

## Multifunctions Tool

MTG3



**MTG3** is an innovative product combining the elegance and prestige of the **BEINATs.r.l** brand with the versatility of a multi-functional instrument.

It offers four products in a single appliance:

**a pressure gauge, thermometer, explosive gas detector and toxic gas detector.**

Its main use is to assist technicians carry out their work, both during the installation of new systems and the inspection of existing ones.

### Thermometer

Temperature is measured using a built-in, hidden probe and detected from **-50 °C to +100 °C**, with **0.5 °C** resolution.

### Pressure Gauge

The pressure gauge is easy to use when inspecting gas heating systems and inspecting flue efficiency. It is calibrated using state-of-the-art testing machines, therefore measurements are very precise. For example, it is calibrated for:

Pressure of gas mains; Gas pressure to burner nozzles; Flue efficiency;

### Explosive Gas Detection

This advanced instrument and its precision are due to use of a catalytic sensor.

In fact, the probe is managed by a micro-processor used to carry out self-calibration to ensure absolute reading reliability.

When **explosive gas** is detected, it not only emits an acoustic signal, whose frequency is regulated according to the amount of gas detected, but a display also enables direct reading of the concentration of gas in the environment.

Reading from **5% to 100% of the LEL**, with **1% LEL** resolution.

### CO Carbon Monoxide Gas Detection

When **CO gas** is detected, it not only emits an acoustic signal, whose frequency is regulated according to the concentration of gas detected, but a display also enables direct reading of the concentration of gas in the environment.

Reading from **25 ppm to 350 ppm**, with **1 ppm** resolution.

User guide

Firmware Version 1.0

Conformity EMC EN50270

### Functions

- 1) Temperature Measuring Device
- 2) Pressure Measuring Device mm H<sub>2</sub>O - mbar
- 3) Explosive Gas Detection
- 4) CO Carbon Monoxide Gas Detection

Thank you for choosing the **BEINAT S.r.L.** digital tool, model **MTG3**.

This manual was designed to help you obtain the best results and efficiency from the product.

### Important Note

Read these instructions carefully before use and always keep them within hands reach while using the instrument.

The illustrations and texts shown on the screens in this manual may differ from those actually displayed

## For your safety

Read the following safety precautions carefully to avoid damaging the product or personal or third party injuries, before using the **MTG3** appliance

**Keep them safe so they are available for consultation by anyone before using the appliance.**

**Immediately turn off the appliance in the event of malfunctioning.**

In the event you detect smoke or a pungent or unusual odour coming from the appliance or power supply (optional accessory):

Immediately turn off the detector; disconnect the power supply from the mains, if connected to charge the battery, and send to the nearest Service Centre.

**Do not try to dismantle the appliance.**

Contact with internal components of the detector can cause injury. In the event of faults, the product should only be repaired by qualified personnel.

If the device is broken due to a fall or crash, consult the Service Centre for the necessary repairs.

**Observe due precautions while handling the Lithium Polymer battery.**

The battery must never be exposed to high temperatures, that is, over + 45°C. To ensure an optimum service life, use it at room temperature.

If used at low temperatures, the service life could be diminished.

Never dismantle the battery and never throw it on a fire as it may explode.

Never dispose of the battery as normal waste. Comply with local regulations on its disposal.

**Use the correct cables supplied.**

To ensure the product complies with standards, for terminal input and output connection only use the cables supplied for this purpose or those sold separately by **BEINAT S.r.l.**

**Avoid contact with liquid crystals.**

In the event the display breaks, pay attention not to injure yourself with the glass fragments and avoid the liquid crystals coming in contact with your skin, eyes or mouth.

## Precautions

To achieve long, satisfactory use of the **MTG3** digital appliance, use and store it in compliance with the following precautions.

**ENSURE** the detector is intact after removing it from the packaging.

Any use other than the designed use of the detector is considered improper and **BEINAT S.r.l.** declines all liability for any damage caused to people, animals or property.

