



1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 07ATEX9180X** Issue: **5**

4 Equipment: **LM80 Laser Distance Measuring Instrument**

5 Applicant: **ABB Inc.**

6 Address: **585 Charest Boulevard East
Suite 300
Québec
Québec G1K 9H4
Canada**

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012

EN 60079-31:2009

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation, which is available on request.

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 2D

Ex tb IIIC T85°C Db (-40°C ≤ Tamb ≤ +60°C)

(With heated lenses option (AC & SC): -40°C ≤ Ta ≤ +45°C)

Project Number 30104

A C Smith
Certification Manager

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13 DESCRIPTION OF EQUIPMENT

The Laser Level and Distance measuring device model LM80series consists of a power source, electronics and optical elements housed in a cylindrical, powder coated, aluminium enclosure that consists of three parts: a screw-on cover (for the terminal compartment), the main body and the front plate. The enclosure has two compartments, the terminal compartment at the top and the electronics/optical compartment at the bottom.

The LM80 is powered from:

Input: 18 — 32 V DC (24 V typical) 0.4 A peak, 0.2 A continuous.

Input: 18V — 32 V DC (24 V typical) 0.52 A peak, 0.32 A continuous (with heated lenses option (AC & SC)).

Inside the terminal compartment, provision is made for a six way terminal strip for electrical connections (power, 4-20 mA current loop and contact relays) as well as a nine way "D" connector. This nine way "D" connector is used for initial setup and configuration of the device, not intended for permanent connection and may not be used in the during hazardous area is present.

A 1/2" NPT (or M20 x 1.5 mm) gland entry is provided for the electrical connection on the side of the main body into the terminal compartment.

The screw-on cover has a M80 x 20 mm internal threaded section, which fits onto the main body. A groove accommodated nitrile O-ring is provided on the main body for sealing the cover. This O-ring is under compression once lid is fit (screwed) onto the main body to ensure the effectiveness of the enclosure sealing.

Four, M5 x 30 stainless steel cap screws secure the front plate to the main body, the front face accommodates a nitrile O-ring to provide an effective seal with the main body. This O-ring is under compression once the front plate is fixed (by the four screws) onto the main body to ensure the effectiveness of the enclosure sealing. Two plastic lenses, approximate diameters 50 mm and 25 mm, are mounted in the front plate using nitrile O-rings. The lenses are kept in position with the O-rings mounted from the inside of the enclosure with separate optical mountings (lens tubes) and screws. Those O-ring are under compression once the optical mountings are fixed in place inside the main body to ensure the effectiveness of the enclosure sealing.

The purge point has no bearing on the explosion protection, as it does not enter into the enclosure or have any electronic components associated with it.

Product variations/options:

- Front plate material option

Description: The model LM80 is being produced with different front plate materials to accommodate different process interface needs. The different options are aluminium or stainless steel.

The mechanical design of the options in regard to sealing against the main body as well as the sealing of the lenses is identical.

- Screw-on cover and main body material option

Description: The LM80 is being produced with different screw-on cover and main body materials to accommodate different mounting location needs. The different options are aluminium or stainless steel.

The mechanical design of the options in regard to sealing against the front plate and the screw on cover is identical.

- Front plates process interface option

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Sira Certification Service

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Description: The model LM80 front plate is being produced in a Triclover version option to accommodate different process interface needs. The mechanical design of the option in regard to sealing against the main body as well as the sealing of the lenses is identical.

- Threading of cable gland option

Description: A 1/2" NPT or M20 x 1.5 mm gland entry is provided for the connection on the side of the main body into the terminal compartment. A suitably certified 1/2" NPT or M20 x 1.5 mm cable gland being certified to either Ex e or Ex n and having an IP rating of at least IP64 shall be used. Note: Default threads are 1/2" NPT. The threads provided will be mark into the installation instruction as request by IEC 60079-0:2011 Clause 16.2.

Those different threading designs are identical in regard to sealing against the main body

- Heated lenses option (for non-condensing optics) (AC & SC option)

Description: The model LM80 is being produced with heated lenses version option to accommodate different process needs. For this option, one heater is mounted on each lens from the inside of the instrument. Power consumption is 3 W total and come from the instrument itself. This option requires a different set of lens tube in order to accommodate the heater and wires.

This option is designed to have a small temperature difference between the systems in order to prevent water condensation on the lenses. The use of this option increases the current consumption by 0.15 A. The connector meets the 15 N pull test according to IEC/EN 60079-15. The mechanical design of the option in regard to sealing against the front plate as well as the sealing of the lenses is identical.

