PROCESS INDUSTRY PRACTICES

TECHNICAL REVISION
December 2023

Process Control

PIP PCCA001
Fixed Gas Detection Design Criteria

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

This Practice has been prepared by harmonizing technical requirements from existing standards of major industrial operators, contractors, and standards development organizations. While this Practice is intended to incorporate the majority of requirements, individual applications may have requirements which take precedence over this Practice. Determinations concerning fitness for purpose or application of this Practice to specific project or engineering situations should not be made solely on information contained in this Practice. All Practices are intended to be consistent with applicable laws and regulations. Should this Practice conflict with applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by this Practice.

Use of trade names should not be viewed as an expression of preference. Other brands having the same specifications are equally correct and may be substituted for those named.

This Practice is subject to revision at any time. For more information refer to PIP ADG001, *Specification for Developing Practices*.

Process Industry Practices
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1. Scope

This Practice provides design criteria for fixed gas detectors installed in process areas to detect the presence of combustible, oxygen, or toxic gases. This Practice addresses combustible, oxygen, and toxic gas detectors permanently installed for ambient air monitoring (e.g., leak detection, oxygen depletion). The technologies included are catalytic bead, infrared, and electrochemical.

This Practice does not cover portable gas monitoring equipment, process analyzers, or sampling systems. The systems used to perform data acquisition, alarming, and control action are not covered by this Practice because the solutions are diverse and can include stand-alone to advanced multisystem configurations.

2. References

Applicable parts of the following Practices and industry codes and standards shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Process Industry Practices (PIP)

- PIP PCCA001-D - *Fixed Gas Detector Data Sheet* (included with this Practice)
- PIP PCEA001 - *Fixed Gas Detection Guidelines*

2.2 Industry Codes and Standards

- The Instrumentation International Society of Automation (ISA)
  - ANSI/ISA 92.00.01 - *Performance Requirements for Toxic Gas Detectors*
  - ANSI/ISA 92.00.02 - *Installation, Operation, and Maintenance of Toxic Gas Instruments*

3. Definitions

CSA: Canadian Standards Association

fixed gas detector: An integral device that consists of a sensor to sense the target gas, electronics to determine the concentration and provide analog, digital, and/or discrete outputs, and may have a local display

FM: Factory Mutual

LEL: Lower explosive limit, which is the minimum concentration of a gas in a gas/air mixture at which the mixture will explode if exposed to an ignition source

NRTL: Nationally Recognized Testing Laboratories

owner: Party who owns the facility wherein fixed gas detection will be used

UL: Underwriters Laboratory