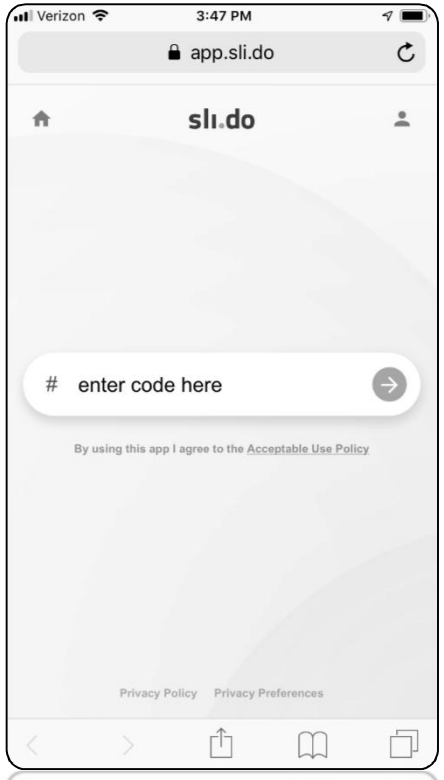
NFPA 99, 2012-2018 Updates

February 13th, 2019

Audience Input

- www.slido.com
- T147



Audience Input

The Joint Commission
(TJC)

Centers for Medicare & Medicaid
Services
(CMS)

Enforced by Colorado Division of
Fire Prevention & Control

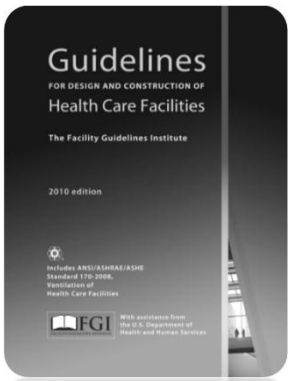
"The Centers for Medicare & Medicaid Services (CMS) has adopted the 2012 edition of NFPA 101: *Life Safety Code*®... The change is effective July 5 and comes after years of CMS considering the change to the more updated standard. In its rule, CMS adopts the 2012 edition of the *Life Safety Code* and the 2012 edition of NFPA: *Health Care Facilities Code*—but makes several changes to the codes.

- ASHE Advocacy Alert (May 3rd, 2016)

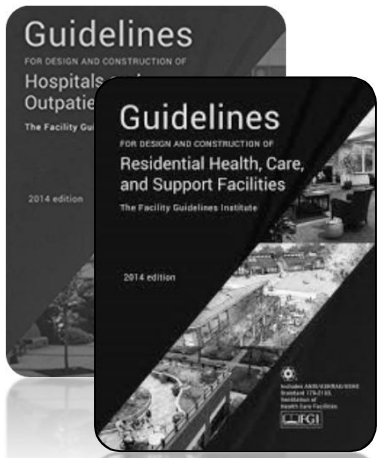
CMS & TJC Surveys were not conducted per NFPA 99, 2012 until November 7th, 2016.

- The 2010 Edition is necessary to meet the requirements of NFPA 99, 2012
  - Hospitals: Table 2.1-6 (Outlets requirements for oxygen, vacuum, and medical air)
  - Outpatient Facilities: Table 3.1-1 (Outlet requirements for oxygen, vacuum and medical air)
- The 2014 Edition is what most engineers use as the current design criteria
  - Hospitals: Table 2.1-4 (Outlets requirements for oxygen, vacuum, and medical air)
    - Primary differences include changes in room names & qty of vacuum inlets in O.R.'s
  - Outpatient Facilities: Table 3.1-1 (Outlet requirements for oxygen, vacuum and medical air)
    - Provides more clarity for outpatient surgery centers vs urgent care/emergency centers
- The 2018 Edition has been published and will used by engineers soon (even more categorization).

2010



2014



2018

- This is advisory material only regarding the typical maintenance and testing procedures for medical gas system equipment including:
  - Medical air compressor systems
  - Medical-surgical vacuum pump systems
  - Medical gas manifolds
  - Compressed air systems
  - Dental air compressor systems
  - Medical gas alarm systems
  - Medical gas system outlets/inlets

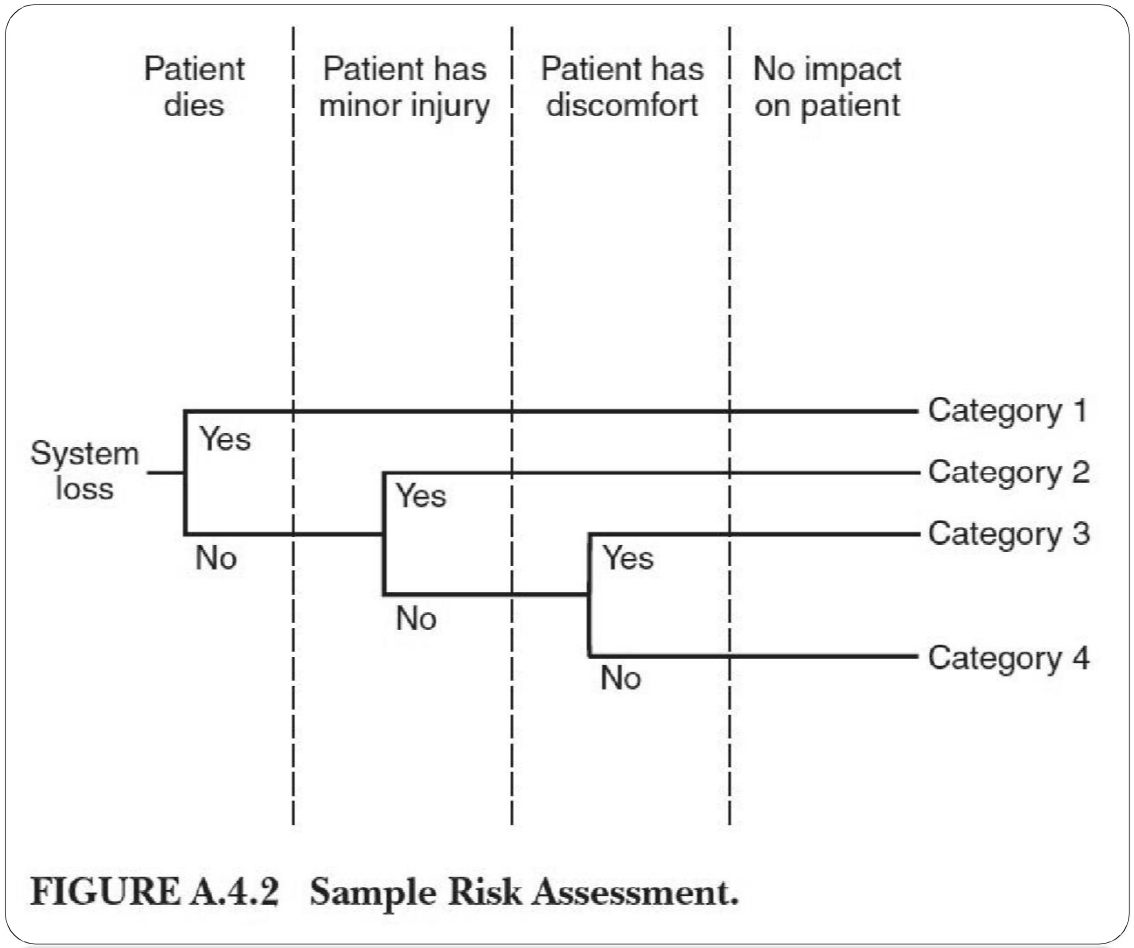


FIGURE A.4.2 Sample Risk Assessment.

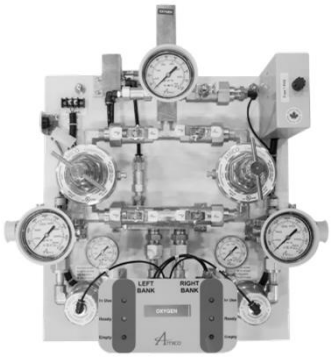
Chapter 3 Definitions & Chapter 4 Fundamentals

American Society of Anesthesiologists
Continuum of Depth of Sedation:
Definition of General Anesthesia and Levels of Sedation/Analgesia

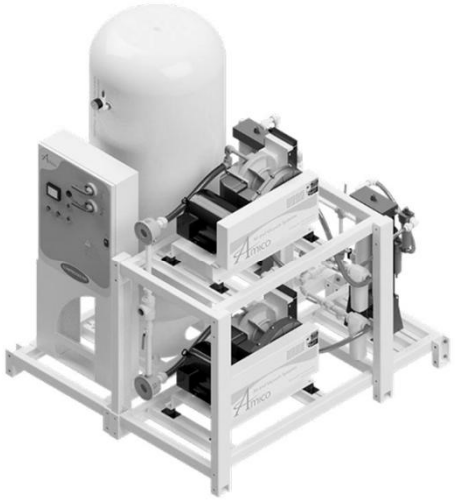
	Minimal Sedation Anxiolysis	*Moderate Sedation/ Analgesia ("Conscious Sedation")*	*Deep Sedation/ Analgesia*	*General Anesthesia*
Responsiveness	Normal response to verbal stimulation	Purposeful** response to verbal or tactile stimulation	Purposeful** response following repeated or painful stimulation	Unarousable even with painful stimulus
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous Ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular Function	Unaffected	Usually maintained	Usually maintained	May be impaired

Central Supply Systems (Sources Equipment)

Medical Gas Manifolds



Medical Air Compressors



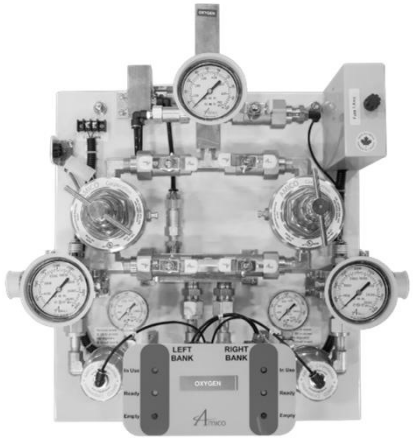
Medical Vacuum Pumps

Bulk Gas Systems

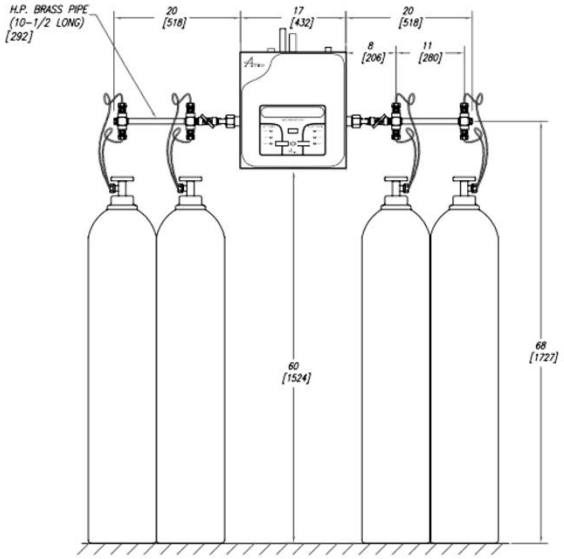
*Also now includes micro-bulk systems, air proportioning systems, instrument air systems, oxygen generators

5.1.3.3 Central Supply System Locations

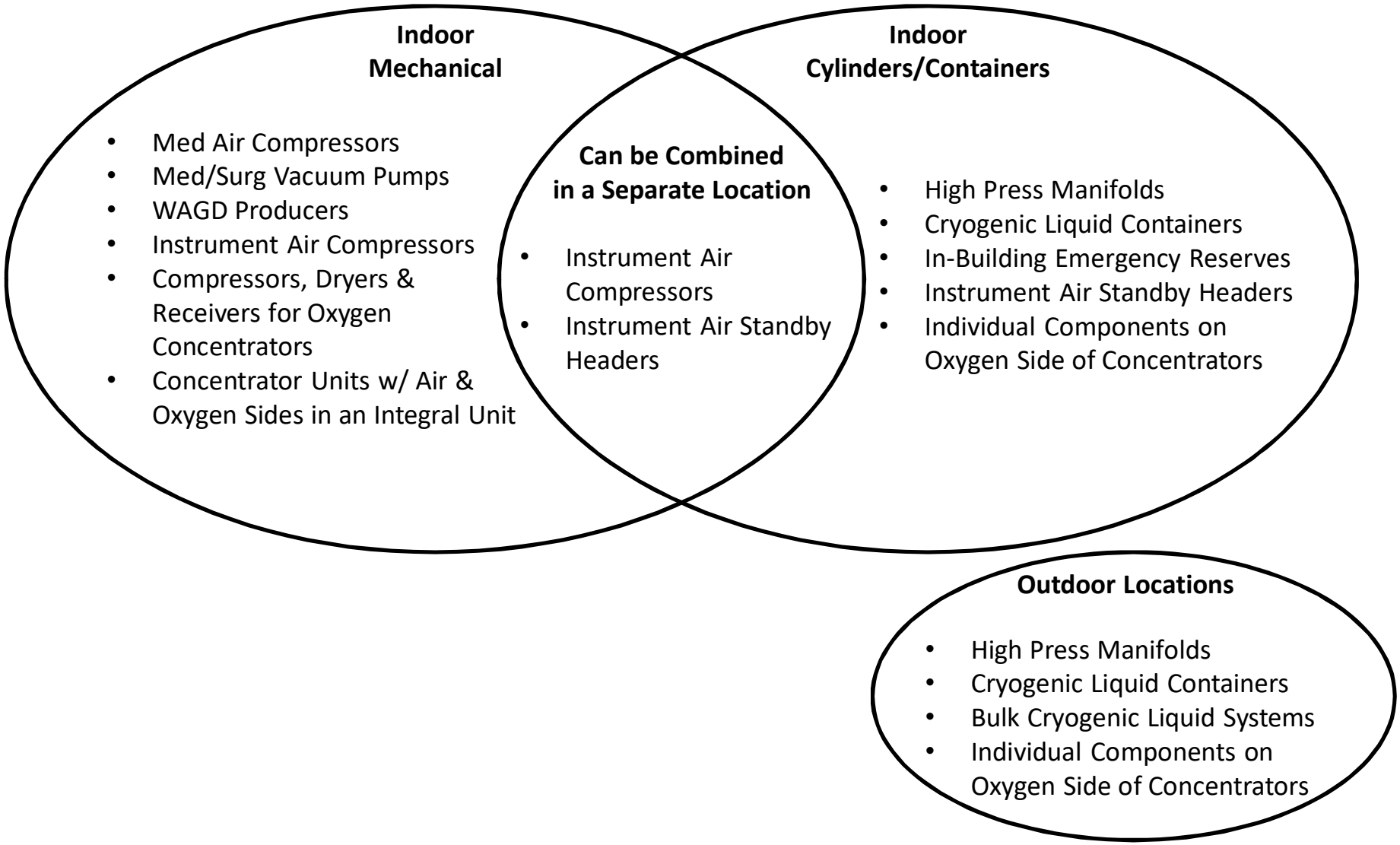
5.1.3.2.12 Cylinders in use and in storage shall be prevented from reaching temperatures in excess of 52°C (125°F)



5.1.3.2.13 Central supply systems for nitrous oxide and carbon dioxide using cylinders or portable containers shall be prevented from reaching temperatures lower than the recommendations of the central supply system's manufacturer, but shall never be lower than −7°C (20°F) or greater than 52°C (125°F).



