CSA GROUP™

CSA C227.4:21
National Standard of Canada

Three-phase, pad-mounted distribution transformers with separable insulated high-voltage connectors

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Contents

Preface

This is the third edition of CSA C227.4, *Three-phase, pad-mounted distribution transformers with separable insulated high-voltage connectors*. It supersedes the previous editions published in 2006 and 1978.

The major changes in this edition include the following:

a) expanded scope to include 34.5 kV system nominal voltage, and discontinued use of the terms "insulation class" and "preferred voltages";
b) updated references to other industry standards;
c) clarified requirements with off-circuit voltage taps and added informative note on dual-voltage transformers with taps;
d) added requirements to the optional load break switch ratings since previous IEEE references are obsolete;
e) modified and clarified requirements with the two-fuse system, also removing tables with manufacturer specific part numbers;
f) improved routine test requirements to better align with IEEE. For example, no-load losses and exciting current will be at 100% rated voltage instead of 105%;
g) added no internal fuse warning markings;
h) clarified and expanded additional optional items in Clause 10. For example, routine partial discharge testing has been added based on the experience and procedures of users;
i) the continued inclusion of the electrical characteristics that apply to the transformers covered by this Standard, which were previously provided in CAN/CSA-C2; and
j) added Clause B.5.3.1.1 to explain the removal of fusing tables.

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 Overhead and Pad-Mounted Distribution Transformers, under the jurisdiction of the Technical Committee on Distribution Transformers and the Strategic Steering Committee on Power Engineering and Electromagnetic Compatibility, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

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.*

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   b) *relevant clause, table, and/or figure number;*
   c) *wording of the proposed change; and*
   d) *rationale for the change.*

CSA C227.4:21
Three-phase, pad-mounted distribution transformers with separable insulated high-voltage connectors

1 Scope

1.1
This Standard specifies the requirements for three-phase, pad-mounted distribution transformers, consisting of a transformer and a cable entrance compartment with provision for separable insulated high-voltage connectors, intended primarily for operation by electric utilities on three-phase underground distribution systems having primary voltages as shown in Clause 4.6.

1.2
This Standard applies to three-phase, 60 Hz, pad-mounted, liquid-filled distribution transformers, rated at 3000 kVA or below, up to 34.5 kV system nominal voltage, and with separable insulated high-voltage connectors. The transformers are suitable for mounting outdoors on pads without additional protective enclosures.

1.3
This Standard includes voltage ratings, kVA ratings, certain mechanical characteristics, and test procedures. The Standard also includes the following performance characteristics: energy efficiency (in accordance with CAN/CSA-C802.1), temperature rise, loading capabilities, audible sound level, and radio influence voltage (RIV).

1.4
When this equipment is intended for operation by other than an electric utility, it is the purchaser's responsibility to ensure that the unit meets the requirements of the appropriate electrical inspection authority.

1.5
This Standard allows for the interchangeability of a dead-front, pad-mounted unit by another of the same basic physical size from a different manufacturer for transformers rated 125 kV BIL and below, without modifications to cables or pad. This Standard covers terminal arrangements for both radial and loop-feed systems, including certain minimum dimensions and certain specific dimensions.

1.6
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.