Specifications

Category: **ELECTRICITY**	Specification: **S-E-09**	Page: **1 of 7**
Document(s): **S-E-07 and LMB-EG-07**	Issue Date: **2010-04-27**	Effective Date: **2010-04-27**
	Supersedes:	

Specification for the Approval of Type of 80mA and 100mA class Measuring Current Transformers

1.0 Scope

This specification applies to 80 milliampere (mA) Current Transformers (CT) and 100 milliampere (mA) Current Transformers (CT) which are intended to be used in revenue metering.

2.0 Authority

This specification is issued pursuant to subsection 12 (1) of the *Electricity and Gas Inspection Regulations*.

3.0 References

Electricity and Gas Inspection Act (R.S. 1985, c. E-4), ss. 9(4).

Electricity and Gas Inspection Regulations (SOR/86-13), ss. 12(1).

Measurement Canada, LMB-EG-07: Specifications for the Approval of Type of Electricity Meters, Instrument Transformers, and Auxiliary Devices.

Measurement Canada, S-E-07: Specifications for the Approval of Measuring Instrument Transformers.

IEEE Std C57.13-2008: IEEE Standard Requirements for Instruments Transformers.

CAN-CSA 60044-X:07 series: Instrument Transformers series.

4.0 Definitions

Applicable definitions can be found in Measurement Canada (MC) S-E-07.

5.0 General Requirements

All requirements specified in MC specifications S-E-07 shall be applicable to the 80 mA and 100mA class CT in addition to the following requirements.

6.0 Ratings

6.1 Current rating of 80 mA class measuring CT shall be according to the values in Table 1 below.

Table 1 - Current rating for 80 mA class measuring CT

Primary Current (A)	Secondary Current (mA)	Ratio
5	80	62.5:1
100	80	1250:1
200	80	2500:1
400	80	5000:1

6.2 Current rating of 100 mA class measuring CT shall be according to the values in Table 2 below.

Table 2 - Current rating for 100 mA class measuring CT

Primary Current (A)	Secondary Current (mA)	Ratio
5	100	50:1
100	100	1000:1
200	100	2000:1
400	100	4000:1
600	100	6000:1
800	100	8000:1

7.0 Rated Burden

7.1 Standard burdens for 80 mA class CT shall be according to the values in Table 3 below.

Table 3 - Standard burdens for 80 mA class measuring CT

Standard Burden	Characteristics			Characteristics for 60 Hz 0.08A Secondary Current	
	Resistance (ohm)	Inductance (mH)	Impedance (ohm)	V*A	PF
B0.005	17.6	23	20	0.125	0.9
B0.01	35.2	45	39	0.25	0.9
B0.03	105.5	135	117	0.75	0.9
B0.05	176	226	195	1.25	0.9

7.2 Standard burdens for 100 mA class CT shall be according to the values in Table 4 below.

Table 4 - Standard burdens for 100 mA class measuring CT

Standard Burden	Characteristics			Characteristics for 60 Hz 0.1A Secondary Current	
	Resistance (ohm)	Inductance (mH)	Impedance (ohm)	V*A	PF
B0.005	11.3	14	13	0.125	0.9
B0.01	22.5	29	25	0.25	0.9
B0.03	67.5	87	75	0.75	0.9
B0.05	112.5	145	125	1.25	0.9

8.0 Accuracy

8.1 Assignment of Accuracy Class - A measuring mA current transformer shall be given an accuracy class as specified in Table 5 for each standard burden, (Tables 3 and 4), up to the maximum for which it is designed.

8.2 Basis for Measurement Accuracy Classes - Accuracy classes for mA measuring CT are based on the requirement that the transformer correction factor (TCF) shall be within specified limits for the following conditions:

(a) 100% of rated primary current or the corresponding continuous current factor

(b) 10% or 5% of rated primary current

(c) Power factor (lagging) of metered power load from 0.6 to 1.0

(d) Burden of a specific standard value

(e) Normal service conditions

NOTE: At 5% or 10% of rated primary current, the permissible error is twice the error at 100% rated primary current.

The relationships between the limits of the ratio correction factors (RCFs) and the phase angle for the limiting values of the TCFs specified in Table 5 are shown in the parallelograms in Figure 1 and Figure 2.

