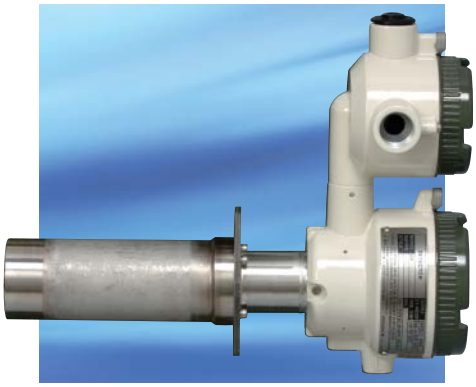
YOKOGAWA

Gas Density

EXA GD402

Measure gas density rather than thermal conductivity for applications such as hydrogen purity analysis and BTU monitoring in refineries.



Bulletin 11T03E01-01E

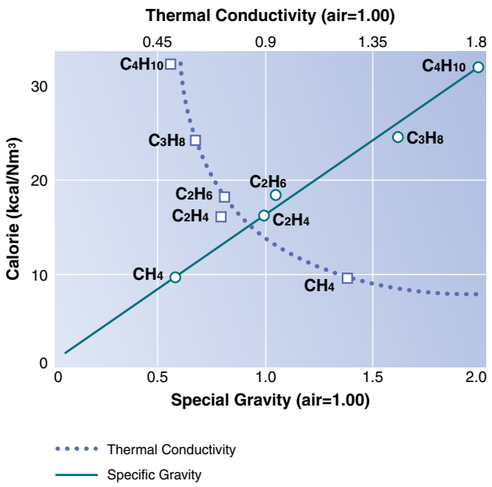
EXA GD402

Gas Density Analyzer

Once again, the global leaders in analytical technology have attained a new level of measurement precision with the **EXA-based Gas Density Analyzer.** Its innovative cylindrical resonator design enables direct linear measurement of gas density without reliance on thermal conductivity properties. The result is improved accuracy that is unaffected by temperature or secular changes.

Driven by a multi-mode oscillation, the GD402 Gas Density Analyzer provides ±1% FS linearity and the total reliability and stability you need to maintain continuous on-line system operation, reducing outages and costs.

Linearity Comparison



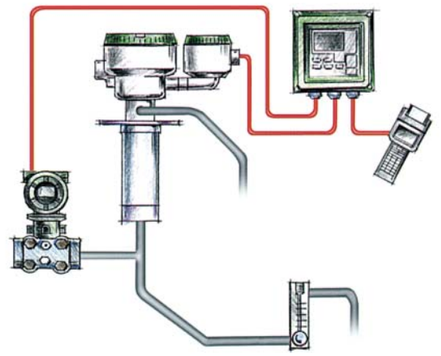
Linearity of specific gravity *for calorie measurement versus thermal conductivity for calorie measurement.*

Consisting of a detector and converter that continuously measure gas density, the **GD402** also utilizes its proven sensor technology to calculate specific gravity, molecular weight, calories, and BTUs. It is ideal for a variety of applications, from measurement of hydrogen purity for cooling generators to BTU monitoring for air-fuel control in oil refining, iron and steel making plants.

Its resistance to external stress ensures stability even under the extreme temperature variations found when measuring the density and molecular weight of off-gases generated in refining processes. Ideal for checking the replacement process from air to CO_2 in hydrogen-cooling turbine generators, the **GD402** provides ultimate reliability for new systems or for upgrading your current system.

Always a leader in primary measurement advancements, Yokogawa responds to the industry's need for cost-effective precision instrumentation with **GD402's** reduced-calibration, low-maintenance design. All-digital remote BRAIN communications, self-diagnostic capabilities, and easy-to-use YES/NO programming enhance functionality and provide a broad range of control options.

Typical GD402 System Configuration



Optional BT200 BRAIN™ *Terminal enhances the Gas Density Analyzer allowing easy programming and complete documentation.*

Yokogawa's Dpharp™ Pressure Transmitter *provides the required line pressure signal for gas density analysis. For more information please refer to GS01C21D01-00E.*

General specifications

Item	Density kg/m^3	Density lb/ft^3	Specific Gravity	Molecular Weight MW	Concentration vol %
Range	0-6	0-0.4	0-5	0-140	0-100
Minimum Range	0.1	0.01	0.1	4	Concentration equivalent to 100kg/m^3
Response Time 90%	approx. 5 seconds				
Linearity	±1% FS	±1% FS	±1% FS	±1% FS	±1
Repeatability	±0.001 or ±0.5% FS(*)	±0.001 or ±0.5% FS(*)	±0.0001 or ±0.5% FS(*)	±0.02 or ±0.5% FS(*)	±0.5 or concentration equivalent to ±0.001kg/m^3(*)
Long term stability	±0.003/month	±0.002/month	±0.003/month	±0.07/month	Concentration equivalent to ±0.003kg/m^3/month

(*) Whichever is greater.

Hydrogen purging Standard Ranges

Item	H_2 in Air vol %	H_2 in CO_2 vol %	Air in CO_2 vol %
Range	85-100	0-100	0-100
Minimum Range			
Response Time 90%	approx. 5 seconds		
Linearity	±1	±1	±1
Repeatability	±0.5	±0.5	±0.5
Drift	±0.5/month	±0.5/month	±0.5/month

Density is the basic measurement, the other items are derived from the density data.

Calorie Specifications

Caloric Value MJ/m^3	British Thermal Unit KBTU/ft^3
0-130	0-3.5
Caloric value equivalent to 0.100kg/m^3	Caloric value equivalent to 0.100kg/m^3
approx. 5 seconds	
±1% FS	±1% FS
±0.5% FS or caloric value equivalent to 0.001kg/m^3(*)	±0.5% FS or caloric value equivalent to 0.001kg/m^3(*)
Caloric value equivalent to ±0.003kg/m^3/month	Caloric value equivalent to ±0.0025/month

Caloric value and BTU are possible representations of the density.

GD402 does not contain table information, only a single mathematical equation.

(*) Whichever is greater.

YOKOGAWA

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