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Overview of Medical Gas Alarms and Zone Valve Box Placement

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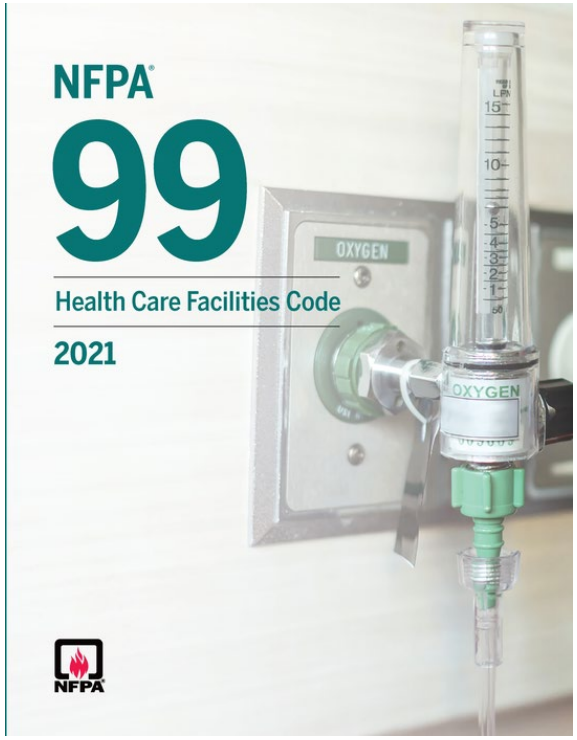

Design Assist & Value Engineering Services

NFPA 99: Health Care Facilities –

Complete rules for the safe application of electrical systems, gas and vacuum systems, and environmental systems, along with materials and emergency management practices.

The 2021 edition has the most recent developments in medical equipment and processes as well as new methods to reduce fire, explosion, and electrical hazards.

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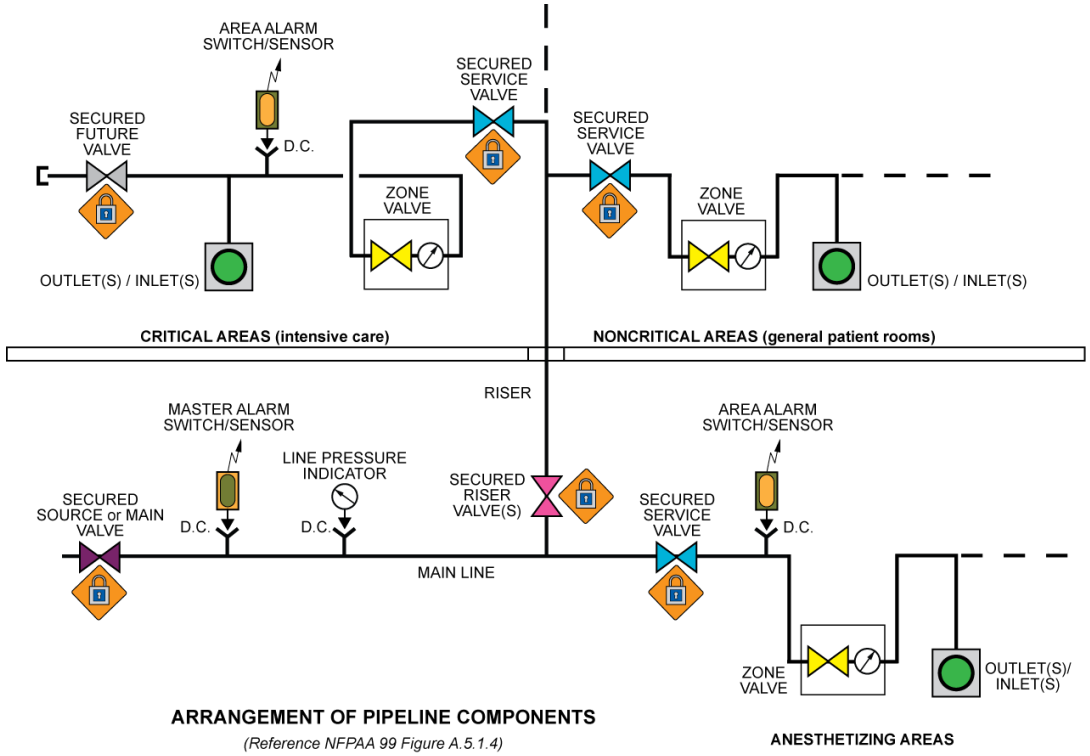
Valves (5.1.4)