8.3 Accuracy Class Limits of Error

Table 5 - Accuracy Classes and Corresponding Limits of Transformer Correction Factors for Measuring Current Transformers

Accuracy Class	100% rated current*	10% rated Current	5% rated current	Limits of power factor (lag) of metered power load
0.15	0.9985–1.0015	-	0.997–1.003	0.6–1
0.3	0.997–1.003	0.994–1.006	-	0.6–1
0.6	0.994–1.006	0.988–1.012	-	0.6–1

NOTE: 1. These limits also shall be applicable at the maximum continuous current rating factor (RF)

2. 5A:80mA 5A:100mA rating CT shall not be approved for accuracy class other than 0.15%

Figure 1 - Limits of 0.3 and 0.6 Accuracy Classes for Measuring Current Transformers

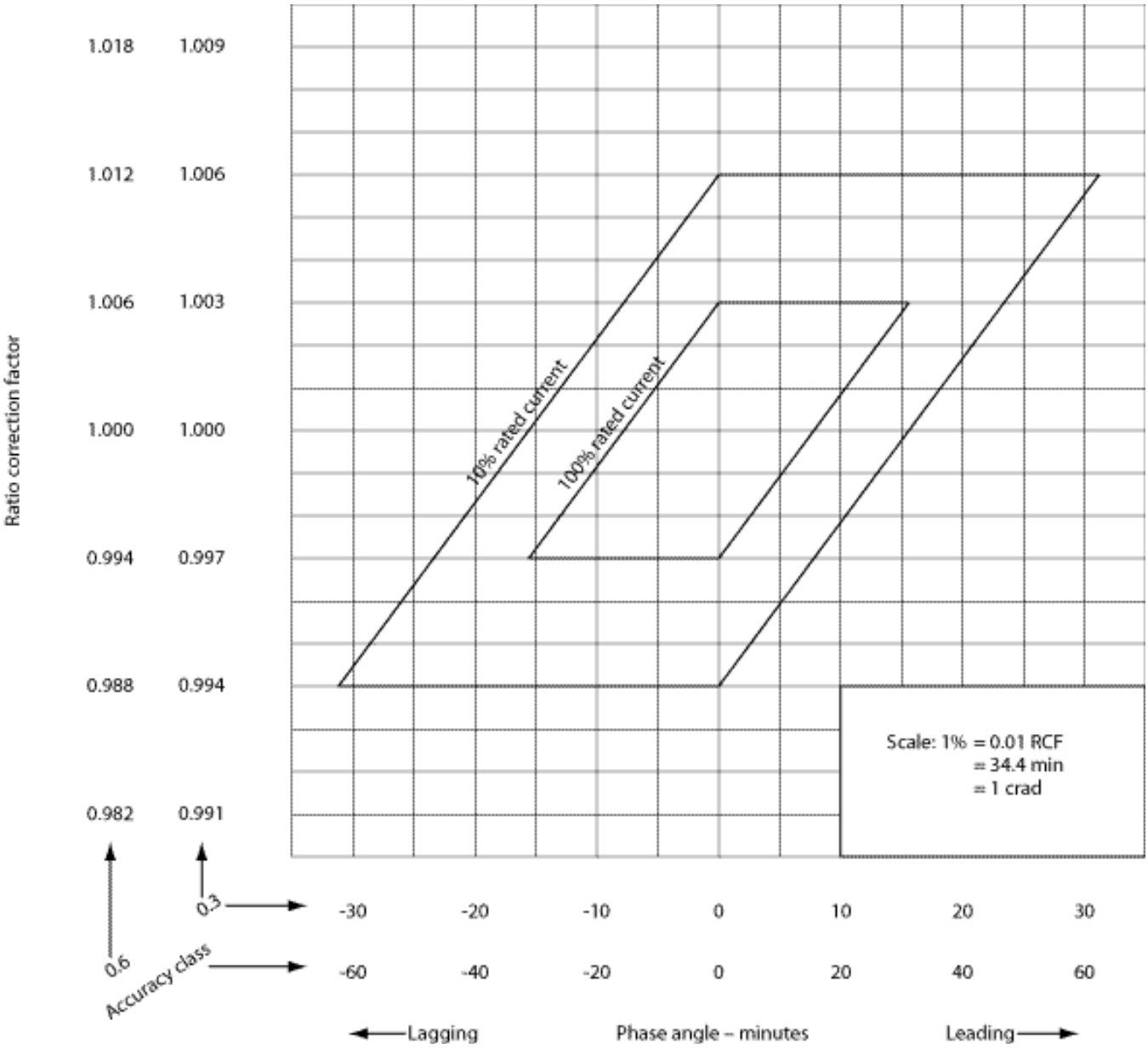
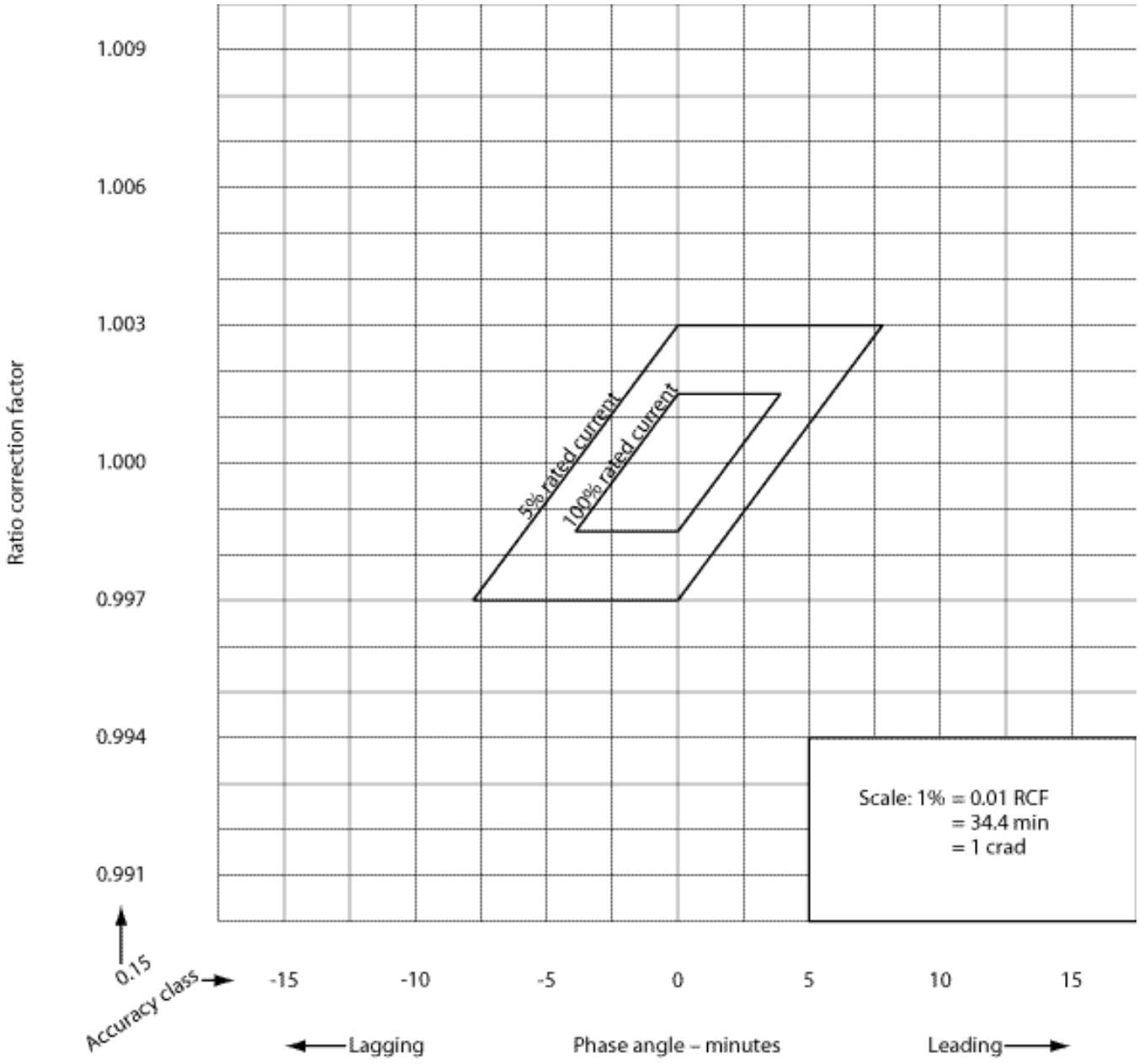


Figure 2 - Limits of 0.15 Accuracy Class for Measuring Current Transformers



9.0 Additional Information

For additional information regarding this specification, please contact the Senior Program Officer responsible for electricity measurement, or visit our website at http://mc.ic.gc.ca.

Alan E. Johnston
President