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Approved May 15, 1996

Standard



Performance Requirements for Instruments Used to Detect Oxygen-Deficient/ Oxygen-Enriched Atmospheres



ANSI/ISA-S92.04.01, Part I—Performance Requirements for Instruments Used To Detect Oxygen-Deficient/Oxygen-Enriched Atmospheres

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ISA

67 Alexander Drive

P.O. Box 12277

Research Triangle Park, North Carolina 27709

Preface

This preface, all footnotes, and annexes are included for informational purposes and are not a part of ANSI/ISA-S92.04.01, Part I.

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S. Bruce	Delphian Corporation
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*R. Loeffelholz	National Draeger, Inc.
*S. Long	Mine Safety Appliances Company
T. Loomis	Consultant
B. Matheson	Sensidyne, Inc.
*J. McCann	International Sensor Technology
*J. McGowan	International Sensor Technology
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B. Northam	Munro Electronics
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R. Warburton	National Draeger, Inc.
D. Wolsk	Wolsk Alarms, Ltd.
J. Zabrenski	Air Products & Chemicals, Inc.

*One vote per company

The following members of ISA Committee SP92 developed this Standard:

NAME	COMPANY
J. Thomason, Chairperson	Omni Industrial Systems, Incl
D. Bishop, Managing Director	Chevron USA Production Company
*W. Alexander	Mine Safety Appliances Company
J. Chang	Motorola SPS
M. Coppler	Bacharach, Inc.
S. Hildebrand	Exxon Company USA
B. Holcom	Gas Tech, Inc.
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*B. Northam	Munro Electronics
R. Novack	AMETEK
*R. Ring	Mine Safety Appliances Company
M. Schaeffer	Control Instruments Corporation
M. Stryker	NCASI
R. Warburton	National Draeger, Inc.

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NAME

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M. Widmeyer, Vice President	Washington Public Power Supply System
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1 Scope

1.1 This Standard addresses the details of construction, performance, and testing of portable, mobile, and stationary electrical instruments used to provide a warning of the presence of oxygen-deficient or oxygen-enriched atmospheres.

NOTE — Human physiology responds to oxygen pressure, not oxygen concentration; however, they are physiologically equivalent at one normal atmosphere. (See Clause 3, Normal atmosphere.) The normal atmosphere is composed approximately of 20.9 percent oxygen (21.2 kPa)(3.07 psia), 78.1 percent nitrogen (79.1 kPa)(11.5 psia), and 1 percent argon (1.01 kPa)(.146 psia) by volume with small amounts of other gases. Reference: National Institute for Occupational Safety and Health, (NIOSH), Pub. No. 80-106.

1.2 This Standard applies to mains-connected instruments rated at 250 V nominal or less, and to portable, mobile, and stationary battery-powered instruments.

1.3 This Standard applies to instruments suitable for use in an ambient temperature range of at least -10°C to 50°C (+14°F to +122°F).

1.4 This Standard applies to instruments providing at least one range that includes 15 to 20.9 (15.2 to 21.2 kPa)(2.20 to 3.07 psia) or 20.9 to 25.0 (21.2 to 25.3 kPa)(3.07 to 3.63 psia) volume percent oxygen at one normal atmosphere. Hereafter, the volume percentage of oxygen at one normal atmosphere will be expressed as "percent oxygen."

1.5 This Standard applies to instruments that provide at least one oxygen-deficient alarm that cannot be adjusted below 18 percent (18.2 kPa)(2.64 psia) oxygen or at least one oxygen-enrichment alarm that cannot be adjusted above 25 percent (25.3 kPa)(3.67 psia) oxygen.

1.6 For instruments with multiple ranges, this Standard does not apply to any range that does not include normal atmospheric oxygen pressure (20.9 percent oxygen or 21.2 kPa[3.07 psia] at one normal atmosphere).

1.7 This Standard does not apply to oxygen-monitoring instruments of the laboratory or scientific type, which are used for analysis or measurement in process control and process-monitoring applications or instruments with full-scale oxygen concentrations less than 15 percent (15.2 kPa)(2.20 psia) or greater than 30 percent (30.4 kPa)(4.41 psia) oxygen.

NOTE — The user should specify instrumentation that will provide a higher level of accuracy than the minimum tolerances of this Standard if required by the application risk.

1.8 The user should be aware of the effects of altitude and barometric pressure on both the instrument and the user. The effects are not intended to be evaluated by this performance Standard.