



PROCESS
INDUSTRY
PRACTICES

TECHNICAL CORRECTION
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Electrical

**PIP ELEGS01
Grounding and Bonding
Guideline**

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.

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1. Scope

This Practice addresses the reasons and methods for the grounding and bonding of electrical systems and equipment within a process industry environment. IEEE, NEMA, and UL documents form the basis of this guideline. IEC methods and terminology are not addressed in this guideline.

This Practice addresses system voltages through 34.5 kV. Refer to the requirements of *IEEE Std. 80* for grounding of system voltages above 34.5 kV.

This Practice does not address the grounding of DC systems as covered by *IEEE Std. 142*, uninterruptible power systems as covered in *IEEE Std. 142*, or temporary protective grounding associated with *NFPA 70E*. Refer to *PIP ELEGL05* for lightning and static protective systems.

This Practice does not address the grounding of instrumentation systems and electronic equipment. Section 4.2.3 of this Practice and *PIP ELEGS01-F* can aid in the installation of the grounding electrode system associated with instrument systems and electronic equipment.

This Practice does not cover installation methods for grounding and bonding systems. These installation methods are addressed in *PIP ELIGD000* and industry standards such as *NFPA 70*, *UL 647*, and *IEC* documents.

Figures are provided as diagrammatical representations of grounding connections and not intended to represent actual field termination connections.

2. References

Applicable parts of the following Practices, industry codes and standards, and publications 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 ELCGL01 – *Electrical Design Criteria*
- PIP ELEGL05 – *Lightning and Static Protection Guideline*
- PIP ELEGS01-F – *Grounding and Bonding Calculations*
- PIP ELIGD000 – *Grounding Installation Details*

2.2 Industry Codes, Standards, and Publications

- Institute of Electrical and Electronic Engineers (IEEE)
 - IEEE Std 80 - *Guide for Safety in AC Substation Grounding*
 - IEEE Std 81 - *Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System*
 - IEEE Std 142 - *Recommended Practice for Grounding of Industrial and Commercial Power Systems (Green Book)*