The use of the heated lenses option reduces the maximum ambient temperature to + 45°C, instead of 60°C

Equipment Type/model:

Application	Equipment Type/Model No	Description
Level measurement & Positioning	LM80.A	Aluminium Enclosure
	LM80.Axxxx	Aluminium Enclosure and accessories
	LM80.AC	Aluminium Enclosure with heated lenses
	LM80.ACxxxx	Aluminium Enclosure with accessories and heated lenses
	LM80.ACT804	Triclover Aluminium unit option with heated lenses
	LM80.S	Stainless Steel Enclosure
	LM80.Sxxxx	Stainless Steel Enclosure with accessories
	LM80.SC	Stainless Steel Enclosure with heated lenses
	LM80.SCxxxx	Stainless Steel Enclosure with accessories and heated lenses

Where xxxx represent the different unit options without impacting on certification

Variation 1, this variation introduced the following change:

- i. The introduction of a revised label material.



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Variation 2, this variation introduced the following change:

- i. The company name and address was changed, it was previously Laser Measurement Pty Ltd, No 3 Stanford Park, 16th Road, Midrand, South Africa.

Variation 3 - This variation introduced the following changes:

- i. The recognition of minor mechanical changes to the interface of the main enclosure and base plate; these amendments involve changes to the design that do not affect the aspects of the product that are relevant to explosion safety.
- ii. Changes to certain component specifications were approved; these devices are non-heat dissipating components in normal operation and do not alter the original assessment.
- iii. An alternative base plate arrangement was introduced, this arrangement is detailed the LM80 Triclover version.
- iv. The Applicant's name and address was changed from K-TEK Instruments (Pty) Limited in South Africa to ABB (Canada), an alternative manufacturing location for ABB South Africa (Pty) Limited was also added.

Variation 4, this variation introduced the following change:

- i. Following appropriate re-assessment to demonstrate compliance with the requirements of the EN 60079 series of standards, the documents previously listed in section 9, EN 61241-0:2006, and EN 61241-1:2004, were replaced by those currently listed, the markings in section 12 were updated accordingly. The description was amended to reflect the new standards.
- ii. The South African address was removed from the certificate.

Variation 5 - This variation introduced the following changes:

- i. The introduction of a variation to the LM80 Laser Distance Measuring Instrument to allow for heated lenses as an option.
- ii. Minor mechanical changes to the enclosure.
- iii. The clarification of the permitted equipment type / model designations, the description is amended accordingly.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report no.	Comment
0	06 August 2007	R52A16665A	The release of the prime certificate.
1	3 September 2007	R52A17185A	The introduction of Variation 1.
2	19 August 2009	R51A20527A	The introduction of Variation 2.
3	21 May 2012	R27265A/00	The introduction of Variation 3.
4	07 November 2012	R27266A/00	The introduction of Variation 4.
5	29 April 2013	R30104A/00	The introduction of Variation 5.

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- 15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)
- 15.1 Unless specifically approved, no connection shall be made to the "D" connector (RS232) inside the hazardous area.
- 15.2 Appropriate insulated lugs or ferrules shall be used for external connections to the terminal blocks and external and internal earth. The flat washer shall be incorporated between the enclosure body and the lug to prevent corrosion from occurring.
- 15.3 Only glands that have been suitably certified by a notified body and are appropriate for the application shall be used for cable entry into the enclosure.
- 15.4 External transient protection of up to 40% (44 V) of the maximum supply voltage ($32 \text{ V} \times 1.4 \leq 44 \text{ V}$) shall be incorporated in the power supply line to the equipment.
- 15.5 The lenses shall not be exposed to direct sunlight.
- 16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)**
- The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.
- 17 **CONDITIONS OF CERTIFICATION**
- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.
- 17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.
- 17.3 The manufacturer shall substitute, on the approved label affixed to the apparatus, the new name and address for the old name and address.

