



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx LCI 09.0010X issue No.:5

Status: **Current**

Date of Issue: **2013-04-05** Page 1 of 4

Applicant: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Certificate history:

- Issue No. 5 (2013-4-5)
- Issue No. 4 (2011-7-22)
- Issue No. 3 (2010-3-31)
- Issue No. 2 (2009-11-6)
- Issue No. 1 (2009-10-28)
- Issue No. 0 (2009-3-9)

Electrical Apparatus: **Gas Chromatograph Analyzer - PGC5000A, PGC5000B, PGC5000C**
Optional accessory:

Type of Protection: **ib py / d e py OR ib px / d e ib px OR nA / d e nA OR pz / d e pz**

Marking:

For zone 1 :

- For PGC5000A : Ex ib py IIB+H2 T4 Gb or
- For PGC5000A : Ex ib px IIB+H2 T4 Gb
- For PGC5000B : Ex d e py IIB+H2 T4 ... T2 Gb or
- For PGC5000B : Ex d e ib px IIB+H2 T4 ... T2 Gb
- For PGC5000C : Ex d e py IIB+H2 T4 ... T2 Gb or
- For PGC5000C : Ex d e ib px IIB+H2 T4 ... T2 Gb

For zone 2 :

- For PGC5000A : Ex nA IIB+H2 T4 Gc or
- For PGC5000A : Ex pz IIB+H2 T4 Gc
- For PGC5000B : Ex d e nA IIB+H2 T4 ... T2 Gc or
- For PGC5000B : Ex d e pz IIB+H2 T4 ... T2 Gc
- For PGC5000C : Ex d e nA IIB+H2 T4 ... T2 Gc or
- For PGC5000C : Ex d e pz IIB+H2 T4 ... T2 Gc

(complete marking on page attachment N2)

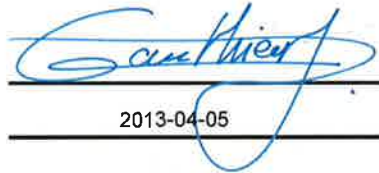
Approved for issue on behalf of the IECEx
Certification Body:

Julien GAUTHIER

Position:

Certification Officer

Signature:
(for printed version)



Date:

2013-04-05

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Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

Documents relative to LCIE certification activities (Certificates, QARs, ExTRs) can be registered under the references "LCI" or "LCIE".





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Page 2 of 4

Manufacturer: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Additional Manufacturing location(s):

ABB Inc.
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2007-04 Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2010 Edition: 4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-2 : 2007-02 Edition: 5	Explosive Atmospheres - Part 2 Equipment protection by pressurized enclosure "p"
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR09.0011/00
FR/LCI/ExTR09.0011/03

FR/LCI/ExTR09.0011/01
FR/LCI/ExTR09.0011/04

FR/LCI/ExTR09.0011/02
FR/LCI/ExTR09.0011/05

Quality Assessment Report:

FR/LCIE/QAR12.0006/00



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2013-04-05

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

DESCRIPTION OF EQUIPEMENT :

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B or PGC5000C) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad. The type PGC5000B and PGC5000C gas chromatograph are designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B and PGC5000C gas chromatograph communicate the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus.

Due to the increase in electrical load, the electrical rating of the Smart Oven is specified as:

PGC5000A @ 120 VA maximum

PGC5000B @ 1200 VA maximum

PGC5000C @ 1600 VA maximum

(See complete description on attachement N°1)

ROUTINE VERIFICATIONS AND TESTS

For pressurized compartments including PGC5000A controller, PGC5000B Oven Electronics, PGC5000B Isothermal oven, PGC5000C Oven Electronics, PGC5000C Isothermal oven, heating device 800-2 :

- IEC60079-2 / §17.1 : The performance of safety devices shall be verified.

- IEC60079-2 / §17.2 : The measured flow rate shall be not greater than the maximum leakage flow rate specified by the manufacturer.

- EN60079-15 / §23.2.1 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For heating device 800-2 and 800 :

- IEC60079-0 / §5 : Checking of the safety device and the temperature class.

- IEC60079-7 / §7.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For FID detector 799 :

- IEC60079-1 / §16 : Routine test under the pressure of 20 bar during at least 10 s without exceeding 1 minute (welded construction)

For PCB 852A047 and 852A017 :

- EN60079-15 / §23.2.1 : Dielectric strength shall be verified by a test at the test voltage 500 V r.m.s. and maintained for at least 1 min.

CONDITIONS OF CERTIFICATION: YES as shown below:

- Ambient temperature : 0 to 50°C

- When PGC5000 is configured as a PGC5007 High Heat T3, a warning label for Type 791 heater block should be added :

WARNING – AFTER DE-ENERGIZING, DELAY 30 MINUTES BEFORE OPENING.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue N°5:

- Normative update according to standards IEC 60079-0 Ed 6 and IEC 60079-15 Ed 4
- Inclusion of the new Touch Panel for the PGC5000A Master Controller
- Inclusion of the new Type 883 Airless Oven module for the PGC5000B and PGC5000C
- Inclusion of a new version of the PGC5007 Fuel Sulfur Analyzer, commonly referred to as the PGC5007 High Heat T3 (only for zone 1)
- Inclusion of alternate printed circuit boards housed within the PGC5000B and PGC5000C oven electronics enclosure
- Inclusion of the previously examined Type 805 Traps as previously examined and approved for the previous PGC2000 analyzer

Description of equipment :

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B or PGC5000C) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad. The type PGC5000B and PGC5000C gas chromatograph are designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B and PGC5000C gas chromatograph communicate the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus.

The Master Controller is the Class A version, type PGC5000A, which controls from one to four Isothermal Ovens type PGC5000B or PGC5000C.

This controller compartment PGC5000A houses a power supply and printed circuit boards for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad. This compartment relies upon type 'py' protection for Zone 1 area; therefore within the compartment is the safety device for monitoring the differential pressure and alarming provision. Moreover, non-sparking concept nA is additionally applied to demonstrate the non-sparking design necessary for the pressurisation by protection mode.

