Applied Physics Systems

# Model 751F

## Focused Natural Gamma Sensor

## Features

- Operational temperature to 150°C
- Digital interface
- High sensitivity crystal with Photomultiplier tube design
- Rugged design for use in high shock and vibration environments
- Axial and transverse 50 Gee accelerometers for vibration monitoring

## Applications

- Geo-Steering in narrow/thin zones
- Evaluation of downhole strata in drilling and logging applications
- Evaluation of downhole vibration and shock magnitudes

The Model 751F Focused Natural Gamma Sensor measures the gamma radiation occurring in well bores in order to detect the presence of porous petroleum reservoirs. The sensor's scintillation crystal and tungsten shield shields one side of the formation from the gamma sensor, which allows operators to differentiate sands from limestones. This allows operators to determine the downhole lithology and accurately place the well path inside the producing (sand) zone.

In order to operate the sensor, rotation in the drillstring is stopped and the sensor is oriented in a specific direction (usually up or 0°, and then down or 180°) and readings are taken to determine if any corrective steering action is necessary to stay within the target zone.

The 751F sensor can be used as either a standalone system or in conjunction with the Applied Physics Model 760 or 850 directional sensors. Communication with the 751F is by means of a bi-directional TTL serial port. To achieve high gamma sensitivity, a 0.7 inch diameter by 5.3 inches long scintillation crystal is used to detect gamma rays.

The 751F sensor also has two 50 Gee vibration sensors to monitor drilling induced vibration and shock. The vibration sensors are oriented to measure axial and lateral shock and vibration.

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| PHYSICAL | |
|---|---|
| Outside Diameter (O.D.) | 1.375" (35 mm) |
| Length | 18.95" (481.33 mm) |
| Weight | 1.5 lbs (681 g) |
| Scintillation Crystal | 0.7" dia. (17.78 mm) x 5.3" long (134.62 mm), in Stainless Steel case |
| Photomultiplier Tube | Hamamatsu |
| Main Connector | MDM9SH003P (ITT Cannon) |
| Mating Connector | MDM9PH003L (ITT Cannon) |

| ELECTRICAL | |
|---|---|
| Input Voltage Range | +15 V to +30 V |
| Current Draw | 40 mA @ 15 V, 20 mA @ 30 V |
| Logic Level | TTL / CMOS |
| Baud Rate | User Programmable up to 9600 Baud |
| Protocol | User Selectable, ASCII or Binary |

| ENVIRONMENTAL PERFORMANCE | |
|---|---|
| Shock | 1000 g 1ms half sine wave |
| Vibration | 10 g rms, 50 - 250Hz |
| Accuracy | ±0.5% |
| Thin-Bed Resolution | 6" (152.4 mm), in 8" (203.2 mm) diameter hole |
| Operating Temperature Range | 0°C to 150°C |
| Storage Temperature Range | -25°C to +195°C |

Specifications within this document are subject to change without notice.

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