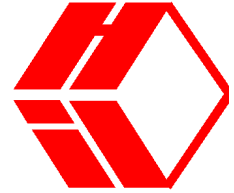


KK650

Hydrogen + Chlorine Analyser



Features & Benefits

- **Very simple to use and service**
- **Benign surrogate gas calibration**
- **Virtually indestructible and interchangeable sensors**
- **Low cost of ownership**
- **Comprehensive set of programmable alarm relay and analogue outputs**



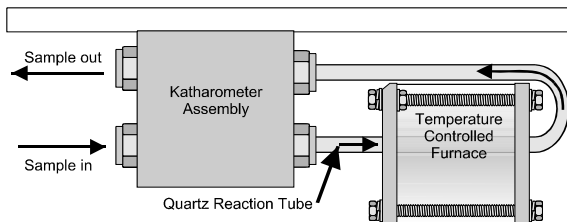
Control—Display Unit

The **KK650** is designed to meet all the challenges of measuring chlorine and hydrogen in the presence of nitrogen and oxygen (so called inerts) in chlorine production plants. It uses a chemically inert thermal conductivity sensor (katharometer), equipped with two measurement chambers, combined with microprocessor based signal processing to provide highly reliable and accurate process monitoring.

All types of chlorine plant can be monitored by one of two models which differ in the hydrogen range and resolution (see specification). Each provides accurate monitoring of the process gas from start up to normal running.

HOW IT WORKS

Firstly, the thermal conductivity of the plant sample is measured. Next, the sample is passed through a



heated reactor tube where the hydrogen reacts with some of the chlorine. A second sensor then measures the thermal conductivity of the reacted mix. The difference in thermal conductivity between the first and second measurement is used to calculate the hydrogen concentration.

The chlorine concentration is calculated from the first thermal conductivity measurement by taking into account the effect of hydrogen.

ADVANTAGES

- **Virtually indestructible sensor with indefinite life**
- **Extremely easy to clean should sample train become contaminated**
- **Sensor interchangeability for minimum down time**
- **Highly stable sensor that is unaffected by fluctuations in sample and atmospheric pressures**
- **Long calibration intervals using benign surrogate gases**

Calibration of chlorine analysers normally requires the handling of hazardous gases by highly trained personnel. Sometimes this necessitates removing the analyser or sensor from the plant and performing the tests in a laboratory.

The KK650, as well as being able to be calibrated on chlorine and chlorine/hydrogen mixtures, can be calibrated by two other methods that overcome the problem of handling hazardous gases.

Firstly, it can be calibrated on benign easily-obtained surrogate gases—argon for chlorine span and hydrogen in air for hydrogen span. Alternatively, the process gas can be used if there is sufficient confidence in its analysis provided by other analysers (e.g. gas chromatographs). It can also be calibrated using a combination of these methods.

SPECIFICATION

Ranges

0 to 100% Cl₂ - Resolution 0.1%
 0 to 5% H₂ - Resolution 0.1%
 or 0 to 2% H₂ - Resolution 0.01%

Stability

Better than 1% f.s.d. over the operating temperature range
 Better than 1% f.s.d./month

Accuracy

± 1% f.s.d. or ± 2% f.s.d. depending on calibration method

Repeatability

Better than 1% f.s.d.

Sample Flow

Between 100 to 300 ml/min for optimum performance

Sample Temperature

0°C to 100°C (non-condensing)

Sample Pressure

Operating 0.9 to 1.1 bar abs (nominally atmospheric)
 Absolute max sample pressure 2 barg

Sample Connections: Inlet and outlet

PFA double ferrule compression fittings suitable for
 ¼ inch o.d. tube

Ambient Temperature

Sensor unit 5 to 55°C
 Electronics -10 to +45°C

Display

Instrument 4 line LCD
 Reactor Controller 4 digit LED
 Reactor fault Front panel LED