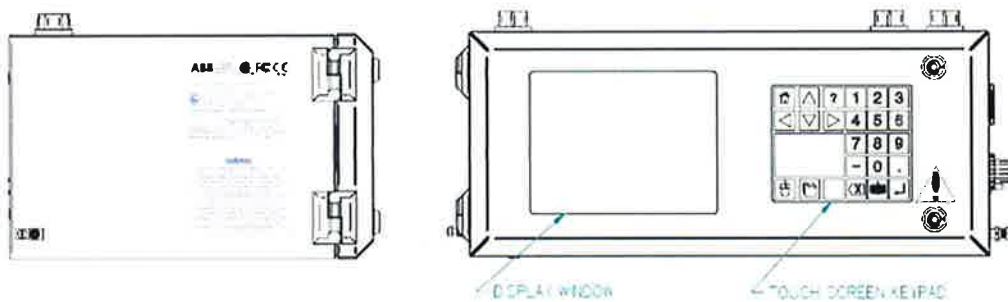


Figure 1: PGC5000A Master Controller

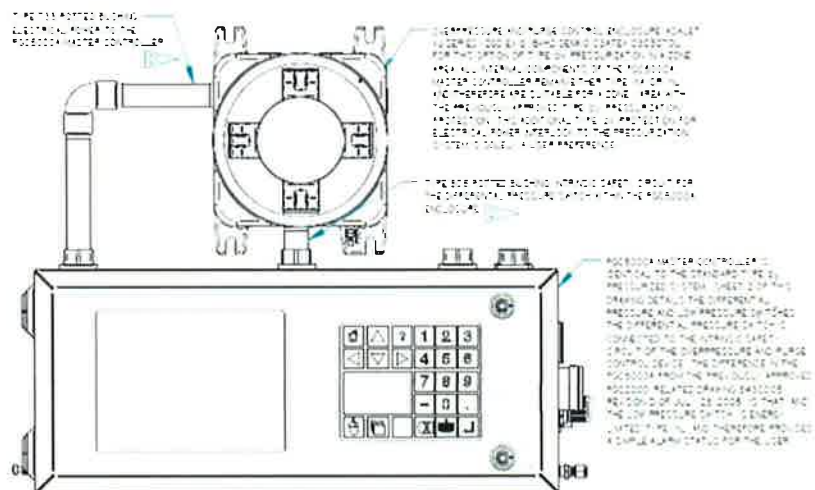


Figure 2: PGC5000A Master Controller with overpressure and purge control device option

The type PGC5000B and PGC5000C gas chromatograph are designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B and PGC5000C gas chromatograph communicates the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus.

The PGC5000B and PGC5000C modules consist of the following three sections :

1.) The electronics compartment (located on the left side) has air-operated solenoids, printed circuit boards for power distribution, oven indication / alarms, detector signal amplification and temperature control of heaters within the oven compartment.

The non-sparking concept nA is additionally applied to demonstrate the non-sparking design necessary for pressurisation by protection mode.

In case of overpressure and purge control device option (x-purge option) the protection of the compartment relies on 'px' protection as per the figure 4 below.

2.) The oven compartment (located on the right side) houses, as dependant upon the configuration / analytical application is composed of many equipments certified as ATEX components to be used exclusively with PGC5000A/B/C.

Despite these components have their own protection mode, the non-sparking concept nA is additionally applied with the pressurisation by protection mode in this compartment to garanty the safety of the remaining small parts like thermocouples and non certified connections.

3.) The top compartment is exposed to hazardous atmosphere and houses the Electronic Pressure Control (EPC) type 801-2 and a manifold for incoming air as required for the air-operated solenoids and regulated purge air for the electronics and oven compartments.

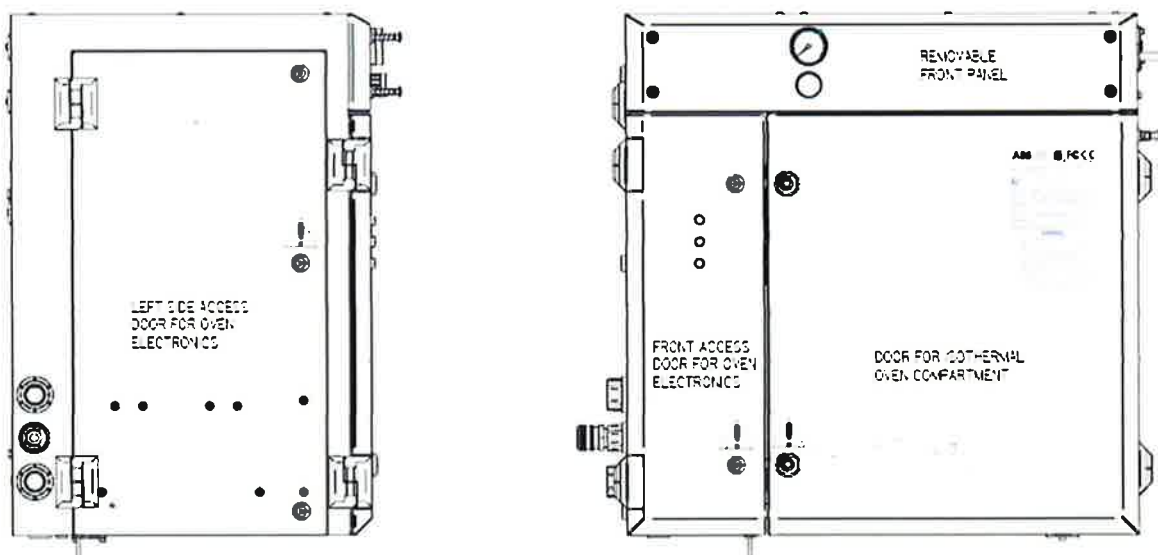


Figure 3: PGC5000B Gas chromatograph

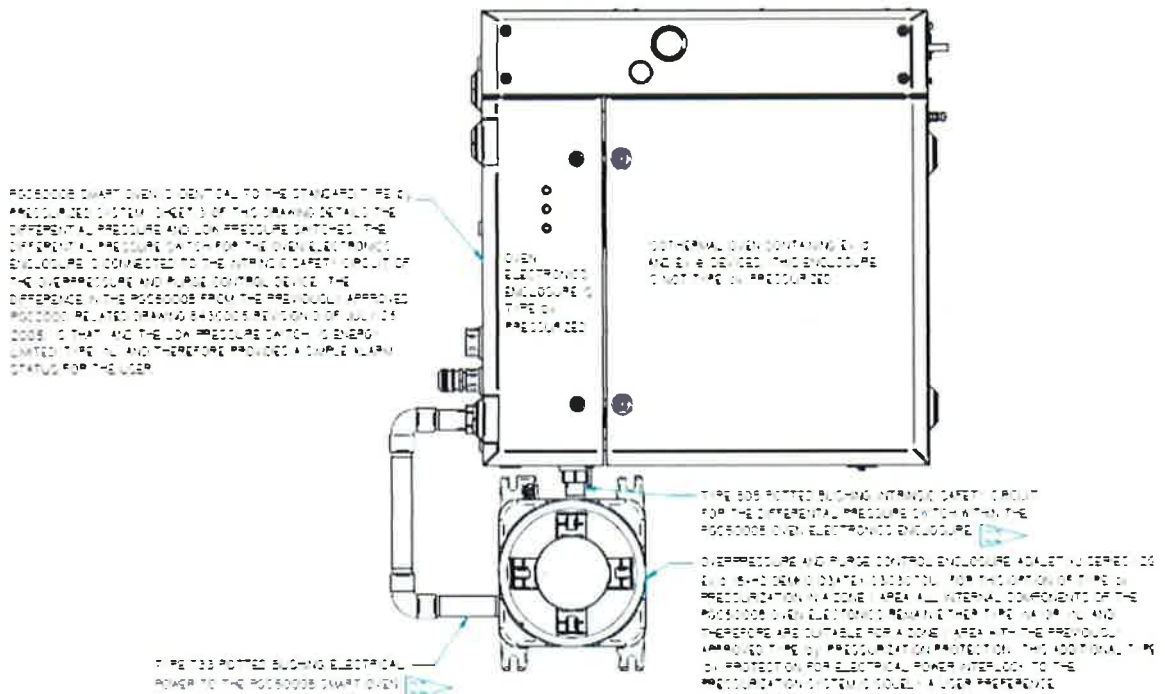


Figure 4: PGC5000B Gas chromatograph with overpressure and purge control device option

The PGC5000C Smart Oven is physically larger than the previously examined PGC5000B by approximately 50% in volume, and is application dependant upon the analytical measurement. Regardless of the model PGC5000B or PGC5000C, the series PGC5000 Smart Oven houses and employs the identical internal components.

