

## Commercial Diver Safety



Are you sure he will be safe when he returns to the diving bell?

## Why monitor hydrocarbons?

- Are your divers working in contaminated waters?  
De-commissioning platforms or pipelines?  
Involved in a clean up operation?
- Does your risk assessment cover all the dangers?
- Could your divers be at risk of anaesthesia?

**Analox Hyper-Gas MKII™ Hyperbaric Hydrocarbon Monitor**

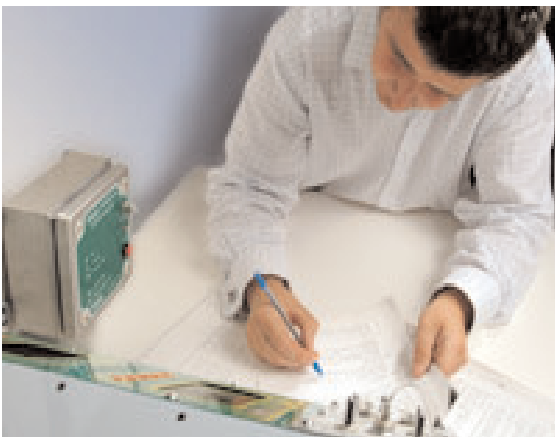
## Diver Safety

The Analox Hyper-Gas MKII™ is designed to detect and warn divers of, potentially fatal, anaesthetic levels of hydrocarbons in the diving bell. Where divers are working on dirty sites, there is a likelihood for contamination of the bell atmosphere from vapourisation of contaminants carried on dive suits and umbilical lines, even when divers are wearing additional safety dive suits. Vapourisation of hydrocarbons into the bell can occur within minutes and can rapidly rise to anaesthetic concentrations.

## Real Dangers to Divers

In the presence of anaesthetic levels of volatiles divers can suffer the effects within a few breaths. Even before unconsciousness, the ability to react normally becomes impaired. The effects caused by sub anaesthetic levels can be compared with the pattern of behaviour caused by alcohol consumption. The following effects have been detailed by Fang et al. (1996);

- 33% of the anaesthetic level of toluene leads to hyperactivity
- 13% of the anaesthetic level of xylene causes tremors which could impair purposeful actions
- 44% of the anaesthetic level of benzene causes uncontrolled jerking of limbs
- 52% of the anaesthetic level of cyclo-hexane causes convulsions



Topside engineer checking topside repeater unit

## How it works

The Hyper-Gas MKII™ comprises;

- Bell monitor; once mounted inside the bell, the monitor will rapidly detect the presence of vapourised hydrocarbons, and will activate audible and visual alarms before the anaesthetic threshold is reached.
- Topside repeater, mounted at the surface the topside repeater mimics the conditions inside the bell.

## Technology

The Analox Hyper-Gas MK II™ system has been designed to operate to depths up to 60 Bar A. It uses a unique hyperbaric hydrocarbon sensor based on highly respected Analox infra red technology. The sensor is sensitive to a range of hydrocarbons, and is able to detect all those commonly given off by the vapourisation of crude oil or condensate.

Automatic correction of pressure and temperature effects ensures the analyser will offer optimum performance in this difficult environment.

## Gas Alarm

The Gas Alarm level is preset to 10% of the anaesthetic dose of vapourised hydrocarbons that could be present in the diving bell. The sensor gives an additive response to the range of hydrocarbons normally present, not one individual compound. For diving in areas where contamination is known to be from 1 or 2 compounds, an alternative alarm set point could be calculated by Analox



## Response Time

The sensor needs to be mounted within the diving bell, rather than relying on an umbilical fed analyser because anaesthesia, or the effects of sub anaesthetic levels can occur within a few breaths, i.e. a few seconds. By analysing for hydrocarbons at the surface its likely that the effects would occur before an alarm is raised. A rapid response is crucial. The Hyper-Gas MKII™ has been designed with an internal sample pump to ensure a fast response to hydrocarbons.

## Datalogging

The Hyper-Gas MKII™ system is fitted with a factory set datalogging facility. This logs and measured levels of hydrocarbons, the depth and the corresponding data and time. Once the datalogging capacity is exceeded the Hyper-Gas MKII™ will automatically overwrite the oldest data. Data can be downloaded via the topside repeater or bell monitor onto a PC, using the data communications cable, and the datalog retrieval programme.

## Analox in Diving

Analox have been supplying gas analysers into the diving industry for over 20 years. We are an acknowledged authority in the design and manufacture of gas monitoring instrumentation across all sectors of the industry, from sports & leisure diving through to military systems. We are recognised as being a specialist in Hyperbaric Chamber monitoring, and the only company capable of developing this type of detection system. This is why the UK Health & Safety Executive, UK offshore Operators Association & the major Dive Companies asked Analox to develop the Hyper-Gas MKII™ system.

**ANALOX**

looking after the air **YOU** breathe®

## Specifications

<b>Operating Range</b>	:	Hydrocarbon, e.g. 0-30% Propane Pressure: 1-60 BAR A
<b>Power Supply</b>	:	External: 8-30vDC
<b>Temperature</b>	:	Compensated 5 to 35°C/41 to 95°F Storage -20 to +55°C/-4 to 131°F
<b>Humidity</b>	:	0-95% RH non-condensing

### Dimensions (mm) & Weight

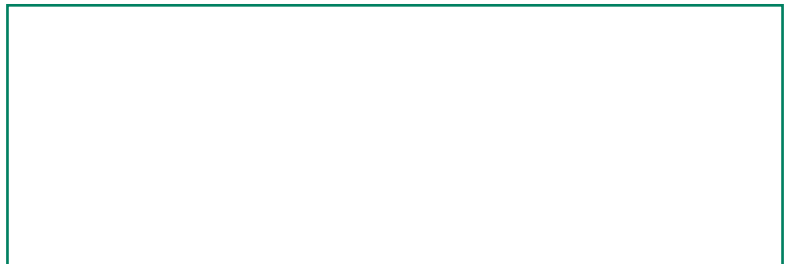
<b>Bell Monitor</b>	:	200 (W) x 215 (h) x 100 (d)	<2.5kg/5.5lbs
<b>Topside Repeater</b>	:	190 (W) x 160 (h) x 100 (d)	<2.0kg/4.4lbs



For further information on the Hyper-Gas MKII™ system, please see [www.analox.net](http://www.analox.net), or view the project on the HSE website, or contact a member of our sales team

*Analox has a policy of continuous improvement and we reserve the right to upgrade or change specifications without prior notice. Full technical specifications are available upon request.*

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