5.1.3.3 Central Supply System Locations



5.1.3.3 Central Supply System Locations

(7) They shall be provided with racks, chains, or other fastenings to secure all cylinders from falling, whether connected, unconnected, full, or empty.

(9) They shall have racks, shelves, and supports, where provided constructed of noncombustible materials or limited-combustible materials.

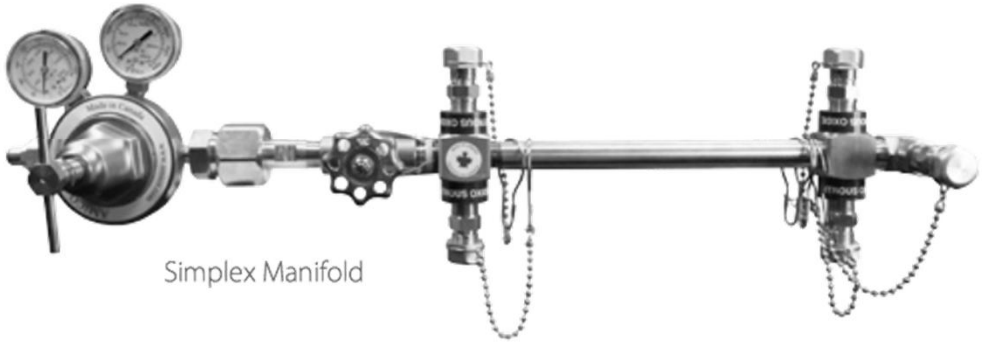
(10) They shall protect electrical devices from physical damage.

- Ventilation is now in Chapter 9
    - Natural ventilation is allowed as long as you can vent directly outside without duct work
    - Louvers must be sized accordingly (24 sq inches per 1,000 cubic ft, but a minimum of 72 sq inches/each)

Manifolds

Digital Dome Loaded Automatic Manifold

Dome Loaded Automatic Manifold



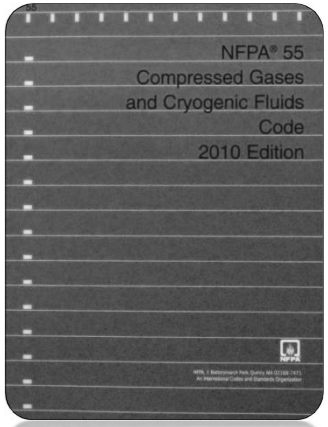
Simplex Manifold

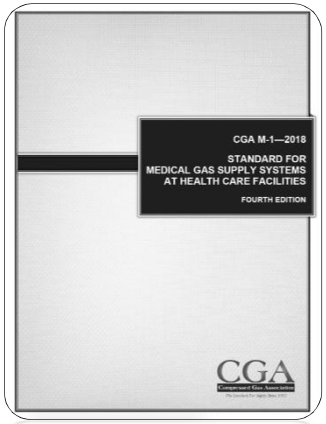
3.3.32.3 Micro-Bulk Cryogenic Fluid Central Supply System

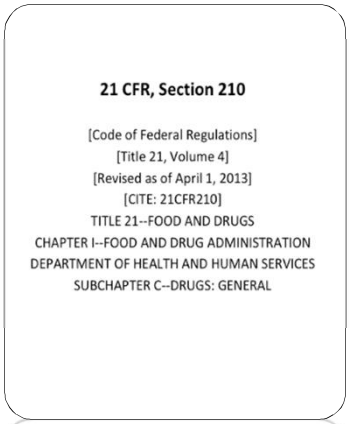
A cryogenic fluid central supply system with a storage capacity of less than or equal to 566 m3 [20,000 ft3 (scf)]

Bulk Gas Supply Systems

- The NFPA 55, 2010 Edition is necessary to meet the requirements of NFPA 99, 2012
  - Bulk Oxygen System Requirements (NFPA 55, 2016 for NFPA 99, 2018)
- The CGA M-1, 2007 Edition is necessary to meet the requirements of NFPA 99, 2012 (CGA M-1, 2018 for NFPA 99, 2018)
  - Compressed Gas Association document referred to by NFPA 99 (similar in content)
- The 21 CFR 210/211 is necessary to meet the requirements of NFPA 99, 2012 (& 2018)
  - Current Good Manufacturing Practices – Quality Control

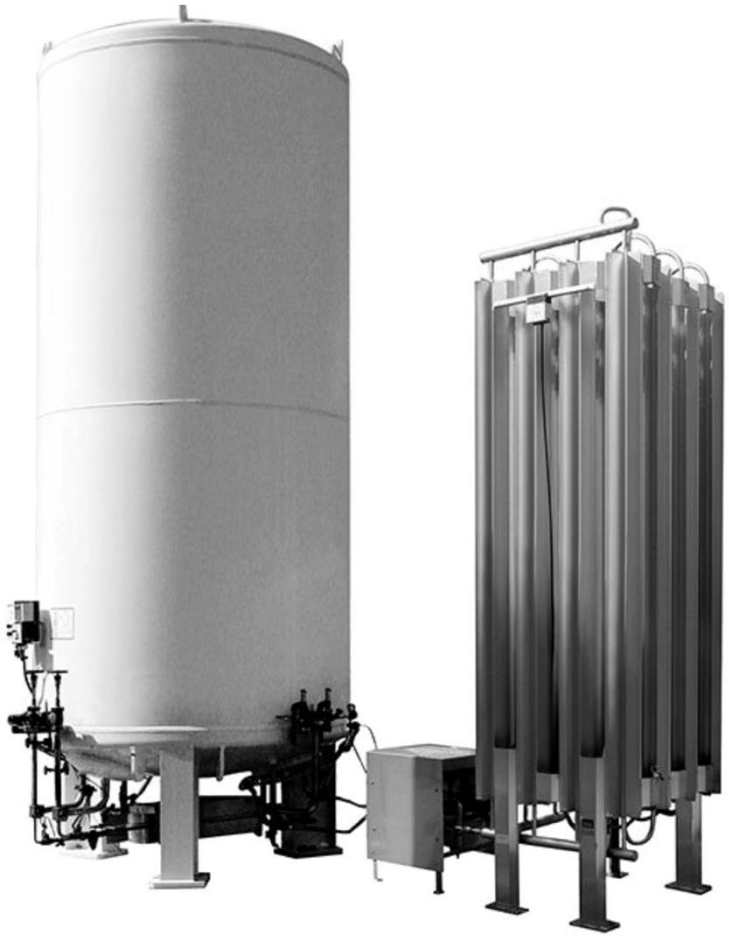






Bulk Gas Supply Systems

- Bulk Oxygen System > 20,000 cubic ft
  (NFPA 55)
- Micro-Bulk Cryogenic System < 20,000 cubic ft
  (NFPA 55)
- Bulk Inert Gas System > 20,000 cubic ft
  (CGA P-18 Standard for Bulk Inert Gas Systems)
- Bulk Nitrous Oxide System > 3,200 lb or roughly 28,000 cubic ft
  (CGA G-8.1 Standard for Bulk N2O Systems)
- ”Bulk” Carbon Dioxide System > 1,000 lb
  (CGA G-6.1 Standard for Insulated CO2 Systems)
- Carbon Dioxide Systems < 1,000 lb
  (CGA G-6.5 Standard for Small, Stationary, Insulated CO2 Systems)



5.1.3.3 Central Supply System Locations

5.1.3.3.2 Design and Construction. Locations for central supply systems and the storage of positive-pressure gases shall meet the following requirements:

(3) If outdoors, they shall be provided with an enclosure (wall or fencing) constructed of noncombustible materials with a minimum of two entry/exits.

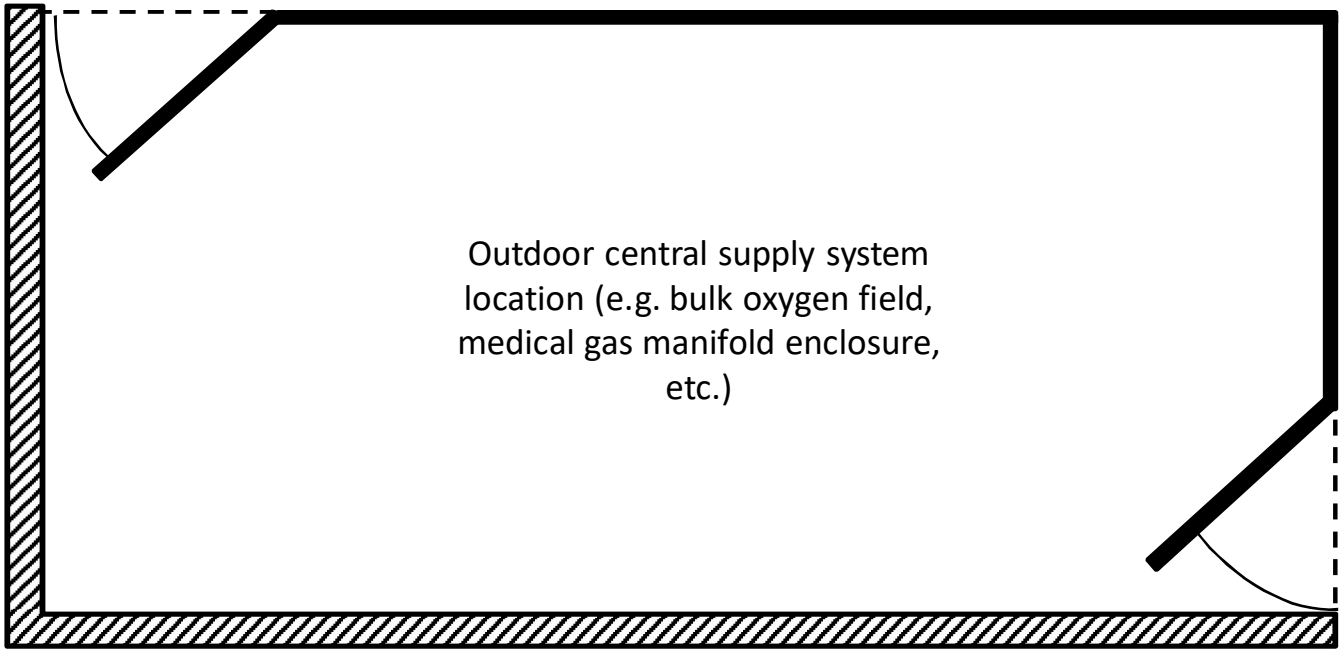
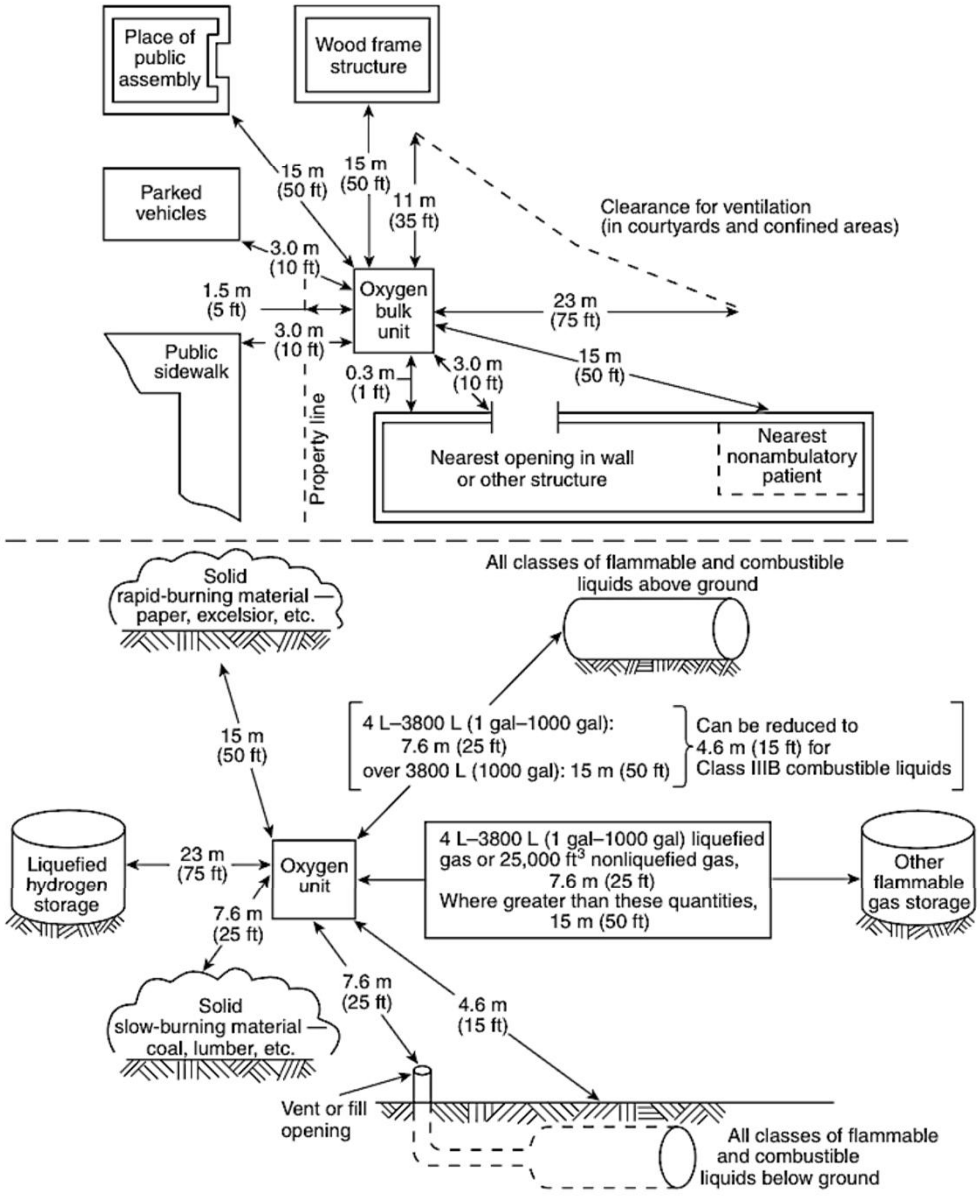


