CGA P-8.1—2016

SAFE INSTALLATION AND OPERATION OF PSA AND MEMBRANE OXYGEN AND NITROGEN GENERATORS

FOURTH EDITION

CGA
Compressed Gas Association
The Standard For Safety Since 1913

PREFACE

As part of a program of harmonization of industry standards, the Compressed Gas Association (CGA) has published CGA P-8.1, *Safe Installation and Operation of PSA and Membrane Oxygen and Nitrogen Generators*, jointly produced by members of the International Harmonization Council.

This publication is intended as an international harmonized standard for the worldwide use and application of all members of the Asia Industrial Gases Association (AIGA), Compressed Gas Association (CGA), European Industrial Gases Association (EIGA), and Japan Industrial and Medical Gases Association (JIMGA). Each association's technical content is identical, except for regional regulatory requirements and minor changes in formatting and spelling.

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This document is subject to periodic review, and users are cautioned to obtain the latest edition. The Association invites comments and suggestions for consideration. In connection with such review, any such comments or suggestions will be fully reviewed by the Association after giving the party, upon request, a reasonable opportunity to be heard. Proposed changes may be submitted via the Internet at our web site, www.cganet.com.

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NOTE—Technical changes from the previous edition are underlined.

FOURTH EDITION: 2016
THIRD EDITION: 2010
SECOND EDITION: 2003
FIRST EDITION: 1995

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1 Introduction

Oxygen and nitrogen generators that use pressure swing adsorption (PSA) and membrane technologies, like many present-day processes, have some degree of potential hazards that must be recognized and addressed. Common hazards associated with these generators are the asphyxiant properties of oxygen-deficient atmospheres and the ability of oxygen-enriched atmospheres to accelerate combustion. Other hazards include noise, electricity, rotating equipment, and gases under pressure.

Oxygen and nitrogen generator technology is not static. Because a wide variety of plant process cycles, equipment, and operating conditions are in use, this publication includes some generalized statements and recommendations with which there may be diversity of opinion or practice. Users of this publication should recognize that it is presented with the understanding that it cannot take the place of sound engineering judgment, training, and experience. It does not constitute, and should not be construed to be, a code of rules or regulations.

2 Scope and purpose

2.1 Scope

This publication is a guide that applies to safety in the location, installation, operation, and maintenance of certain oxygen and nitrogen generators. Included are systems using PSA and membranes for nitrogen production, PSA and vacuum swing adsorption (VSA) for oxygen production, and catalyst-based oxygen removal systems for nitrogen purification. For systems using cryogenic technologies for the production of nitrogen, oxygen, or both, see CGA P-8, *Safe Practices Guide for Cryogenic Air Separation Plants* [1].[1]

Emphasis has been placed on equipment and operational features that are unique to these system processes. Limited coverage has been given to plant equipment such as air compressors used in other industrial applications and for which safe practices in design, installation, and use have already been established elsewhere. While important supplemental equipment such as in-plant transfer piping is included, liquid backup for pipelines and cylinder filling facilities that are an adjunct to some oxygen and nitrogen generators are not covered. Also, coverage is not extended to equipment such as product transmission piping outside the generator boundaries.

While many references have been cited in this publication that give information relating to air separation plants, related equipment, and their products, the reference section is not intended to be all inclusive. Not all federal, state, provincial, territorial, or local requirements, regulations, and ordinances are listed. Further, as this publication is not intended as a universal safe practices manual for specific design and safety features, it is important to refer to the operating manuals of the equipment supplier.

2.2 Purpose

This publication is intended to serve the interest of all who may be associated with oxygen and nitrogen generator installation and operations.

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 Publication terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

[1] References are shown by bracketed numbers and are listed in order of appearance in the reference section.