



TCD2222 Heat exchange/thermal conductivity Sensor

## Gas Concentration Transmitter

\_\_\_\_Designed for Special Industry Process Application  
Ref: TCD2222IntE

Modernized traditional gas concentration technology,

# Familiar and reliable!

TCD2222 gas analyzer is designed to provide a highly sensitive and accurate analysis of a binary (2-component) mixture of gases. The principles of thermal conductivity are used to determine the sample gas concentration. The TCD2222 analyzer compares the thermal conductivity of the gas being measured with that of a reference gas of known thermal conductivity. The analyzer then calculates the concentration of gas and displays it on an easy-to-read LCD at field.

The TCD2222 transducer provides an acknowledged driven memo for easy-to-use operational interface with professional logic; Users can calibrate the instrument at field or inline. And it could be adapted to different application from plant defaulted setup.

For some definitive application, BD5 TCD2222 STIM could display more information, such as the dedicated triple range for hydrogen purity applications.

Enhanced BD5 TCD2222 STIM also provides on auxiliary channel for third gas measurement and compensation. But the third gas must be measured by selective/independent device, or the concentration can be setup if it is fixed concentration but influencing the *thermal conductivity measurement of majority gas*.

The TCD2222 gas concentration measurement is the still reliable solution for some industrial applications within the Power industry, such as electric utilities and power plants at large industrial facilities, as well as dissociated ammonia. In spite of it's relative principle.

### Measurement

General gases Methane, Natural gas, Inert gases, such as H<sub>2</sub>, Ar, CO<sub>2</sub> etc.  
Binary mixture gases

### Applications

- Natural gas quality control
- Combustion control
- Natural gas engine control
- Environmental
- Gas plant
- hydrogen, methane, ethane, and propane.
- methane-ethane mixtures.
- argon and nitrogen.
- nitrogen-oxygen-argon mixtures.
- neon-nitrogen mixtures.
- R32-R125-R134a-propane mixtures.
- IUPAC Round-robin on R134a.
- Refrigerant vapor.
- Propane.
- Butane.
- Isobutane



### Key specifications

- Typical concentration range 0.01 - 100% Vol.
- Very stable long term operation
- Physical method for gas concentration measurement
- Low power consumption; typical heating power: < 6 mw

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Fast response time; 90% signal level: < 20 sec.

## Special Applications

Major gas	Backgrounds	Range	Resolution	Repeatability	Applications
H <sub>2</sub>	N <sub>2</sub>	35 ~ 75% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2% F.S	NH <sub>3</sub> Industry
H <sub>2</sub>	N <sub>2</sub>	50 ~ 80% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2% F.S	
H <sub>2</sub>	N <sub>2</sub>	20 ~ 50% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2% F.S	N <sub>2</sub> protection system; calcium carbide stove gas monitoring
H <sub>2</sub>	N <sub>2</sub>	0 ~ 2% H <sub>2</sub>	0.01% H <sub>2</sub>	± 5% F.S	
H <sub>2</sub>	N <sub>2</sub>	0 ~ 10% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2.5% F.S	
H <sub>2</sub>	N <sub>2</sub>	0 ~ 15% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2.5% F.S	
H <sub>2</sub>	N <sub>2</sub>	0 ~ 25% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2.5% F.S	
H <sub>2</sub>	N <sub>2</sub>	60 ~ 100% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2% F.S	Hydrogen purification and plant
H <sub>2</sub>	N <sub>2</sub>	70 ~ 100% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2% F.S	
H <sub>2</sub>	N <sub>2</sub>	70 ~ 100% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2% F.S	
H <sub>2</sub>	N <sub>2</sub>	90 ~ 100% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2.5% F.S	
H <sub>2</sub>	N <sub>2</sub>	95 ~ 100% H <sub>2</sub>	0.01% H <sub>2</sub>	± 2.5% F.S	
H <sub>2</sub>	Ar	0 ~ 2% H <sub>2</sub>	0.01% H <sub>2</sub>	± 5% F.S	Argon industry
H <sub>2</sub>	Ar	0 ~ 3% H <sub>2</sub>	0.01% H <sub>2</sub>	± 5% F.S	
H <sub>2</sub>	O <sub>2</sub>	0 ~ 2% H <sub>2</sub>	0.01% H <sub>2</sub>	± 5% F.S	electrolytic production
H <sub>2</sub>	Air	0 ~ 100% H <sub>2</sub>	0.01% H <sub>2</sub>	± 5% F.S	Gas plant
SO <sub>2</sub>	Air	0 ~ 6% SO <sub>2</sub>	0.01% SO <sub>2</sub>	± 5% F.S	Vitriol, hydrogen sulphate plant
Ar	O <sub>2</sub>	0 ~ 15% Ar	0.01% Ar	± 5% F.S	Argon industry
Ar	N <sub>2</sub>	80 ~ 100% Ar	0.01% Ar	± 5% F.S	
CO <sub>2</sub>	Air	0 ~ 10% CO <sub>2</sub>	0.01% CO <sub>2</sub>	± 5% F.S	Biochemical ferment process
CO <sub>2</sub>	Air	0 ~ 20% CO <sub>2</sub>	0.01% CO <sub>2</sub>	± 5% F.S	
CO <sub>2</sub>	Air	0 ~ 50% CO <sub>2</sub>	0.01% CO <sub>2</sub>	± 5% F.S	
CO <sub>2</sub>	Air	0 ~ 100% CO <sub>2</sub>	0.01% CO <sub>2</sub>	± 5% F.S	
NH <sub>3</sub>	Air	0 ~ 15% NH <sub>3</sub>	0.01% NH <sub>3</sub>	± 5% F.S	Ammonium nitrate plant
NH <sub>3</sub>	Air	0 ~ 20% NH <sub>3</sub>	0.01% NH <sub>3</sub>	± 5% F.S	

