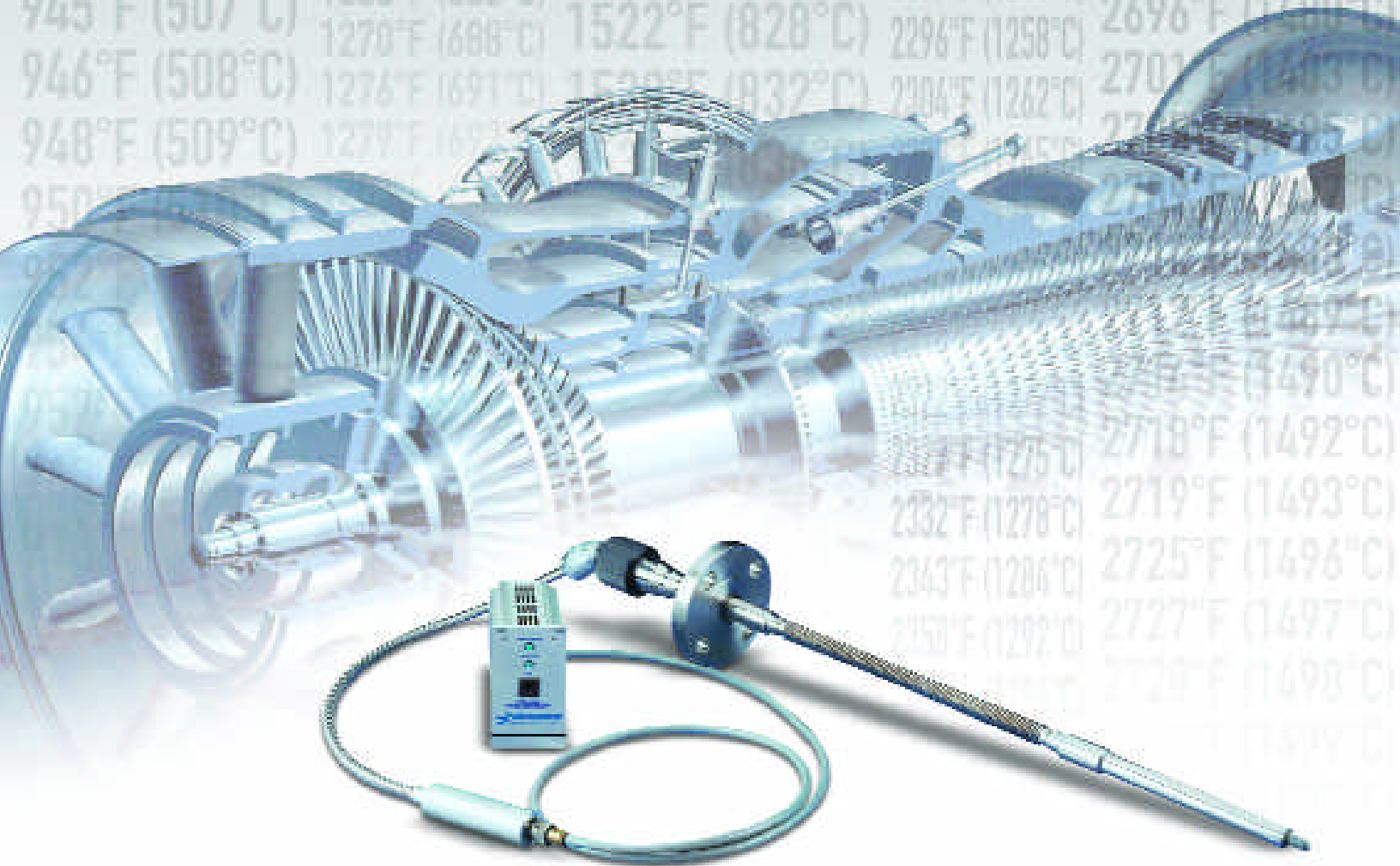


FIBER OPTIC TEMPERATURE SENSORS FOR ADVANCED GAS TURBINES



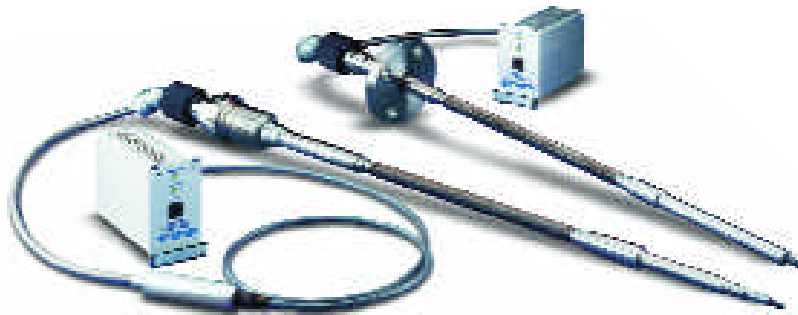
Conax[™]
Buffalo Technologies

A NEW STANDARD IN HIGH-TEMPERATURE

Conax Buffalo Technologies' Fiber Optic Temperature System revolutionizes temperature measurement in gas turbine engines. Conax's new optical sensor system operates directly in the turbine inlet, withstanding temperatures and gas flow rates far beyond the capability of conventional sensor technology. This provides considerable improvement over traditional thermocouple technology that measures exhaust gas temperature. Efficiency and power output improvements in gas turbine systems have produced increases in turbine inlet temperatures to well over 1000°C for base load operation. At such elevated temperatures and in gas flow velocities, Conax's patented technology has been proven superior for the measurement of turbine inlet and inter-turbine temperatures. As power generation facilities seek more efficient methods of operation, Conax Fiber Optic systems play a key role in the control solution for advanced gas turbines.



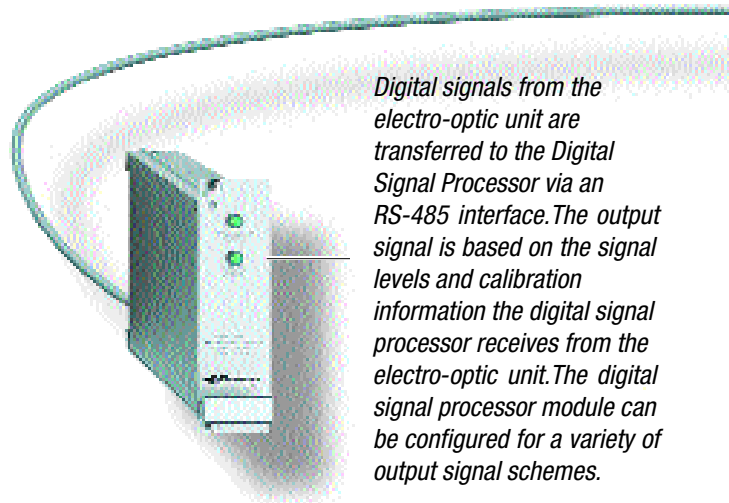
Sapphire sensor protection is provided by a silicon carbide sheath housed in a superalloy well. Material selection and housing design have provided reliable performance at turbine inlet locations.



■ **Precision Control** - The increased long-term accuracy and repeatability of the unique Conax optical technology offer greater control of temperature-sensitive variables that affect the efficiency of gas turbine performance.

■ **High Reliability** - Conax fiber optic probes are designed to function until scheduled inspections. The electro-optic unit uses state-of-the-art surface mount technology with high-reliability electronic components. These are designed to last to major turbine rebuild and beyond.

■ **Cost of Ownership** - After extended use, probes can be rebuilt and returned to service. Refurbished temperature probes are installed and matched with the original factory-supplied digital signal processor.



Digital signals from the electro-optic unit are transferred to the Digital Signal Processor via an RS-485 interface. The output signal is based on the signal levels and calibration information the digital signal processor receives from the electro-optic unit. The digital signal processor module can be configured for a variety of output signal schemes.

TEMPERATURE MEASUREMENT FOR GAS TURBINES

Mounting configurations are designed to fit virtually any turbine system interface. Sensor probe lengths can be varied to accommodate turbine frames.

The optical path is integrated with the electro-optical unit, forming a closed loop system.

The flexible design of the shaft accommodates the thermal expansion normally encountered during turbine operation between the hot gas path and the turbine housing.

