UL 920004

STANDARD FOR SAFETY

Performance Requirements for Open Path Toxic Gas Detectors

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UL Standard for Safety for Performance Requirements for Open Path Toxic Gas Detectors, UL 920004

Second Edition, Dated December 6, 2024

Summary of Topics

This new Second Edition ANSI/UL 920004 dated December 6, 2024 is being issued to redesignate the ANSI/ISA 92.00.04-2014 (R2022) Standard as UL 920004 and incorporates the proposals dated August 30, 2024.

These requirements are substantially in accordance with Proposal(s) on this subject dated August 30, 2024.

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Second Edition

ULSE Inc.
UL 920004
Second Edition

Performance Requirements for Open Path Toxic Gas Detectors

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The most recent designation of ANSI/UL 920004 as an American National Standard (ANSI) occurred on December 6, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in ULSE's Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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CONTENTS

PREFACE 5

1 Scope 7
2 Referenced Publications 7
3 Glossary 8
4 General Requirements 11
4.1 Introduction 11
4.2 Markings 11
4.3 Instructions 12
4.4 Construction and function 14
4.5 Test equipment calibration 18
5 Performance Requirements 18
5.1 General 18
5.2 Samples and sequence 19
5.3 Preparation of equipment 19
5.4 Conditions for test and test area 19
5.5 Un-powered preconditioning storage 23
5.6 Vibration 24
5.7 Calibration 24
5.8 Accuracy 24
5.9 Alarm reliability 25
5.10 Trouble signals 25
5.11 Temperature 25
5.12 Alignment 27
5.13 Time of response 27
5.14 Solar radiation 28
5.15 Power supply variations 29
5.16 Partial obscuration 29
5.17 Electromagnetic compatibility 29
5.18 Water vapor interference 30
5.19 Beam blockage fault 30
5.20 Long range operation 31
5.21 Environmental ratings 31
5.22 Slow increase of gas volume fraction (equipment with automatic drift compensation only) 31
5.23 Long term stability 31

ANNEX A (informative)

ANNEX B (Informative) – WATER VAPOR TEST FIXTURE

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PREFACE

This is the harmonized FM and ULSE standard for Performance Requirements for Open Path Toxic Gas Detectors. It is the second edition of ANSI/FM 920004 and the second edition of ANSI/UL 920004.

This harmonized standard is based on ISA 92.00.04, Performance Requirements for Open Path Toxic Gas Detectors.

This harmonized standard was prepared by FM Approvals LLC (FM) and ULSE Inc. (ULSE).

This Standard is considered suitable for use for conformity assessment within the stated scope of the standard.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this Standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

Level of Harmonization

This Standard is published as an equivalent standard for FM and UL.

An equivalent standard is a standard that is substantially the same in technical content. Presentation is word for word except for editorial changes.

While the technical content is the same in each organization's version, the format and presentation may differ.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

The following people served as members of STP 9200 and participated in the review of this Standard:

NAME	COMPANY
*J. Miller	MSA Innovation LLC
F. AlSahan	Saudi Aramco
R. Chalmers	Industrial Scientific Corp.
J. Chin	CSA Group
G. Edwards	Det-Tronics
M. Foerster	UL Standards & Engagement
G. Garcha	Gurinder Garcha Consulting
C. Gestler	MSA Innovation LLC
T. Jelkin	Rosemount Inc.

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NAME	COMPANY
*W. Lawrence	FM Approvals
S. Henney	FM Approvals LLC
M. Marrington	Index
D. Mills	UL Solutions
C. Palumbo	Captial Testing and Certification Services
E. Ramirez	FM Approvals
B. Saxinger	BW Technologies by Honeywell
J. Schenayder	Dooley Tackaberry Inc.
R. Seitz	ARTECH Engineering
M. Shaw	Sensor Resource Inc.
J. Thomason	Omni Industrial Systems Inc.
L. Vlagea	General Monitors
D. Wechsler	American Chemistry Council

* Non-voting member

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1 Scope

1.1 This Standard provides minimum requirements for fixed and transportable open path toxic gas detection equipment.

1.2 This Standard specifies the construction, performance and testing of open path (line-of-sight) gas detectors that sense the presence of toxic gas concentrations in air.

1.3 For equipment used for sensing the presence of multiple gases, this document applies only to the portion sensing the toxic gas. Sensing of combustible flammable gases is outside the scope of this document.

1.4 This Standard addresses toxic gas detectors intended to provide a broad indication or alarm, the purpose of which is to give warning of possible presence of potentially toxic concentrations of gas.

1.5 Conformance to this Standard does not imply suitability for process gas monitoring. This Standard does not apply to equipment of the laboratory or scientific type used for analysis or measurement, equipment used for process control and process monitoring purposes, or equipment used for residential purposes.

1.6 This Standard specifies the requirements for gas detection equipment that are intended to detect gases in ambient air by measuring the spectral absorption by the gases over an extended optical path. The units of measurement and range of the gas detection equipment are a mathematical integral of the gas concentration along the optical path. The units of measurement are expressed as full concentration of the toxic gas concentration multiplied by the distance (ppm.m). Cross duct gas detectors divide the integral concentration by the width of the duct to output a path-averaged ppm reading.

1.7 This Standard only specifies the requirements for instrument applications where calibration is performed using either the gas to be detected or another gas for which response conversion data appears in the instruction manual.

1.8 This Standard does not address the electrical shock or fire requirements, and this Standard does not address performance of open path detectors intended to detect chemical warfare agents (CWA's).

2 Referenced Publications

2.1 Any undated reference to a code or standard appearing in the requirements of this Standard shall be interpreted as referring to the latest edition of that code or standard.

2.2 The following publications are referenced in this Standard:

FM 62990-1, *Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases*

FM 62990-2, *Workplace Atmospheres – Part 2: Gas Detectors – Selection, Installation, Use and Maintenance of Detectors for Toxic Gases and Vapours*

IEC 61326-1:2021, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

UL 62990-1, *Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases*

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