Source Valves- required at the source equipment to isolate it.

Main Line Valves –if the source equipment is located outside the facility, this is required on the line as it immediately enters the building.

Riser Valves- required on the riser adjacent to the main line.

Service/Floor Valves-required off branch of the riser.



ARRANGEMENT OF PIPELINE COMPONENTS

(Reference NFPAA 99 Figure A.5.1.4)

Zone Valve Boxes (5.1.4.6)

A zone valve is a shut off valve for the zone/ area it serves with its fundamental purpose being fire control.

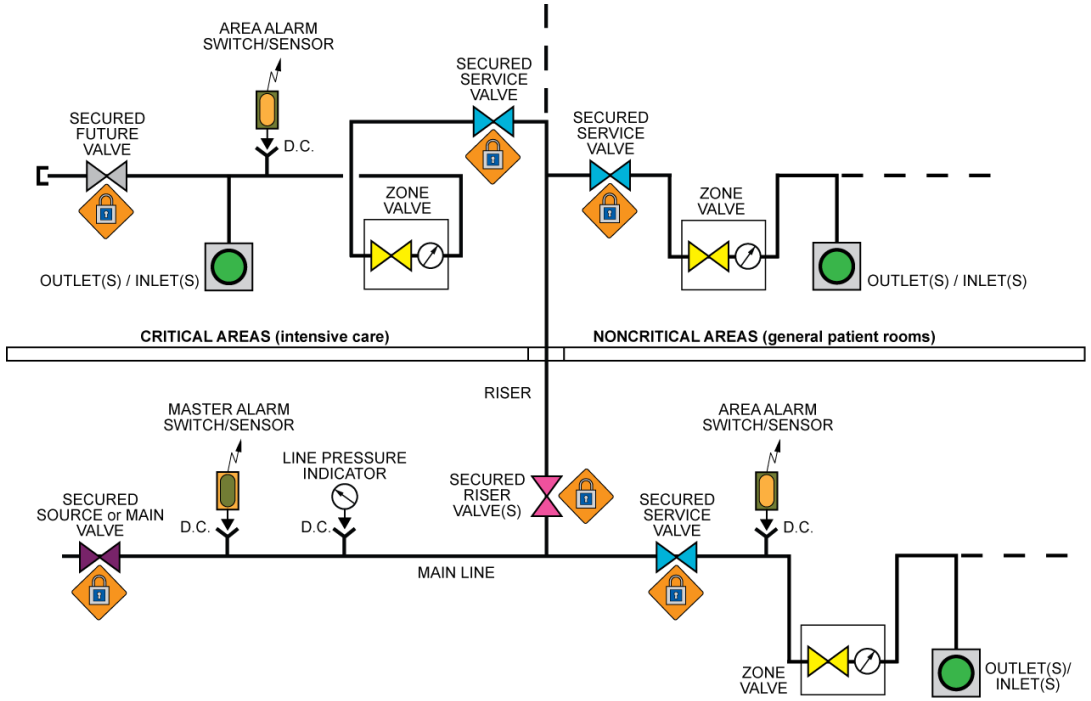
ALL medical gas outlets must be covered by a ZVB on the same floor they serve.

A ZVB shall not be located in a room with the outlets it controls.

A wall shall intervene between the ZVB and the outlets it controls.

A ZVB needs to be available to the floor staff with a removable cover, so that it is visible and accessible at all times, and readily operable at a standing position.

