentration levels
- Raw automotive and diesel exhaust analysis
- Thermal reactor and combustor emissions monitoring (e.g. Commercial Bakeries)
- CEM compliance testing

**Product Brochure,
FID Model 109A, english, © J.U.M. Engineering 2009**

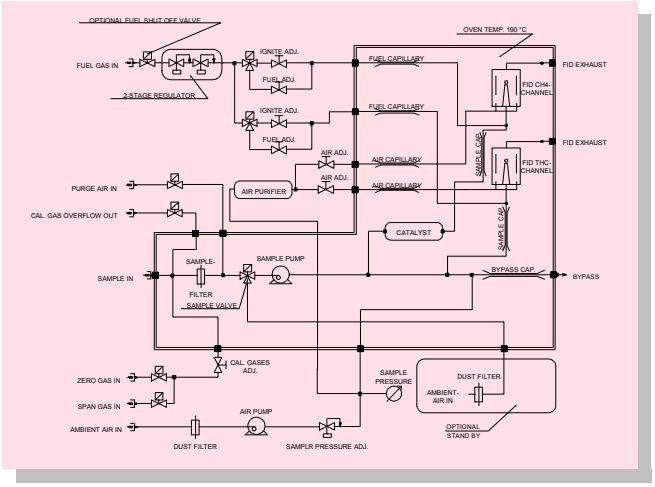
## Principle of Operation

The Flame Ionization Detection (FID) method is used to determine the presence of total hydrocarbon concentrations in a gaseous sample:

Burning hydrocarbon-free hydrogen in hydrocarbon-free air produces a negligible number of ions.

Once a sample containing hydrocarbons is introduced into this flame a very complex ionization process is started. This process creates a large number ions. A high polarizing voltage is applied between the two electrodes around the burner nozzle and produces an electrostatic field. Now negative ions migrate to the collector electrode and positive 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 our electrometer-unit.

One of the two sample capillaries is connected in series to a high temperature catalyst module. This catalyst oxidizes all hydrocarbons except Methane. Both detectors are connected to individual electrometer amplifiers. From these two signals, total hydrocarbons from the detector without the catalyst and methane from the detector with the catalyst, the non methane hydrocarbon signal is generated via a differential amplifier, resulting in the three continuous simultaneous signals displayed on individual digital meters.




| 1 Technical Data | |
|---|---|
| Method of analysis . . . | Flame Ionization Detector |
| Sensitivity . . . . . | Max. 1 ppm $CH_4$ full scale |
| Response Time . . . . | 90% full scale in >1 second (THC), >45 seconds ($CH_4$, NMHC), synchronizing for both channels optional; >45s |
| Zero drift . . . . . | <1.5% full scale / 24h |
| Span drift . . . . . | <1.5% full scale / 24h |
| Linearity . . . . . | Up to 10.000ppm within 1% FSD |
| Oxygen synergism . . . | < 1.5% FSD |
| Measuring ranges (ppm) | 0-10,100, 1.000, 10.000, 100.000, others on request |
| Analog outputs . . . . . | 3 x 0-10 VDC |
| Display . . . . . | 3 x 3 1/2 digital |
| Sample pump . . . . . | approx. 2.5 l/min capacity @ operating temp. |
| Zero / span adjust . . . | Manual on front panel |
| Fuel consumption . . . | 100% $H_2$ approx. 40 ml/min @ 1.5 bar (22 psig) |
| Fuel consumption . . . | 40%$H_2$/60%He approx. 180 ml/ min @ 1.5 bar (22 psig) |
| Burner air consumption | built in burner air supply |
| Oven temperature . . . | 190°C (374°F) |
| Power requirements . . | either 230VAC/50Hz, 1250 W or 115VAC/60Hz, 1250 W |
| Ambient temperature . | 5-43°C (41-110°F) |
| Dimensions (W x D x H) | 19" (483 mm) x 460 mm x 221 mm |
| Weight . . . . . | approx. 28 kg (60 lbs) |
| J.U.M. reserves the right, at any time and without notice, to change specifications presented in this data sheet and assumes no responsibility for the application or use of the devices described herein. | |

| Available Options | |
|---|---|
| **AMU 9** | Automatic range selection |
| **APO 9** | Automatic programmable back purge system for the sample filter; EXTERNAL MODULE! |
| **AZM 9** | Automatic flame ignition |
| **ENGA 9** | 3 direct reading engineering unit displays, 0-100.000 units, e,g, ppm. Overlaps 3 decades of sensitivity. Possibility of reading 2 to 3 decades without range change |
| **FOAS 9** | Flame out control with automatic fuel shut off valve |
| **MBP 9** | Integrated bypass pump |
| **PDA 9** | Sample pressure monitor with alarm |
| **RCC 9** | Remote control range selection |
| **TPR 9** | EXTERNAL temperature controller for heated sample line, e.g. JUM TJ100 |
| Availability of options may change unannounced! Please contact us before specifying your purchase order | |

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