Certificate Annexe

Certificate Number: Sira 07ATEX9180X

Equipment: LM80 Laser Distance Measuring Instrument

Applicant: ABB (Canada) or ABB South Africa (Pty) Ltd



CERTIFICATION

Issue 0

Drawing no	Sheets	Rev.	Date (Sira stamp)	Description
LM80 – 0024	1 of 1	1	12 Jul 07	LM80 Final Assembly
LM80 - 0026	1 and 2	5	12 Jul 07	LM80 Body Assembly With Metric Gland Hole
N.A. (See Description)	1 of 1	0	12 Jul 07	LM80 Assembly
N.A. (See Description)	1 of 1	0	12 Jul 07	LM80 Sections Through Pointer And Lenses
N.A. (See Description)	1 of 1	0	12 Jul 07	LM80 Pointer Assembly Section View
LM80 – 0015	1 of 1	1	12 Jul 07	LM80 Pointer Assy
LM80 – 0028	1 of 1	1	12 Jul 07	LM80 Almin Lid Finnished Machined Casting
LM80 – 0056	1 of 2	0	12 Jul 07	LM80 Body As Cast
LM80 – 0056	2 of 2	0	12 Jul 07	LM80 Body As Cast
LM80 – 0059	1 of 2	1	12 Jul 07	LM80 Front Plate Finnished Machined For Atex
LM80 – 0059	2 of 2	1	12 Jul 07	LM80 Front Plate Finnished Machined For Atex
LM80 – 0072	1 of 1	1	12 Jul 07	LM80 Almin Lid Finnished Machined Casting
LM80 – 0070	1 of 2	0	12 Jul 07	LM80 Body As Cast
LM80 – 0070	2 of 2	0	12 Jul 07	LM80 Body As Cast
LM80 – 0071	1 of 2	1	12 Jul 07	LM80 Front Plate Finnsihed Machined For Atex
LM80 – 0071	2 of 2	1	12 Jul 07	LM80 Front Plate Finnsihed Machined For Atex
LM80 – 0073	1 of 1	0	12 Jul 07	LM80 Final Assembly With Earth Screw
N.A. (See Description)	1 of 1	0	12 Jul 07	LM80 Plastic Lenses
N.A. (See Description)	1 of 1	0	12 Jul 07	LM80 Final Assembly Lid Earth Test
LM80 – 0001	1 of 1	1	12 Jul 07	LM80 Interface (Circuit Diagram)
LM80 – 0063	1 of 1	0	12 Jul 07	LM80 Interface (Track Layout)
LM80 – 0067	1 of 1	1	12 Jul 07	LM 80 Interface (Component Layout)
LM80 – 0000	1 of 1	0	12 Jul 07	LM80 Interface (Component List)
LM80 – 0005	1 of 1	1	12 Jul 07	LM Family Processor (Circuit Diagram)
LM80 – 0064	1 of 1	0	12 Jul 07	LM Family Processor (Track Layout)
LM80 – 0066	1 of 1	0	12 Jul 07	LM Family Processor (Component Layout)
LM80 – 0064	1 of 1	0	12 Jul 07	LM Family Processor (Track Layout)
LM80 – 0004	1 of 1	0	12 Jul 07	LM Family Processor (Component List)
LM80 – 0009	1 of 1	1	12 Jul 07	LM Family Top Laser (Circuit Diagram)
LM80 – 0062	1 of 1	0	12 Jul 07	LM Family Top Laser (Track Layout)
LM80 – 0068	1 of 1	0	12 Jul 07	LM Family Top Laser (Component Layout)
LM80 – 0008	1 of 1	0	12 Jul 07	LM Family Top Laser (Component List)
LM80 – 0003	1 of 1	1	12 Jul 07	LM Family Bottom Laser (Circuit Diagram)
LM80 – 0060	1 of 1	0	12 Jul 07	LM Family Bottom Laser (Track Layout)
LM80 – 0069	1 of 1	0	12 Jul 07	LM Family Bottom Laser (Component Layout)
LM80 – 0002	1 of 1	0	12 Jul 07	LM Family Bottom Laser (Component List)
LM80 – 0007	1 of 1	1	12 Jul 07	LM Family Rxr (Circuit Diagram)
LM80 – 0061	1 of 1	0	12 Jul 07	LM Family Rxr (Track Layout)
LM80 – 0065	1 of 1	0	12 Jul 07	LM Family Rxr (Component Layout)
LM80 – 0006	1 & 2	0	12 Jul 07	LM Family Rxr (Component List)
LM200B – 0065	1 of 1	0	12 Jul 07	LM80 Laser Module Showing Potting
LM200B – 0067	1 of 1	1	12 Jul 07	LM80 Plug Retaining Clip
LM200B – 0066	1 of 1	1	12 Jul 07	LM80 Plug Retaining Clip Assembly
LM80 – 0074	1 of 1	0	12 Jul 07	LM80 Unit Label
LM80 – 0093	1 of 1	0	12 Jul 07	ASL LM80 Unit Label
LM80 – 0095	1 of 1	0	12 Jul 07	K-Tek Lm80 Unit Label

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Certificate Annexe

Certificate Number: Sira 07ATEX9180X

Equipment: LM80 Laser Distance Measuring Instrument

Applicant: ABB (Canada) or ABB South Africa (Pty) Ltd

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CERTIFICATION

Issue 1

Drawing no	Sheets	Rev.	Date	Description
LM80 – 093	1 of 1	1	22 Aug 07	ASI LM80 UNIT LABEL
LM80 – 095	1 of 1	1	22 Aug 07	K-TEK LM80 UNIT LABEL

Issue 2

Drawing No	Sheets	Rev.	Date (Sira Stamp)	Description
LM80 – 0074	1 of 1	2	19 Aug 09	LM80 Unit Labelling
TAG0229	1 of 1	NC	19 Aug 09	LM80 Nameplate for K-TEK Instruments
TAG0230	1 of 1	NC	19 Aug 09	LM80 Nameplate for K-TEK Instruments