A ZVB shall not be hidden behind an open door, or in closed/locked rooms or areas.



ARRANGEMENT OF PIPELINE COMPONENTS

(Reference NFPAA 99 Figure A.5.1.4)

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Zone Valve Boxes

Placement should be in a logical exit corridor.

Placement needs proper wall space.

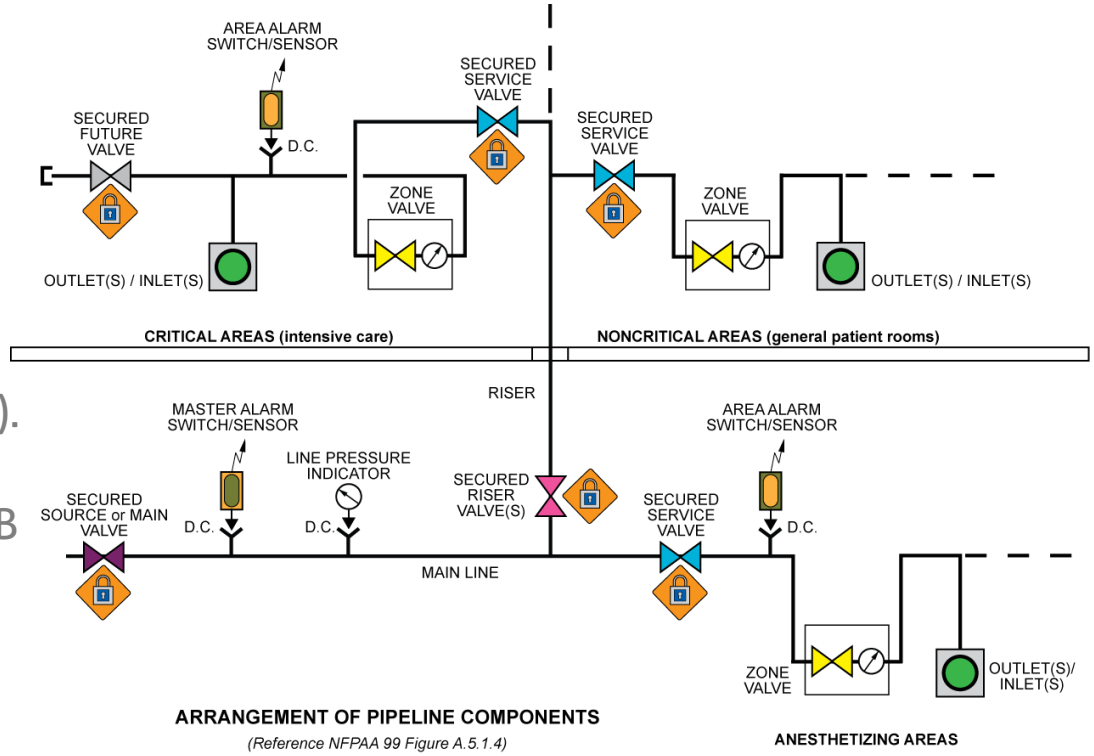
Labeled to include which area it serves.

Piped left to right (source side to patient side).

Can not be placed downstream of another ZVB (in series).

Any critical care, life support, and anesthetizing location needs its own ZVB; although an ICU area may have 1 shared ZVB.

Patient room areas should be broken up with what makes the most sense.



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Zone Valve Boxes

Pattons Medical Zone Valve Box:

•Can be configured to hold 1 to 7 zone valves with tube extensions.

•Consists of a pull-out, removable opaque window.

•Large, color-coded gas identification labels provided.

•Provided with 2 adjustable steel brackets for mounting to structural support.

•2" Single Valves available in 4" depth box.

•Currently Pattons Medical only offers in horizontal configuration with brazed connections (5.1.10).

ALARMS (5.1.9)

There are three types of medical gas alarms:

- Local Alarm
- Master Alarm Panel (MAP)
- Area Alarm Panel (AAP)

LOCAL ALARMS

Local to the source equipment on the control panel.

