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IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment—General, Testing, Marking, and Documentation Requirements

IEEE Industry Applications Society

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IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment—General, Testing, Marking, and Documentation Requirements

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Abstract: The general requirements, testing, markings, and documentation for impedance heating systems for pipes and equipment intended for use in general industrial applications are provided in this standard. This standard provides requirements when utilizing impedance heating systems in ordinary as well as hazardous areas having explosive atmospheres.

Keywords: condensation prevention, heating systems, IEEE 844.3, CSA C22.2 No. 293.3, process heating, freeze protection and temperature maintenance, re-melting solidified fluids, impedance heating, thermal insulation

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IEEE Introduction

This introduction is not part of IEEE Std 844.3-2019/CSA C22.2 293.3:19, IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment—General, Testing, Marking, and Documentation Requirements.

Impedance heating systems have been used for a number of years in the industry. Impedance heating of pipes and equipment in petrochemical as well as other industries is a portion of total heating requirements.

This standard should be read in conjunction with IEEE Std 844.4™/CSA C293.4, IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment-Application Guide for Design, Installation, Testing, Commissioning, and Maintenance.

Since impedance heating systems are interrelated with electric power, control, and alarm systems, other standards (some of which are listed in Clause 2) should be referred to when using this standard. This standard is not intended to supersede any current standards or recommended practices, and sound engineering judgment should always be used when applying this or any other standard.

CSA Preface

This is the first edition of IEEE Std 844.3™/CSA C22.2 No. 293.3, IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment—General, Testing, Marking, and Documentation Requirements, which is a harmonized Standard jointly developed by IEEE and CSA Group. It is one in a series of Standards issued by CSA Group under Part II of the *Canadian Electrical Code*.

Impedance heating systems have been used for a number of years in the industry. Impedance heating of pipes and equipment in petrochemical as well as other industries is a growing portion of total heating requirements.

This standard should be used in conjunction with IEEE Std 844.4™/CSA C293.4, IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment—Application Guide for Design, Installation, Testing, Commissioning, and Maintenance.

Since impedance heating systems are interrelated with electric power, control, and alarm systems, other standards (some of which are listed in Clause 2) should be referred to when using this standard.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed for use in Canada by the CSA Integrated Committee on Trace Heating, under the jurisdiction of the CSA Technical Committee on Wiring Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

Interpretations: The Strategic Steering Committee on Requirements for Electrical Safety has provided the following direction for the interpretation of standards under its jurisdiction: "The literal text shall be used in judging compliance of products with the safety requirements of this standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a relevant CSA committee interpretation has not already been published, CSA Group's procedures for interpretation shall be followed to determine the intended safety principle."

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Contents

IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment—General, Testing, Marking, and Documentation Requirements

1. Overview

1.1 General

This standard is divided into seven clauses that cover requirements for impedance heating when installed in ordinary locations as well as in hazardous (classified) locations. Clause 1 provides the scope, purpose, and typical applications. Clause 2 lists normative references to other standards that are indispensable in applying this standard. Clause 3 provides definitions that are not found in other standards or have been modified for use with this standard. Clause 4 establishes general system requirements for impedance heating. Clause 5 provides both type and routine testing requirements for insulated impedance conductors and other impedance system components. Clause 6 covers marking requirements. Clause 7 details additional documentation requirements.

This standard also contains annexes. Annex A provides bibliographical references. Annex B provides requirements for installations that are in explosive atmospheres classified using the Division method of area classification. Annex C provides additional requirements in explosive atmospheres classified using the Zone method of area classification. Annex D covers impedance heating design verification methodologies. Annex E provides reference tables associated with insulated impedance conductor testing in Clause 5. Annex F provides the formula for calculating insulation resistance. Annex G provides alternative national markings.

1.2 Scope

This standard applies to general, testing, marking, and documentation requirements for impedance heating systems for steel or steel alloy pipe or equipment, rated up to and including 132 Vac. These heating system components are intended for installation in accordance with CSA C22.1, Canadian Electrical Code, Part I (CE Code); NFPA 70, National Electrical Code® (NEC®) in the USA; or with any other national electrical installation code, as applicable.[1]

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