## BD5 series Intelligent Transducer

IEEE Standard for a Smart Transducer Interface for Sensors and Actuators & Transducer to Microprocessor Communication Protocols and Transducer Electronic Data Sheet (TEDS) Formats Compatible, 1451.1 NCAP Network support. Analog and Digital Signals Output. Remote Setup and Operate.

- *Continuous analysis. Direct measurement in sample*
- *Accurate and reliable, low-maintenance*
- *Self diagnostic, professional intelligent, Menu-driven digital user interface*
- *Auto diagnostic and alarm, optional purge or flush accessories*
- *Easy maintenance \_\_ on time clear or replace of sensor in situ*
- *Data log of measurements for day/month/year*

## Feature

- Auto temperature compensation
- Professional data process. And Special calibration model of BigDipper Technochem
- User calibration at field to get high accuracy application
- on-line sample calibration: Three Know Addition(3KA) function available
- Off-line sample calibration: Known Sample Calibration(KS), Tow Known Sample Calibration (TKS), Three Known Sample Calibration(3KS), function available
- Low power design, may be driven by battery or solar battery in remote area.
- Refer to <Introduction to BD4/5 Transducer and Controller> for electronic property and functions

## Electronics of STIM Transducer

- Linear analog signal output, 0/4 to 20 mA select. default status is 0 to 20 mA
- RS232 serial port always available, RS485 attached as to BD5xB upper configuration.
- Power supply: DC 9 to 24 V; consumption <100mA x 5V
- Intrinsic safe design

For more details, please refer to : **BD4&5IntE**

## TCD2222 Model

Range	Repeatability	Model	Conditions	Information
0.01-100%	≤ ±5%	CPT TM2222A-CPA1+2222	-40 to 85°C ; -0.1 to 1.0MPa	TCD method, for 2 gas blend under constant pressure and humidity.
0.01-100%	≤ ±2%	TBD5CMD-CPA1+TM222-TH	-40 to 85°C ; -0.1 to 1.0MPa	TCD method, for 2 gas blend under constant pressure.
0.01-100%	≤ ±2%	TBD5CMD-CPA1+TM2222-THP	-40 to 85°C ; -0.1 to 1.0MPa	TCD method, for 2 gas blend .
0.01-100%	≤ ±2%	TBD5CMD-CPA1+MR222-TH	-40 to 180°C ; -0.1 to 1.0MPa	TCD method, for 2 gas blend under constant pressure.
0.01-100%	≤ ±2%	TBD5CMD-CPA1+MR2222-THP	-40 to 180°C ; -0.1 to 1.0MPa	TCD method, for 2 gas blend .

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<http://www.fullsense.com/Products/Meters/>

<http://www.fullsense.com/Products/BD2000/2600/online/CPT2000IntE.htm>

<http://www.fullsense.com/Products/BD2000/2600/GasSensorList1E.htm>

<http://www.fullsense.com/Products/BD2000/2600/GasSensorList2E.htm>

## BD4Controller & BD5 STIM

<http://www.fullsense.com/Meters/>

BD4&5Introduction: [http://www.fullsense.com/Meters/BD4\\_IntE.htm](http://www.fullsense.com/Meters/BD4_IntE.htm)

BD4&5 Functions: [http://www.fullsense.com/Meters/BD4\\_TB\\_E.thm](http://www.fullsense.com/Meters/BD4_TB_E.thm)

BD4&5 Selection: [http://www.fullsense.com/Meters/BD4\\_Sel\\_E.htm](http://www.fullsense.com/Meters/BD4_Sel_E.htm)

BD4\_5Configuration: [http://www.fullsense.com/Meters/BD4\\_Cfg\\_E.htm](http://www.fullsense.com/Meters/BD4_Cfg_E.htm)

BD4Application: [http://www.fullsense.com/Meters/BD4\\_AG\\_E.htm](http://www.fullsense.com/Meters/BD4_AG_E.htm)

## Related Technical References:

<http://www.fullsense.com/Network/>

Scm Protocol

STIMcom Protocol

IEEE1451.1 NCAP Protocol

IEEE1451.2 STIM Protocol

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