PROCESS INDUSTRY PRACTICES

TECHNICAL REVISION
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Process Control

PIP PCSPS010
Small, General Purpose Packaged Equipment Instrumentation Specification

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

July 2002	*Issued*
March 2008	*Complete Revision*
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August 2017	*Technical Revision*

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Data Form

PCSPS010D – Small, General Purpose Packaged Equipment Instrumentation Data Sheet

1. Scope

This Practice provides the minimum requirements for the performance, design, fabrication, testing, and inspection of instrumentation and control systems installed on small, general purpose packaged equipment units.

This Practice is not intended for packaged analyzers systems or for safety-instrumented systems (SIS). For instrumentation associated with larger, more complex equipment packages, see *PIP PCSPS001*.

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 PCTPS001 - *Packaged Equipment Instrumentation Inspection and Testing Requirements Data Sheet*
- PIP PCDPS001-R - *Packaged Equipment Instrumentation Documentation Requirements Sheet*
- PIP PCSPS010-D – *Small General Purpose Packaged Equipment Instrumentation*
- PIP PCSPS001 – *Packaged Equipment Instrumentation Specification*

2.2 Industry Codes and Standards

- American Petroleum Institute (API)
  - API RP 520 - *Sizing, Selection and Installation of Pressure-Relieving Devices*
  - API RP 576 - *Inspection of Pressure Relieving Devices*
  - API 598 - *Valve Inspection and Testing*
- American Society of Mechanical Engineers (ASME)
  - *ASME Boiler and Pressure Vessel Code*
    - *Section* I - *Rules for Construction of Power Boilers*
    - *Section IV - Rules for Construction of Heating-Boilers*
    - *Section VIII - Rules for construction of Pressure Vessels*
- Fluid Controls Institute (FCI)
  - FCI/ANSI 70-2 - *Quality Control Standard for Control Valve Seat Leakage*
- National Fire Protection Association (NFPA)
  - NFPA 70 - *National Electrical Code* (*NEC*)

3. Requirements

3.1 Instrument Selection and Installation

3.1.1 All instruments shall be provided with permanently attached stainless steel tags engraved with customers tag numbers.

3.1.2 All instruments shall be installed according to the Manufacturer's instructions in addition to the requirements stated herein.

3.1.3 The entire instrumentation system shall be fully assembled, wired and piped.

Comment: Some components may be removed prior to shipment.

3.1.4 All instruments shall be installed so that they are easily accessible for operation, maintenance and inspection. They shall not be located under grating or in any place or manner that would make it difficult or dangerous for personnel to inspect or work on them during operation or shutdown.

3.1.5 Instruments that are connected to the process shall have a primary isolation (root) block valve to permit safe maintenance while equipment is operating.

3.1.6 Process instruments that are not line mounted shall have a secondary isolating valve and bleeder valve or manifold at the instrument.

3.1.7 Instrument primary isolation (root) block valves shall be in accordance with the applicable piping specification.

3.1.8 Instruments shall be located and installed such that accuracy and reliability are not impaired by vibration, pulsation, temperature, or contamination.

3.1.9 Length of impulse lines connected to process pipelines or equipment shall be minimized. Impulse lines shall be supported and protected.

3.1.10 Process transmitters shall be used preferentially to process switches (e.g., level, flow, pressure, temperature, etc.). Use of switches shall be approved by owner.

3.1.11 Transmitter outputs shall be owner specified in accordance with *PIP PCSPS010-D*.

3.1.12 Normal operating pressure for transmitters shall be between 30% and 70% of scale range.

3.1.13 Pressure instruments in steam, liquid, liquid-sealed, and condensing services shall be located below process connections, and impulse tubing/piping shall slope continuously down to instruments.

3.1.14 Pressure instruments in gas and vapor services shall be located above process connections, and impulse tubing/piping shall slope continuously up to instruments.

3.1.15 Process tubing to instrumentation shall be 1/2-inch OD minimum (outside diameter), 316 stainless steel, with 0.049-in. minimum wall thickness, or other compatible material as specified in the datasheet *PIP PCSPS010-D*.

3.1.16 Instrument supports shall be designed and installed in such a way to avoid strain on equipment, piping connections, and instruments, and shall allow for flexibility required for thermal expansion of equipment and piping.