(1) # EC-TYPE EXAMINATION CERTIFICATE

(2) **Directive 94/9/EC**

Equipment and Protective Systems intended for use in potentially explosive atmospheres

(3) EC-Type Examination Certificate Number: **BAM 04 ATEX 0002 X**

(4) Equipment: Portable gas detector Model „GasAlertMicro"
„GAMIC-X(y)-(DL2-IR)" with catalytic sensor for combustible gases

(5) Manufacturer: BW Technologies Ltd.

(6) Address: 2840 – 2nd Avenue S.E., Calgary, Alberta, Canada T2A 7X9

(7) This equipment and any acceptable variations thereto are specified in the annex to this certificate and the documents therein referred to.

(8) The Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung und –prüfung, BAM), notified body number 0589, in accordance with Article 9 of Council Directive 94/9/EC of 23 March 1994, certifies that this equipment complies with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential test report no. BAM II-4146/2003 of December 15th, 2004.

(9) The Essential Health and Safety Requirements are complied by conformity with EN 61779-1, EN 61779-4 (June 2000) and EN 50271 (November 2001).

(10) If the sign "X" is placed behind the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the annex to this certificate.

(11) This EC-Type examination certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive applies to the manufacturing and placing on the market of this equipment. Compliance with these requirements is not certified by this certificate.

(12) Marking of the equipment shall include the following:

II 2G EEx ia d IIC T3 or T4

Bundesanstalt für Materialforschung und –prüfung (BAM)
D-12200 Berlin, Dezember 20th, 2004

Dr. rer. nat. R. Schmidt
BAM Certification Body

Dr. rer. nat. V. Lohse
Technical Expert and Assessor

1st copy: BW Technologies Ltd.
2nd copy: BAM Certification Body

(13) **Annex**
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(15) **Description of the equipment**

The GasAlertMicro is a group II gas detector intended for use in potentially explosive atmospheres (excluding mines susceptible to firedamp).
The gas detector GasAlertMicro is a portable, explosion-proofed gas detector which can be fitted with Alkaline batteries or alternatively with rechargeable NiMH accumulators. The GasAlertMicro has 3 sensor plug-in positions and the tested apparatus was fitted with a sensor for measuring combustible gases, an oxygen sensor and a CO & H_2S dual sensor. Gas reaches the sensor by diffusion.
The GasAlertMicro may be equipped with a variable number of sensors which are selected by the implemented software in the menu "User Options". All apparatus types GAMIC-X(y)-(DL2-IR) are equipped with the same software version „bb", the same parameter memory EEPROM version „J" and the same hardware, except for the fitted sensors and the implemented MMC adapter, if applicable.
The LEL sensor is intended for warning of dangerous concentrations of combustible gases (e.g. methane) in mixture with air in concentrations up to the lower explosion limit (LEL).
The LEL sensor of the GasAlertMicro operates on the measuring principle based on catalytic burning of the applied gas at a preheated active bead, known as a „Pellistor". The heat quantity released by the combustion is measured indirectly and serves as a measure for the concentration of the combustible gas in the measured atmosphere, which is indicated as % LEL methane if the apparatus is calibrated with methane.
The measuring channel for the measurement of combustible gases is equipped with two adjustable alarm thresholds, the pre- and the main alarm, respectively, are triggered if these thresholds are exceeded. The apparatus is delivered with non-latching alarms, although these may be configured to latching alarms by the user. The alarm signal is given visually, acoustically, by indication in the graphic display and as vibration alarm.

Sensors:	CiTipel® 4P-90 and CiTipel® 4P-90C, City Technology Limited Certificate: Sira 01ATEX1205X
Batteries:	a) Alkaline Battery Duracell MN1500 b) NiMH-Accumulator Quest HG1600AACS c) Rechargeable Battery Pack NiMH (GAMicro Batt) GAMIC-BAT-03
Accessories:	Battery charger Model GAMIC-C01-K-EU

(16) **Test report BAM II-4146/2003** of December 15th, 2004

The test report comprises 59 pages and 32 annexes with 931 pages.

