

Model 2000XTC

Thermal Conductivity Transmitter



The Model 2000XTC Transmitter from Teledyne Analytical Instruments resets the standard for thermal conductivity detector based applications within the process control industry.

As an intrinsically safe transmitter packaged within a rugged, weatherproof housing, the 2000XTC is suitable for use in harsh, hazardous outdoor environments. Using a novel, solid-state thermal conductivity sensor, this cost-effective transmitter can be configured to detect H₂, He, N₂, Ar, CO₂ or a number of other gases of interest in binary or multi-component sample gas mixtures.

Applications

- Power plant: H₂ purity analysis on turbine generator purge gas
- Petrochemical plant: H₂ purity analysis on H₂ / HC recycle gas streams, redensulfurization, and tail gas treatment processes
- Air separation plant: Bulk gas purity monitoring and welding / diving / cal gas cylinder verification
- Heat treating: Annealing furnace blanket gas monitoring
- Electrolysis: H₂ purity analysis in O₂
- Fuel cell development: Methane feed gas purity analysis and reformer efficiency

Sensor Operating Principle

The thermal conductivity sensor measures the concentration of a specific gas between a hot surface resistor and an ambient temperature reference resistor using the thermal conductivity coefficient of the gas itself.

Sensor Description

The sensor structure consists of an integrated heater located on a thin electrical and thermal insulating membrane. Two thin film resistors are used for heating and measuring the temperature of the membrane. Two resistors are integrated on the silicon beside the membrane for the compensation of the ambient temperature changes.

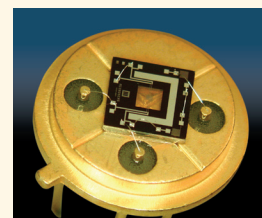
Features – 2000XTC Transmitter

- Unique, long-life, solid-state, TC sensor design
- No reference gas requirements
- Temperature controlled TCD providing excellent zero and span stability over a wide temperature range
- Intrinsically safe design allowing for use in hazardous areas
- Robust, weatherproof housing suitable for outdoor installations
- Linearized 4-20 mA signal output
- Small, space-saving, compact design
- Simple to install

Gases which have a lower density than air (CH₄) cause a decrease on the surface membrane temperature. On the other hand, gases with densities heavier than air (CO₂) increase the temperature of the measuring resistor.

Features

- Stable long term operation
- Physical method for gas concentration measurement
- Low power consumption
- Small dimensions

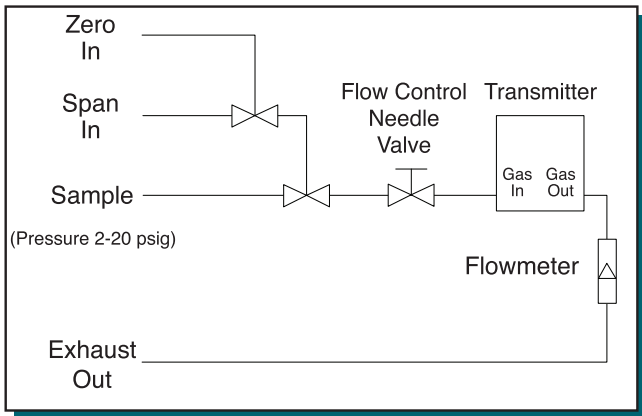


Built for reliability and performance

MODEL 2000XTC THERMAL CONDUCTIVITY TRANSMITTER

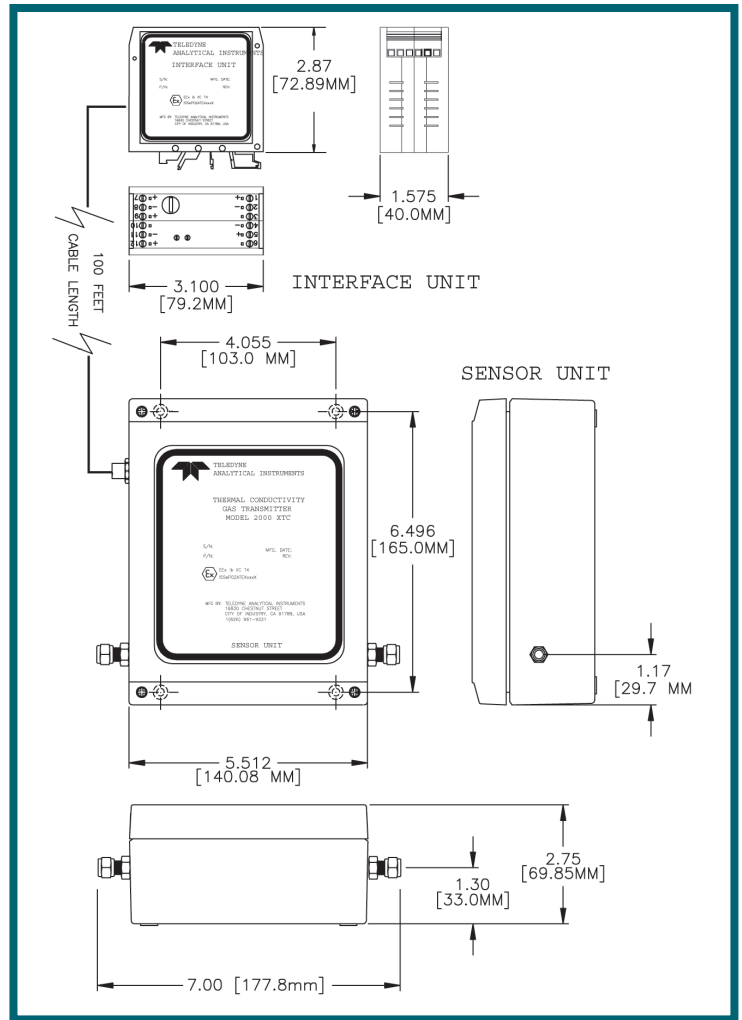
Specifications

- Ranges: Customer specified
- Accuracy: $\pm 2\%$ of full scale at constant temp;
 $\pm 5\%$ of full scale over 0-50° C
- Response time: 10-90% in less than 20 seconds application and flow dependent
- System operating temperature: 0 to 50° C
- Sensor type: Silicon micro-machined thermal conductivity sensor
- Signal output: 4 - 20 mADC output signal, linear with the gas concentration
- Cell material: Nickel plated brass block, stainless steel tubing
- Max load impedance: 700 Ohms for current output
- Reference gas: Not required
- Tube connections: 1/4" compression fittings
- Materials in contact with sample: Nickel plated brass cell block, stainless steel tubing and connectors; NACE compliant / stainless steel wetted parts available as option
- Sample gas flow rate: Recommended between 0.4 to 2.0 SCFH
- Area classification: Intrinsically safe: Class I, Div 1, Groups A, B, C & D; CENELEC / ATEX as per EEx ib IIC - T3 per EN 50020



Suggested piping diagram for positive pressure applications

- Power requirements: 24 VDC
- Power consumption: 11 watts max
- Zero drift: Typically $\pm 1\%$ over 48 hours
- Span drift: Typically $\pm 1\%$ over 48 hours
- Mounting:
- Interface unit: DIN rail mounting (UL 64 flammability rating)
 - Transmitter unit: Wall mounted, NEMA 4X (IP66 rated); flammability rating per UL 50; IEC 60529 and IP66
 - Interface unit: Provided with transmitter



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Warranty

Instrument is warranted for 1 year against defects in material or workmanship

NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

