

Welcome to the New Millenium

Welcome to the first Technical Bulletin of the New Millennium. Included in this issue are articles concerning the new 4P-75 & 4P-75C CiTipeLs[®], the recently obtained ISO9001 & CE Marking certification, the new DiveceL[™] 3, and an article on humidity transients.

new accreditation

City extends its Quality Approvals

Following a successful audit in November, City Technology's Quality Management system is now approved to BS EN 9001. This means that the design of all our products is now covered by an approved Quality Management System helping to ensure new products meet our Customers expectations from the outset.

The approval builds on the work done by the new Design and Development Director, Tony Cowburn, who put in place clear priorities on key projects with formal reviews at critical stages.

Tony Cowburn "We revised our design and development procedures during the second half of 1999 to ensure that all new products went through a detailed design process and an exhaustive set of verification testing, and I am delighted that this has now resulted in ISO9001 certification.

The updated procedures are already paying dividends for us, and the extension of our ISO certification to include the design & development process is a key step to demonstrating our commitment to building robust products".

CE Marking

Of interest to our medical customers will be the news that we have demonstrated our compliance to EN46001: Application of EN ISO 9001 to the manufacture of medical devices and received an EC certificate allowing us to CE mark our medical oxygen sensors.

The MOX range of medical Oxygen sensors will bear the CE mark on City Technology's own label as soon as new stocks arrive.

product news

■ New CiTipeLs Launched - 4P-75 & 4P-75C

City Technology Ltd announces the addition of two new superior poison resistant and lower power catalytic bead sensors for the detection of combustible gases, the 4P-75 and the 4P-75C CiTipeLs[®]

Designed for easy incorporation into portable safety instruments these new sensors offer a number of benefits born from research driven technology. Reduced power consumption allows longer battery life, while an increased resistance to poisons, particular hydrogen sulphide, gives the sensors increased survivability in the field. The 4P-75C also offers improved resistance to HMDS/silicone.

These factors combine with the core benefits of the 4P range, including existing North American and European approvals, that save both time and resources in the development of instruments; and



better-than-ever field performance due to reduced orientation sensitivity, fast wake-up times and excellent shock resistance. The first in a number of additions to the CiTipeL[®] range over the forthcoming months, these leading developments will ensure users of CiTipeLs[®] have a competitive advantage in the marketplace.

Performance characteristics

The sensors function over a range of 0-100% LEL and require an operating voltage of 3.0V d.c. They require a detector operating current of $76 \pm 6\text{mA}$ while the output sensitivity is $24 \pm 4\text{mV}/\%\text{methane}$. The T90 response time is < 15 seconds and they are linear from 0-3% methane. Long-term sensitivity drift is better than 5% signal/month while the long-term zero drift is less than 5% LEL methane/month.

■ The DiveceL™ 3

City Technology is launching a new range of sensors for monitoring the partial pressure of oxygen within diving gases; namely the DiveceL™ range of oxygen sensors. Specifically developed for diving applications, both on land and sub-aqua, these sensors are suitable for oxygen analysers



and re-breathing systems. The DiveceL™ range offers real benefits in terms of technical performance including:

- Extremely fast T90 response times
- Broad temperature range for "all weather" diving
- Extremely stable outputs throughout their operational lifetimes
- Multiple connection options
- Customer ex-stock facilities available for fast deliveries

For further information please contact Mark Green

Next issue:

City Technology electrodes
Automotive products

Key contact:

Mark Green
Technical Support Officer
+ 44 23 9228 8134
Mark.Green@citytech.co.uk

■ Technical Titbits

In the past we have presented a series of technical articles covering our Oxygen and Toxic gas sensors, sensors with electronics and combustible gas sensors. The Technical Titbit this month describes the effect of humidity on our CiTiceLs. Coming up in the next issue we will be looking at the electrodes used in electrochemical sensors and would welcome suggestions for any other technical titbits you would like to see in future issues.

■ Humidity Effects on Oxygen & Toxic Gas CiTiceLs®

Humidity Transients

Unlike infrared and semi-conductor sensors, CiTiceLs are relatively unaffected by steady state changes in humidity. They will in general, however, show transient responses to step changes in humidity, that quickly fade away once the level of humidity has stabilised. This can be demonstrated by breathing on a sensor - i.e. effectively challenging the sensor with a step change in humidity from ambient to 100%. A spike in the sensor's signal is likely to be observed before it quickly returns to its original level after a few seconds.

As with other transient responses, experiment shows that the value of the operating circuit load resistor can determine the magnitude and period of the transient - the lower the value, the greater the transient peak, and shorter period. Increasing R_{LOAD} decreases the peak, but increases the period.

Humidity Extremes

Toxic Gas CiTiceLs® have been designed for use in a wide range of applications and environments and are specified to operate in the range 15-90%RH non- condensing. Problems can occur in condensing conditions if the gas is allowed to condense on the sensor membranes as this can block any gas diffusion, causing a drop in signal.

However this is only a temporary effect and once the membrane has "dried out", the sensor will return to normal.

The concentration of electrolyte has been chosen for good sensors performance over the specified humidity range, but in conditions of high humidity (100% RH), electrolyte absorbs water until its vapour pressure equals that of the atmosphere.

Sensors are designed with free internal space, so water uptake is only harmful to a sensor if the volume increase exceeds the available free space within it. At this stage, internal leakage will occur, and the sensor will no longer function correctly. Theoretically, a standard CO sensor can withstand 100% RH at 35°C for between 6 and 8 weeks. A more dilute electrolyte would result in an increased response time, but if the sensor is then allowed to recover at normal humidity (15-90% RH), any water taken on board will tend to diffuse out of the sensor.

In conditions of low humidity (<15%RH), electrolyte loses water until its vapour pressure equals that of the atmosphere. Eventually the concentration of the electrolyte could increase to such an extent that internal seals will start to deteriorate, and ultimately in the worse case scenario the sensor will cease to function.

City Technology Limited

City Technology Centre, Walton Road, Portsmouth, England PO6 1SZ
Telephone: +44 23 9232 5511 Facsimile: +44 23 9238 6611
E-mail: sensors@citytech.co.uk Website: <http://www.citytech.com>