For complex analytical applications, the PGC5000C Smart Oven is capable of operating simultaneous detectors (i.e. TCD or FID), two Electronic Pressure Controllers (EPC) and two Liquid Sample Valves (LSV). The larger PGC5000C Smart Oven offers another access door to the internal electronics, due to the increased height of the enclosure, and a higher wattage air heater to effectively heat the isothermal oven compartment.

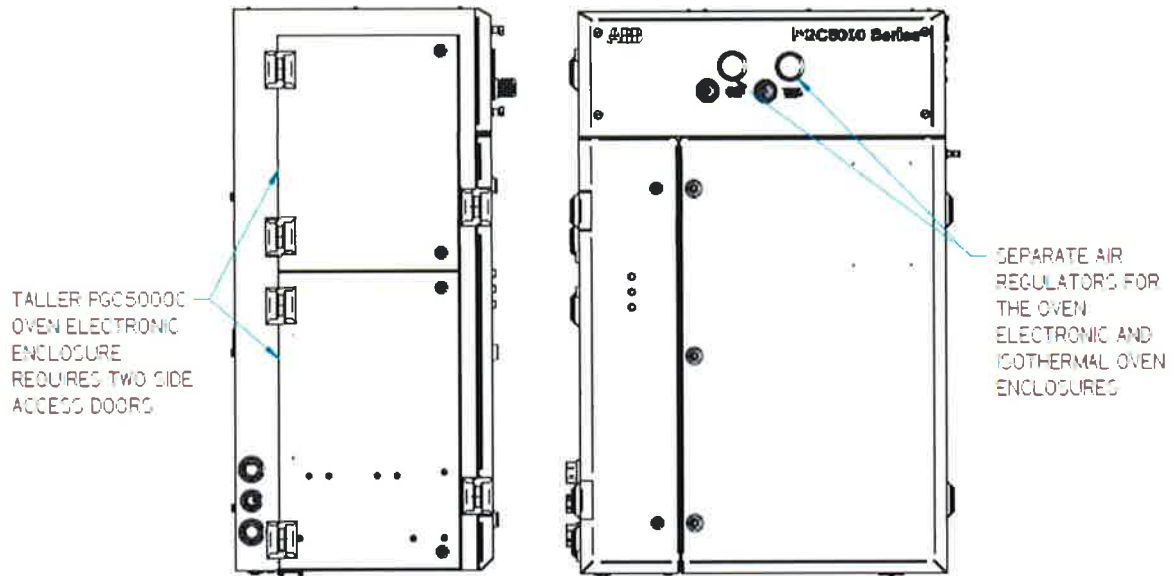


Figure 5: PGC5000C Gas chromatograph

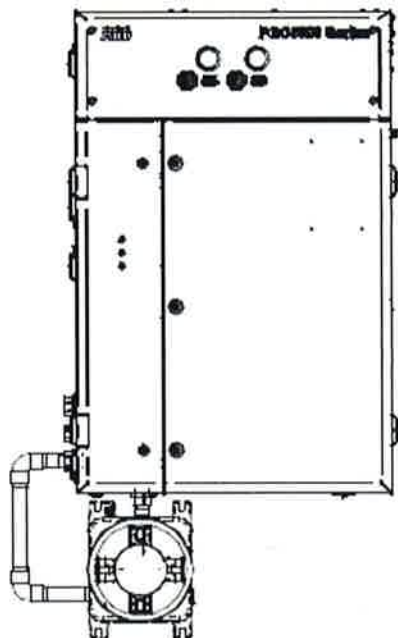


Figure 6: PGC5000C Gas chromatograph with overpressure and purge control device option



IECEX LCI 09.0010X issue 05 Attachment n°1



Application for zone 2 :

As EN60079-15 and EN60079-11 were applied behind the 'py' protection to demonstrate the non sparking design of the analyzer, PGC5000A, PGC5000B and PGC5000C can also be marked Ex nA without pressurization.

The 'pz' protection mode can be marked on the PGC5000A, PGC5000B and PGC5000C whatever the purge control device option (x-purge option) for the electronic enclosure.

Due to the increase in electrical load, the electrical rating of the Smart Oven is specified as :

PGC5000A @ 120 VA maximum

PGC5000B @ 1200 VA maximum

PGC5000C @ 1600 VA maximum



IECEX LCI 09.0010X issue 05 Attachment n°2



Marking :

For Zone 1 :

ABB Inc
Address : ...
Type : PGC5000A
Serial number : ...
Year of manufacturer: ...
Ex ib py IIB+H₂ T4 Gb
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Total internal free volume : 62L
Minimum air supply flow rate : 17,84 L/min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 21,66 L/min
Maximum overpressure : 3,3 mbar
Purge wait time : 18,20 min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ABB Inc
Address : ...
Type : PGC5000A, option X-PURGE type
Serial number : ...
Year of manufacturer: ...
Ex ib px IIB+H₂ T4 Gb
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Total internal free volume : 62L
Minimum air supply flow rate : 17,84 L/min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 21,66 L/min
Maximum overpressure : 3,3 mbar
Purge wait time : 18,20 min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ABB Inc
Address : ...
Type : PGC5000B or PGC5000C Oven Electronics
Serial number : ...
Year of manufacturer: ...
Ex d e py IIB + H₂ T4...T2 Gb
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Minimum air supply flow rate : 39,36 L/Min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 79,00 L/Min
Maximum overpressure : 1,76 mbar
Purge wait time : 18,20 Min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

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IECEX LCI 09.0010X issue 05 Attachment n°02



ABB Inc
Address : ...
Type : PGC5000B or PGC5000C Oven Electronics, option X-PURGE
Serial number : ...
Year of manufacturer : ...
Ex d e i b px IIB + H₂ T4...T2 Gb
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Minimum air supply flow rate : 39,36 L/Min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 79,00 L/Min
Maximum overpressure : 1,76 mbar
Purge wait time : 18,20 Min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ABB Inc
Address : ...
Type : PGC5000B or PGC5000C Isothermal oven,
Serial number : ...
Year of manufacturer : ...
Ex d e py IIB + H₂ T4...T2 Gb
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Minimum air supply flow rate : 106,47 L/Min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 169,05 L/Min
Maximum overpressure : 2,33 mbar
Purge wait time : 18,20 Min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ABB Inc
Address : ...
Type : PGC5000B or PGC5000C Isothermal oven, option X-PURGE
Serial number : ...
Year of manufacturer : ...
Ex d e i b px IIB + H₂ T4...T2 Gb
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Minimum air supply flow rate : 106,47 L/Min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 169,05 L/Min
Maximum overpressure : 2,33 mbar
Purge wait time : 18,20 Min