Figure A.5.1.3.5.12(a) Distance Between Bulk Oxygen Systems & Exposures



5.1.3.5.13 Emergency Oxygen Supply Connection (EOSC)

5.1.3.5.13.1 EOSCs shall be located as follows:

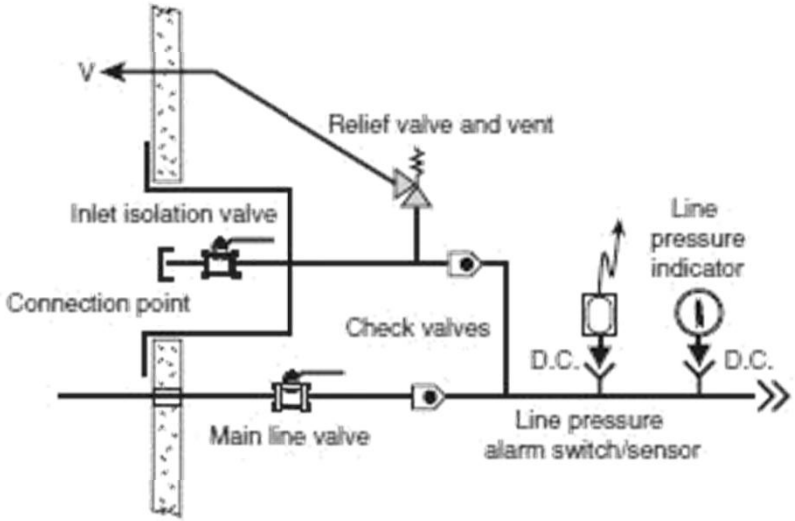
(1) Located on the exterior of the building being served in a location accessible by emergency supply vehicles at all times in all weather conditions

(2) Connected to the main supply line immediately downstream of the main shutoff valve

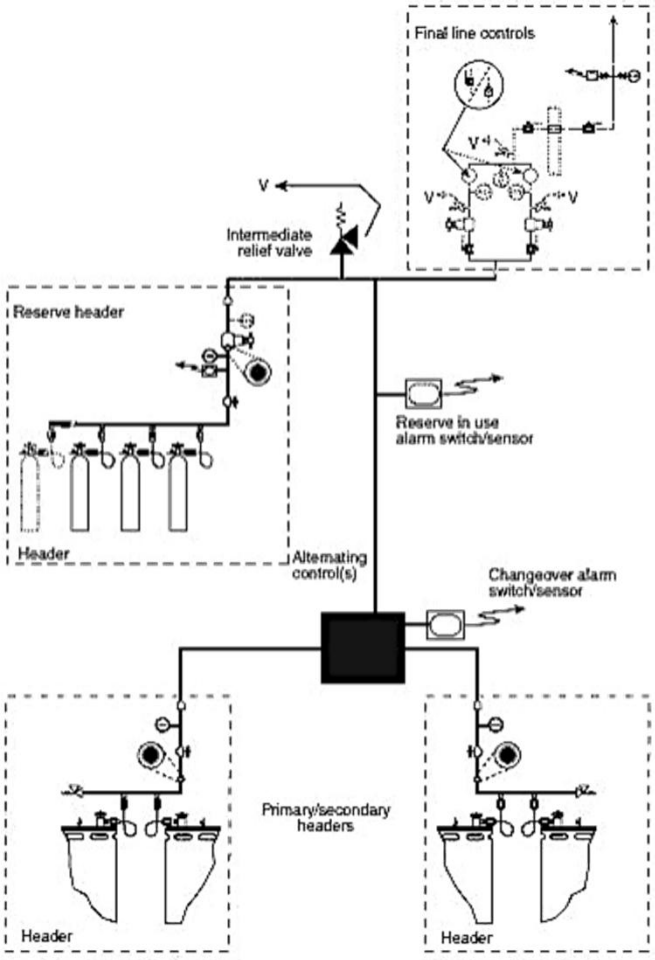
5.1.3.5.13.2 EOSCs shall consist of the following:

(1) Physical protection to prevent unauthorized tampering

(7) Minimum of 1 m (3 ft) of clearance around the EOSC for connection of temporary auxiliary source



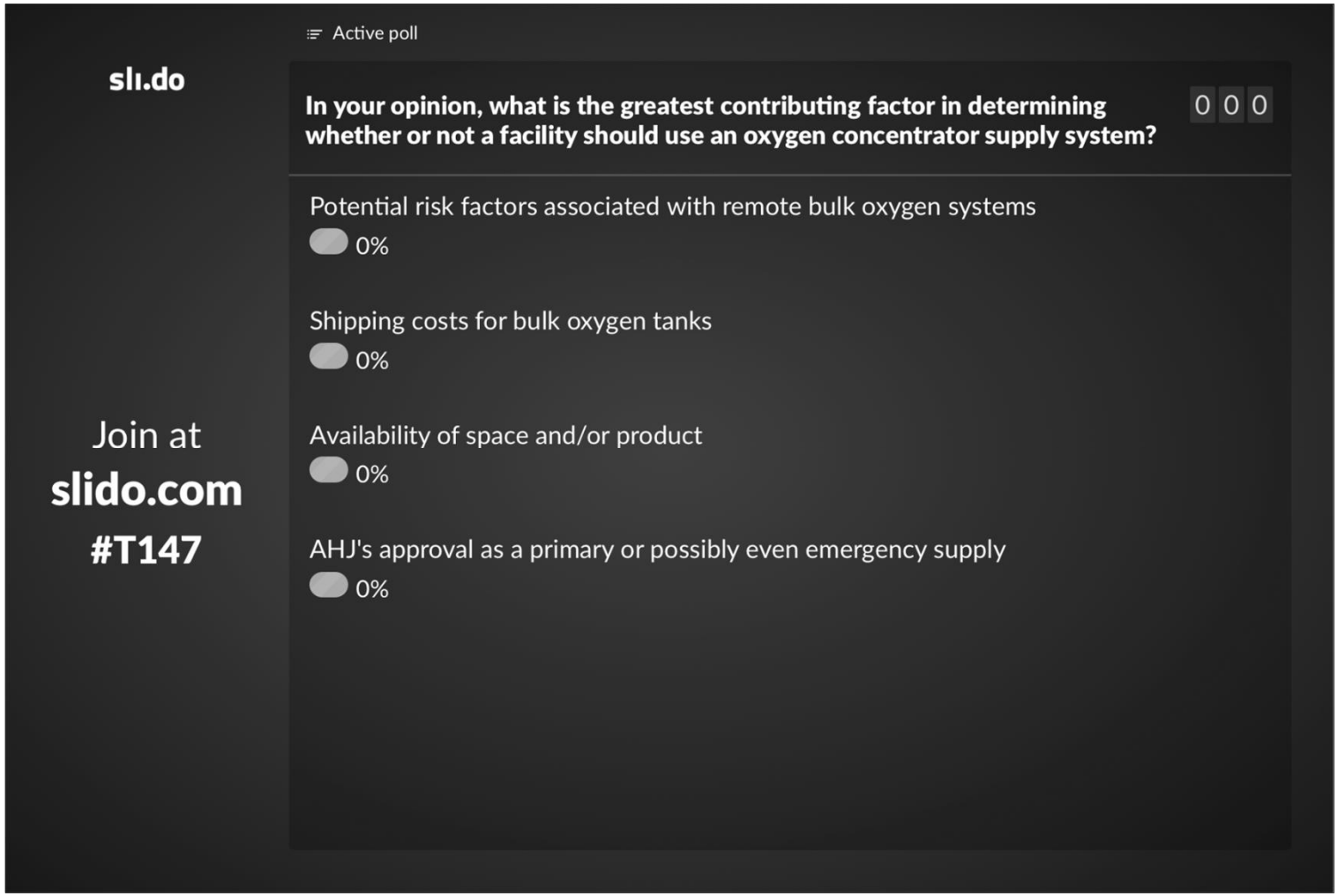
5.1.3.5.13 Emergency Oxygen Supply Connection (EOSC)
vs
5.1.3.5.14 In-Building Emergency Reserves



Benefits of in-building emergency reserves:

- No loss of gas if line gets damaged outside the building
- Facility is not dependent upon delivery of emergency supply
- There is a know amount of emergency reserve supply available
- Alarm set points indicate when emergency reserve supply is low
- High pressure tanks do not off-gas into atmosphere and deplete themselves whether or not they are in use
- The emergency reserve supply is already connected to the system while access to the EOSC is not a certainty
- Can also be installed in addition to EOSC

Audience Input



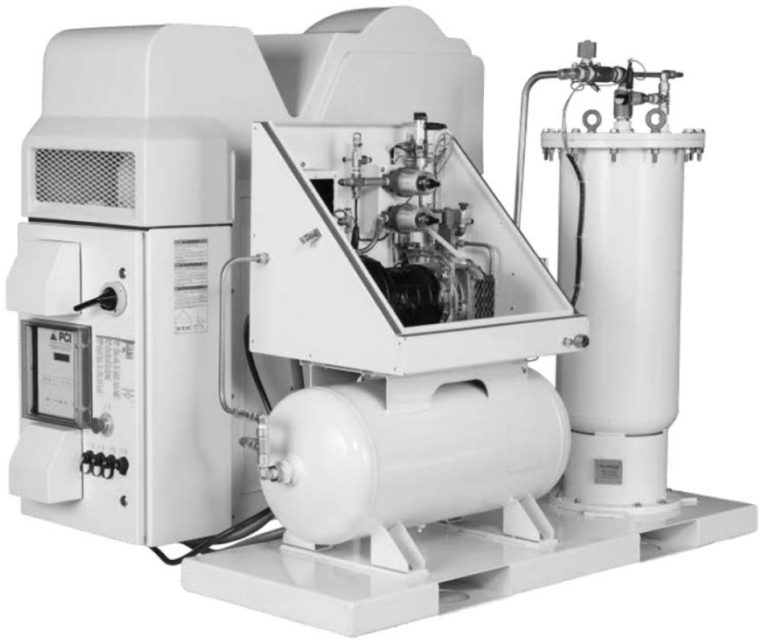
5.1.3.5.11* Oxygen Concentrator Supply Units (2018)

5.1.3.5.11.1 Oxygen concentrator supply units for use with medical gas pipelines shall produce oxygen meeting the requirements of Oxygen 93 USP or Oxygen USP

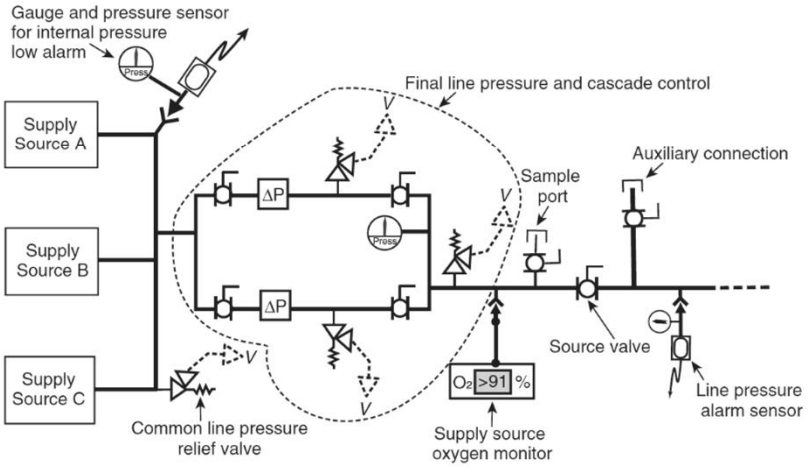
- **FDA Prohibits mixing USP drugs in the same pipeline. Oxygen USP (99%) & Oxygen 93 USP (90%-96%) are separately listed drugs.**

Potential Factors:

- Locations where delivery costly (shipping is more costly than product)
- Locations where delivery is difficult (islands, mountains, cities)
- Risks involved with bulk supply
- Emergency purposes (reserve supply – ask your AHJ!!!)