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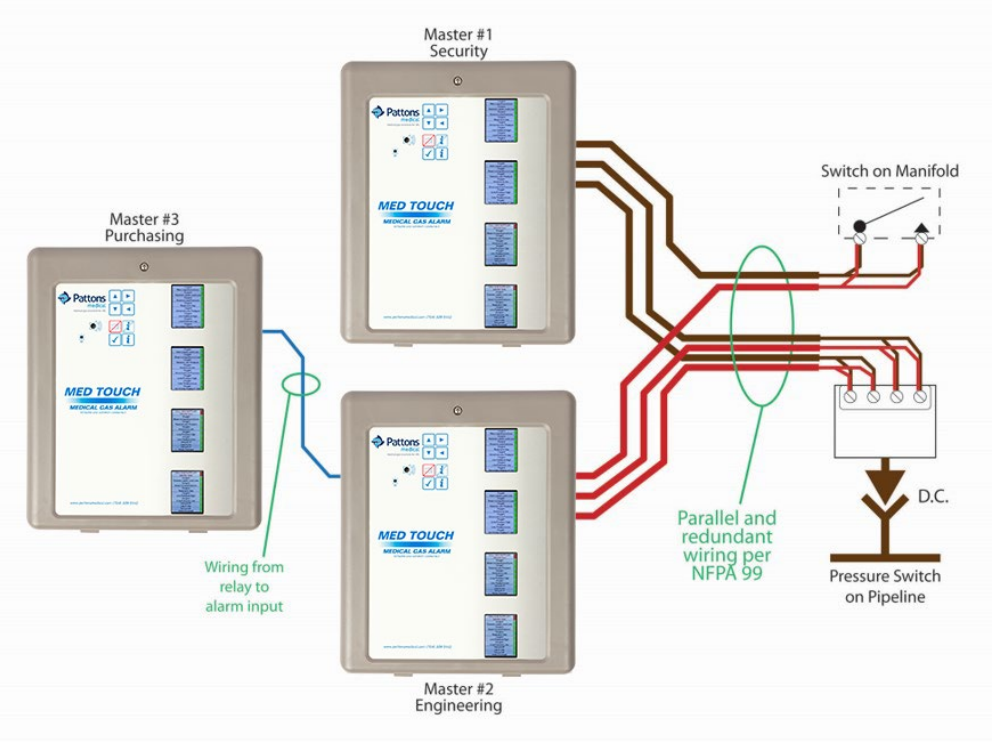
ALARMS – Master Alarm Panels (MAP)

•Monitors source equipment only.

•Wires run from source cabinets and main line switches in parallel to TWO MAPs (for Cat 1 facilities).

•1 in the office of the person responsible for the med gas equipment and 1 in a 24 hour location or wherever staff will be present when the facility is open.



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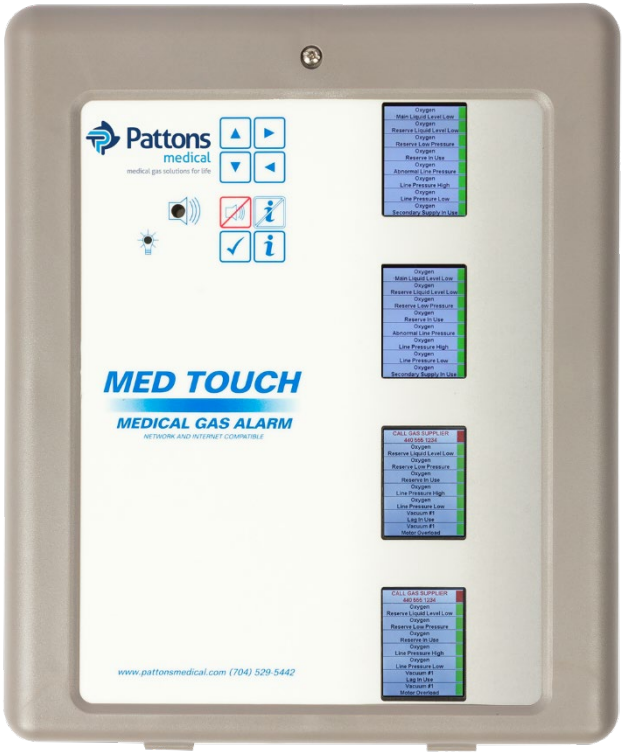
Master Alarm Panels

