Adjustable speed drives
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Preface

This is the second edition of CSA C22.2 No. 274, Adjustable speed drives, one of a series of Standards issued by CSA Group under Part II of the Canadian Electrical Code. It supersedes the previous edition published in 2013.

This edition includes:
- updates to the Scope to deal with integrated motor/drive combinations;
- clarification on using the spacing requirements of IEC 61800-5-1;
- clarification on the use of MOVs;
- clarifications regarding the 30 A fuse in ground circuits;
- expansion of the contactor overload requirements;
- information on testing when surge arresters are present;
- additional requirements for mechanical interlocks;
- an annex on dielectric testing; and
- numerous other minor edits and clarifications throughout.

This Standard follows traditional North American practices for evaluating adjustable speed drives, the international requirements described in IEC 61800-5-1 were reviewed in detail and accommodated within this Standard whenever possible. It is anticipated that the next round of activity for adjustable speed drives will be an adoption of IEC 61800-5-1 to align Canadian requirements with those of the IEC.

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

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

This Standard was prepared by the Integrated Committee on Adjustable Drives (ICAD), under the jurisdiction of the Technical Committee on Industrial Products (TCIP) and the Strategic Steering Committee on Requirements for Electrical Safety (SCORES), 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.”

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 Standard 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 Standard.
4) To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:
   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) where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.

5) This Standard is subject to review five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:

a) Standard designation (number);

b) relevant clause, table, and/or figure number;

c) wording of the proposed change; and

d) rationale for the change.
C22.2 No. 274-17
Adjustable speed drives

1 Scope

1.1
This Standard specifies requirements for adjustable speed drives (ASDs) with respect to electrical, thermal, and energy safety considerations. It applies to adjustable speed ac and dc electric drives connected to line voltages up to 34.5 kV, 50 Hz, or 60 Hz.

1.2
This Standard applies to the following:
   a) power conversion, drive control equipment and interface circuits;
   b) servo drives and integral servo drive/motor combinations; and
   c) integrated ASDs (adjustable speed drives) where the motor and ASD are mechanically integrated into a single unit.

1.3
The equipment covered by this Standard is for use in ordinary locations in accordance with the Canadian Electrical Code, Part I.

1.4
The adjustable speed drives covered by this Standard are intended for use in an ambient temperature range of 0 to 40 °C.

Note: This Standard does not include requirements for equipment intended for use in an ambient temperature outside of this range. Additional investigation of the equipment is needed when equipment is to be used in ambient temperatures outside of this range.

1.5
Equipment intended for special applications can be subject to additional requirements not included in this Standard.

1.6
This Standard does not apply to solid state, single phase motor speed controls rated 300 V and less, 20 A and less that are covered by CSA C22.2 No. 156.

1.7
This Standard does not apply to
   a) traction and electric vehicle drives;
   b) motors as covered by CSA C22.2 No. 100;
   c) driven equipment;
   d) cord connected drives; and
   e) the motor portion of a motor and ASD system that is mechanically integrated into a single unit.
1.8
The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only.

1.9
In this Standard, “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.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications
This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below:

Note: The following Standards may be applicable for the ASD and its components.

CSA Group
C22.1-15
Canadian Electrical Code, Part I

CAN/CSA-C22.2 No. 0-10 (R2015)
General requirements—Canadian Electrical Code, Part II

C22.2 No. 0.2-16
Insulation coordination

C22.2 No. 0.5-16
Threaded conduit entries

CAN/CSA-C22.2 No. 0.17-00 (R2013)
Evaluation of properties of polymeric materials

C22.2 No. 4-16
Enclosed and dead-front switches

C22.2 No. 5-13
Molded-case circuit breakers, molded-case switches and circuit-breaker enclosures

C22.2 No. 14-13
Industrial control equipment