WARNING – PRESSURIZED ENCLOSURE
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IECEX LCI 09.0010X issue 05 Attachment n°02



For Zone 2:

ABB Inc
Address : ...
Type : PGC5000A
Serial number : ...
Year of manufacturer: ...
Ex ib nA IIB+H₂ T4 Gc or
Ex pz IIB+H₂ T4 Gc
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Total internal free volume : 62L
Minimum air supply flow rate : 17,84 L/min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 21,66 L/min
Maximum overpressure : 3,3 mbar
Purge wait time : 18,20 min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ABB Inc
Address : ...
Type : PGC5000B or PGC5000C Oven Electronics
Serial number : ...
Year of manufacturer: ...
Ex d e nA IIB + H₂, T4...T2 Gc or
Ex d e pz IIB + H₂ T4...T2 Gc
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Minimum air supply flow rate : 39,36 L/Min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 79,00 L/Min
Maximum overpressure : 1,76 mbar
Purge wait time : 18,20 Min

WARNING – PRESSURIZED ENCLOSURE
WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ABB Inc
Address : ...
Type : PGC5000B or PGC5000C Isothermal oven,
Serial number : ...
Year of manufacturer : ...
Ex d e nA IIB + H₂ T4...T2 Gc or
Ex d e pz IIB + H₂ T4...T2 Gc
IECEX LCI 09.0010X
0°C ≤ Tamb ≤ +50°C
Protective gas : Continuous flow, air
Minimum air supply flow rate : 106,47 L/Min.
Minimum overpressure : 0,5 mbar
Maximum leakage flow rate : 169,05 L/Min
Maximum overpressure : 2,33 mbar
Purge wait time : 18,20 Min

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IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx LCI 09.0010X** issue No.: **4**
Status: **Current**
Date of Issue: **2011-07-22** Page 1 of 5

Certificate history:
Issue No. 4 (2011-7-22)
Issue No. 3 (2010-3-31)
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Issue No. 1 (2009-10-28)
Issue No. 0 (2009-3-9)

Applicant: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Electrical Apparatus: **Gas Chromatograph Analyzer - PGC5000A, PGC5000B, PGC5000C**
Optional accessory:

Type of Protection: **ib py / d e py OR ib px / d e ib px OR nA nL / d e nA nL OR pz / d e pz**

Marking: **For zone 1 :**
For PGC5000A : Ex ib py IIB+H2 T4 or
For PGC5000A : Ex ib px IIB+H2 T4
For PGC5000B : Ex d e py IIB+H2, T4, T3 or T2 or
For PGC5000B : Ex d e ib px IIB+H2, T4, T3 or T2
For PGC5000C : Ex d e py IIB+H2, T4, T3 or T2 or
For PGC5000C : Ex d e ib px IIB+H2, T4, T3 or T2
For zone 2 :
For PGC5000A : Ex nA nL IIB+H2 T4 or
For PGC5000A : Ex pz IIB+H2 T4
For PGC5000B : Ex d e nA nL IIB+H2, T4, T3 or T2 or
For PGC5000B : Ex d e pz IIB+H2, T4, T3 or T2
For PGC5000C : Ex d e nA nL IIB+H2, T4, T3 or T2 or
For PGC5000C : Ex d e pz IIB+H2, T4, T3 or T2
(complete marking on page 4)

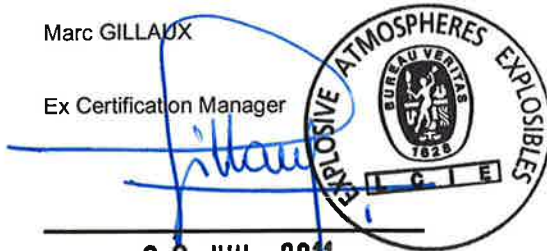
Approved for issue on behalf of the IECEx
Certification Body:

Marc GILLAUX

Position:

Ex Certification Manager

Signature:
(for printed version)



Date:

22 JUL. 2011

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2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France





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Manufacturer: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Manufacturing location(s):
ABB Inc.
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This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

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IEC 60079-1 : 2007-04 Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 60079-2 : 2007-02 Edition: 5	Explosive Atmospheres - Part 2 Equipment protection by pressurized enclosure "p"
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR09.0011/04

Quality Assessment Report:

NL/KEM/QAR09.0015/01



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Page 3 of 5

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B or PGC5000C) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad. The type PGC5000B and PGC5000C gas chromatograph are designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B and PGC5000C gas chromatograph communicate the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus. The PGC5000B and PGC5000C modules consist of the following three sections:

1.) The electronics compartment (located on the left side),

2.) The oven compartment (located on the right side), houses, as dependant upon the configuration / analytical application, the isothermal air-mass heater type 800-2, pneumatic actuated sample valves, TCD detectors type 002A or type 865, FID detector type 799, methanizer / air cleanup type 805-5 or type 862, or the LSV vaporizer heater block type 791. The oven compartment also includes the Type 867 Flame Photometric Detector (FPD). This Type 867 FPD shall be considered as an option to the PGC5000B. The FPD configuration is dependant upon the intended analytical application of the PGC5000B application. The components of the type 867 FPD are very similar to the previously submitted and approved type 804 FPD (see page 92 of this report for details). The purpose of the present modification report (issue 03) is to add the standard type 865-2 Thermal Conductivity Detector (TCD) which is application dependant and shall be compared to the previously examined standard type 002A TCD and multi-port type 865 TCD. The type 865-2 Thermal Conductivity Detector (TCD) has the identically same analytical ports as the previously examined type 865 TCD. The standard type 865-2 TCD does not have the additional wiring chamber or wiring conduct that was previously examined for the multi-port type 865 TCD. The flameproof construction of the standard type 865-2 TCD is identical to the previously examined type 002A TCD, certified LCIE 03ATEX0038U, except that the previous standard type 002A TCD employed external flame arrestors whereas the new standard type 865-2 TCD employs the same internal flame arrestors as the previously examined multi-port type 865 TCD, which inserts the internal flame arrestors inside of the analytical ports.

3.) The top compartment is exposed to hazardous atmosphere and houses the Electronic Pressure Control (EPC) type 801-2 and a manifold for incoming air as required for the air-operated solenoids and regulated purge air for the electronics and oven compartments.