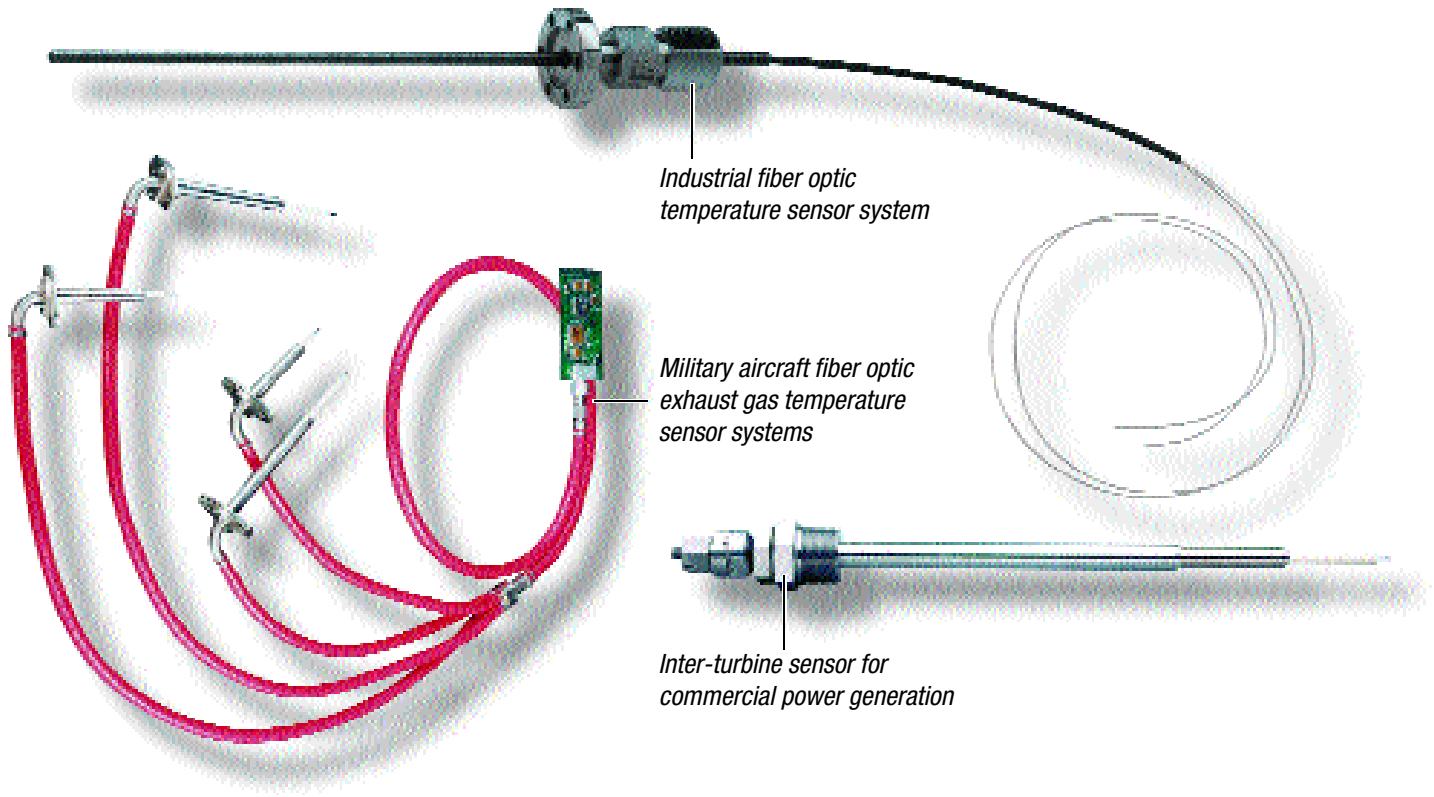
The rugged termination head is designed for the power plant environment.

The electro-optic unit (EOU) separates the optical signal into two separate wavelength bands, amplifies the signals and converts to digital values. The EOU is permanently attached to each probe and stores information specific to that probe's operation. This calibration information is downloaded to the signal processor when a new probe is installed, limiting reprogramming.

Double-linked superflex stainless steel armor cable for optical cable protection.

SPECIFICATIONS

Input power	115-230 VAC, 47-63 Hz
Available output signal	4-20 mA, 0-5 Vdc, RS485, etc.
Sensing range	+350°C to +1300°C
System accuracy	± 3% over the range of +350°C to +700°C ±1% over the range of +700°C to +1300°C
System response time	<1 sec.
Environmental temperature	0°C to +50°C (electro-optic unit and digital signal processor)
Probe vibration	20g random vibration on mutually perpendicular axes



Industrial fiber optic temperature sensor system

Military aircraft fiber optic exhaust gas temperature sensor systems

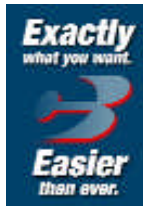
Inter-turbine sensor for commercial power generation

Conax Buffalo Technologies is the leader in the development and manufacture of fiber optic temperature sensor systems for NASA, General Electric and Pratt & Whitney Aircraft Engines, Rolls Royce and ABB-Alstom Power Generation.

THE EXPERIENCE AND INGENUITY TO MEET ANY APPLICATION REQUIREMENTS...

Conax Buffalo Technologies' wealth of experience with a wide variety of turbines has enabled us to customize our technology to meet the unique needs of gas turbine users.

For more than 40 years, Conax has been a major supplier of temperature sensors and sealing devices for steam, gas and nuclear power systems, as well as a host of other industries ranging from aerospace to process control. In addition to our large selection of standard products, Conax's custom designs have defined the standards of the industry for many years.



All Conax products are manufactured in our fully integrated facility and are subject to rigorous quality control systems.

Our technical support team is always at your service to answer your application questions and provide engineered solutions to new industry challenges.

Call the sales office nearest you today to see how Conax Buffalo Technologies can meet your sensing needs.



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