CANADIAN STANDARDS ASSOCIATION

C22.2 No. 0.8-09

Safety functions incorporating electronic technology

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Preface

This is the second edition of CSA C22.2 No. 0.8, *Safety functions incorporating electronic technology*, one of a series of Standards issued by the Canadian Standards Association under Part II of the *Canadian Electrical Code*. It supersedes the previous edition published in 1986.

For general information on the Standards of the *Canadian Electrical Code, Part II*, see the Preface of CAN/CSA-C22.2 No. 0.

This edition is intended to update the 1986 version of C22.2 No 0.8 to reflect recent advances made in the use of electronic technology. The scope has been expanded slightly from that of the 1986 version to include not only the safety functions but also the operational logic and logic circuits that make up the safety functions. The scope has been further clarified to better describe the application of this Standard. The development of this new edition has relied on numerous sources of material in order to create a useful, comprehensive, stand-alone document while maintaining accepted principles and procedures in accordance with international standard practice.

This Standard places an emphasis on the architecture that covers the control elements and other devices where a failure could impact the safety of the overall product. In order to remain technology independent, this Standard accommodates a variety of safety-design architectures.

To provide broader coverage for new and innovative designs in operational safety controls, the section on hazard analysis has been substantially rewritten to require the manufacturer to prepare documents justifying the electronic safety design based on the operation of the overall product in its defined environment. This should also assist the manufacturer to prepare the required documents when submitting a product and its controller for safety certification.

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

This Standard was prepared by the Subcommittee on Safety Functions Incorporating Electronic Technology, under the jurisdiction of the Technical Committee on General Requirements and the Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the 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 committee interpretation has not already been published, CSA's procedures for interpretation shall be followed to determine the intended safety principle."

October 2009

Notes:

(1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*

(2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

(3) *This publication was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.*

(4) *CSA Standards are subject to periodic review, and suggestions for their improvement will be referred to the appropriate committee.*

(5) *All enquiries regarding this Standard, including requests for interpretation, should be addressed to Canadian Standards Association, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.*

Requests for interpretation should

(a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;

(b) provide an explanation of circumstances surrounding the actual field condition; and

(c) be phrased where possible to permit a specific "yes" or "no" answer.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization *and are published in CSA's periodical* Info Update*, which is available on the CSA Web site at www.csa.ca.*

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Safety functions incorporating electronic technology

1 Scope

1.1
This Standard applies to products and component devices where the electronics technology handles the operational logic including the safety features. This Standard applies to the following configurations:
(a) safety control function(s) implemented in hardware only; and
(b) safety control function(s) implemented in some combinations of hardware and software.

1.2
The scope of this Standard includes the sensors and actuators that are associated with the safety control.

1.3
The requirements in this Standard apply to products where failure in either the hardware or software, or any associated devices, can lead to a hazard.

1.4
This Standard prescribes minimum requirements for the documentation necessary to evaluate and confirm that the equipment meets the safety requirements as specified in this Standard.

1.5
This Standard applies to a product identified under a relevant product standard and where the purpose of the product, along with its features and operational role, can be described.
Note: *An understanding of the specific end-use environment and any risks associated with the product are essential for this Standard to apply.*

1.6
This Standard does not cover general-purpose applications or products where the end-application or the safety requirements for the product are not known or cannot be described, such as for a general-purpose Programmable Logic Controller (PLC).

1.7
The requirements and applicable conditions stated in the relevant product standard take precedence over the requirements outlined in this Standard.

1.8
In CSA Standards, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.