The PGC5000C Smart Oven is physically larger than the previously examined PGC5000B by approximately 50% in volume, and is application dependant upon the analytical measurement. Regardless of the model PGC5000B or PGC5000C, the series PGC5000 Smart Oven houses and employs the identical internal components. For complex analytical applications, the PGC5000C Smart Oven is capable of operating simultaneous detectors (i.e. TCD or FID), two Electronic Pressure Controllers (EPC) and two Liquid Sample Valves (LSV). Such configurations can be compared to the previously examined PGC2000, IECEx LCI 07.0011 and ExTR LCIE 60054857-555326 (FRI/LCI/ExTR07.0008/00). The larger PGC5000C Smart Oven offers another access door to the internal electronics, due to the increased height of the enclosure, and a higher wattage air heater to effectively heat the isothermal oven compartment.

Due to the increase in electrical load, the electrical rating of the Smart Oven is specified as:

PGC5000A @ 120 VA maximum

PGC5000B @ 1200 VA maximum

PGC5000C @ 1600 VA maximum

CONDITIONS OF CERTIFICATION: YES as shown below:

Ambient temperature : 0 to 50°C.



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2011-07-22

Issue No.: 4

Page 4 of 5

EQUIPMENT(continued):

MARKING :

ABB Inc – Lewisburg - USA

Serial number / Year of manufacture / Certificate number / Ambient temperature : 0 to 50°C

WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

For PGC5000A controller:

For ZONE 1:

Type : PGC5000A

Ex ib py IIB+H2 T4 or Ex ib px IIB+H2 T4 (with optional overpressure and purge control device)

Protective gas : Continuous flow, air

Total internal free volume : 62L

Minimum air supply flow rate: 17.84 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 3.3 mbar

Maximum leakage flow rate : 21.66 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex ib nA nL IIB+H2 T4 or Ex pz IIB+H2 T4 (with optional overpressure and purge control device)

For PGC5000B and PGC5000C Oven Electronics :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 or Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

Protective gas : Continuous flow, air

Total internal free volume : 37.94L

Minimum air supply flow rate : 39.36 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 1.76 mbar

Maximum leakage flow rate : 79.00 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 or Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

For PGC5000B and PGC5000C Isothermal oven :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 or Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

Protective gas : Continuous flow, air

Total internal free volume : 36.81L

Minimum air supply flow rate: 106.47 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 2.33 mbar

Maximum leakage flow rate : 169.05 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 or Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

ROUTINE VERIFICATIONS AND TESTS

For pressurized compartments including PGC5000A controller, PGC5000B Oven Electronics, PGC5000B Isothermal oven, PGC5000C Oven Electronics, PGC5000C Isothermal oven, heating device 800-2 :

- IEC60079-2 / §17.1 : The performance of safety devices shall be verified.

- IEC60079-2 / §17.2 : The measured flow rate shall be not greater than the maximum leakage flow rate specified by the manufacturer.

- EN60079-15 / §34.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For heating device 800-2 and 800 :

- IEC60079-0 / §5 : Checking of the safety device and the temperature class.

- IEC60079-7 / §7.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For FID detector 799 :

- IEC60079-1 / §16 : Routine test under the pressure of 20 bar during at least 10 s without exceeding 1 minute (welded construction).



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2011-07-22

Issue No.: 4

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):


The purpose of this report is :Inclusion of improved Digital Temperature Controller printed circuit boards housed within the oven electronics enclosure, and addition of the new model PGC5007 Fuel Sulfur Analyzer, including the type 868 furnace housed within the isothermal oven of the PGC5000B



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEX LCI 09.0010X	issue No.:	3	Certificate history: Issue No. 3 (2010-3-31) Issue No. 2 (2009-11-6) Issue No. 1 (2009-10-28) Issue No. 0 (2009-3-9)
Status:	Current			
Date of Issue:	2010-03-31		Page 1 of 5	
Applicant:	ABB Inc. 843, North Jefferson Street Lewisburg, WV 24901 United States of America			
Electrical Apparatus: <i>Optional accessory:</i>	Gas Chromatograph Analyzer - PGC5000A, PGC5000B, PGC5000C			
Type of Protection:	ib py / d e py OR ib px / d e ib px OR nA nL / d e nA nL OR pz / d e pz			
Marking:	For zone 1 : For PGC5000A : Ex ib py IIB+H2 T4 or For PGC5000A : Ex ib px IIB+H2 T4 For PGC5000B : Ex d e py IIB+H2, T4, T3 or T2 or For PGC5000B : Ex d e ib px IIB+H2, T4, T3 or T2 For PGC5000C : Ex d e py IIB+H2, T4, T3 or T2 or For PGC5000C : Ex d e ib px IIB+H2, T4, T3 or T2 For zone 2 : For PGC5000A : Ex nA nL IIB+H2 T4 or For PGC5000A : Ex pz IIB+H2 T4 For PGC5000B : Ex d e nA nL IIB+H2, T4, T3 or T2 or For PGC5000B : Ex d e pz IIB+H2, T4, T3 or T2 For PGC5000C : Ex d e nA nL IIB+H2, T4, T3 or T2 or For PGC5000C : Ex d e pz IIB+H2, T4, T3 or T2 (complete marking on page 4)			
Approved for issue on behalf of the IECEx Certification Body:	Marc GILLAUX			
Position:	Ex Certification Manager			
Signature: (for printed version)				
Date:	02 JUN 2010			

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
 33 Avenue du General Leclerc
 FR-92260 Fontenay-aux-Roses
 France



LCIE



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2010-03-31

Issue No.: 3

Page 2 of 5

Manufacturer: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Manufacturing location(s):
ABB Inc.
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 60079-2 : 2001 Edition: 4	Electrical apparatus for explosive gas atmospheres - Part 2: Pressurized enclosures 'p'
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/EXTR09.0011/03

Quality Assessment Report:
NL/KEM/QAR09.0015/00



IECEX Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2010-03-31

Issue No.: 3

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B or PGC5000C) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad. The type PGC5000B and PGC5000C gas chromatograph are designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B and PGC5000C gas chromatograph communicate the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus. The PGC5000B and PGC5000C modules consist of the following three sections:

1.) The electronics compartment (located on the left side),

2.) The oven compartment (located on the right side) , houses, as dependant upon the configuration / analytical application, the isothermal air-mass heater type 800-2, pneumatic actuated sample valves, TCD detectors type 002A or type 865, FID detector type 799, methanizer / air cleanup type 805-5 or type 862, or the LSV vaporizer heater block type 791. The oven compartment also includes the Type 867 Flame Photometric Detector (FPD). This Type 867 FPD shall be considered as an option to the PGC5000B. The FPD configuration is dependant upon the intended analytical application of the PGC5000B application. The components of the type 867 FPD are very similar to the previously submitted and approved type 804 FPD (see page 92 of this report for details). The purpose of the present modification report (issue 03) is to add the standard type 865-2 Thermal Conductivity Detector (TCD) which is application dependant and shall be compared to the previously examined standard type 002A TCD and multi-port type 865 TCD. The type 865-2 Thermal Conductivity Detector (TCD) has the identically same analytical ports as the previously examined type 865 TCD. The standard type 865-2 TCD does not have the additional wiring chamber or wiring conduct that was previously examined for the multi-port type 865 TCD. The flameproof construction of the standard type 865-2 TCD is identical to the previously examined type 002A TCD, certified LCIE 03ATEX0038U, except that the previous standard type 002A TCD employed external flame arrestors whereas the new standard type 865-2 TCD employs the same internal flame arrestors as the previously examined multi-port type 865 TCD, which inserts the internal flame arrestors inside of the analytical ports.

