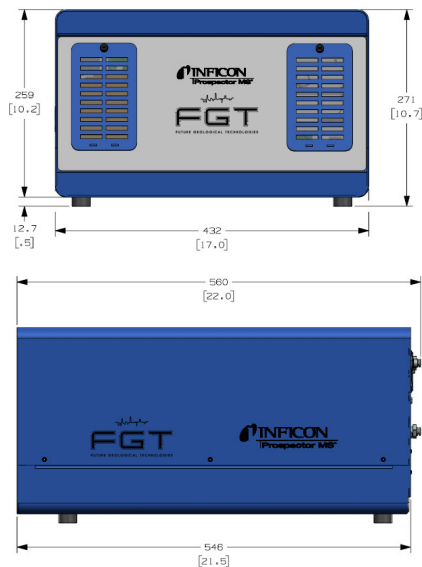


Future Geological Technologies™ & INFICON™ Wellsite Prospector Mass Spectrometer™



Modern quadrupole technology specialized for Oil & Gas Exploration

This premier portable DQMS mass spectrometer for wellsite use is fully deployable for real-time mudlogging applications. This is a direct quadrupole mass spectrometer gas analyzer providing broad spectrum analysis for gas species having molecular weights between AMU2 and AMU150. This gives an approximate PPM reading for every volatile gas species (whether hydrocarbon or not) between Hydrogen and Decane (C10). This instrument connects to any rig EDR system via WITS input for lag information and depth correlation. Data can be exported at any time as a LAS file or viewed live through our user-friendly monitoring software package.



Mass range	AMU 1 - 150
Peak width @ 10% peak maximum	<1 AMU
Detector type	Faraday Cup/Electron Multiplier
Response time	<1 second
Sample inlet connection	1/4" quick connect fitting
Sample pressure	15 psia (1 atmosphere)
Detection limit	<1 ppm
Maximum data rate	1.8ms per point (555 data points per second)
Communication PC interface	CAT5e Ethernet cable connection (RJ45)
Standard I/O	Two analog inputs, two digital inputs, three digital outputs - 24V @ 0.5A
Dimensions (L x W x H)	
Bench Top	56 x 43.2 x 27.1 cm (22 x 17 x 10.7 in)
Rack Mount	59.8 x 48 x 26.7 cm (23.5 x 18.9 x 10.5 in)
Weight	
Bench Top	54lbs
Rack Mount	63lbs
Environmental conditions	5 – 35°C up to 85% RH non-condensing
Power input	110 - 230 V (ac)

HYDROCARBONS

(Alkane and Cycloalkane)

Methane
Ethane
Propane
Butane
Pentane
Hexane
Heptane
Octane
Nonane
Decane

SW INDICATORS

Benzene
Toluene
Xylene
Acetic Acid

SULFURS

SO/SO2
CS2
H2S

INORGANICS/OTHER

Helium
Hydrogen
CO2
Nitrogen
Oxygen
Argon

APPLICATIONS

Flexible rig up options include integration with existing mudlogging operations or it can be operated remotely which greatly helps reduce startup and operator training requirements. The mass spectrometer uses standard gas instrument sampling with the option of splitting a line with the loggers.

The system is virtually 'plug and play', requiring only WITS, a gas sample, and 2-way LAN access. Auxiliary monitors may be plugged in; such as independent temperature, H2S, and/or CO2 monitors. Outputs include direct WITS output, local and online real time graphic monitors, and digital LAS export files. Error condition alerts immediately notify operators if something needs addressed. The mass spectrometer periodically self-calibrates automatically using atmospheric gas references.

Post-drill analysis of data can be provided as part of the service package.

ADDITIONAL BENEFITS

- All species are read on a linear scale - even if any are at notably different abundances
- May assist with lateral steering by detecting and characterizing components in order to identify lithologic/stratigraphic units
- Directly indicates primary porosity and secondary porosity changes such as proximity to faults and fracture intervals, etc.
- Tracks changes in the reservoir fluid profile including GOR changes and "sweet spots" of improved Oil/Gas contribution
- Indicates relatively hydrocarbon depleted or residual intervals
- Assists with identifying Gas/Oil/Water contacts and transitions
- Monitors for relative Hydrogen increases which can directly indicate bit wear and motor failure
- Distinctly indicates onset and base of pay sections in vertical wells
- Identifies limits for fluid compartments and vertical charge units which can then be used to map and characterize composition changes
- Assists with directly indicating water saturation increases
- Comparisons between Helium and/or Argon to Methane can directly indicate porosity and permeability profile changes
- Geolocate producible H₂S sources in both lateral and vertical wells