Oxygen Concentrator Supply Configurations



Note: Drawing is illustrative, alternative arrangements might be acceptable.

Δ **FIGURE A.5.1.3.9(a) Elements of an Oxygen Concentrator Central Supply Source.**

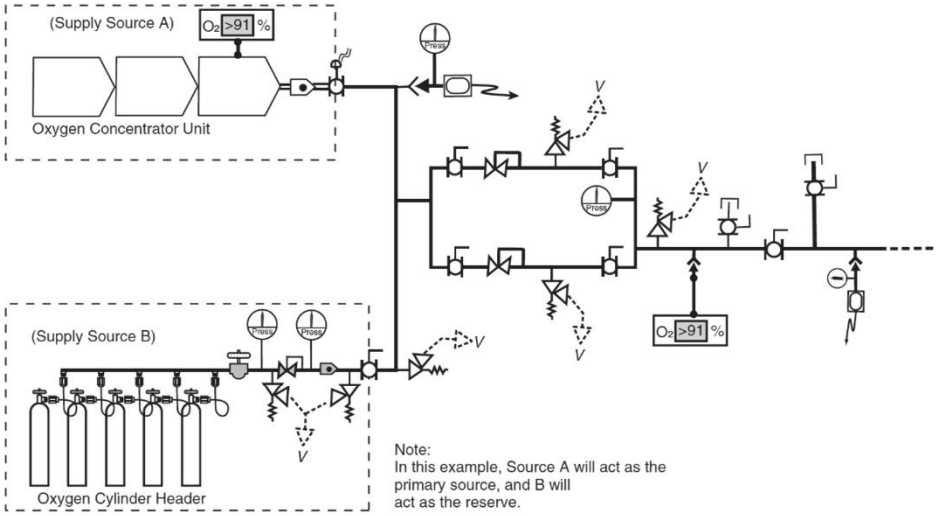
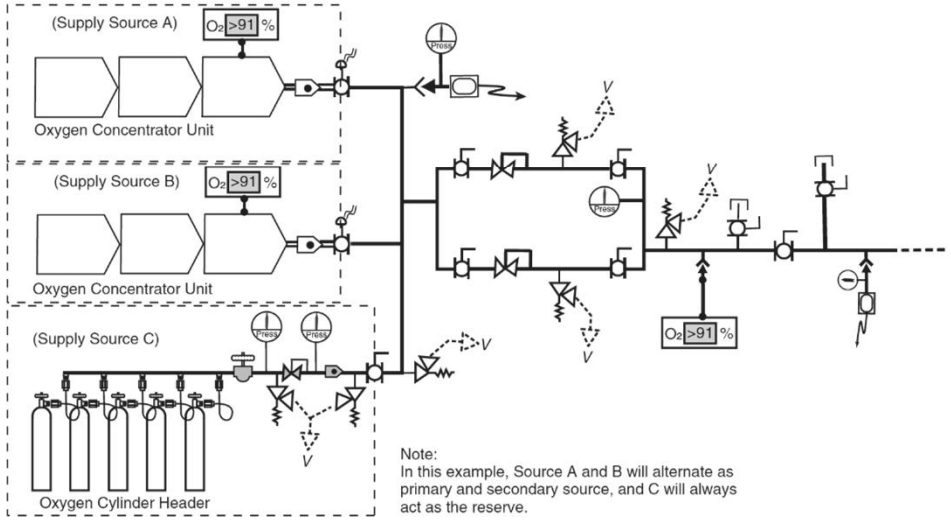


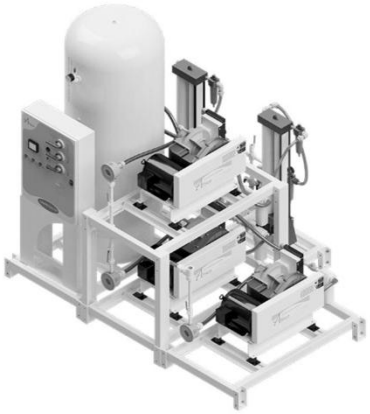
FIGURE A.5.1.3.9(b) Elements of an Oxygen Concentrator Central Supply Source with Two Sources.

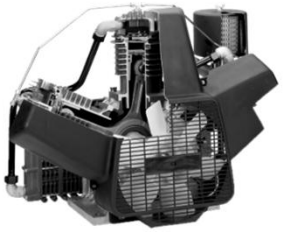


Δ **FIGURE A.5.1.3.9(c) One Example of an Oxygen Concentrator Central Supply Source in Practice.**

5.1.3.6 Category 1 Medical Air Supply Systems

5.1.3.6.2 Uses of Medical Air. Medical air sources shall be connected to the medical air distribution system only and shall be used only for air in the application of human respiration and calibration of medical devices for respiratory application.





When sizing air compressor systems for altitude it is important to note that all manufacturers' standard specifications are given at sea level conditions. Two considerations should be made when sizing compressors: maximum allowable pressure and flow capacity.

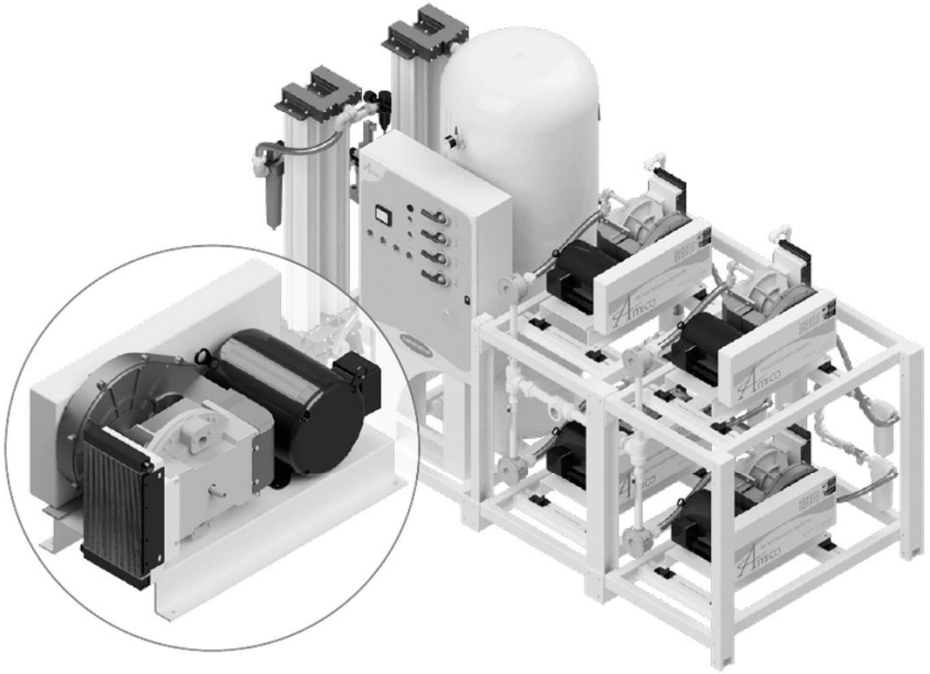
1) Maximum Allowable Pressure: "Rule of thumb" is to multiply the maximum pressure rating of the pump at sea level by the percent of atmospheric pressure (in atm) at the specific altitude.

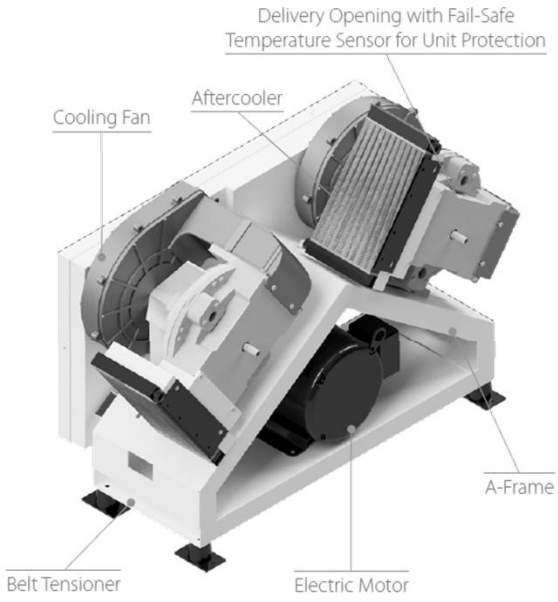
2) Flow Capacity: "Rule of Thumb" – Reduce the capacity rating by 3% per 1,000 feet of elevation.

(100 PSI + 14.7) / 14.7 = 7.8 cr is the design point (for sea level)
(100 PSI + 12.2) / 12.2 = 9.2 cr @ 5,280 ft elevation
12.2 x 7.8 = 95.2 – 12.2 = 83 PSIG
100 PSI @ Sea Level = 83 PSI @ 5,280 ft

