



Bulletin

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Policy on electricity and gas legal units of measurement and functions used for billing

1.0 Purpose

The purpose of this bulletin is to clarify Measurement Canada's policy for the approval and verification of electricity and gas meters with regards to the application and use of legally relevant parameters, functions and units of measurement for billing.

2.0 References

2.1 [Electricity and Gas Inspection Act](#)^[link 1] (R.S. 1985, c. E-4)

2.2 [Electricity and Gas Inspection Regulations](#)^[link 2] (SOR/86-131)

3.0 Definitions

Legally relevant function

An operation within a device that performs a specified action or results in a defined output subject to legal control.

Legally relevant

Software, hardware, data or a part thereof which interferes with properties regulated by legal metrology.

Legally relevant parameter

Parameter of a measuring instrument, electronic device or a sub-assembly subject to legal control. Legally relevant parameters typically form part of the legally relevant functions performed by a device. For the purposes of this bulletin, legally relevant parameters are those parameters which are, either individually or as part of a function, subject to verification under the *Electricity and Gas Inspection Act*.

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Legal unit of measurement

Unit of measurement required or permitted by legislation. In Canada, legal units of measurement for the sale of electricity and gas on the basis of measurement are prescribed in section 3 of the *Electricity and Gas Inspection Act* and subsection 5(1) of the *Electricity and Gas Inspection Regulations*.

Verification

All the operations carried out by an inspector or accredited meter verifier having the object of ascertaining and confirming that a meter fully satisfies specified requirements. Any reference to "verification" includes both the initial verification and reverification of meters, whether by 100% inspection or through the use of statistical sampling methods authorized by Measurement Canada.

Verification triggering event

Any event deemed by Measurement Canada to require a verification of the device before it is permitted to be used or continued for use in trade. The recording of a verification triggering event is analogous to breaking a physical seal and shall have the same ramifications and consequences as the breaking of a physical seal.

4.0 Background

4.1 Prior to September 1999, Measurement Canada's policy required that all legal units of measurement (LUMs) and functions contained in an electricity meter be assessed and approved by Measurement Canada (unless suppressed from the meter). Once approved for use, a meter presented for verification would be verified for all the approved LUMs and functions used for billing purposes. With the advent of electronic electricity meters, manufacturers have designed and manufactured complex meters capable of measuring, monitoring, storing and transmitting an ever increasing amount of information. However, meter owners often only use a subset of the approved LUMs and functions for billing purposes and requested that the Agency revise its policy to require the verification of only the approved units of measurement and functions used by meter owners for billing purposes, and to allow the use of non-verified functions for non-billing purposes. This revised policy, along with other administrative verification requirements applicable to both electricity and gas meters, was issued in bulletin GEN-25 in June 2000.

4.2 The policy decision described in 4.1 applicable to electronic electricity meters was formally extended to gas meters in 2015.

5.0 General

5.1 Approval of legal units of measurement and legally relevant functions

5.1.1 Units of measurement and related functions that are used for billing purposes shall be subject to approval requirements and specifications.

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5.1.2 Units of measurement that may be approved for billing purposes are identified in section 3 of the Act and subsection 5(1) of the Regulations. Any such unit is defined as a LUM.

5.1.3 Additional units of measurement that are legally relevant, but do not meet the criteria of a LUM, may be approved if they have an impact on the value of a LUM.

5.1.4 The applicant may specify the LUMs and legally relevant units and functions to be assessed for approval purposes. Consequently, only the specified LUMs and legally relevant functions will be assessed for type approval and only those meeting the requirements will be listed in the Notice of Approval as being approved for that specific meter type. All other units of measurement and functions provided by the meter would not be approved for that particular meter type for billing purposes and therefore would not be subjected to verification and sealing.

6.0 Provisions specific to gas meters

6.1 Verification and reverification of gas meters

6.1.1 All LUMs approved for billing purposes are subject to verification except where they have been disabled and are not capable of being re-enabled after the meter is sealed.

