

## K1650 hydrogen purity and purge gas Analyser

Designed for hydrogen cooled turbines in power stations

- **Single remote sensor**
- **Measures all gas purge stages**
- **ATEX certified for hazardous areas**
- **Simple, low cost servicing**
- **Optional sample systems**
- **Easy replacement of old analysers**

### Applications

- **Hydrogen purity measurement in turbo-generators**
- **Hydrogen purity measurement in synchronous compensators**
- **Inert gas monitoring during service shut downs**

**The K1650 analyser has been designed specifically for use in power stations.** Modern turbogenerators produce a great amount of heat and the most efficient way of removing this heat is by enveloping the parts in hydrogen because hydrogen has seven times the cooling capacity of air. It is possible however for air to leak into the system, so it is essential to monitor the hydrogen purity for both efficiency and safety - as an air mixture will produce a potentially explosive atmosphere. When maintenance needs to be carried out, the atmosphere surrounding the turbogenerator has to be replaced with air. This cannot be a direct replacement because of the explosive mixture that would be produced in the process. Instead, an inert gas, usually carbon dioxide, is used to purge the hydrogen, then air is introduced to purge the carbon dioxide. The same procedure must be followed in reverse when replacing the hydrogen atmosphere.

**The K1650 analyser has three ranges** to monitor hydrogen purity and the shut down/start up purge stages of generators. A single katharometer sensor, based on Hitech's proven thermal conductivity technology, is calibrated over the three ranges. The inherent stability of this system means infrequent calibration and a low cost of ownership. There are no consumables and no required spares for the first two years of operation.

**The K1650 fixed analyser is delivered already mounted in a panel for easy retrofitting.** An MTL zener barrier is also mounted on the rear of the panel. This enables the remote sensor housing to be sited in a



hazardous area with the analyser electronics in a safe area. The remote sensor is in a IP65 housing complete with flowmeter and needle valve. For full, hazardous-area use the analyser electronics can be supplied in an Ex enclosure.

**For portable analyser requirements** the battery-operated **K6050APGM** analyser can be supplied in a rugged IP65 case. The K6050APGM combines all the features of the K1650 in a portable version with internal pump and rechargeable battery designed to last a full purge cycle. Flowmeter and needle valve are included as standard, no extra accessories are required.

**Different sample conditioning systems are available** for the K1650, standard or bespoke, according to the process conditions. Filters, pumps and regulators can all be incorporated to deliver the sample in the correct condition. Oil mist, water vapour, calibration at pressure and returning the sample to the process can all be accommodated. Hitech engineers are ready to recommend the right system for you on receipt of full gas stream specifications.

**For sites using nitrogen as a purge gas** (instead of CO<sub>2</sub>) please contact Hitech for an alternative solution.

**All your turbine gas analysis requirements in one package from the katharometer experts.**

# K1650 hydrogen purity and purge gas analyser

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## SPECIFICATION

### Display

Dot matrix LCD registering 4 lines of alphanumeric characters

### Ranges

0 to 100% CO<sub>2</sub> in Air (Resolution 0.5%)  
 0 to 100% H<sub>2</sub> in CO<sub>2</sub> (Resolution 0.1%)  
 90 to 100% H<sub>2</sub> in Air (Resolution 0.1%)

### Stability

Better than 1% fsd/month

### Accuracy

±1% fsd typically

### Sample flow

Between 100 to 300 ml/min for optimum performance

### Sample temp.

-10°C to +55°C (non-condensing)

### Sample pressure

Set by vent pressure which must be nominally atmospheric

### Speed of response

T90 - typically 5secs or less

### Sample connections:

Captive seal compression fittings suitable for 0.25inch (or 6mm) outside diameter tube.

### Output (signal)

4 to 20mA, proportional to the selected range. Maximum load 600Ω.

