

## Model GT1200 Fiber Optic Pressure Pulsation Transducer

DavidsonSensors™ provide the safest, most reliable and cost-effective instrumentation for harsh industrial environments.

This product data sheet describes Model GT1200 family of pressure pulsation transducers. The temperature tolerant transducers have been specifically designed to measure pressure pulsations in gas turbines near the combustion zone. The result of this direct measurement is higher quality combustion dynamics signal with lower installation and maintenance cost.

### Gas Turbine Compatibility

General Electric 7FA
General Electric 7E/7EA
Siemens 501D/F/G

Large power generation gas turbine engines must operate outside stable stoichiometric limits to minimize emission and to operate efficiently.

Stable firing of a gas turbine combustor assures reliability and maximum component life. Combustion instabilities due to sudden changes in operating conditions such as fuel calorific value, fuel quality, ambient temperature, or sudden changes in operating load can trigger high-pressure fluctuations. Combustion monitoring and control systems can be programmed to adjust the air bypass valves and fuel nozzles to maintain the appropriate fuel/air ratio based on the flame conditions.

Proper airflow controls can prevent flame out, combustion oscillation, and flash back under various modes as well as unexpected disturbances in the combustion process.

Davidson offers three turnkey combustion dynamics monitoring systems, CDMS-7FA, CDMS-7E, and CDMS-501G. For more information these systems, see the Davidson website at:

[www.Davidson-Instruments.com](http://www.Davidson-Instruments.com)



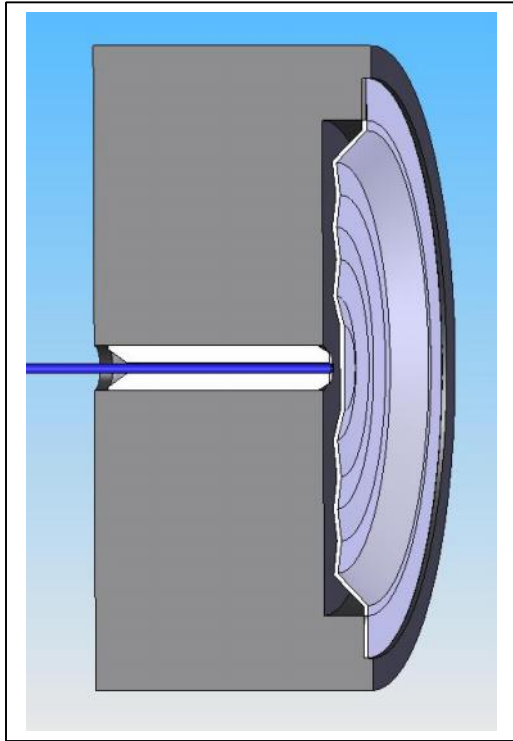
*10 psi Transducers for Gas Turbine*

### Performance Specifications

- Operating Temperature Limit:** 1000° F
- Static Overpressure Limits:** 750 psi
- Dynamic Pressure Range:** +/- 10 psi
- Frequency Response:** 5 Hz to 10 kHz +/- 5%
- Resolution Sensitivity:** 0.05% Full Scale
- Linearity:** 0.25% Full Scale
- Resonant Frequency:** > 30kHz
- Sensitivity Variation:** 300nm/psi +/- 5%
- Shock:** 1000 g peak (half sine 1 ms)
- Acceleration Sensitivity Error:** < 0.001 psi/g
- Calibration at Operating Temperature**

## Theory of Operation

Combustion instabilities cause pressure fluctuations that deflect a thin corrugated pressure sensing diaphragm. The diaphragm is integrated with a fiber optic sensor. The deflection of the diaphragm is measured remotely by the fiber optic signal conditioner where the optical signal is converted into an electronic output signal in the appropriate engineering units.



**Fiber Optic Pressure Sensing Diaphragm**

## Fiber Optic Sensing Advantages

Fiber optic sensing offers a number of advantages for measurement in harsh industrial environments. DavidsonSensors™ are intrinsically-safe, immune to electromagnetic interference, and suitable for continuous use at temperatures up to 1000°F.

Although fiber optic sensing systems can be used effectively even in benign environments, Davidson fiber optic sensing systems offer significant technical advantages when used in the following environments:

- **Hot, Corrosive Environments**
- **Explosion Hazardous Areas**
- **High EMI Areas**

Fiber optic sensing systems eliminate or mitigate many of the following common problems:

- **Failure and Drift due to Hydrogen Permeation**
- **Drift due to Fill-Fluid Leaks**
- **Failure due to Lightning**
- **Problems due to Ground Potential**
- **Noise due to EMI/RFI**
- **Costs of Nitrogen Purge Systems**

## Testing and Calibration

Standard test and calibration includes the following:

Pressure test is performed at 750 psi.

Calibration is performed at the expected operating temperature.

## Documentation

Calibration data sheets will be provided for each transducer upon request.

## Tagging

Stainless steel tags will be permanently attached to each transducer upon request.

## Safety (Transducer with Cable)

Intrinsically-safe and suitable for use in:

- Class I, Division 1, Groups B, C, and D
- Class II, Division 1, Groups E, F, and G
- Class III, Division 1

## Other Applications

For information about other Davidson products, see [www.davidson-instruments.com](http://www.davidson-instruments.com)

## Guide to Configuring a Fiber Optic Sensing System

For information to assist you in planning a fiber optic sensing system, see

[www.davidson-instruments.com](http://www.davidson-instruments.com)



**Ordering Data Worksheet**

Unit Number	Model Number	Gas Turbine	Cable Jacket / Length	Cable Temperature Rating	Cable Termination	NPT Thread Size	Other Specifications
1	GT1200						
2	GT1200						
3	GT1200						
4	GT1200						
5	GT1200						
6	GT1200						

Mechanical Design

U.S. and Foreign Patents Pending

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