Examination documents:

1. Quick Reference Guide GasAlertMicro D5554/4 (English), 2004, 20 pages
2. GasAlertMicro ATEX Approval Label with drawing No.GMIA-25F of March 30th, 2004, GasAlertMicro BAM Certification Sticker GMIA-322 of October 14th, 2003 and BAM CalGas Label with drawing No. FXUA 09 C of April 2nd, 2004, 3 pages
3. GasAlertMicro Assembly with drawing No. GMID-40D, 1 page
4. GasAlertMicro Plastic Assembly with drawing No. GMID-65A, 1 page
5. GasAlertMicro Battery retaining screw, 1 page
6. GasAlertMicro, Overview with drawing No. GMIW-01Q of March 26th, 2004, 1 page

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7. Primary Micro controller with in-circuit program option with drawing No. GMIW-05Q of March 26th, 2004, 1 page
8. I2C/SPI Interface circuitry, voltage reference with drawing No. GMIW-10Q of March 26th, 2004, 1 page
9. Sensor circuitry – H_2S- and CO-Dual gas sensor with drawing No. GMIW-15Q of March 26th, 2004, 1 page
10. Sensor circuitry – LEL- and O2-Sensor with drawing No. GMIW-20Q of March 26th, 2004, 1 page
11. Temperature sensing, Battery and light monitor with drawing No. GMIW-25Q of March 26th, 2004, 1 page
12. Keypad and main power supply control with drawing No. GMIW-30Q of March 26th, 2004, 1 page
13. Main power supply and Battery PCB with drawing No. GMIW-35Q of March 26th, 2004, 1 page
14. Step-up speaker power supply with drawing No. GMIW-40Q of March 26th, 2004, 1 page
15. LCD Display with drawing No. GMIW-45Q of March 26th, 2004, 1 page
16. Visual indicators and Vibrator with drawing No. GMIW-50Q of March 26th, 2004, 1 page
17. Audible indicators with drawing No. GMIW-55Q of March 26th, 2004, 1 page
18. IR Communications with drawing No. GMIW-60Q of March 26th, 2004,1 page
19. Multimedia Card datalogger, EEPROM Memory and real time clock with drawing GMIW-65Q of March 26th, 2004, 1 page
20. Parts list GasAlertMicro Non-Datalogger PCB with Revision Level 110748, 9 pages
21. Part list GasAlertMicro Datalogger PCB with Revision Level 110959, 9 pages
22. Layout - Layer descriptions PCB with identification Gmig-10g of August 8th, 2002, 8 pages
23. EC Declaration of Conformity with Directive 94/9/EG (ATEX) and Directive 89/336/EWG (EMC) of April 1st, 2003, 1 page
24. GasAlertMicro Software & digital technologies, Revision C, December 13th, 2004, 7 pages
25. Declaration of manufacturer for the use of hardware components within her specifications according to EN 50271, October 26th, 2004, 1 page
26. Software program listing rev "bb", Revision stand March 23rd, 2004, 837 pages
27. EC Type Examination Certificate with number LCIE 03 ATEX 6091 X of May 6th, 2003 with 2 additions, 5 pages
28. EC Type Examination Certificate with number SIRA 01 ATEX 1205X of June 26th, 2002, 2 pages
29. Technical specification LEL-Sensor 4P-90 CiTipel®, City Technology Ltd. with identification 4p90 Rev03 Issue 5.2 of June 17th, 2004, 4 pages
30. Technical specification LEL-Sensor 4P-90C CiTipel®, City Technology Ltd. with identification 4p90c Rev03 Issue 2.2 of June 17th, 2004, 4 pages

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(17) **Special conditions for safe use:**

1. Compliance with the user manual is required for safe use of the GasAlertMicro.
2. The following climatic ranges of use apply for the use of the GasAlertMicro:

   Temperature: -20°C to +50°C
   Relative humidity: 5% to 95%
   Pressure: 80 kPa to 120 kPa
   (extended range of use for temperature, pressure and humidity compared to EN 61779)
3. The ambient conditions (temperature, pressure, humidity) during the calibra-tion of the measuring channels should be as close as possible to the operating conditions in order to minimise the measuring errors.
4. Measuring values from 0 %LEL to +2 %LEL are indicated as "0 %LEL" in the measuring operation with activated Stability option.
5. In case interfering admixtures which may cause a rapid change of sensitivity (e.g. sensor poisons) are to be expected in the atmosphere to be monitored, this must be taken into account for specification of the calibration intervals.
6. Measuring gases of other installed measuring channels of the GasAlertMicro (e.g. hydrogen sulphide) may decrease the sensitivity of the LEL sensor. This has to be taken into account for specification of the calibration intervals.
7. Before use, it must be checked whether the alarm time delay for the safety related measurement is sufficiently low to ensure that protective measures to be carried out after an alarm can be executed in time to avoid dangerous situations.
8. Cross sensitivities described in the sensor data sheet have to be considered.
9. Some types and concentrations of dust in the measured atmosphere may impair the measuring function of the gas detector.
10. The battery slide-in unit has to be fixed with the retaining screw. After an impact the detector has to be checked on function ability.
11. The gas detector shall be brought in a hazardous area only in the switched on state.
12. If the Low Battery Alarm is given the user has to leave the hazardous area immediately.
13. The EC Type examination certificate only applies to the measuring of methane up to the lower explosion limit (LEL) in air. Additional subtests of a notified body are required for the measuring of other combustible gases, the results being informed about as addition to this certificate.