Issue 3

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
LM80-0026	1 of 2	5 (Revised)	18 May 12	LM-80 Body with metric Gland Hole
LM80-0006	1 of 1	0 (Revised)	18 May 12	LM Family RXR (Component List)
LM80-0004	1 of 1	0 (Revised)	18 May 12	LM Family Processor (Component List)
AA008100-01	1 of 1	A	18 May 12	LM80 Triclover Front Plate
AA008169-01	1 of 1	A	18 May 12	LM80 Certification Label (ABB Canada)
AA008169-03	1 of 1	A	18 May 12	LM80 Certification Label (ABB South Africa)

Issue 4

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
00051-00-0-00005-01	1 of 1	A	06 Nov 12	LM80 Aluminum Product
AA008057-01	1 of 1	D	06 Nov 12	LM80 Aluminum Lid
AA008054-02	1 & 2	D	06 Nov 12	LM80 Machined Body
AA008040-01	1 & 2	D	06 Nov 12	LM80 Aluminum Front Plate
AA008160-01	1 of 1	A	06 Nov 12	Z-LASER Pointer Adaptor
AA008042-01	1 of 1	A	06 Nov 12	LASER Lens Tube
AA008041-01	1 of 1	A	06 Nov 12	Detector Lens Tube
AA008043-01	1 to 4	C	06 Nov 12	Plano-Convex Lens Dia=25mm
AA008044-01	1 to 4	C	06 Nov 12	Plano-Convex Lens Dia=50mm
0051-11-2-00002-1_SCH	1 of 1	B	06 Nov 12	LM80 Interface (Circuit Diagram)
0051-11-2-00002-1_BOM	1 to 3	C	06 Nov 12	LM80 Interface (Component List)
0051-11-2-00001-1_SCH	1 of 1	A	06 Nov 12	LM Family Processor (Circuit Diagram)
0051-11-2-00001-2_BOM	1 to 2	B	06 Nov 12	LM Family Processor (Component List)
LM80-0009 (0051-01-2-00001-1_SCH)	1 of 1	A	06 Nov 12	LM Family Top Laser (Circuit Diagram)
0051-01-2-00001-1_BOM	1 to 2	B	06 Nov 12	LM Family Top Laser (Component List)
LM80-0003 (0051-01-2-00002-1_SCH)	1 of 1	A	06 Nov 12	LM Family Bottom Laser (Circuit Diagram)
0051-01-2-00002-1_BOM	1 to 2	B	06 Nov 12	LM Family Bottom Laser (Component List)
LM80-0007 (0051-06-2-00001-1_SCH)	1 of 1	A	06 Nov 12	LM Family RXR (Circuit Diagram)
0051-06-2-00001-1_BOM	1 to 3	C	06 Nov 12	LM Family RXR (Component List)
AA008070-01	1 of 1	C	06 Nov 12	LM80 Stainless Steel Lid
AA008071-02	1 of 1	D	06 Nov 12	LM80 Machined Stainless Steel Body
AA008069-01	1 of 1	C	06 Nov 12	LM80 SS Front Plate
AA008075-01	1 to 2	C	06 Nov 12	LM80 Body For Triclover Unit

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Certificate Annexe

Certificate Number: Sira 07ATEX9180X

Equipment: LM80 Laser Distance Measuring Instrument

Applicant: ABB (Canada) or ABB South Africa (Pty) Ltd



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Drawing	Sheets	Rev.	Date (Sira stamp)	Title
AA008100-01	1 of 1	A	06 Nov 12	LM80 Triclover Front Plate
AA008169-02	1 of 1	B	06 Nov 12	LM80 Unit Label
BOM-LLVM-0054	1 to 6	E	06 Nov 12	LM80 Descriptive Note for IECEx & ATEX

Issue 5

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
AA008054-02	1 & 2	E	19 Apr 13	LM80 Machined Body
AA008040-01	1 & 2	E	19 Apr 13	LM80 Aluminium Front Plate
AA008071-02	1 of 1	E	19 Apr 13	LM80 Machined Stainless Steel Body
AA008069-01	1 of 1	D	19 Apr 13	LM80 SS Front Plate
AA008075-01	1 to 2	D	19 Apr 13	LM80 Body For Triclover Unit
AA008169-02	1 of 1	D	19 Apr 13	LM80 Unit Label
BOM-LLVM-0054	1 to 6	G	19 Apr 13	LM80 Descriptive Note for IECEx & ATEX
AA008042-02	1 of 1	B	19 Apr 13	LASER Heated Lens Tube
AA008041-02	1 of 1	B	19 Apr 13	Detector Heated Lens Tube

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