PROCESS INDUSTRY PRACTICES

TECHNICAL REVISION
July 2022

Process Control

PIP PCCFL001
Flow Measurement Design Criteria

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other 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 the Practice.

This Practice is subject to revision at any time.

PUBLISHING HISTORY

June 1998	*Issued*	*July 2022*	*Technical Revision*
August 2006	*Complete Revision*		
October 2015	*Complete Revision*		

Not printed with State funds

PIP PCCFL001
Flow Measurement Design Criteria

Table of Contents

Tables

1. Scope

This Practice describes the design requirements for flow measurement systems that include head (differential pressure), velocity, oscillatory, electromagnetic and mass flow meters.

This Practice does not cover:

a. Restriction flow elements and flow switches

b. Process isolation (root) valves, secondary transmitters, or process piping

c. Custody transfer measurement requirements

2. References

Applicable parts of the following Practices, industry codes and standards and references 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 PCCGN001 - *General Instrument Design Basis*

– PIP PCCGN002 - *General Instrument Installation Criteria*

– PIP PCIDP000 - *Differential Pressure Installation Details*

– PIP PNF0200 - *Vents, Drains, and Instrument Connection Details*

2.2 Industry Codes and Standards

- American Gas Association (AGA)
- American National Standards Institute (ANSI)
  – ANSI-2530/API 14.3/AGA-3/GPA-8185 - *Natural Gas Fluids Measurement - Concentric, Square-Edged Orifice Meters*
    Part 1 General Equations and Uncertainty Guidelines
    Part 2 Specification and Installation Requirements
    Part 3 Natural Gas Applications
    Part 4 Background, Development, Implementation Procedures and Subroutine Documentation
- American Petroleum Institute (API)
  – API *Manual of Petroleum Measurement Standards* (MPMS):
  Chapter 5 - Metering
  5.2 Measurement of Liquid Hydrocarbons by Displacement Meters
  5.3 Measurement of Liquid Hydrocarbons by Turbine Meters
- American Society of Mechanical Engineers (ASME)
  – ASME B16.36 - *Orifice Flanges*
  – ASME MFC-3M - *Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi*