

**THIS DOCUMENT RELATES ONLY TO
THE BELL UNIT OF THE HYPER-GAS MkII™**

This document must be read by all working in dive control and all divers before working in a bell which carries a Hyper-Gas MkII™.

A copy should be kept in Dive Control at all times.



INSTALLATION AND MAINTENANCE

INSTALLATION

It is vital that the Hyper-Gas MkII™ is installed where it cannot be knocked and where it cannot be flooded with water.

A position about halfway up the bell is best. In trials it was found satisfactory to fit the Hyper-Gas MkII™ within the umbilical frame which provided some protection against accidental bumps. Any similar position will be suitable.

ROUTINE CHECKS

The Hyper-Gas MkII™ must be switched on and shown to be functioning whenever there are divers in the bell. From "switch on" the indicator lights and buzzer will flash and sound 4 times. The Alarm, Flow Alarm and Sensor Fault indicator will remain illuminated for 40 seconds and the display reads "Cold" while the instrument warms up. No alarms will sound during this warm up phase.

After the warm up period, under normal circumstances operation of the unit is indicated by the flashing **green OK** indicator.

It is recommended that the responsible person topside asks for a check on the green OK light once an hour and the check should be logged.

The **yellow Flow Alarm indicator** will illuminate when there is insufficient flow, the buzzer will also sound. The alarm can be silenced by pressing the test switch; the warning light will stay on until flow is restored.

RE-CERTIFICATION CHECKS

Each Hyper-Gas MkII™ must be returned to Analox at 6 monthly intervals for checks of the integrity of the sensor, the in-line filters and the sample pump. New certificates will be returned with the Hyper-Gas MkII™.

USE OF THE HYPER-GAS MkII

ROUTINE CHECKS DURING BELL RUN

At hourly intervals take readings from the flowmeter and the LCD display. Record these in the dive log together with details of which lights are showing.

THE GAS ALARM

If hydrocarbon levels exceed the alarm level the flashing green OK light will go off, the **red Danger indicator** will flash and the pulsing audible alarm will sound. The audible alarm can be muted for 5 minutes by pressing the test button; this is so that the sound does not interfere with verbal communications during the emergency. The Danger light will continue to flash. The alarm will re-sound unless hydrocarbon levels have dropped below the danger threshold.

IF THE GAS ALARM SOUNDS AND THE RED LIGHT FLASHES THIS IS AN EMERGENCY SITUATION.

The first action must be for all occupants of the diving bell to be on a breathing gas supply which is independent of the bell atmosphere.

It is not appropriate to wait to see if the level on the display stops rising; it is not appropriate to consult topside.

Once all personnel are breathing clean gas the evacuated gas cylinder stored in the bell should be opened to allow a sample of bell gas to be taken. Take care to close the valve properly.

The Hyper-Gas MkII™ stores the information about gas levels in a data base. This data will be available from the topside repeater if one is in use; otherwise it is in the bell unit. **This information must be downloaded and secured as soon as possible.** It must be available for all enquiries into the incident and for comparison with the analysis of the cylinder contents.

IF THERE IS ANY CONCERN ABOUT BELL GAS BUT NO ALARM

The Hyper-Gas MkII™ is continually monitoring hydrocarbon levels in the bell. Acceptable levels in a clean bell are too low for the Hyper-Gas MkII™ to detect.

The nose is very sensitive and is able to detect some volatile hydrocarbons at levels which the most sophisticated analytical procedures can not match; it is a very unreliable guide to danger. For most of the compounds which could cause narcosis in the diving bell the nose can detect a fraction of the allowed exposure level and these are themselves a fraction of the narcotic level.

However whenever there is a query about bell gas contamination the data stored in the Hyper-Gas MkII™ should be downloaded and secured. This information may be useful to determine the reason for the concern.

It is optional whether or not a sample of bell gas is taken into a cylinder, however it must be remembered that this is the only sure way to find out what the levels of the different compounds are in the bell gas.

EQUIPMENT FAILURE

Equipment failures in the past have been entirely due to failure of gas flow through the Hyper-Gas MkII™ and often occurred before diving started.

In the event of an apparent failure of the equipment it is vital to check whether the alarm which is sounding is a flow alarm or a gas alarm. The flow alarm indicator light is amber; the gas alarm light is red.

The Sensor Fault indicator will flash should there be an internal fault in the sensor.

In the event of a failure which is not a simple flow problem only a technician with an in-date certificate, issued on completion of the Analox course, should proceed further to identify the problem.