

**CGA M-1—2013**

**STANDARD FOR MEDICAL  
GAS SUPPLY SYSTEMS  
AT HEALTH CARE FACILITIES**

**THIRD EDITION**



**PLEASE NOTE:**

The information contained in this document was obtained from sources believed to be reliable and is based on technical information and experience currently available from members of the Compressed Gas Association, Inc. and others. However, the Association or its members, jointly or severally, make no guarantee of the results and assume no liability or responsibility in connection with the information or suggestions herein contained. Moreover, it should not be assumed that every acceptable commodity grade, test or safety procedure or method, precaution, equipment or device is contained within, or that abnormal or unusual circumstances may not warrant or suggest further requirements or additional procedure.

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 website, [www.cganet.com](http://www.cganet.com).

This document should not be confused with federal, state, provincial, or municipal specifications or regulations; insurance requirements; or national safety codes. While the Association recommends reference to or use of this document by government agencies and others, this document is purely voluntary and not binding unless adopted by reference in regulations.

A listing of all publications, audiovisual programs, safety and technical bulletins, and safety posters is available via the Internet at our website at [www.cganet.com](http://www.cganet.com). For more information contact CGA at Phone: 703-788-2700, ext. 799. E-mail: [customerservice@cganet.com](mailto:customerservice@cganet.com).

Work Item 09-028  
Medical Gases Committee

---

**NOTE**—Due to the extensive changes in this document, technical changes from the previous edition are not identified.

THIRD EDITION: 2013  
SECOND EDITION: 2007  
FIRST EDITION: 2003

© 2013 The Compressed Gas Association, Inc. All rights reserved.

All materials contained in this work are protected by United States and international copyright laws. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopying, recording, or any information storage and retrieval system without permission in writing from The Compressed Gas Association, Inc. All requests for permission to reproduce material from this work should be directed to The Compressed Gas Association, Inc., 14501 George Carter Way, Suite 103, Chantilly VA 20151. You may not alter or remove any trademark, copyright or other notice from this work.

<b>Contents</b>	<b>Page</b>
1 Introduction.....	1
2 Scope .....	1
3 Definitions.....	2
4 Health hazards and safety considerations .....	5
5 Applicable codes and standards .....	5
6 Personnel .....	6
6.1 Quality control unit.....	6
6.2 Personnel qualifications.....	6
7 Site selection .....	8
7.1 Meeting code setback distances .....	8
7.2 Healthcare facility, system owner, and supplier responsibilities.....	9
8 Developing a suitable site .....	10
8.1 Equipment layout.....	10
8.2 Foundations.....	10
8.3 Security.....	10
9 Equipment selection .....	11
9.1 System specifications .....	11
9.2 Equipment specifications.....	12
9.3 Process flow diagrams .....	14
9.4 Regulator set points.....	15
9.5 Line pressure relief valves (thermal reliefs).....	15
9.6 Final line pressure relief valves .....	15
9.7 Vendor selection.....	15
9.8 Equipment reuse .....	15
10 Equipment transportation and setting.....	15
11 Equipment installation .....	16
11.1 Temporary system.....	16
11.2 Cleaning .....	16
11.3 Odor test.....	17
11.4 Installation .....	17
11.5 Pipe joints .....	18
11.6 System identification, marking, and tagging .....	19
11.7 System pressure test.....	19
12 Startup.....	19
12.1 First fill .....	19
12.2 Purge.....	19
12.3 Product testing.....	20
12.4 Startup testing .....	20
12.5 System verification .....	20
12.6 Commissioning.....	21
13 Operation.....	21
13.1 Maintenance.....	21
13.2 Reporting complaints.....	22
13.3 Product recall.....	23
14 System removal.....	23

15 Documentation ..... 23  
    15.1 Installation/modification ..... 23  
    15.2 Equipment inspection ..... 24  
16 References ..... 24  
17 Additional information ..... 25

## 1 Introduction

Compressed medical gases (CMG) are intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in human beings or animals.

Medical gas supply systems deliver CMG to piped distribution systems at health care facilities. Oxygen USP and medical air USP provide direct assistance for breathing and also assist in the delivery of medical treatment(s). Oxygen USP, medical air USP, and CMG mixtures are used in hyperbaric chambers. Nitrogen NF is used to operate power tools during patient care procedures. CMG shall be permitted to be supplied to the medical gas piped distribution system by cylinders or containers connected to a manifold system, a permanently installed bulk supply, small bulk system, or a temporary supply system.

Supplier-owned or health care facility-owned storage and control systems that supply CMG shall be installed and maintained in a safe and consistent manner in compliance with this standard, applicable regulations, and current good manufacturing practices (CGMP).

The system owner is responsible for compliance with CGMP. Supplier and contractor personnel that work on supplier-owned equipment shall be able to provide documentation that demonstrates compliance with this standard.

For the purpose of this standard, use of the word *should* indicates a recommendation and use of the word *shall* indicates a requirement.

## 2 Scope

This standard provides the minimum requirements for the installation, maintenance, and removal of CMG supply systems at health care facilities.

This standard applies to all new or upgraded CMG supply systems at health care facilities. It provides direction for compliance with the following national regulations and model codes:

- Federal *Food, Drug, and Cosmetic Act* [1]<sup>1</sup>;
- Title 21 of the U.S. *Code of Federal Regulations* (21 CFR) Parts 210-211 [2];
- NFPA 55, *Compressed Gases and Cryogenic Fluids Code* [3]; and
- NFPA 99, *Health Care Facilities Code* [4].

Section 5 covers the scope of these regulations and their applicability to CMG supply systems. CGA M-1 captures the requirements from these codes along with best practices to provide a comprehensive document for the process of designing, locating, installing, starting up, maintaining, testing, removing, and documenting work on a medical gas supply system.

In an upgrade, the complete system shall be modified to comply with current standards. Failure of individual components may not invoke a full system upgrade. Exception: replacing piping or control assemblies that do not include the replacement or relocation of the bulk liquid storage vessel(s) may not invoke the foundation requirements in 8.2.

This standard does not apply to:

- the piped distribution system;
- manufacturing plants or other establishments operated by the supplier or the supplier's agent for the purpose of storing and refilling portable containers, trailers, mobile supply trucks, or tank cars with medical gases; or
- nonhealth care facilities such as laboratories, pharmaceutical, or biotechnology facilities.

---

<sup>1</sup> References are shown by bracketed numbers and are listed in the order of appearance in the reference section.