- High/Low pressure switches shall be installed immediately downstream/patient side of the source valve.
  - Note: If "Main Line" valve is required, pressure switches and gauges shall be installed downstream/patient side of the Main Line valve
- Main line gauges required adjacent to pressure switches.
- Alarm wiring shall be a minimum of 22 AWG.
- Power shall be from the life safety branch of the emergency electrical system.
- Ethernet capable.



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Master Alarm Panel Points

Typical points per equipment: (5.1.9.2.4)

Medical Air Points

- High Pressure
- Low Pressure
- Dew Point Alarm
- Lag in Use
- System Fault

Medical Vacuum Points:

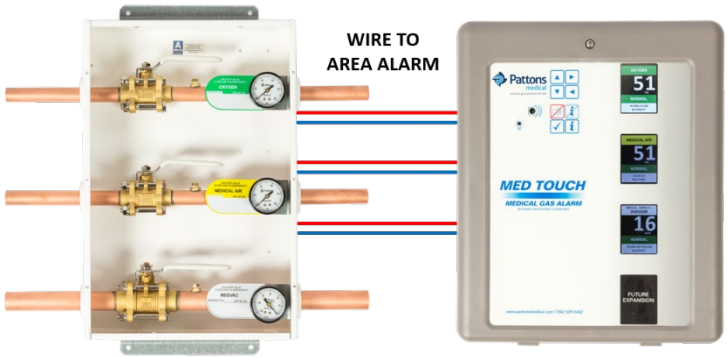
- Low Vac
- Lag in Use

HP Manifolds:

- High Pressure
- Low Pressure
- Reserve in Use/Changeover

ALARMS – What is an Area Alarm Panel (AAP)

- Monitors the pressure or vacuum of the area/zone for which it serves.
- Shall be located in the area of the person responsible for that area (ex. RN stations).
- Labeled for area served.
- Sensors shall be located to permit access for testing.
- Alarm wiring shall be a minimum of 22 AWG.
- Power shall be from the life safety branch of the emergency electrical system.
- An AAP does not communicate with a MAP.
- Ethernet capable.



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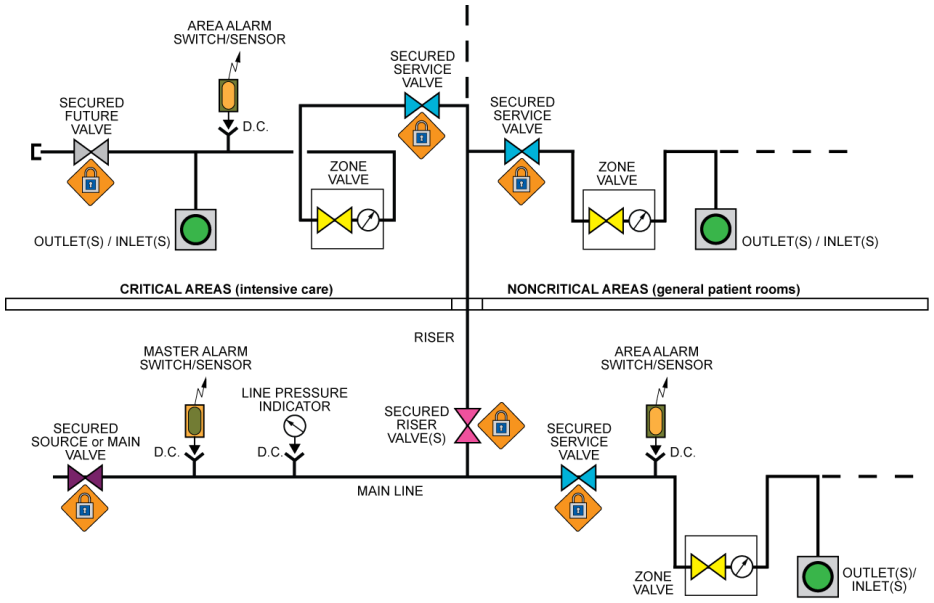
Where is an AAP required?