Analogue Outputs

Isolated 4 to 20mA proportional to Hydrogen range
 Isolated 4 to 20mA proportional to Chlorine range
 (Maximum load 600 ohm)

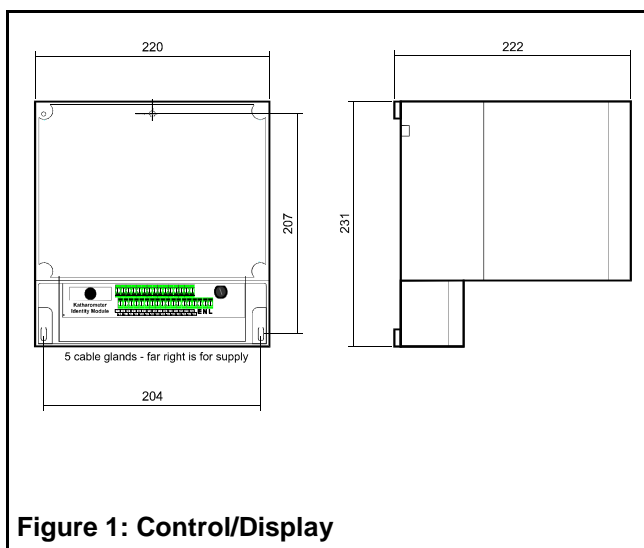


Figure 1: Control/Display

Alarm Relay Outputs

Four volt-free relay alarm outputs are provided as detailed below. Each is a changeover contact with a maximum rating of 48V, 0.5A, a.c. or d.c.

- Instrument status
- Reactor heater status +/- 10°C of set point
- User programmable for Cl₂ concentration
- User programmable for H₂ concentration

Speed of Response

T₉₀ 30 seconds.

Power Requirements

110Vac or 230Vac ± 10% at 80VA max.

Control Unit

Mounting: Wall mounting case
 Dimensions: H 231mm, W 225mm, D 225mm, (without glands). See Figure 1.
 Materials: Enclosure polycarbonate to IP54 with front cover, terminal cover in place and fitted with suitable glands.

Sensor/Reactor

Mounting: Wall mounting PVC panel
 Dimensions: H 90mm W 240mm D 150mm without heat shield. See Figure 2.

Sensor to Control: Max 30m separation. 2m cable is provided as standard connected to the sensor. Each sensor as supplied has its own electronic identity module, which enables it to be used with any control unit

NOTE

The sample supplied to the analyser must be dry to a maximum dewpoint of 0°C. Hitech can supply a complete sample conditioning system in addition to the analyser.

All data given on this data sheet only applies to samples from brine electrolysis plants.

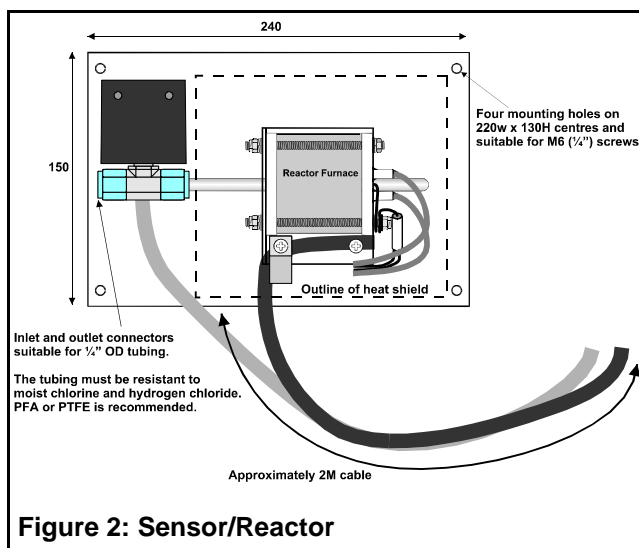


Figure 2: Sensor/Reactor

In keeping with our policy of continuous development, Hitech Instruments Ltd reserves the right to change any part of this specification without notice