3.) The top compartment is exposed to hazardous atmosphere and houses the Electronic Pressure Control (EPC) type 801-2 and a manifold for incoming air as required for the air-operated solenoids and regulated purge air for the electronics and oven compartments.

The PGC5000C Smart Oven is physically larger than the previously examined PGC5000B by approximately 50% in volume, and is application dependant upon the analytical measurement. Regardless of the model PGC5000B or PGC5000C, the series PGC5000 Smart Oven houses and employs the identical internal components. For complex analytical applications, the PGC5000C Smart Oven is capable of operating simultaneous detectors (i.e. TCD or FID), two Electronic Pressure Controllers (EPC) and two Liquid Sample Valves (LSV). Such configurations can be compared to the previously examined PGC2000, IECEx LCI 07.0011 and ExTR LCIE 60054857-555326 (FRI/LCI/ExTR07.0008/00). The larger PGC5000C Smart Oven offers another access door to the internal electronics, due to the increased height of the enclosure, and a higher wattage air heater to effectively heat the isothermal oven compartment.

Due to the increase in electrical load, the electrical rating of the Smart Oven is specified as:

PGC5000A @ 120 VA maximum

PGC5000B @ 1200 VA maximum

PGC5000C @ 1600 VA maximum

CONDITIONS OF CERTIFICATION: YES as shown below:

Ambient temperature : 0 to 50°C.



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2010-03-31

Issue No.: 3

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EQUIPMENT(continued):

MARKING :

ABB Inc – Lewisburg - USA

Serial number / Year of manufacture / Certificate number / Ambient temperature : 0 to 50°C

WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

For PGC5000A controller:

For ZONE 1:

Type : PGC5000A

Ex ib py IIB+H2 T4 **or** Ex ib px IIB+H2 T4 (with optional overpressure and purge control device)

Protective gas : Continuous flow, air

Total internal free volume : 62L

Minimum air supply flow rate: 17.84 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 3.3 mbar

Maximum leakage flow rate : 21.66 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex ib nA nL IIB+H2 T4 **or** Ex pz IIB+H2 T4 (with optional overpressure and purge control device)

For PGC5000B and PGC5000C Oven Electronics :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 **or** Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

Protective gas : Continuous flow, air

Total internal free volume : 37.94L

Minimum air supply flow rate : 39.36 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 1.76 mbar

Maximum leakage flow rate : 79.00 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 **or** Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

For PGC5000B and PGC5000C Isothermal oven :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 **or** Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

Protective gas : Continuous flow, air

Total internal free volume : 36.81L

Minimum air supply flow rate: 106.47 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 2.33 mbar

Maximum leakage flow rate : 169.05 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 **or** Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

ROUTINE VERIFICATIONS AND TESTS

For pressurized compartments including PGC5000A controller, PGC5000B Oven Electronics, PGC5000B Isothermal oven, PGC5000C Oven Electronics, PGC5000C Isothermal oven, heating device 800-2 :

- IEC60079-2 / §17.1 : The performance of safety devices shall be verified.

- IEC60079-2 / §17.2 : The measured flow rate shall be not greater than the maximum leakage flow rate specified by the manufacturer.

- EN60079-15 / §34.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For heating device 800-2 and 800 :

- IEC60079-0 / §5 : Checking of the safety device and the temperature class.

- IEC60079-7 / §7.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For FID detector 799 :

- IEC60079-1 / §16 : Routine test under the pressure of 20 bar during at least 10 s without exceeding 1 minute (welded construction).



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2010-03-31

Issue No.: 3

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Initial Issue :

Initial issue based on tests performed by CSA International, Toronto

Issue 01 :

Addition of the optional overpressure and purge control device (x-purge option).

Issue 02 :

Addition of the optional flame photometric detector type 867 FPD in the oven compartment of the PGC5000B

Issue 03 :

Addition of the optional Extended I/O devices within the PGC5000A, the Malema flow switch and type 865-2 Thermal Conductive Detector (TCD) for the isothermal oven and the inclusion of the PGC5000C Smart Oven



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx LCI 09.0010X issue No.:2

Status: **Current**

Date of Issue: 2009-11-06 Page 1 of 5

Certificate history:
Issue No. 2 (2009-11-6)
Issue No. 1 (2009-10-28)
Issue No. 0 (2009-3-9)

Applicant: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Electrical Apparatus: **Gas Chromatograph Analyzer - PGC5000A, PGC5000B**
Optional accessory:

Type of Protection: **ib py / d e py OR ib px / d e ib px OR nA nL / d e nA nL OR pz / d e pz**

Marking:
For zone 1 :
For PGC5000A : Ex ib py IIB+H2 T4 or
For PGC5000A : Ex ib px IIB+H2 T4
For PGC5000B : Ex d e py IIB+H2, T4, T3 or T2 or
For PGC5000B : Ex d e ib px IIB+H2, T4, T3 or T2
For zone 2 :
For PGC5000A : Ex nA nL IIB+H2 T4 or
For PGC5000A : Ex pz IIB+H2 T4
For PGC5000B : Ex d e nA nL IIB+H2, T4, T3 or T2 or
For PGC5000B : Ex d e pz IIB+H2, T4, T3 or T2

Approved for issue on behalf of the IECEx
Certification Body:

Marc GILLAUX

Position:

Ex Certification Manager

Signature:
(for printed version)


06 NOV. 2009

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France





IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-11-06

Issue No.: 2

Page 2 of 5

Manufacturer: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Manufacturing location(s):
ABB Inc.
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 60079-2 : 2001 Edition: 4	Electrical apparatus for explosive gas atmospheres - Part 2: Pressurized enclosures 'p'
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR09.0011/02

Quality Assessment Report:

NL/KEM/QAR09.0015/00



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-11-06

Issue No.: 2

Page 3 of 5

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad.

The type PGC5000B gas chromatograph is designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B gas chromatograph communicates the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus.

The PGC5000B module consists of the following three sections:

1.) The electronics compartment (located on the left side),

2.) The oven compartment (located on the right side) , houses, as dependant upon the configuration / analytical application, the isothermal air-mass heater type 800-2, pneumatic actuated sample valves, TCD detectors type 002A or type 865, FID detector type 799, methanizer / air cleanup type 805-5 or type 862, or the LSV vaporizer heater block type 791.

The purpose of the present certificate (issue 02) is to add the Type 867 Flame Photometric Detector (FPD) in the oven compartment. This Type 867 FPD shall be considered as an option to the previously submitted and approved PGC5000B. The FPD configuration is dependant upon the intended analytical application of the PGC5000B application. The components of the type 867 FPD are very similar to the previously submitted and approved type 804 FPD.

