

Electrical Distribution Safety

GENERAL STATEMENT:

The following Bulletin outlines how LDCs meet the required Safety Standards for electrical utilities located inside buildings, under Sections 4&5 of Regulation 22/04. Section 2 (4)(b) of Regulation 22/04 states when inside buildings that the OESC and not the Regulation applies.

- For electrical utilities located ***inside of buildings***, the Safety Standards are met when the installation meets the requirements of the Ontario Electrical Safety Code (OESC).
- For electrical utilities located ***entirely outside of buildings***, the Safety Standards are met when installations meet the requirements of CSA Standards C22.3 or the OESC.

CSA SCOPE STATEMENTS:

The Scope of CSA Standards C22.3 No.1 and No.7 do not include electrical utilities inside of buildings. The electrical utilities located inside the building must meet the requirements of the OESC in order to meet the Safety Standards of Regulation 22/04.

Scope of C22.3 No.1

- This Standard applies to the lines and equipment of electric supply and communication utilities ***located entirely outside of buildings*** and fenced supply stations.
- Conditions not covered herein shall be governed by the appropriate requirements or equivalent Standards in common use, or as required by constituted authority.

Scope of C22.3 No.7

- This Standard applies to the lines and equipment of electric and communication utilities ***located entirely outside buildings*** and fenced supply stations...
- Conditions not covered herein shall be governed by the appropriate requirements or equivalent Standards in common use, or as required by constituted authority.

ELECTRICAL UTILITIES CONSIDERED OUTSIDE THE BUILDING:

Electrical utility equipment is considered outside of the building or other structure under any of the following conditions:

1. Where installed within a building or other structure in a raceway that is encased in concrete or masonry not less than 50mm thick
2. Where installed under not less than 50mm of concrete beneath a building or other structure
3. Where installed in any vault that meets the applicable requirements of the National Building Code
4. Where installed in conduit and under not less than 450mm of earth beneath a building or other structure

ADDITIONAL INFORMATION:

If you can provide additional information on this Bulletin or any other Utility issue, please contact ESA to share your experiences. Additional information requests, and follow-up information, may be directed to ESA. Please be prepared to quote Bulletin “DSB-05/07”.

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EXAMPLE 1:

This picture shows a residential meter base where the electrical conduit is run inside the garage wall cavity. To meet the Safety Standards this conduit shall meet all OESC requirements including being concrete or masonry encased.



EXAMPLE 2:

For Apartment Style (including individually metered condos), Industrial, or Commercial secondary service installations the attached Bulletin 6-8-0 applies. The “Direction” section of this Bulletin is applicable and states:

The Ontario Electrical Safety Code requirements for certification shall not apply to revenue billing devices (meters, and associated CTs and /or PTs), with a measurements Canada Approval number. Therefore customer as well as utility billing meters, and instrument transformers are deemed to be approved if they have a measurements Canada Approval number, which are owned by the Local Distribution Companies, or a Meter utility licensed by Measurement Canada. (CAN3-13-M83)

However all other equipment such as the meter mounting device, check meters, cabinet, conductors etc, of the consumer's installation from the service box or its equivalent up to and including the point at which the supply authority makes connection is required to meet the requirement of the Ontario Electrical Safety Code. Application for Inspection shall be filed as per Rule 2-004.

March 2005

Transformer Rated, Meter Mounting Equipment

Rule 6-100

This Bulletin is intended to give direction for the installation and acceptance of revenue recovery Electricity Meters, and Instrument Transformers.

ESA has received questions from an organization that installs revenue billing devices regarding difficulties they are experiencing with respect to the standards that apply to the design and installation of these devices or more particularly the acceptance of ratings marked on the device.

The Constitution Act assigns authority for weights and measures to the Federal Government.

This Bulletin is to provide consistent direction with respect to ESAs jurisdiction over revenue billing devices, governed the Weights and Measures Act and Electricity and Gas Inspection Act and used by Local Distribution Companies, licensed by the Ontario Energy Board (OEB).

The Federal Legislation:

- Does not require the revenue billing devices to be approved as required by the Canadian Electrical Code or [Ontario Electrical Safety Code](#); and
- Does not give ESA any jurisdiction over revenue billing devices, and/or associated Current Transformers (CTs) and Potential Transformers (PTs) associated with the revenue billing device.



CT PHOTO



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Meters and instrument transformers are required to be tested to specifications, which are set out in the Electricity and Gas Inspection Act. These specifications establish design, composition, construction and performance requirements for any meter or instrument transformer. The specification also requires a unique Measurements Canada approval number, as identified in LMB-EG-07 Specification for Approval of Type of Electricity Meters, Instrument Transformers and Auxiliary Devices

Current Transformers are defined by Accuracy Classes depending on the application.

- Metering Accuracy CTs are used where a high degree of accuracy is required from low-load values up to full-load of a system. An example of this application would be the current transformers utilized by utility companies for large capacity revenue billing.



These meter mounting devices, owned by the consumer, incorporate a current transformer owned by the LDC.

The size and rating of these current transformers has given rise to questions, as to their rating, and operating ability under full loading.

- Continuous current rating factor (RF) means the specified factor by which the rated current transformer can be multiplied to obtain the maximum current that can be carried continuously without exceeding either the limiting temperature rise from a 30 C ambient temperature, or rated accuracy class limitation. (taken from the CAN3-C13)

Therefore, rating factors are taken into consideration when selecting CTs.

For example:

a 200/5 CT with an RF of 2 can operate at $200 \times 2 = 400$ amp maximum;

a 300/5 CT with a RF of 1.5 could operate at $300 \times 1.5 = 450$ amp maximum

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There is some confusion as to selection of current transformers which are rated based on Continuous current rating factor (RF). Based on testing requirements set out in CAN3-C13 CTs with a rating below 400/5 can be used in a 400 amp meter base, providing the Continuous Current Rating factor of the CT is equal to or greater than 400 when multiplied by the rating factor.

Direction:

The [Ontario Electrical Safety Code](#) requirements for certification shall not apply to revenue billing devices (meters, and associated CTs and /or PTs), with a measurements Canada Approval number. Therefore customer as well as utility billing meters, and instrument transformers are deemed to be approved if they have a measurements Canada Approval number, which are owned by the Local Distribution Companies, or a Meter utility licensed by Measurement Canada. (CAN3-13-M83)

However all other equipment such as the meter mounting device, check meters, cabinet, conductors etc, of the consumer's installation from the service box or its equivalent up to and including the point at which the supply authority makes connection is required to meet the requirement of the [Ontario Electrical Safety Code](#). Application for Inspection shall be filed as per Rule [2-004](#).