Scroll Compressors

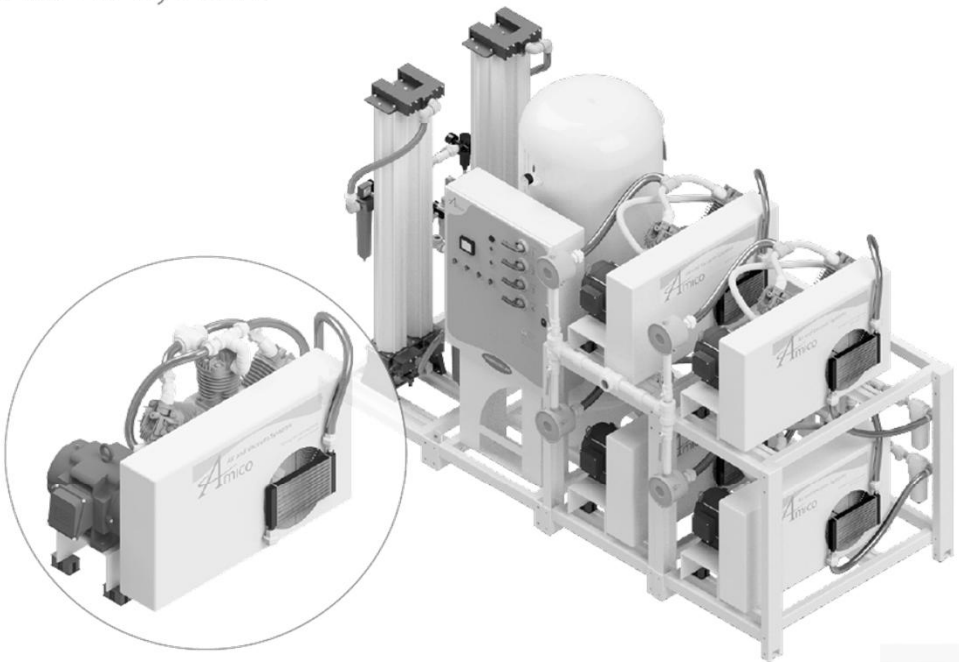
Medical Air Systems

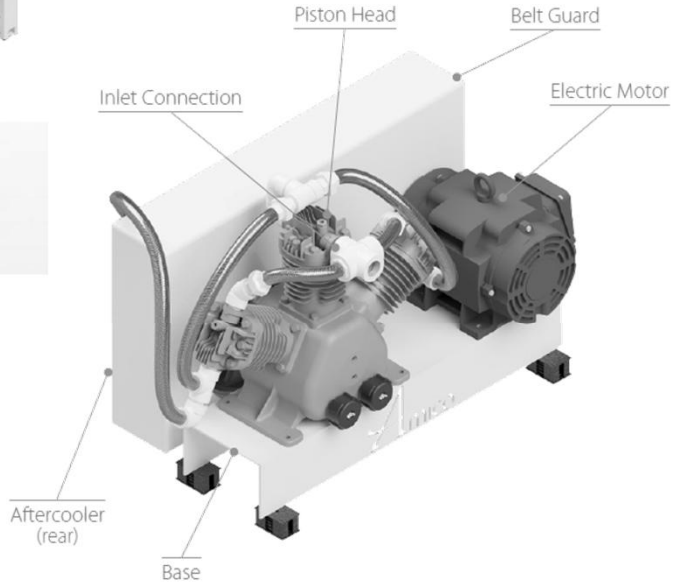




Reciprocating Compressors

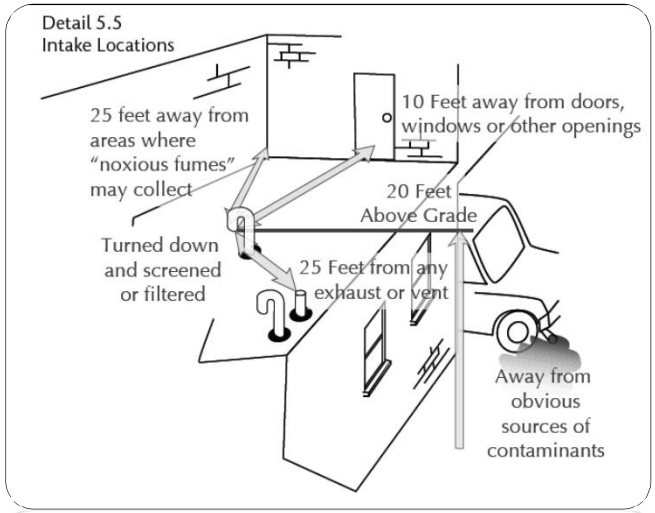
Medical Air Systems





5.1.3.6.3.12 Compressor Intake

(A) The medical air compressors shall draw their air from a source of clean air



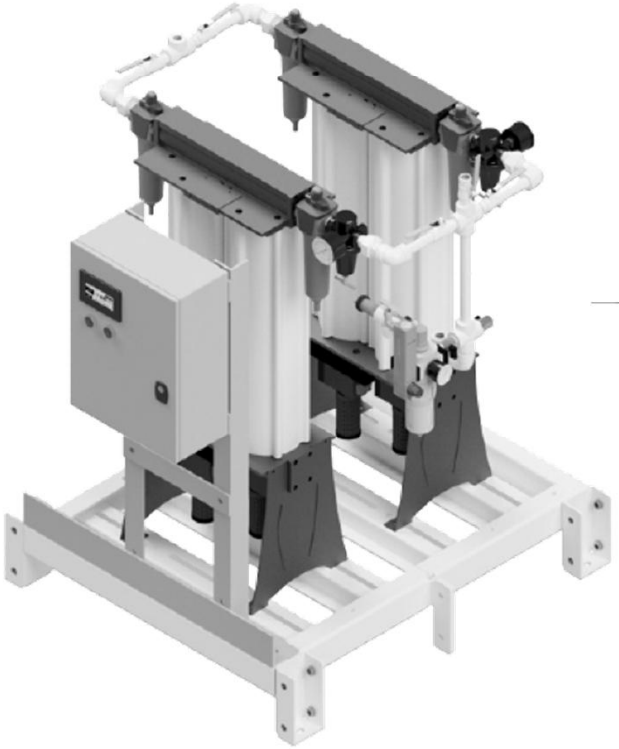
(E) If an air source equal to or better than outside air (e.g., air already filtered for use in operating room ventilating systems) is available, it shall be permitted to be used for the medical air compressors with the following provisions:

1) This alternate source of supply air shall be available on a continuous 24-hour-per-day, 7-day-per-week basis.

2) Ventilating systems having fans with motors or drive belts located in the airstream shall not be used as a source of medical air intake.

Dryer/Filter/Regulator System

Medical Air Dryer Systems



Dew Point/Carbon Monoxide Monitors

Medical Air Quality Monitors

5.1.3.6.3.14 Category 1 Medical Air Proportioning Supply Sources

(A) General

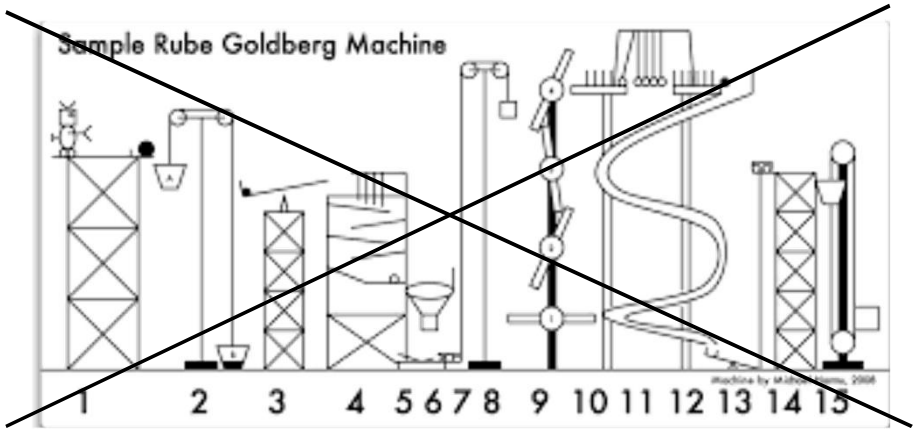
(1) Medical air reconstituted from oxygen USP and nitrogen NF, produced using proportioning system(s), shall be required to meet the following:

(a) The quality of medical air shall be in accordance with 5.1.3.6.1

(b) The system shall be capable of supplying this quality of medical air, per 5.1.3.6.1, over the entire range of flow

(c) The system shall produce medical air with an oxygen content of 19.5 percent to 23.5 percent

(d) The medical air shall be cleared for marketing by the FDA or approved by the FDA



Just don't do it!

5.1.3.7 Medical–Surgical Vacuum Supply Systems

5.1.3.8.1.1 WAGD shall be permitted to be produced through the medical–surgical vacuum source, by a dedicated producer, or by venturi.

5.1.3.8.1.2 If WAGD is produced by the medical–surgical vacuum source, the following shall apply:

1)The medical–surgical vacuum source shall comply with 5.1.3.7.

2)The total concentration of oxidizers (oxygen and nitrous oxide) shall be maintained below 23.6 percent, or the vacuum pump shall comply with 5.1.3.8.2.1.

3)The medical–surgical vacuum source shall be sized to accommodate the additional volume.

5.1.3.8.2.2 (1) Permitted to be made of any materials determined by the manufacturer as suitable for the service.

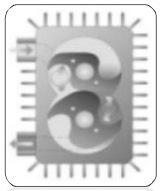
*Several manufacturers put limitations on vacuum pump technologies to be specified at elevation.

**NFPA 99, 2018 requires this on all combined use systems. Not just new installations.

Oil-Lubricated Rotary Vane

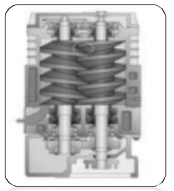
Dry Rotary Vane

Oil-Less Claw



Liquid-Ring (Oil/H2O Sealed)

Oil-Lubricated Rotary Screw



5.1.3.7 Medical–Surgical Vacuum Supply Systems

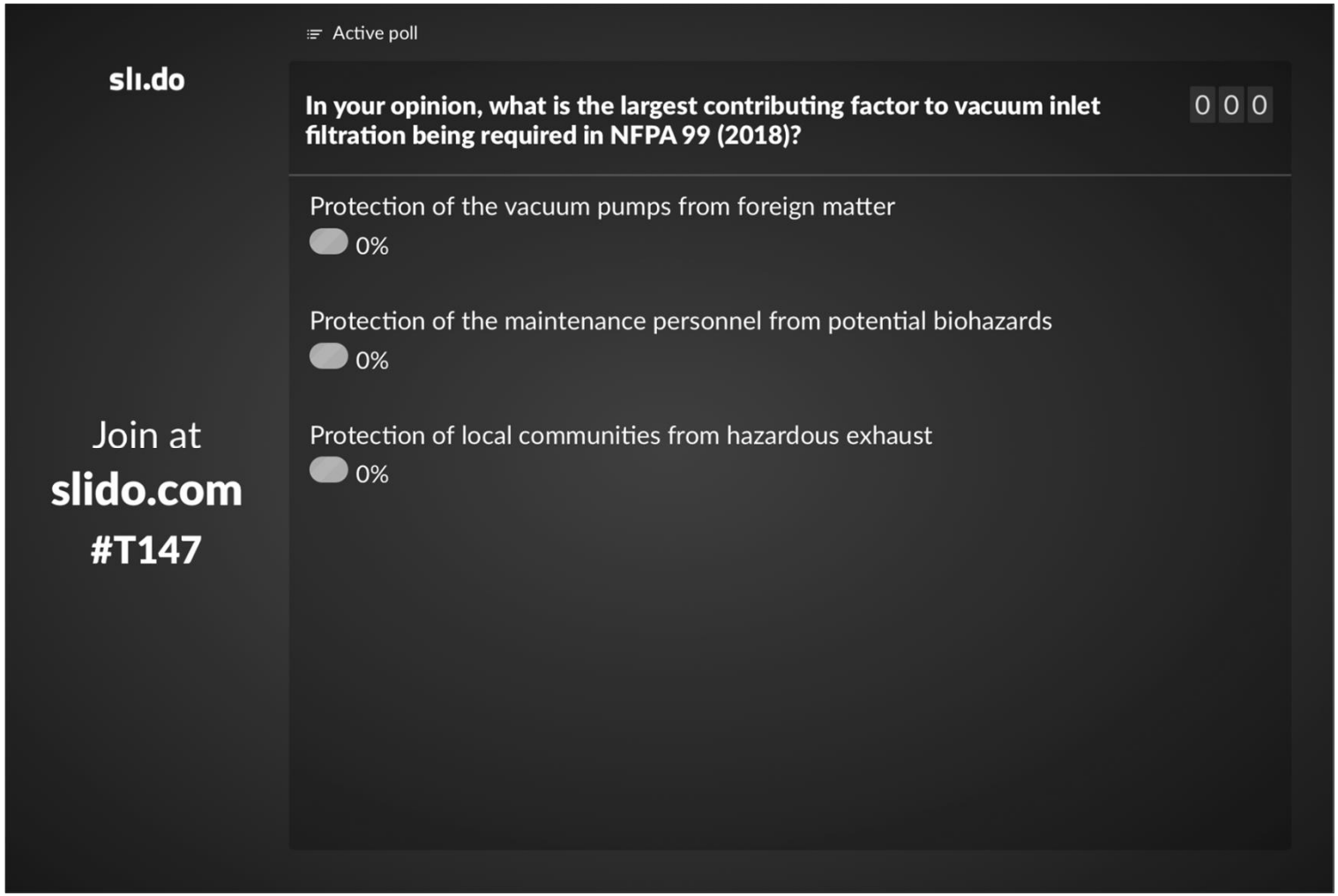
When sizing vacuum systems for altitude, it is important to note that all manufacturers' standard specifications are given at sea level conditions. There are two main affects of altitude on vacuum performance that should be taken into consideration: maximum end vacuum level and flow capacity.

1) Maximum End Vacuum Level: "Rule of thumb" is to reduce the end vacuum level by 1" Hg per 1,000 ft.

2) Flow Capacity: The performance of a vacuum pump must also be corrected for altitude due to atmospheric variations in air pressure, temperature and density.

Altitude (ft)	Barometric Press	SCFM Multiplier
Sea Level	29.92" Hg	1.00
1,000	28.86" Hg	1.04
2,000	27.82" Hg	1.08
3,000	26.82" Hg	1.12
4,000	25.84" Hg	1.16
5,000	24.90" Hg	1.20
6,000	23.98" Hg	1.25
7,000	23.09" Hg	1.30

Audience Input



5.1.3.7 Medical–Surgical Vacuum Supply Systems

5.1.3.7.4 Vacuum Filtration. Central supply systems for vacuum shall be provided with inlet filtration with the following characteristics:

1) Filtration shall be at least duplex to allow one filter to be exchanged without impairing vacuum system

2) Filtration shall be located on the patient side of the vacuum producer

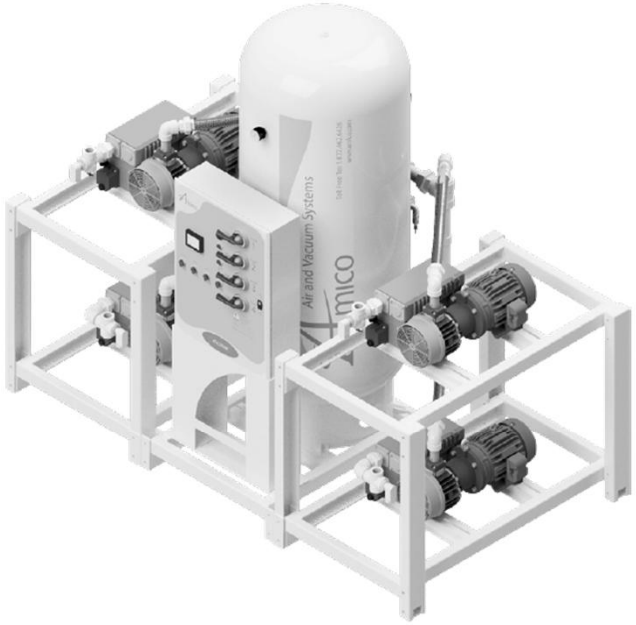
3) Filters shall be efficient to 0.03 μ and 99.97 percent HEPA or better, per DOE-STD-3020

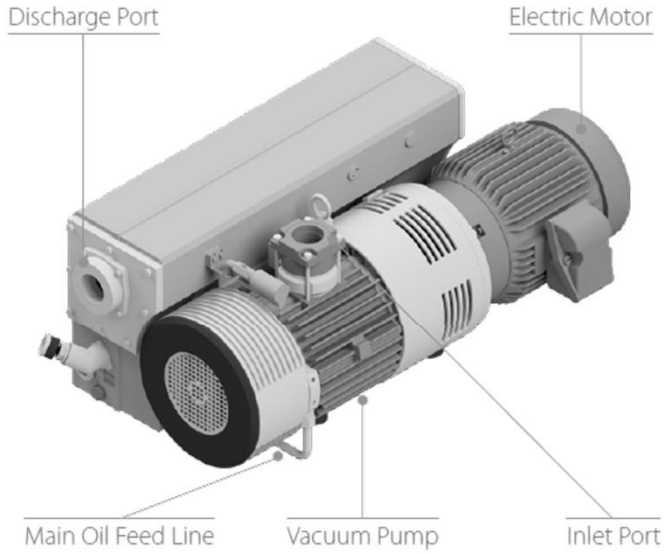
Benefits:

