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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 15322.4-2019

Replacing GB 15322.4-2003

**Combustible gas detectors - Part 4: Line-type optical beam
combustible gas detectors for industrial and commercial use**

可燃气体探测器 第4部分：工业及商业用途线型光束可燃气体探测器

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Foreword

All technical content in this section is mandatory. GB 15322 "combustible gas detector" is divided into the following parts.

- Part 1. Point-type combustible gas detectors for industrial and commercial use;
- Part 2. Household flammable gas detectors;
- Part 3. Portable combustible gas detectors for industrial and commercial use;
- Part 4. Linear and flammable gas detectors for industrial and commercial use. This part is the fourth part of GB 15322. This part is drafted in accordance with the rules given in GB/T 1.1-2009. This part is proposed and managed by the Emergency Management Department of the People's Republic of China. This section drafted by: Shenyang Fire Research Institute of Emergency Management Department, Beijing Fire Rescue Corps, Yingjisen Safety Fire System (Shanghai) Co., Ltd., Chengdu Anchuang Electronics Co., Ltd., Hanwei Technology Group Co., Ltd., Xi'an Bokang Electronics Co., Ltd., Beijing Products Proud Optoelectronics Technology Co., Ltd., Wuxi Greenstone Safety Equipment Co., Ltd. The main drafters of this section. Zhao Yu, Wang Wenqing, Lu Yiran, Guo Chunlei, Guan Mingyang, Li Yunhao, Ding Hongjun, Zhang Yingxi, Liu Wei, Jiang Ling, Sun Zhenhui, Liu Kai, Zhao Kangzhu, Fei Chunxiang, Li Xin, Li Zhigang, Xiong Wei. Combustible gas detector Part 4. Linear beam for industrial and commercial use Combustible gas detector

1 Scope

Part 4 of China's mandatory series on combustible gas detectors, covering the open-path optical beam detector - transmitter one end, receiver or retroreflector the other, measuring the gas in the whole path between them by the light it absorbs. The whole technical content of this part is mandatory. It specifies the terms and definitions, the classification, the requirements, the tests, the inspection rules and the marking of line-type optical beam combustible gas detectors for industrial and commercial use, and it applies to the detectors that use the principle of spectral absorption to detect the flammable vapours of hydrocarbons, ethers, esters, alcohols and similar substances in industrial and commercial installations. The reason this type exists is that a point detector only sees the gas that reaches it, and on an open plant, a tank farm, a jetty or a large compressor hall a release

can drift past a dozen heads without triggering one. A beam across the site sees any cloud that crosses it, anywhere along its length. That changes what has to be specified: the measurement is not a concentration but a concentration-path product, expressed in LEL-metres, and the standard sets the alarm thresholds in those terms together with the accuracy, the response and recovery times, and the drift. Around them sit the problems peculiar to an open path: the loss of signal from fog, rain, snow and dust and the requirement to distinguish that from a gas reading, the tolerance to partial and total beam obstruction, the effect of solar radiation and of stray light, the alignment and the tolerance to the slow movement of the structures the units are mounted on - which is the failure mode that takes beam detectors out of service in practice - and the fault signals that must reach the panel when any of it goes wrong. The explosion protection to GB 3836 and the environmental and electromagnetic programme complete the part. Issued on 14 October 2019 and in force since 1 November 2020, it replaces GB 15322.4-2003.

This part of GB 15322 specifies the terms and definitions, classifications, requirements, and tests for linear and flammable gas detectors for industrial and commercial use. Inspection, inspection rules and marking requirements. This section applies to industrial and commercial installations using the principle of spectral absorption to detect flammability of hydrocarbons, ethers, esters, alcohols, etc. A linear beam of combustible gas detectors (hereinafter referred to as "detectors") for gases and vapors. Special properties used in industrial and commercial locations The detectors may be implemented in addition to the special requirements, which may be separately specified by the relevant standards.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2423.17-2008 Environmental testing of electric and electronic products - Part 2. Test method test Ka. salt spray

GB 3836.1-2010 Explosive atmosphere - Part 1. General requirements for equipment

GB/T 9969 General guidelines for the use of industrial products

GB 12978 Fire Electronic Product Inspection Rules

GB 15322.1-2019 flammable gas detectors - Part 1. flammable gas detectors for industrial and commercial use

GB/T 16838 Fire electronic products environmental test methods and severity

GB/T 17626.2-2018 Electromagnetic compatibility test and measurement technology
Electrostatic discharge immunity test

GB/T 17626.3-2016 Electromagnetic compatibility test and measurement technology RF electromagnetic field radiation immunity test

GB/T 17626.4-2018 Electromagnetic compatibility test and measurement technology Electrical fast transient burst immunity test

GB/T 17626.5-2008 Electromagnetic compatibility test and measurement technology Surge (impact) immunity test

GB/T 17626.6-2017 Electromagnetic compatibility test and measurement technology Conducted disturbance immunity of RF field induction

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Optical path length optical path length The propagation distance of the probe beam between the transmitting device and the receiving device (or reflecting device).

3.2 Integral concentration integral concentration The mathematical integral of the concentration of combustible gas along the length of the optical path.

Note 1. The lower explosive limit (LEL) is the lowest explosive concentration of flammable gas or vapour in the air.

Note 2. The concentration of combustible gas is in LEL, the length of optical path is in m, and the integral concentration is in LEL·m.