An AAP is required in any anesthetizing location where moderate sedation, deep sedation, or general anesthesia is being administered and any critical care areas. Any zone or area may have an AAP.

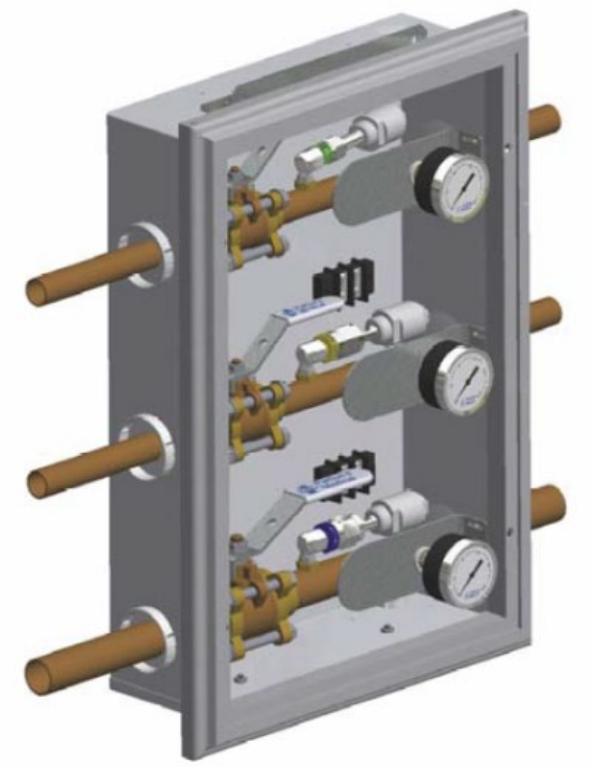
•Typically, the sensor is placed on the patient side of the ZVB to monitor any pressure/vacuum change for that area.

•Code allows an OR/anesthetizing suite to have 1 AAP and the sensor would be placed on the source side of the ZVBs.



ARRANGEMENT OF PIPELINE COMPONENTS

(Reference NFPAA 99 Figure A.5.1.4)



Where are the sensors placed?

Sensor Placement:

- In alarm panel (local)
- In ceiling on pipe to be wired back to panel (remote)
- In ZVB and wired back to panel (ZVB with sensor provision)

ZVB/AAP Combo

The sensor and alarm included in the ZVB.

•Puts the area alarm in a hallway and not necessarily at a RN station.

•Not a great fir for an ASC or hospital as it's an expensive application.

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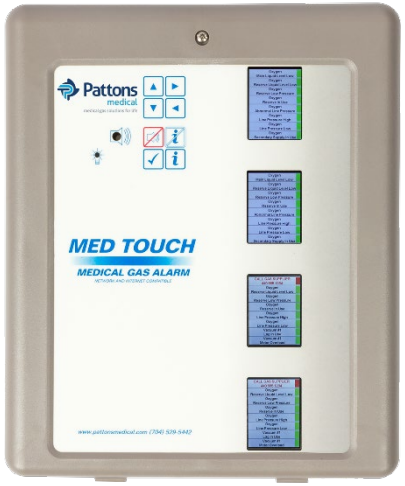
Master + Area = Combo Alarms

AAP Alarm

Combo MAP/AAP



MAP

Q&A

Please submit questions in the "Questions" field box.

Thank You

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