6.1.2 All legally relevant functions approved for billing purposes are subject to verification except where they:

- a) have been disabled and are not capable of being re-enabled after the meter is sealed and secured, or
- b) are granted permanent, conditional or temporary permission to be put into service without verification.

6.2 Gas meters permitted to be put into service without sealing

6.2.1 Any meter for which a permanent, conditional or temporary permission to be put into service without sealing was granted shall be verified in the manner in which it is intended to be used in service.

6.2.2 Any post-verification enabling of any LUM or legally relevant function disabled at the time verification shall be considered a verification triggering event.

7.0 Provisions specific to electricity meters

7.1 Legal units of measurement and functions assessed for approval purposes

7.1.1 Pursuant to section 5.1.3, units of V²-hour and I²-hour may be approved where those units are used to establish quantity losses of a LUM.

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7.1.2 The following legally relevant functions may be approved:

- a) each register of a multi-register meter
- b) pulse initiators
- c) pulse recorders
- d) time-stamping functions
- e) data outputs comprising values of a LUM
- f) data outputs of other formats which represent a value of a LUM
- g) prepayment operations
- h) event loggers

7.2 Displays and accessibility of non-approved units of measurement and functions

The register(s) containing the non-approved units of measurement and functions may remain accessible and the content may be modified when desired by the owner as long as the modifications do not affect the approved and verified LUMs and functions, and their values contained in the register(s) where they are stored.

7.3 Verification of electricity meters conforming to a type approved after September 1, 1999

7.3.1 General

The Notice of Approval will list the approved LUMs and functions. Only those units of measurement and functions will be subject to the verification requirements.

7.3.2 Programming of approved legal units of measurement and functions for a particular application

7.3.2.1 Notwithstanding section 7.3.1, the meter owner may also select a subset of the LUMs and functions approved for billing purposes for a particular application, and have the meter verified and sealed for those selected approved units of measurement and functions on condition that all the other LUMs and functions approved for billing purposes are deactivated at the time of the verification. The deactivation of the units of measurement and functions shall be done in such a way as to prevent access to those units of measurement and functions through the meter display or through any meter communication modules or output ports. Reactivation of those LUMs and functions would require the breaking of the seal, which is a verification triggering event. Consequently, a reverification of the meter would be required.

7.3.2.2 Any units that are not directly used for billing purposes, but are used to establish values of other LUMs outside of an approved device for billing purposes, shall not be deactivated. The subset of units selected subject to 7.3.2.1 must include such units.

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7.4 Verification of electricity meters conforming to a type approved before September 1, 1999

7.4.1 Legal units of measurement – energy

Pursuant to paragraph 3(1)(a) of the Act, the following units of measurement, if enabled, shall be verified: W·h, var·h, Va·h and joule.

7.4.2 Legal units of measurement – demand

Pursuant to subsection 5(1) of the Regulations, the following demand units of measurement and the cumulative maximum, if enabled, shall be verified: W, VA and var.

7.4.3 Others units of measurement

The following units of measurement shall be verified where those units of measurement are integral to the calculation of, or are a factor in, resultant LUMs delineated in sections 7.4.1 and 7.4.2 above:

- a) Q·h
- b) Q
- c) V²·h
- d) A²·h

7.4.4 Functions and components

The following functions and/or components shall be verified in accordance with applicable specifications if identified as approved on the NOA and if enabled:

- a) each register of a multi-register meter
- b) pulse initiators
- c) pulse recorders
- d) prepayment operations

8.0 Revision

The purpose of this revision is to remove references to approval and verification of time-of-use (TOU) functions, to ensure there is no conflict with telemetering policies and to clarify that approved LUMs, functions and outputs must be disabled if not verified. The policies pertaining to electronic electricity meters have been extended to natural gas meters. Editorial corrections and restructuring of the document were also performed to improve clarity.

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[link 1] <http://laws.justice.gc.ca/eng/acts/E-4/>

[link 2] <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-131/>