- Protect the pumps
- Protect the maintenance workers
- Protect the public from perceived hazards

Lubricated Rotary Vane Vacuum Systems

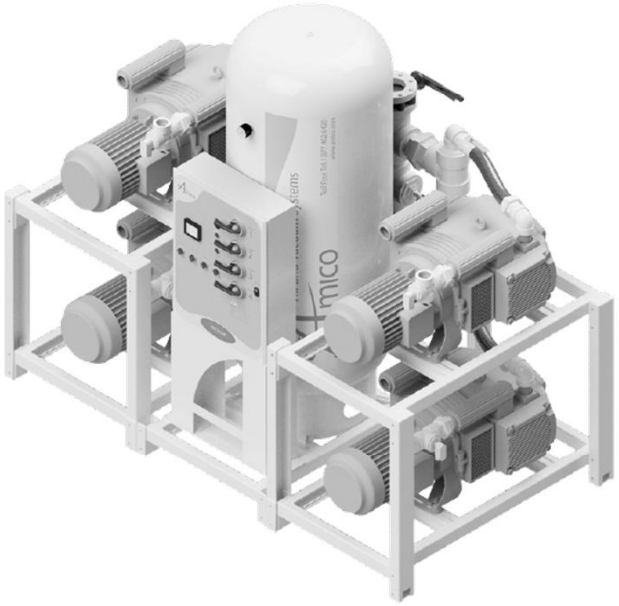
Medical Vacuum Systems

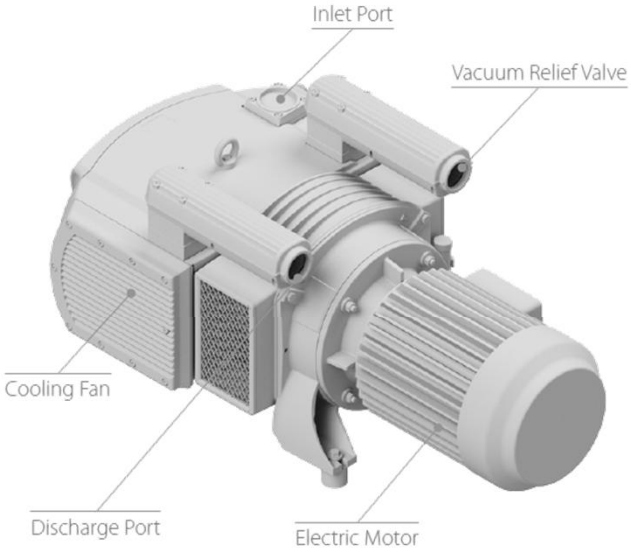




Dry Rotary Vane Vacuum Systems

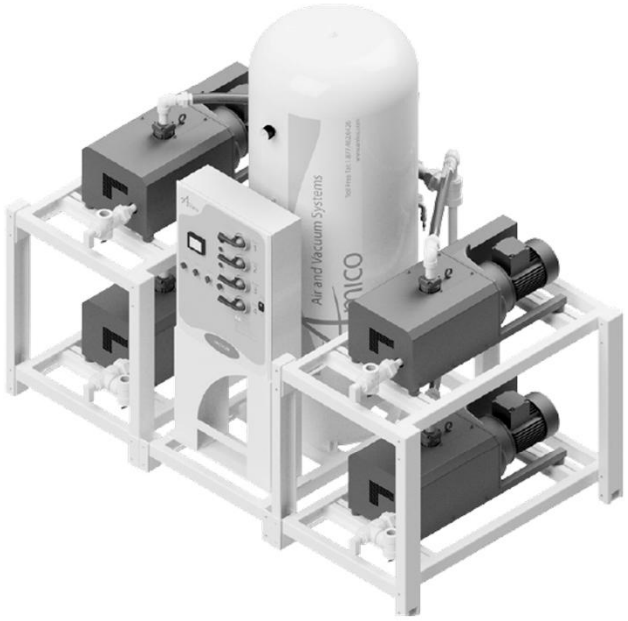
Medical Vacuum Systems

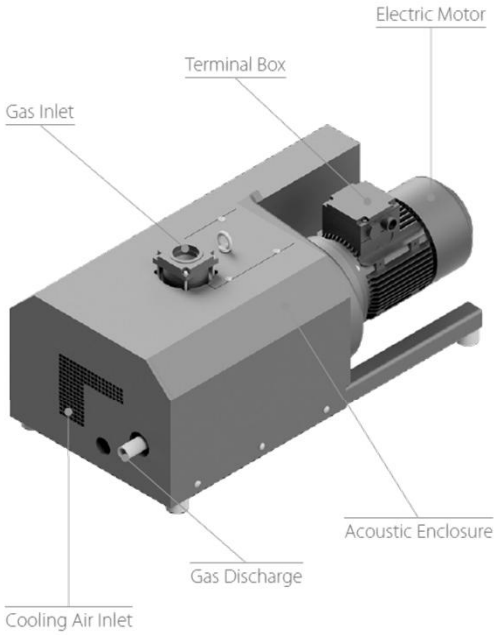




Contact-Less Claw Vacuum Systems

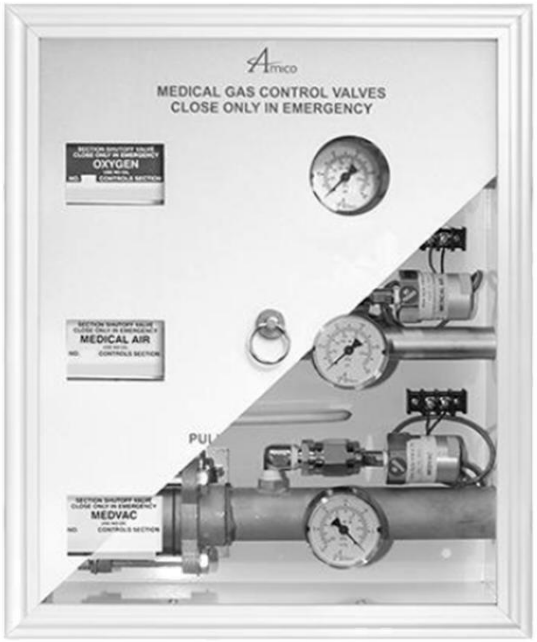
Medical Vacuum Systems





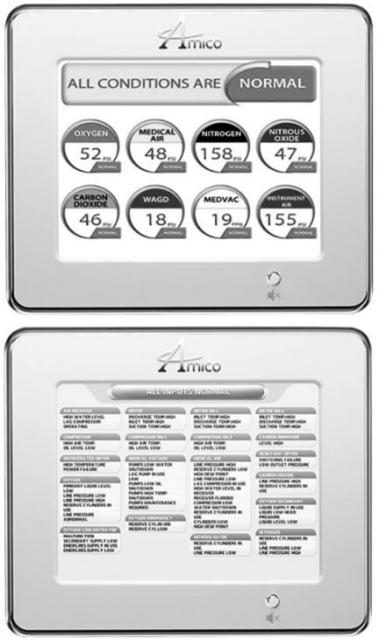
Medical Gas Pipeline Equipment

Valve Assemblies



Medical Gas Outlets/Inlets

Area & Master Alarm Panels



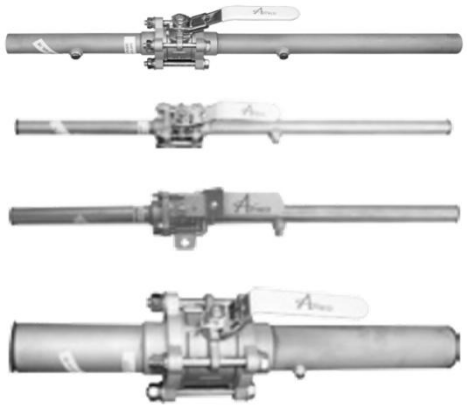
*Also includes gas control panels, pressure sensors, isolation valves, pressure switches, gauges, etc.

Valve Assemblies

Sensor Indicator Panel Combo

Zone Indicator Panel Assembly

Alarm Valve Combo



Isolation Ball Valves with Extension

5.1.4 Valves

5.1.4.8 Zone Valves. All station outlets/inlets shall be supplied through a zone valve as follows:

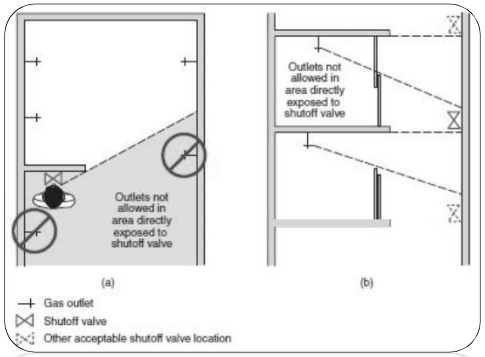
(1) The zone valve shall be placed such that a wall intervenes between the valve and outlets/inlets that it controls.

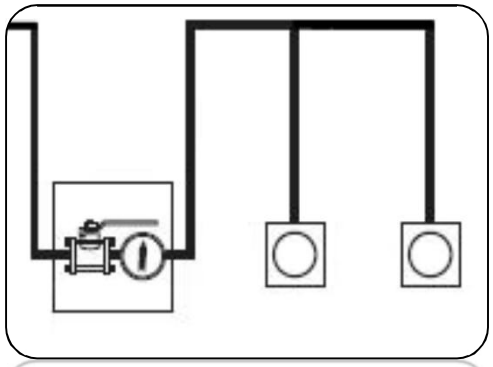
(2) The zone valve shall serve only outlets/inlets located on that same story.

(3) The zone valve shall not be located in a room with station outlets/inlets that it controls.

5.1.5.16 WAGD networks shall provide a WAGD inlet in all locations where nitrous oxide or halogenated anesthetic gas is intended to be administered.

5.1.3.8.3 WAGD Connections to Vacuum Piping. If WAGD is joined to vacuum piping, it shall be connected at a minimum distance of 1.5 m (5 ft) from any vacuum inlet.

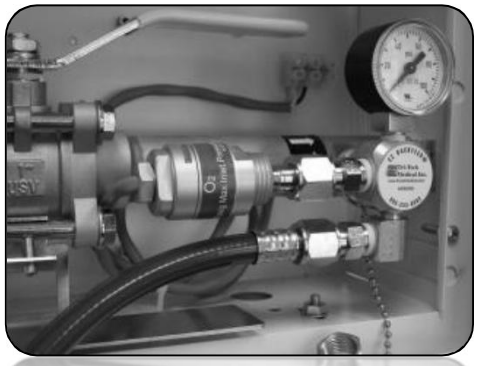




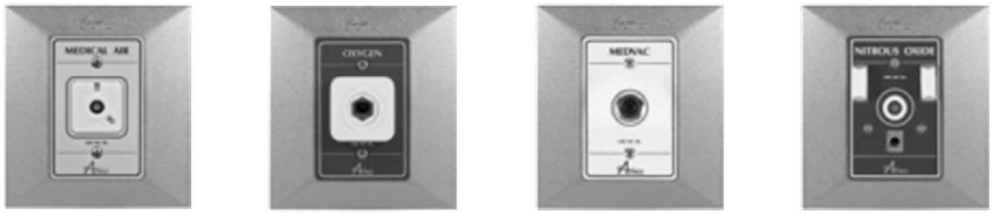
Zone Valves

Benefits:

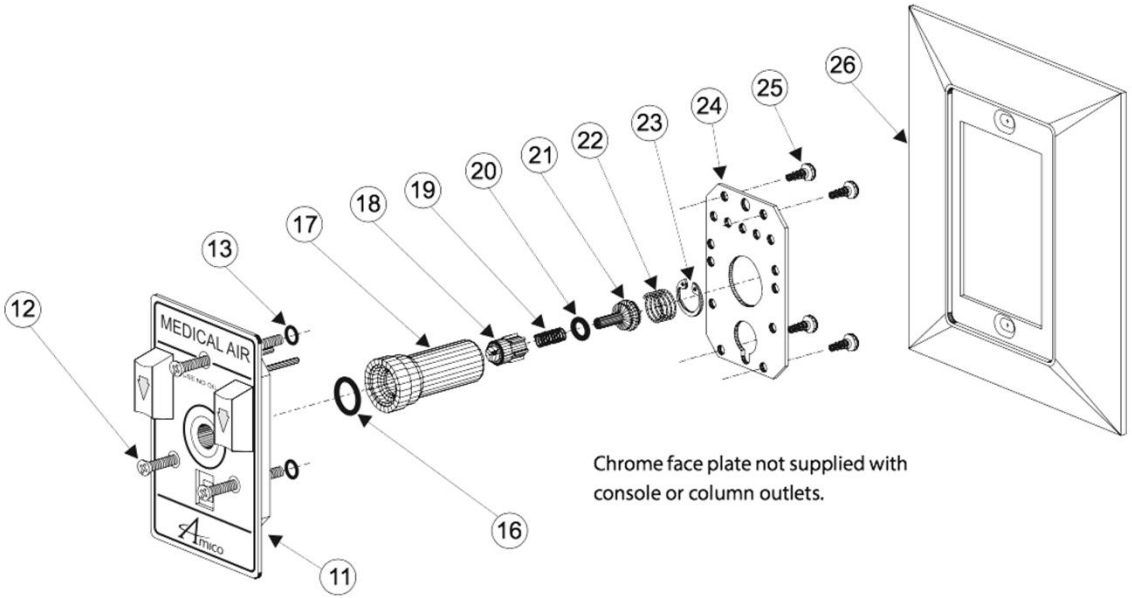
- Safe, fast method for back-feeding medical gases
- Without shutting down the gas supply
- Without disrupting patients
- Easy to locate alarm transducers
- Convenient test location for alarm transducers
- Life-cycle cost savings



Outlets/Inlets



Latch Valve Assembly Chemetron Compatible



Chrome face plate not supplied with console or column outlets.

