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Hydrogen detection apparatus — Stationary applications

Détecteurs d'hydrogène — Applications fixes



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 26142 was prepared by Technical Committee ISO/TC 197, *Hydrogen technologies*.

Introduction

Over the course of several years, international efforts have been initiated for the development of necessary regulations, codes and standards required for the introduction of hydrogen energy systems in consumer environments. Such codes and standards usually require a safety system to detect hydrogen concentrations before a fraction of the flammable or explosive limit is reached, in order to allow for purging, shut-off, and similar safety operations.

This International Standard provides requirements for stationary hydrogen detection apparatus, covering both performance requirements and test methods. This International Standard is intended to cover situations where the user desires the ability to detect hydrogen leaks and monitor hydrogen concentrations relevant to safety. This International Standard is primarily intended for hydrogen detection apparatus at vehicle refuelling stations, where a high level of safety management is required. This sector has an immediate need for this standard and is expected to be the main application for such apparatus, but this standard can also be applied to other stationary installations where the detection of hydrogen is required.

This International Standard is not intended to exclude any specific technologies that meet the performance requirements herein.

This International Standard contains the important quantitative and technical specifications against the danger of hydrogen leakage. This standard will promote international cooperation under easy-to-understand requirements, by leading to widespread use of hydrogen energy.

Benefits to be gained by the implementation of this International Standard include using the performance requirements in the standard to overcome safety concerns and aiding in development of the hydrogen fuel infrastructure.

In this International Standard, attention is concentrated on specific requirements related to performance and testing of hydrogen detection apparatus, such as a specific detection range for single and multiple safety systems, selectivity, poisoning, fast response time, and hydrogen-specific test methods needed by the hydrogen energy industry. This International Standard focuses primarily on stationary hydrogen technologies whose main purpose is to produce, store and handle hydrogen, and not on systems that might generate hydrogen as an undesirable by-product. The purpose of a hydrogen detection apparatus according to this standard is to mitigate risk from unintended hydrogen releases within a wide range of hydrogen concentrations including those exceeding the lower flammability limit.

Hydrogen-related facilities might be required to have the ability to detect hydrogen concentrations before a specified concentration of hydrogen or fraction of flammable limit is reached, in order to allow for single and/or multilevel safety operations, such as nitrogen purging or ventilation and/or system shut-off; or there might be a desire to detect hydrogen concentrations above the lower flammability limit, in order to monitor concentrations following a release. The hydrogen detection apparatus described in this International Standard can detect the hydrogen leak concentration at multiple points determined by users to realize such multilevel safety operations.