Marking:

a) Manufacturer (short form, small equipment)
Address (short form)
Type: GasAlertMicro
Model: „GAMIC-X(y)-(DL2-IR)“
Serial number
Year of construction
 II 2G
EEx ia d IIC T3 or T4 (depending on approved batteries used)
LCIE 03 ATEX 6091 X
BAM 04 ATEX 0002 X

b) „Calibration gas: Methane“

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(14)

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c) The CE marking shell be accompanied by the identification number of the notified body, which is responsible for surveillance of the approved quality assurance system.

Additional informations:

This EC-Type examination certificate is part of the EC-Type examination for gas detectors with a measuring function for explosion protection in accordance with Directive 94/9/EC, Annex II, Section 1.5 and is only valid in connection with the EC-Type examination certificate Sira 01 ATEX 1205 X of June 26th, 2002 for the sensors and the EC-Type examination certificate already issued for the GasAlertMicro regarding the safety of the equipment with number LCIE 03 ATEX 6091 X of May 6th, 2003. This supplementary EC-Type examination covers the test of the measuring function of the equipment on the basis of the harmonized standards EN 61779-1 and EN 61779-4 for apparatus with a measuring function for combustible gases and a measuring range up to 100% of the lower explosive limit (LEL) as well as the test of the installed software and the used digital technologies in the gas detector to EN 50271. This EC-Type examination certificate applies to apparatus with installed software version "bb" and the parameter memory EEPROM version „J".
The Datalogger functions of equipment types with data logging options are not covered by this EC-Type examination certificate.

The manufacturer shall inform the notified body (BAM) of all changes at the approved equipment which must receive further approval where such changes may effect conformity with the essential requirements or the prescribed conditions for use of the product (Directive 94/9/EC, Annex III, Section 6).

On behalf of **Bundesanstalt für Materialforschung und –prüfung (BAM)**
D-12200 Berlin, December 20th, 2004

Dr. rer. nat. R. Schmidt
BAM Certification Body

Dr. rer. nat. V. Lohse
Technical Expert and Assessor

1st Addition

to EC-Type Examination Certificate BAM 04 ATEX 0002 X

in accordance with Directive 94/9/EC Annex III Clause 6

Equipment:	Portable Gas Detector Model **GasAlertMicro** Types GAMIC-4 and GAMIC-4-DL2-IR
Manufacturer:	BW Technologies Ltd.
Address:	2840 – 2nd Avenue S.E., Calgary, Alberta, Canada T2A 7X9

Description of changes and additions:

Changes:	Software update to version „AJ " and update of EEPROM parameter memory to version "O" with implementation of a new battery management and addition of user options "Micro-bat" and "Bump due".
Conformity with:	EN 61779-1 and -4 (June 2000) for the measurement of Methane and EN 50271 (November 2001)
Test report:	BAM II-1367/2005

For **Bundesanstalt für Materialforschung und –prüfung (BAM)**

D-12200 Berlin, March 23rd, 2006

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2nd Addition

to EC-Type Examination Certificate BAM 04 ATEX 0002 X

in accordance with Directive 94/9/EC Annex III Clause 6

Equipment:	Portable Gas Detector Model **GasAlertMicro** Types GAMIC-4 and GAMIC-4-DL2-IR
Manufacturer:	BW Technologies by Honeywell
Address:	2840 – 2nd Avenue S.E., Calgary, Alberta, Canada T2A 7X9

Description of changes and additions:

Changes:	Software update to version „AU" and EEPROM parameter memory version "O".
Conformity with:	EN 61779-1 and -4 (June 2000) for the measurement of Methane and Propane, EN 50271 (November 2001)
Test report:	BAM II-3246/2006

For **Bundesanstalt für Materialforschung und –prüfung (BAM)**

D-12200 Berlin, June 21st, 2007

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CERTIFICATE

1st copy: BW Technologies by Honeywell
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