Warning Systems – Area vs Master

5.1.9.2* Master Alarms. A master alarm system shall be provided to monitor the operation and condition of the source of supply, the reserve source (if any), and the pressure in the main lines of each medical gas and vacuum piping system.

5.1.9.3* Area Alarms. Area alarm panels shall be provided to monitor all medical gas, medical–surgical vacuum, and piped WAGD systems supplying the following:

(1) Anesthetizing locations where moderate sedation, deep sedation, or general anesthesia is administered

(2) Critical care areas

Master Alarm Panel

Area Alarm Panel

Alarm Panels

Cell phone

WiFi

Exact image

Alert-4 LCD Ethernet Area Alarm

Cell phone

WiFi

Exact image

Alert-4 LCD Ethernet Master Alarm

5.1.9 Category 1 Warning Systems

5.1.9.2.1 The master alarm system shall consist of two or more alarm panels located in at least two separate locations, as follows:

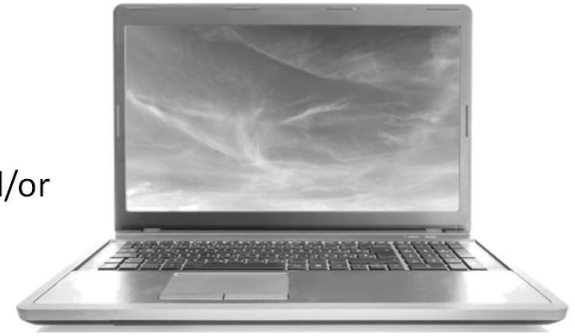
(1) One master alarm panel shall be located in the office or work space of the on-site individual responsible for the maintenance of the medical gas and vacuum piping systems

(2) In order to ensure continuous surveillance of the medical gas and vacuum systems while the facility is in operation, the second master alarm panel shall be located in an area of continuous observation

5.1.9.2.2 A centralized computer system shall be permitted to be substituted for one of the master alarms required in 5.1.9.2.1 if the computer system complies with 5.1.9.4

+

and/or



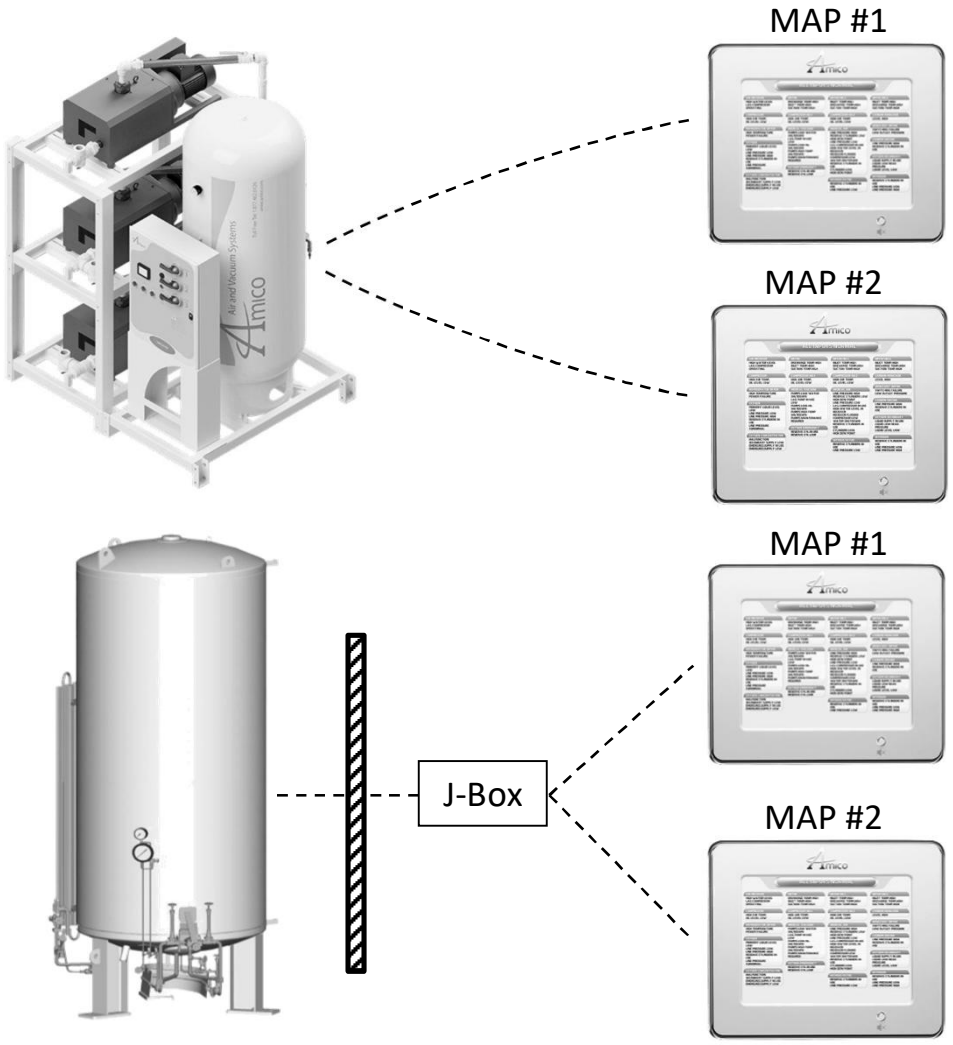
5.1.9 Category 1 Warning Systems

5.1.9.2.3.3 Each set of wires (in whatever number as required by the alarm) shall run to the initiating device(s) without interruption other than in-line splices necessary to complete the necessary length of wire.

5.1.9.2.3.6 Where initiating devices are remote from the building and the wiring is to run underground in compliance with *NFPA 70,* the following exceptions shall be permitted to be used:

(1) Wiring from the initiating device and through the underground section shall be permitted to be run to a junction box located where the wiring first enters the building.

5.1.9.2.3.8 Master alarm signals shall not be relayed from one master alarm panel to another.



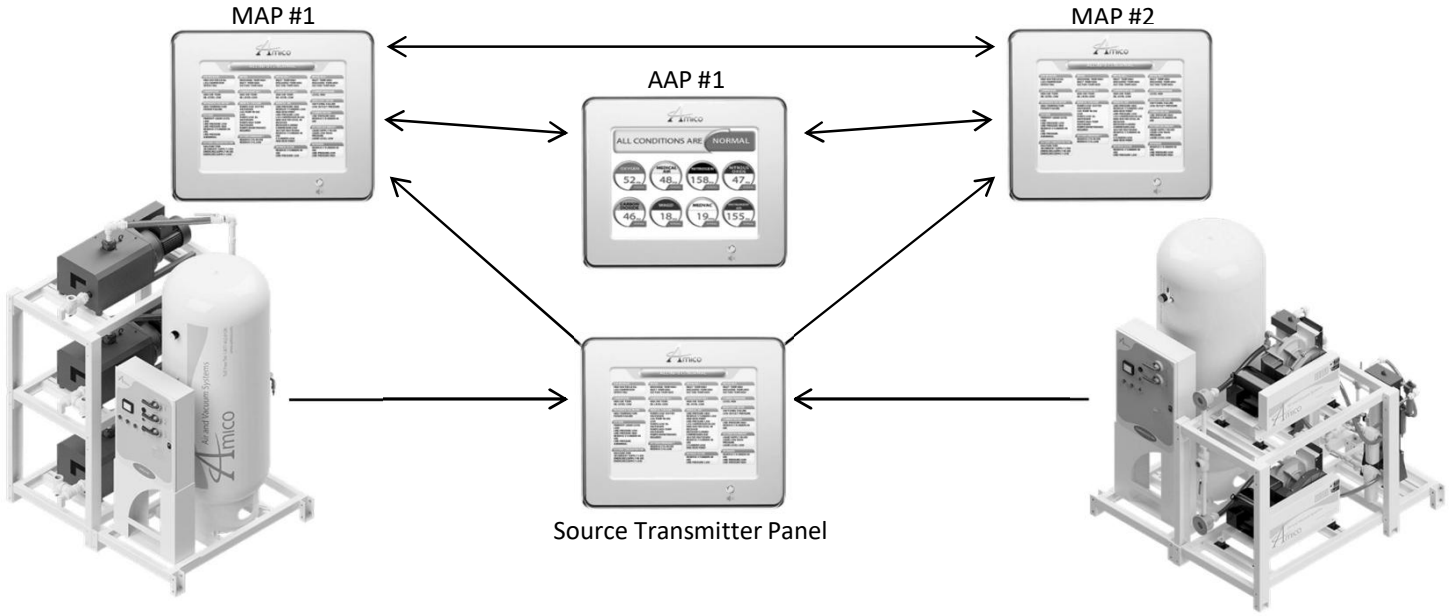
5.1.9 Category 1 Warning Systems

(1999) (2012-2018)

5.1.9.2.3 The master alarm panels required in 5.1.9.2.1 shall ~~be wired~~ **communicate** directly to the alarm-initiating devices that they monitor.

Benefits:

- No overhead low-voltage wiring required
- Wireless transmitters receive reliable signal strength up to ½ mile radius (AAP repeaters optional)
- Exponential redundancy with each repeater



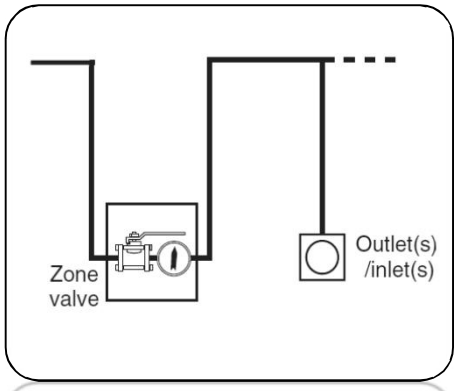
5.1.9 Category 1 Warning Systems

5.1.9.3.4 Alarm sensors for area alarms shall be located as follows:

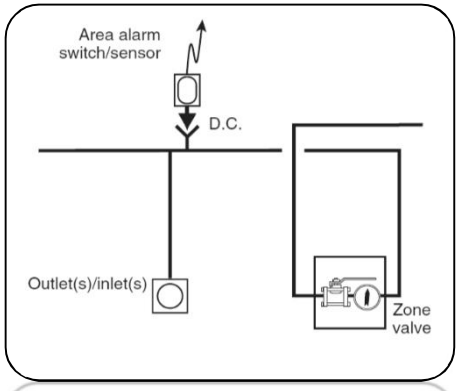
1) Critical care areas shall have the alarm sensors installed on the patient or use side of each individual zone valve box assemblies.

2) Anesthetizing locations where moderate sedation, deep sedation, or general anesthesia is administered shall have the sensors installed either on the source side of any of the individual room zone valve box assemblies or on the patient or use side of each of the individual zone valve box assemblies.

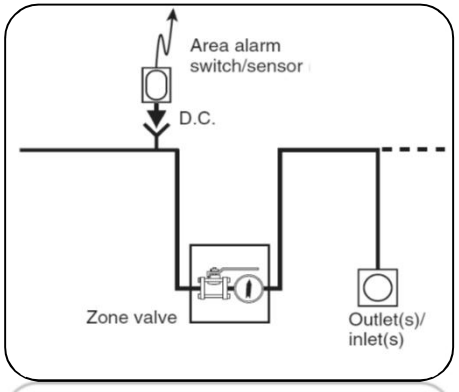
Non-Critical Care Areas



Critical Care Areas



Anesthetizing Locations



Pipeline Distribution Materials

5.1.10.3 Joints.

5.1.10.3.1* Positive pressure patient gas systems, medical support gas systems, vacuum systems, and WAGD systems constructed of hard-drawn seamless copper or stainless steel tubing shall have all turns, offsets, and other changes in direction made using fittings or techniques appropriate to any of the following acceptable joining methods:

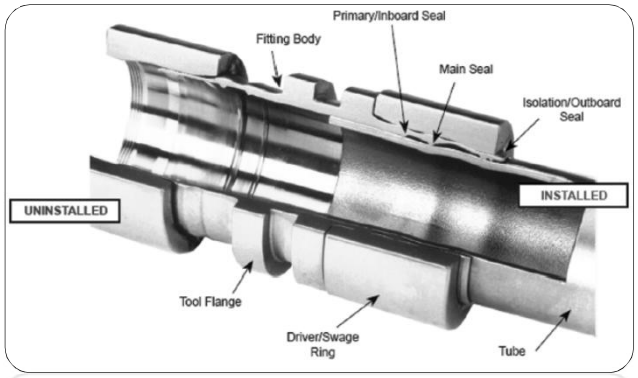
(1) Brazing, as described in 5.1.10.4

(2) Welding, as described in 5.1.10.5

(3) Memory metal fittings, as described in 5.1.10.6

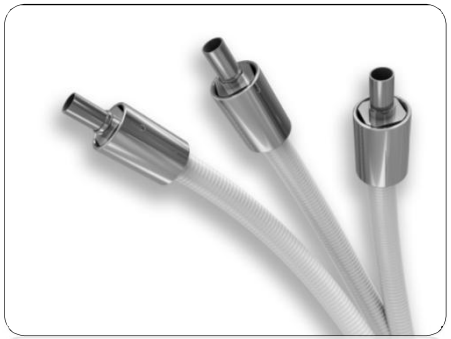
(4) Axially swaged, elastic preload fittings, as described in 5.1.10.7