3.) The top compartment is exposed to hazardous atmosphere and houses the Electronic Pressure Control (EPC) type 801-2 and a manifold for incoming air as required for the air-operated solenoids and regulated purge air for the electronics and oven compartments.

PCG5000A : 120Vac / 240Vac, 50/60 Hz, 120VA

PCG5000B : 120Vac / 240Vac, 50/60 Hz, 1200VA

CONDITIONS OF CERTIFICATION: YES as shown below:

Ambient temperature : 0 to 50°C.



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-11-06

Issue No.: 2

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EQUIPMENT(continued):

MARKING :

ABB Inc – Lewisburg - USA

Serial number / Year of manufacture / Certificate number / Ambient temperature : 0 to 50°C

WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

For PGC5000A controller:

For ZONE 1:

Type : PGC5000A

Ex ib py IIB+H2 T4 **or** Ex ib px IIB+H2 T4 (with optional overpressure and purge control device)

Protective gas : Continuous flow, air

Total internal free volume : 62L

Minimum air supply flow rate: 17.84 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 3.3 mbar

Maximum leakage flow rate : 21.66 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex ib nA nL IIB+H2 T4 **or** Ex pz IIB+H2 T4 (with optional overpressure and purge control device)

For PGC5000B Oven Electronics :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 **or** Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

Protective gas : Continuous flow, air

Total internal free volume : 37.94L

Minimum air supply flow rate : 39.36 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 1.76 mbar

Maximum leakage flow rate : 79.00 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 **or** Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

For PGC5000B Isothermal oven :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 **or** Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

Protective gas : Continuous flow, air

Total internal free volume : 36.81L

Minimum air supply flow rate: 106.47 L/Min.

Minimum overpressure : 0.5 mbar / Maximum overpressure : 2.33 mbar

Maximum leakage flow rate : 169.05 L/Min

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 **or** Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control)

ROUTINE VERIFICATIONS AND TESTS

For pressurized compartments including PGC5000A controller, PGC5000B Oven Electronics and PGC5000B Isothermal oven, heating device 800-2 :

- IEC60079-2 / §17.1 : The performance of safety devices shall be verified.

- IEC60079-2 / §17.2 : The measured flow rate shall be not greater than the maximum leakage flow rate specified by the manufacturer.

- EN60079-15 / §34.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For heating device 800-2 :

- IEC60079-0 / §5 : Checking of the safety device and the temperature class.

- IEC60079-7 / §7.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For FID detector 799 :

- IEC60079-1 / §16 : Routine test under the pressure of 20 bar during at least 10 s without exceeding 1 minute (welded construction).



IECEX Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-11-06

Issue No.: 2

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

The purpose of the Issue No. 02 is to add the optional Type 867 Flame Photometric Detector (FPD) in the oven compartment.



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx LCI 09.0010X issue No.:1

Certificate history:
Issue No. 1 (2009-10-28)
Issue No. 0 (2009-3-9)

Status: **Current**

Date of Issue: 2009-10-28 Page 1 of 5

Applicant: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Electrical Apparatus: **Gas Chromatograph Analyzer - PGC5000A, PGC5000B**
Optional accessory:

Type of Protection: **ib py / d e py OR ib px / d e ib px OR nA nL / d e nA nL OR pz / d e pz**

Marking:
For zone 1 :
For PGC5000A : Ex ib py IIB+H2 T4 or
For PGC5000A : Ex ib px IIB+H2 T4
For PGC5000B : Ex d e py IIB+H2, T4, T3 or T2 or
For PGC5000B : Ex d e ib px IIB+H2, T4, T3 or T2
For zone 2 :
For PGC5000A : Ex nA nL IIB+H2 T4 or
For PGC5000A : Ex pz IIB+H2 T4
For PGC5000B : Ex d e nA nL IIB+H2, T4, T3 or T2 or
For PGC5000B : Ex d e pz IIB+H2, T4, T3 or T2

Approved for issue on behalf of the IECEx
Certification Body:

Marc GILLAUX

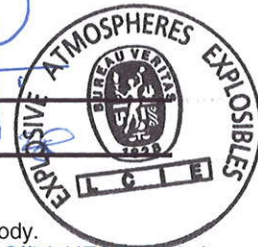
Position:

Ex Certification Manager

Signature:
(for printed version)

Date:

2009-10-28



1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France





IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-10-28

Issue No.: 1

Page 2 of 5

Manufacturer: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Manufacturing location(s):
ABB Inc.
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 60079-2 : 2001 Edition: 4	Electrical apparatus for explosive gas atmospheres - Part 2: Pressurized enclosures 'p'
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR09.0011/01

Quality Assessment Report:

NL/KEM/QAR09.0015/00



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-10-28

Issue No.: 1

Page 3 of 5

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad.

The type PGC5000B gas chromatograph is designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B gas chromatograph communicates the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus.

CONDITIONS OF CERTIFICATION: YES as shown below:

Ambient temperature : 0 to 50°C.



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-10-28

Issue No.: 1

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EQUIPMENT(continued):

The PGC5000B module consists of the following three sections:

- 1.) The electronics compartment (located on the left side),
- 2.) The oven compartment (located on the right side), houses, as dependant upon the configuration / analytical application, the isothermal air-mass heater type 800-2, pneumatic actuated sample valves, TCD detectors type 002A or type 865, FID detector type 799, methanizer / air cleanup type 805-5 or type 862, or the LSV vaporizer heater block type 791.
- 3.) The top compartment is exposed to hazardous atmosphere and houses the Electronic Pressure Control (EPC) type 801-2 and a manifold for incoming air as required for the air-operated solenoids and regulated purge air for the electronics and oven compartments.

PCG5000A : 120Vac / 240Vac, 50/60 Hz, 120VA
PCG5000B : 120Vac / 240Vac, 50/60 Hz, 1200VA

MARKING :

ABB Inc – Lewisburg - USA

Serial number / Year of manufacture

Certificate number

Ambient temperature : 0 to 50°C

WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

For PGC5000A controller:

For ZONE 1:

Type : PGC5000A

Ex ib py IIB+H2 T4 or Ex ib px IIB+H2 T4 (with optional overpressure and purge control device)

Protective gas : Continuous flow, air

Total internal free volume : 62L

Minimum air supply flow rate: 17.84 L/Min.

Minimum overpressure : 0.5 mbar

Maximum leakage flow rate : 21.66 L/Min

Maximum overpressure : 3.3 mbar

Purge wait time : 18.20 Min

or For ZONE 2:

Ex ib nA nL IIB+H2 T4 or Ex pz IIB+H2 T4 (with optional overpressure and purge control device)

For PGC5000B Oven Electronics :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 or Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control device)

Protective gas : Continuous flow, air

Total internal free volume : 37.94L

Minimum air supply flow rate : 39.36 L/Min.

