NEROXIS by VEOLIA

KAPTA™ 5000 – H_2

Online multi-parameter H_2 measurement & control Atex probe: Hydrogen, Pressure, Temperature, Relative Humidity

Applications: H_2 measurement/control

• Market applications:
- Hydrogen fuel security in transportation industry
- Hydrogen fuel security and monitoring in power plants
- Fuel cells application
- Hydrogen security in production (electrolysis), storage (fuel tanks, battery, nuclear waste)

• System management optimization by providing a dedicated software to manage the continuous data transmission. Analog 4-20 mA output directly proportional to the hydrogen concentration.

Advantages

• In situ measurement

• 4-20 mA output proportional to the H_2 concentration

• Fully integrated sensor

• Simple and quick maintenance

Main characteristics

• H_2 pre-calibrated probe in a defined environment

• 1-inch 1/8 diameter for probe attachment

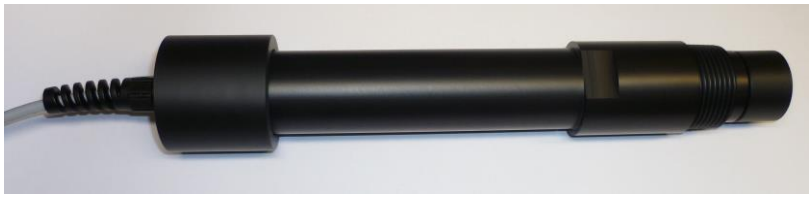
• Simple maintenance requiring only the filters to be changed (for dirty environnement only)

• ATEX probe – Zone 0 – Ex II 1 G -

• 24VDC power supply – Imax= 100 mA

• Data transfer via Modbus RTU RS232

A NEW SOLUTION FOR H_2 MEASUREMENT



General description

Hydrogen fuel is becoming more and more important as renewable energy. However, the manufacturing, storage, transportation and use of H_2 need some security systems as it is an explosive gas (LEL is 4%).

For some specific storage, such as radioactive waste, H_2 measurement is also a necessity for security reasons.

Neroxis Probes & Systems for H_2 control are based on a Miniaturized Thermal Conductivity Sensor (MTCS). Its physical principle of measurement (no chemical interaction) ensures a high level of stability.

Each application has specific environmental conditions of pressure, temperature, relative humidity and background gas. Moreover, the H_2 range of concentration and the required accuracy will also depend on the application.

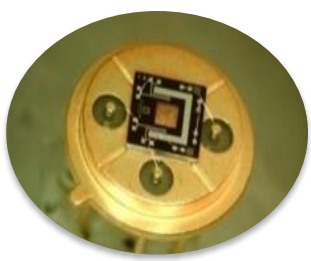
KAPTA™ 5000 H_2 is a multi-parameter probe which also measures pressure, temperature and relative humidity.

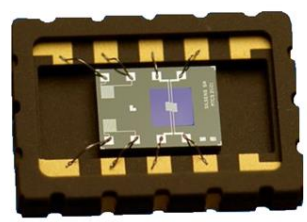
KAPTA™ 5000 H_2 calibration is performed using the environment conditions defined by the customer. The H_2 concentration level is directly compensated using the multi-parameter information. The probe design allows high flexibility, by the fact that it's always possible to change the calibration constants (via RS232) inside the micro-controller register.

Neroxis also provides a specific software together with the probe. This is probably the most efficient and flexible system currently available to control the H_2 level, as well as pressure, temperature and relative humidity. Such a system, using Modbus RTU RS232, is compatible with the simultaneous management of more than 10 probes.

It's very important to avoid any water condensation inside the probe where the sensors are located. To overcome this potential problem, a heater can be added near the sensors to increase the ambient temperature by about 5 to 10°C.

Hydrogen sensor specifications	
General specifications	• H_2: Hydrogen measurement [% or ppm] • P: pressure measurement [mbar] • T: temperature measurement [°C] • RH: relative humidity measurement [%] • Output [4; 20mA] proportional to the hydrogen concentration (in option)
Operating range	Typical operating range (extended range possible) **1. Hydrogen** [0%; 10%] **2. Pressure** [500 mbar; 1'100 mbar] **3. Temperature** [10°C; 60°C] **4. Relative humidity** [20%; 90%]
Measurement accuracy	Hydrogen signal compensation makes the probe accuracy dependent on the operating condition. **1. Typical Hydrogen:** ± 0.1% in the range [0; 4%] **2. Pressure:** ± 1.5 mbar at 25°C within the range [750; 1'100 mbar]; ± 2.5 mbar within the range [-20°C; 85°C] and [300; 1'100 mbar] **3. Temperature:** ± 0.2°C within the range [-20°C; 85°C] **4. Relative humidity:** ± 2.0% within the range [15%; 90%] and [20°C; 35°C]; ± 3.0% within the range [15%; 80%] and [20°C; 60°C]
Data transmission	Continuous data transmission by Modbus RTU RS232 protocol. Maximum recording frequency of 1 mes/second.
Analog output 4-20 mA	Analog output proportional to the H_2 concentration.
Calculation constant modification	The constants used for the 4-20 mA calculation according to the H_2 concentration may be modified by the user via Modbus RTU RS232.
Maintenance	Filter replacement with sensor powered down - Frequency to be defined depending on the dirt build-up.
Usage time	> 1 year
Electrical power supply	24 VDC. Imax: 100 mA.
Standard	ATEX – Zone 0 – Ex II 1 G – IP68 (upper part of the sensor on the atmosphere side)
Sensor materials	Sensor body and upper part in POM-C EC (Electrically Conductive)
Cable/Connector	3 m cable (outside potential Explosive Atmosphere zone) with IP68 6-contact male plug
Filters	316 L metal sintered filter + PTFE membrane
Sensor attachment	On 1-inch 1/8 pipe
Sensor dimensions	Max overall: L= 27.5 cm; Ø upper part = 50 mm; Ø max sensor body = 42 mm
Sensor weight	~ 650 g including the 3m cable and the connector





NEROXIS

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