

Thermal Conductivity Analyser AMS FTTC 1100



The Application:

For the constant regulation of Density and Calorific value in gas mixing stations for AMS has developed the Thermal Conductivity Analyser FTTC 1100 with Fourier-Transformation of the sensor signal. For this application fast responses of the thermal conductivity sensor are required, since the changing's of density and calorific value occurs fast and within narrow boundaries. A typical application for this analyser is the measuring of methane, carbon dioxide and nitrogen in Bio-Gas and Natural gas.

Measuring principle:

The conventional measurement of the thermal conductivity of gases is limited to binary gases. However, the thermal conductivity measurement with Fourier-Transformation allows the simultaneous measurement of three and four gas components. Only with the invention of miniaturized thermal conductivity sensors, with an extremely low thermal mass, this technology could be realized. It has become feasible to use the physical effect of the varying thermal conductivity of gases with the change

of the temperature. Due to the modulation of the membrane temperature of the sensor, the measuring signals of a gas mixture shows periodic changes which can be displayed as Fourier-Coefficients. The first step in setting up an application is the definition of a calibration matrix which covers the range of the expected gas concentrations. In a mixture of three gas components this can be visualised in a two-dimensional diagram, as the third component is the supplement to 100 %. Calibration thereby means, to establish with the help of known gas mixtures a correlation matrix between a set of concentration values and a set of Fourier coefficients. The temperature of the sensor block, the average membrane temperature, the amplitude of the temperature modulation and the modulation frequency has to be defined and optimized for each and every application.

The Measuring system:

The Thermal conductivity Analyser FTTC 1100 is usually installed in a wall mounting housing IP 65. The micro-processor controlled electronics is separated from the gas analytics. Calibration and service are controlled via the keyboard in the analyser menu. Integrated automation components such as the time-controlled calibration allow the remote operation of the Thermal conductivity Analyser FTTC 1100 from the control room.

Technical Data

Measuring system	FTTC 1100
Measuring components / ranges	The measuring ranges have to be selected specifically for an application Example: Methane (CH ₄) 40...90Vol% Carbondioxide (CO ₂) 5...50Vol% Nitrogen (N ₂) 0...30Vol%
Analogue output (Option)	each measuring component 1* 4 ... 20 mA, galvanically sperated
Reproducibility	< 2 % of measuring value
Resolution	0,01% - 0,3Vol% for each measuring component and application
T90-Time	≤ 20 Seconds
Long term drift	≤ 0,5Vol% according to application
Temperature drift	0,2 %/K
Display	2* 16 digit, illuminated LCD display
Digital communication	Interface RS 232 / RS 485
Ambient temperature	+ 5 °C to + 40 °C
Gas temperature	max. + 40 °C
Gas connections	
Inlet	6 mm ferrule pack
Outlet	6 mm ferrule pack
Gas flow	Measuring gas 20 ... 50 NI/h
Gas pressure (Inlet)	1 < p < 2 bar(g)
Power supply	90 ... 240 VAC / 24 VDC
Protection class / Housing /	IP65
Dimensions	600 x 380 x 210 mm (hxbxt)
Weight	10 kg, depending on protection class
Options	Suitable for operation in Ex-Zone 2 Flame barriers
Version: AMS FTTC 1100 T E V02-2014	

Specification subject to change.