Minimum overpressure : 0.5 mbar

Maximum leakage flow rate : 79.00 L/Min

Maximum overpressure : 1.76 mbar

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 or Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control device)

For PGC5000B Isothermal oven :

For ZONE 1:

Type : PGC5000B

Ex d e py IIB+H2, T4, T3 or T2 or Ex d e ib px IIB+H2 T4, T3 or T2 (with optional overpressure and purge control device)

Protective gas : Continuous flow, air

Total internal free volume : 36.81L

Minimum air supply flow rate: 106.47 L/Min.

Minimum overpressure : 0.5 mbar

Maximum leakage flow rate : 169.05 L/Min

Maximum overpressure : 2.33 mbar

Purge wait time : 18.20 Min

or For ZONE 2:

Ex d e nA nL IIB+H2, T4, T3 or T2 or Ex d e pz IIB+H2 T4, T3 or T2 (with optional overpressure and purge control device)

ROUTINE VERIFICATIONS AND TESTS

For pressurized compartments including PGC5000A controller, PGC5000B Oven Electronics and PGC5000B Isothermal oven, heating device 800-2 :

- IEC60079-2 / §17.1 : The performance of safety devices shall be verified.
- IEC60079-2 / §17.2 : The measured flow rate shall be not greater than the maximum leakage flow rate specified by the manufacturer.
- EN60079-15 / §34.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For heating device 800-2 :

- IEC60079-0 / §5 : Checking of the safety device and the temperature class.
- IEC60079-7 / §7.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For FID detector 799 :

- IEC60079-1 / §16 : Routine test under the pressure of 20 bar during at least 10 s without exceeding 1 minute (welded construction).



IECEX Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-10-28

Issue No.: 1

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

The purpose of the issue No. 1 is to add an optional overpressure and purge control device for compliance to the 'px' requirements.



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: issue No.:

Status:

Date of Issue: Page 1 of 4

Applicant: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Electrical Apparatus: **Gas Chromatograph Analyzer - PGC5000A, PGC5000B**
Optional accessory:

Type of Protection: **ib py/d e py or nA nL/d e nA nL**

Marking: **For zone 1 :**
For PGC5000A : Ex ib py IIB+H2 T4
For PGC5000B : Ex d e py IIB+H2, T4, T3 or T2
For zone 2 :
For PGC5000A : Ex nA nL IIB+H2 T4
For PGC5000B : Ex d e nA nL IIB+H2, T4, T3 or T2

*Approved for issue on behalf of the IECEx
Certification Body:*

Marc GILLAUX

Position:

Ex Certification Manager

*Signature:
(for printed version)*

Date: **21/04/2009**

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France





IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-03-09

Issue No.: 0

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Manufacturer: **ABB Inc.**
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

Manufacturing location(s):
ABB Inc.
843, North Jefferson Street
Lewisburg, WV 24901
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 60079-2 : 2001 Edition: 4	Electrical apparatus for explosive gas atmospheres - Part 2: Pressurized enclosures 'p'
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR09.0011/00

Quality Assessment Report:

NL/KEM/QAR09.0015/00



IECEX Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-03-09

Issue No.: 0

Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The controller compartment PGC5000A (which controls from one to four Isothermal Ovens type PGC5000B) houses a power supply and PCBs for the single board computer, oven controller and the front panel that employs an intrinsically safe circuit for the front panel mounted external keypad.

The type PGC5000B gas chromatograph is designed to operate automatically analyzing process streams and reporting the analysis of the analyzer. The type PGC5000B gas chromatograph communicates the analytical detection and analytical process scheduling back and forth to the type PGC5000A Master Controller by means of fiber optic CAN bus.

CONDITIONS OF CERTIFICATION: YES as shown below:

Ambient temperature : 0 to 50°C.



IECEx Certificate of Conformity

Certificate No.: IECEx LCI 09.0010X

Date of Issue: 2009-03-09

Issue No.: 0

Page 4 of 4

EQUIPMENT(continued):

The PGC5000B module consists of the following three sections:

- 1.) The electronics compartment (located on the left side),
- 2.) The oven compartment (located on the right side) , houses, as dependant upon the configuration / analytical application, the isothermal air-mass heater type 800-2, pneumatic actuated sample valves, TCD detectors type 002A or type 865, FID detector type 799, methanizer / air cleanup type 805-5 or type 862, or the LSV vaporizer heater block type 791.
- 3.) The top compartment is exposed to hazardous atmosphere and houses the Electronic Pressure Control (EPC) type 801-2 and a manifold for incoming air as required for the air-operated solenoids and regulated purge air for the electronics and oven compartments.

PGC5000A : 120Vac / 240Vac, 50/60 Hz, 120VA
PGC5000B : 120Vac / 240Vac, 50/60 Hz, 1200VA

MARKING :

ABB Inc – Lewisburg - USA
Serial number / Year of manufacture
Certificate number
Ambient temperature : 0 to 50°C
WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

For PGC5000A controller:
Type : PGC5000A
Ex ib py IIB+H2 T4
Protective gas : Continuous flow, air
Total internal free volume : 62L
Minimum air supply flow rate: 17.84 L/Min.
Minimum overpressure : 0.5 mbar
Maximum leakage flow rate : 21.66 L/Min
Maximum overpressure : 3.3 mbar
Purge wait time : 18.20 Min

or :
Ex ib nA nL IIB+H2 T4 (For zone 2)

For PGC5000B Oven Electronics :
Type : PGC5000B
Ex d e py IIB+H2, T4, T3 or T2
Protective gas : Continuous flow, air
Total internal free volume : 37.94L
Minimum air supply flow rate : 39.36 L/Min.
Minimum overpressure : 0.5 mbar
Maximum leakage flow rate : 79.00 L/Min
Maximum overpressure : 1.76 mbar
Purge wait time : 18.20 Min

or :
Ex d e nA nL IIB+H2, T4, T3 or T2 (For zone 2)

For PGC5000B Isothermal oven :
Type : PGC5000B
Ex d e py IIB+H2, T4, T3 or T2
Protective gas : Continuous flow, air
Total internal free volume : 36.81L

Minimum air supply flow rate: 106.47 L/Min.
Minimum overpressure : 0.5 mbar
Maximum leakage flow rate : 169.05 L/Min
Maximum overpressure : 2.33 mbar
Purge wait time : 18.20 Min

or :

Ex d e nA nL IIB+H2, T4, T3 or T2 (For zone 2)

ROUTINE VERIFICATIONS AND TESTS

For pressurized compartments including PGC5000A controller, PGC5000B Oven Electronics and PGC5000B Isothermal oven, heating device 800-2 :

- IEC60079-2 / §17.1 : The performance of safety devices shall be verified.
- IEC60079-2 / §17.2 : The measured flow rate shall be not greater than the maximum leakage flow rate specified by the manufacturer.
- EN60079-15 / §34.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For heating device 800-2 :

- IEC60079-0 / §5 : Checking of the safety device and the temperature class.
- IEC60079-7 / §7.2 : Dielectric strength shall be verified by a test at the test voltage 1500 V r.m.s. and maintained for at least 1 min.

For FID detector 799 :

- IEC60079-1 / §16 : Routine test under the pressure of 20 bar during at least 10 s without exceeding 1 minute (welded construction).