Crowcon Technical Note

Document Reference: **GEN079 Workplace Exposure Limit (WEL) and Oxygen Alarm Changes (Issue 3)**

Date: **22nd August 2018**

Document applies to: **Portable products**

EU Directive and National Standards

The UK Health & Safety Executive (HSE) has adopted EU Directive 2017/164 which establishes new 'indicative occupational exposure limit values' (IOELVs) for a number of toxic substances. This decision complies with Articles 2 and 7 of the Directive requiring Member States to establish the new occupational exposure limit values within national standards by August 21st 2018 (mining and tunnelling applications do not need to comply until 2023).

The HSE publish Workplace Exposure Limits (WELs: based on the current EU IOELVs) in document EH40 which is available for download from: http://www.hse.gov.uk/pubns/priced/eh40.pdf. In addition to changes to some WELs, Nitrogen Monoxide (NO) Nitrogen Dioxide (NO_2) and Sulphur Dioxide (SO_2) are re-introduced into the document.

Gas Detector Alarm Thresholds

Crowcon's portable instruments are configured with time-weighted average (TWA) alarms based on national standards. UK & European instruments are configured with alarm thresholds based on the current EU Directive (adopted in EH40 in the UK) so that they are compliant. Alternative alarm configurations are available based on national standards of countries outside of the EU.

It should be noted that the exposure limits defined in EH40/Directive 2017/164 are based on the risks of personal exposure: a workers' exposure to toxic substances over time. The limits (configured into gas detectors as 'TWA alarm levels') are expressed over two time periods:

- STEL (short-term exposure limit): a 15 minute limit
- LTEL (long-term exposure limit): an 8-hour limit

Portable (personal) monitors are intended to be worn by the user near to their breathing zone so that the instrument can measure their exposure to gas. The instruments TWA (time-weighted alarms) will therefore alert the user when their exposure exceeds the limits set within the national standards.

Portable monitors can also be configured with 'instantaneous' alarms which activate immediately when the gas concentration exceeds the threshold. There are no standards to define alarm levels for instantaneous alarms, and so these have in the past been generally set at the same thresholds as the TWA alarms. The instantaneous alarm thresholds configured in new portable instruments may be higher than the averaged TWA alarms to reduce the possibility of false alarms. Details of revised alarm configurations are shown on the following page.

Fixed gas detectors only utilise 'instantaneous' alarms as they are not worn by the user and therefore cannot measure an individuals' exposure to gas over time. Alarm levels for fixed detectors are often based on the TWA alarms as these are the only published guidelines. HSE document RR973 (Review of alarm setting for toxic gas and oxygen detectors) provides guidance on setting appropriate alarm levels for fixed detectors in consideration of site conditions and risk assessment. In some applications where there may be a background of gas it may be appropriate for fixed detector alarm levels to be set higher than those listed in EH40 to prevent repeated false alarms.

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Product Alarm Thresholds from August 2018

In order to comply with the WEL/IOELV changes described, Crowcon's portable instruments with standard UK and EU configurations will be manufactured with TWA alarms as follows. The figures in brackets are the levels set in Crowcon instruments prior to the adoption of the new Directive.

TWA alarms for gases not listed remain as previously configured (ie based on previous Directive/EH40 levels). Alternative configurations are available on request.

Instantaneous alarms for most UK& EU specification instruments will be configured as shown; they are higher than the TWA thresholds to reduce the possibility of false alarms. Different instantaneous alarms may be configured according to region; please refer to the configuration report provided with your instrument for details.

	TWA Alarms		Instantaneous Alarms	
Gas Type	LTEL (Alarm 1)	STEL (Alarm 2)	Alarm 1	Alarm 2
Carbon Monoxide (CO)	20ppm (30ppm)	100ppm (200ppm)	30ppm	100ppm
Hydrogen Cyanide (HCN)	0.9ppm (5ppm)	4.5ppm (10ppm)	2ppm	25ppm
Nitrogen Monoxide (NO)	2ppm (25ppm)	35ppm* (35ppm)	25ppm	35ppm
Nitrogen Dioxide (NO_2)	0.5ppm (1ppm)	1ppm (5ppm)	1ppm	5ppm
Sulphur Dioxide (SO_2)	0.5ppm (0.5ppm)	1ppm (1ppm)	1ppm	5ppm
Oxygen (O_2)	n/a	n/a	19.5% (Falling; was 19%)	23.5% (Rising)

* The Directive does not list an STEL value for Nitrogen Monoxide; the previously defined STEL value will be configured.

Oxygen Sensor Alarm Thresholds

For many years the first falling alarm threshold for oxygen sensors has been set at 19% in Crowcon portable instruments. In order to comply with national guidelines (UK HSE, OSHA, NIOSH) and industry standard practice the first level of alarm will now be configured at 19.5%.

Revised O_2 alarms configured in Portable instruments will therefore become:

Units with one falling, one rising alarm: 19.5%/23.5%.
Units with two falling alarms: 19.5%/17%.
Triple Plus+/Detective + (three alarms): 19.5%/17%/23.5%.

Re-configuration of Gas Detector Alarm Thresholds

Users of portable gas detectors who choose to adjust their TWA alarm thresholds to comply with the Directive, or wish to adjust the instrument instantaneous alarms can easily do-so using a variety of accessories available from Crowcon. For full details of calibration and configuration accessories visit the product pages at www.crowcon.com.

For more information please contact +44 (0)1235 557711, customersupport@crowcon.com

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