(5) Threaded, as described in 5.1.10.8



Pipeline Distribution Materials

- Positive Pressure Systems **(5.1.10.1)**
    - ASTM B88 (Type K or L for High Pressure)
    - CMT (Corrugated Metal Tube - 2018)
- Vacuum/WAGD Systems **(5.1.10.2)**
    - ASTM B88 (Type K, L or M Copper)
    - ASTM B280 (ACR Copper)
    - ASTM B819 (Type K or L Copper)
    - ASTM A269/A269M, TP304L or 316L (Stainless Steel)
    - ASTM A312/A312M, TP304L or 316L (Stainless Steel)
    - A312 TP 304L/316L Schedule 5S & A403 WP304L/316L (Stainless Steel)
    - CMT (Corrugated Metal Tube - 2018)



Labeling

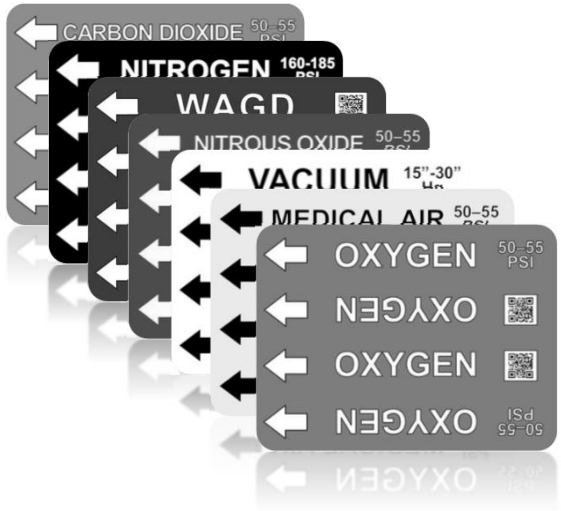
EC.02.05.09 – EP5: The hospital makes main supply valves and area shutoff valves for piped medical gas and vacuum systems accessible and clearly identifies what the valves control.

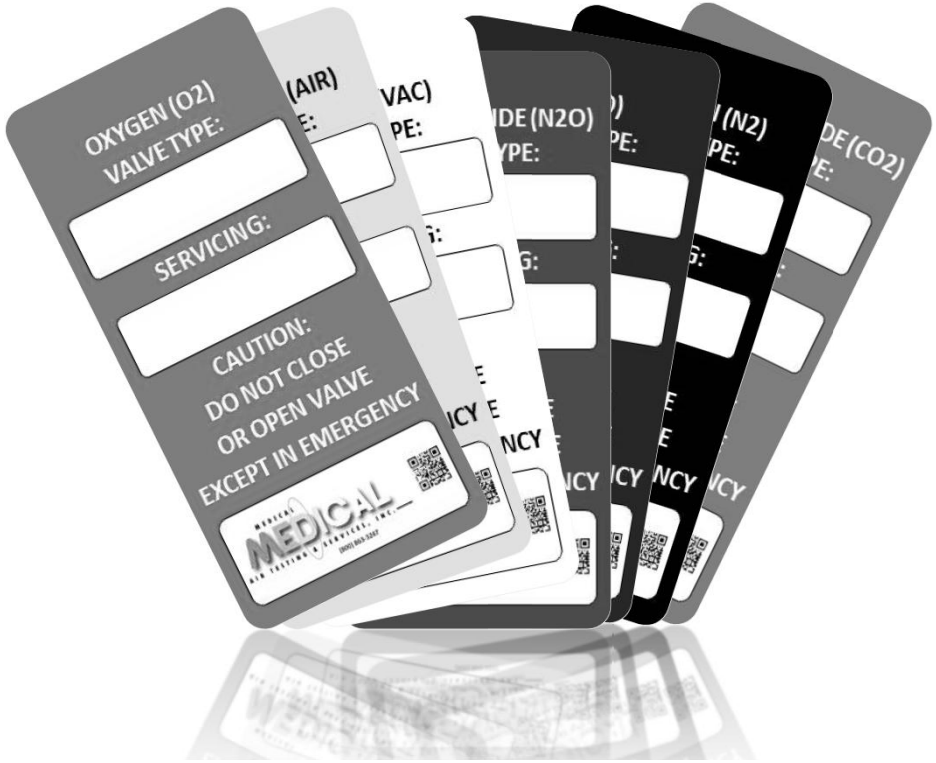
NFPA 99, 2012 - 5.1.11.2.1 Shutoff valves shall be identified with the following:

(1) Name or chemical symbol for the specific medical gas or vacuum system

(2) Room or areas served

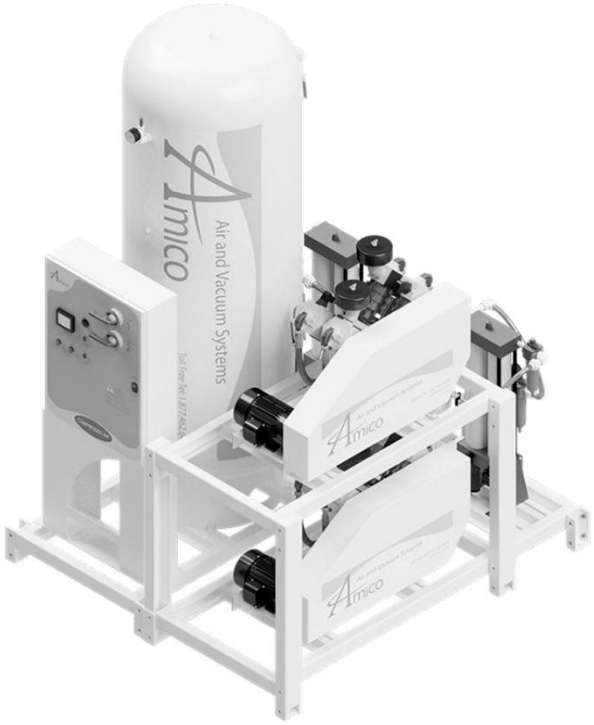
(3) Caution to not close or open the valve except in emergency





Support Gas Systems

5.1.3.5.3 Support Gases. Central supply systems for support gases shall not be piped to, or used for, any purpose except medical support application.



5.1.3.9 Instrument Air Supply Systems

5.1.3.9.2.1 Instrument air shall be permitted to be used for any medical support purpose (e.g., to remove excess moisture from instruments before further processing, or to operate medical–surgical tools, air-driven booms, pendants, or similar applications) and, if appropriate to the procedures, to be used in laboratories.

5.1.13.3.4.5 Instrument air compressors shall be permitted to be of any type capable of the output pressure needed for the intended line pressure see Table 5.1.11, and of providing air meeting the definition of instrument air in 5.1.13.3.4.1

NFPA 99, 2018

5.1.14.2.2.5 Qualifications. Persons maintaining these systems shall be qualified to perform these operations. Appropriate qualification shall be demonstrated by any of the following:

1) A documented training program acceptable to the health care facility by which such persons are employed or contracted to work with specific equipment as installed in that facility

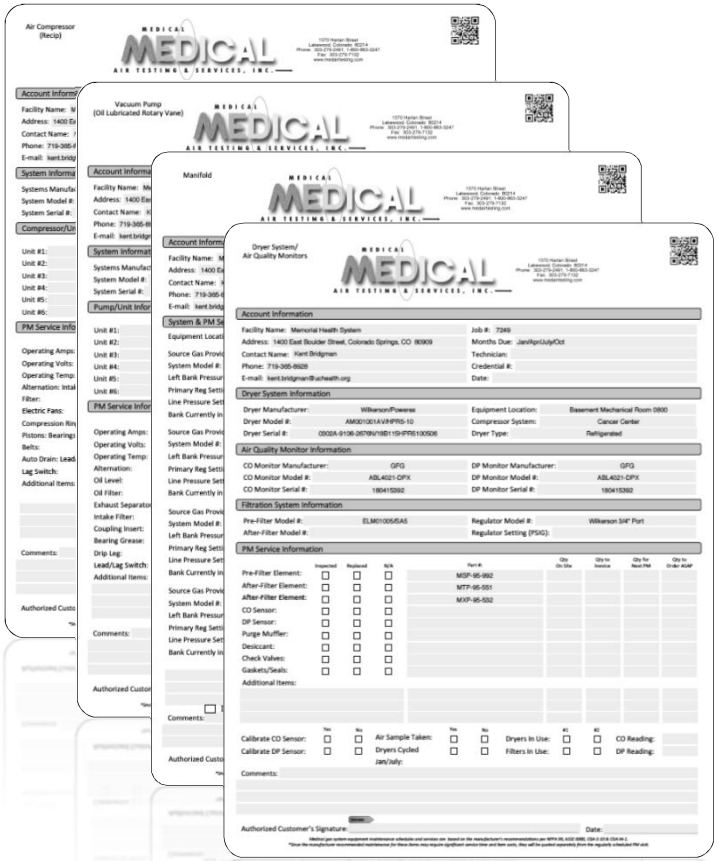
2) Credentialing to the requirements of ASSE 6040, Professional Qualification Standard for Medical Gas Maintenance Personnel

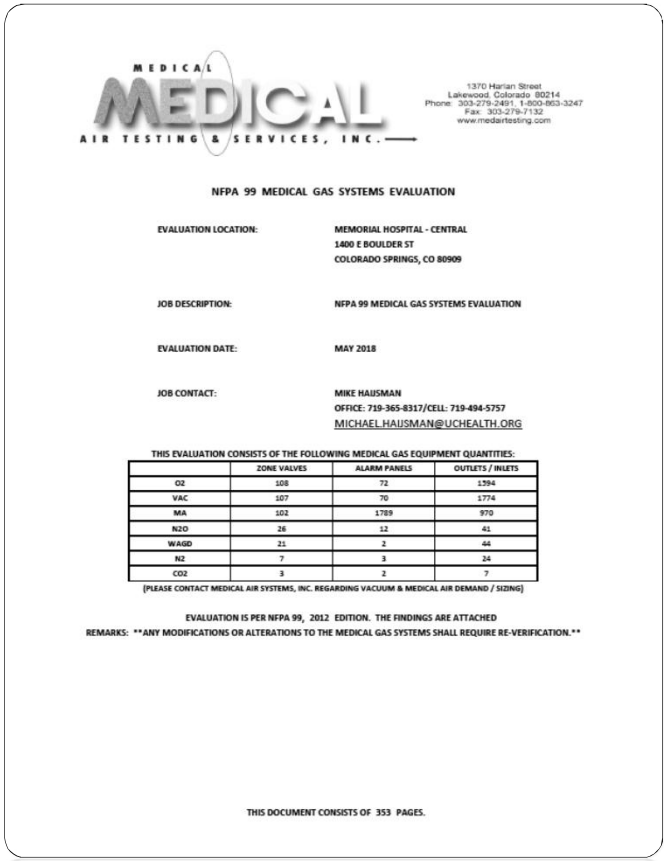
3) Credentialing to the requirements of ASSE 6030, Professional Qualification Standard for Medical Gas Systems Verifiers

Documentation & Record Keeping

5.1.14 – Operations & Management

5.1.15 – Maintenance





MEDICAL AIR TESTING & SERVICES, INC.

1370 Harlan Street
Lakewood, Colorado 80214
Phone: 303-279-2491, 1-800-863-3247
Fax: 303-279-7132
www.mediairtesting.com

NFPA 99 MEDICAL GAS SYSTEMS EVALUATION

EVALUATION LOCATION:	**MEMORIAL HOSPITAL - CENTRAL** **1400 E BOULDER ST** **COLORADO SPRINGS, CO 80909**
JOB DESCRIPTION:	**NFPA 99 MEDICAL GAS SYSTEMS EVALUATION**
EVALUATION DATE:	**MAY 2018**
JOB CONTACT:	**MIKE HAUSMAN** **OFFICE: 719-365-8317/CELL: 719-494-5757** MICHAEL.HAUSMAN@UCHEALTH.ORG

THIS EVALUATION CONSISTS OF THE FOLLOWING MEDICAL GAS EQUIPMENT QUANTITIES:

	ZONE VALVES	ALARM PANELS	OUTLETS / INLETS
O2	108	72	1594
VAC	107	70	1774
MA	102	1789	970
N2O	26	12	41
WAGD	21	2	44
N2	7	3	24
CO2	3	2	7

(PLEASE CONTACT MEDICAL AIR SYSTEMS, INC. REGARDING VACUUM & MEDICAL AIR DEMAND / SIZING)

EVALUATION IS PER NFPA 99, 2012 EDITION. THE FINDINGS ARE ATTACHED
REMARKS: **ANY MODIFICATIONS OR ALTERATIONS TO THE MEDICAL GAS SYSTEMS SHALL REQUIRE RE-VERIFICATION.**

THIS DOCUMENT CONSISTS OF 353 PAGES.

Chapter 15 Dental Gas and Vacuum Systems (2018)

15.1.1 Category 1 dental piped gas and piped vacuum system requirements shall be applied in facilities where general anesthesia and deep sedation is performed, as defined in 3.3.65.1 and 3.3.65.2

15.1.2 Category 2 dental piped gas and piped vacuum system requirements shall be applied in facilities where only moderate and minimal sedation is performed, as defined in 3.3.65.3 and 3.3.65.4

15.1.3 Category 3 dental piped gas and piped vacuum system requirements shall be applied in facilities where minimal or no sedation is performed, as defined in 3.3.65.4

NFPA 99, 2012-2018 Updates

February 13th, 2019