### Alarms

Four user configurable alarms programmable for level, function and hysteresis are provided as follows:

- 1 alarm for CO<sub>2</sub> in Air
- 1 alarm for CO<sub>2</sub> in H<sub>2</sub>
- 2 alarms for H<sub>2</sub> purity

Outputs are volt-free changeover relay contacts rated at: 48V AC or DC, 0.5A

### Ambient temp

-5°C to +40°C

### Power supply

110/120V or 220/240VAC, 50/60Hz power consumption, 12VA

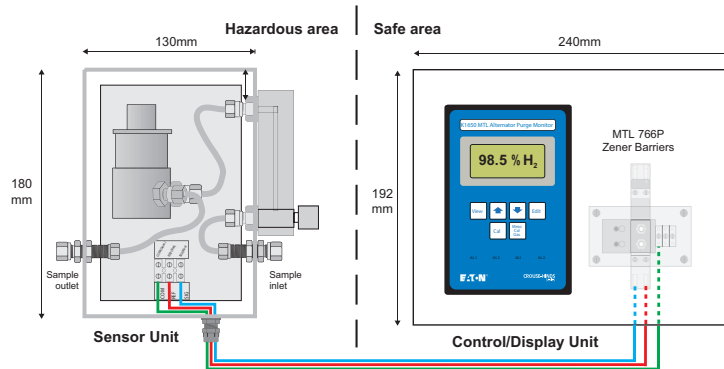
### Mounting

Electronics unit/Control/Display unit: panel mounting with six screws  
 Remote sensor unit: wall/bulkhead

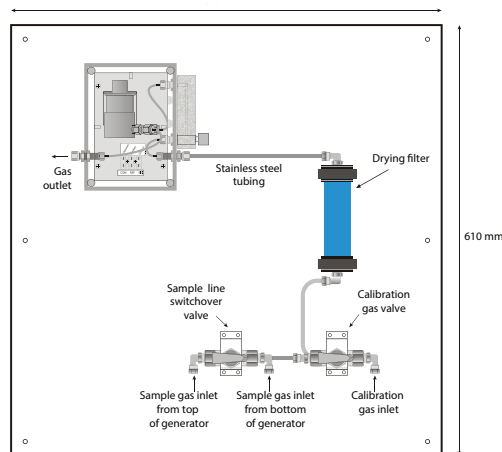
### Options

- Ex d enclosure for K1650 electronics unit
- Larger electronics mounting plate, dimensions: 432mm(h) x 381mm(w)
- Sample conditioning panel - see diagram

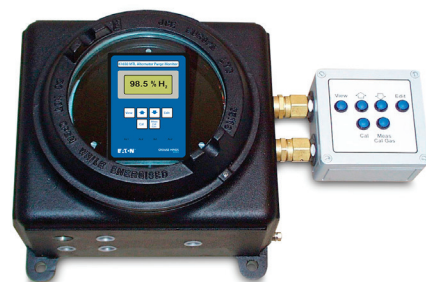
## Electrical interconnection diagram



## K1650 sample conditioning panel



## Electronics unit in optional EEx d enclosure with remote keypad



## APPROVALS (for Europe) - associated with version K1650

Authority	Product/Cert. No.	Standards	Approved for
DEMKO	210 Gas detection head DEMKO02ATEX132848X	EN50014	⊕ II 2G EEx d IIB + H <sub>2</sub> T6 -40°C ≤ T <sub>a</sub> ≤ 40°C
		EN50018	⊕ II 2G EEx d IIB + H <sub>2</sub> T3 -40°C ≤ T <sub>a</sub> ≤ 150°C
BASEEFA	MTL766P barrier BAS01ATEX7202	IEC60079-0	⊕ II 1GD [EEx ia] IIC T6 -20°C ≤ T <sub>a</sub> ≤ 60°C
		IEC60079-11	
ISSeP	EEx d enclosure ISSeP03ATEX005	EN50014	⊕ II 2GD EEx d IIC T6 (85°C) or T5 (100°C)
		EN50018	
		EN50281-1-1	



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