**Do not allow it to get wet.**

**The MTG3** is not waterproof and can be seriously damaged if immersed in water or exposed to high levels of humidity.

**Do not drop it.**

Heavy knocks on hard surfaces and strong vibrations can damage the machine.

**Avoid strong magnetic fields.**

This detector should not be used or stored near radiation or strong magnetic fields. Static electricity or magnetic fields generated by devices such as radio transmitters can cause interference during measurements.

**Avoid abrupt temperature fluctuations.**

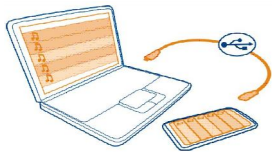
Sudden temperature variations can cause condensation and the batteries could supply lower voltage.

Over a certain temperature (circa + 45°C) the monitor becomes black. To restore visibility place it in a fridge for a few minutes to allow it to cool.

**Cleaning**

Never clean the appliance using chemical products. If necessary, wipe with a damp cloth.

## Concepts and Battery Charging



Recharge from PC



Recharge from AC 230V

### Rechargeable Battery

This device is equipped with a **3.7V** rechargeable LITHIUM POLYMER battery.

To recharge the battery it should be connected to the PC using a USB cable or you can purchase a 230V recharging cable separately.

### When first turned on

On purchase the batteries are not fully charged.

Before using the instrument we recommend you charge the batteries for **a maximum of 10 hours**.

### Charging.

**1** Connect the battery charger connector to the micro USB socket on the lower part of the instrument, and connect this to the USB port of any PC.

**2** Connect the battery charger connector with the power supply unit to the micro USB socket on the lower part of the instrument, and then connect the battery charger to a power socket.

**3 Do not recharge the battery in an ATEX zone.**

### Use

Batteries should never be exposed to high temperatures, or rather exceed working temperatures of  $-20^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$ .

To ensure an optimal service life, use at room temperature.

If used at both low and high temperatures its service life may be diminished.

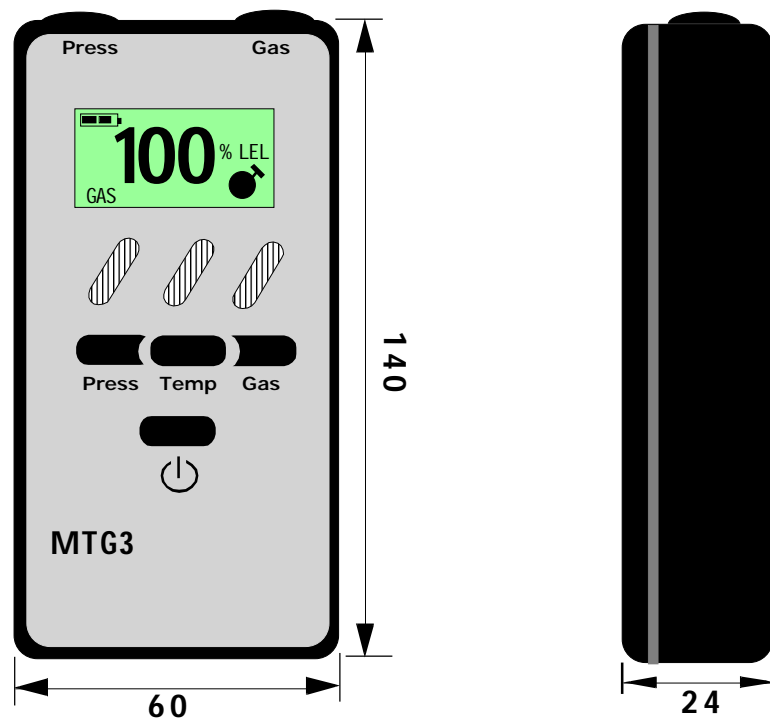
Never dismantle the battery and never throw it on a fire as it may explode.

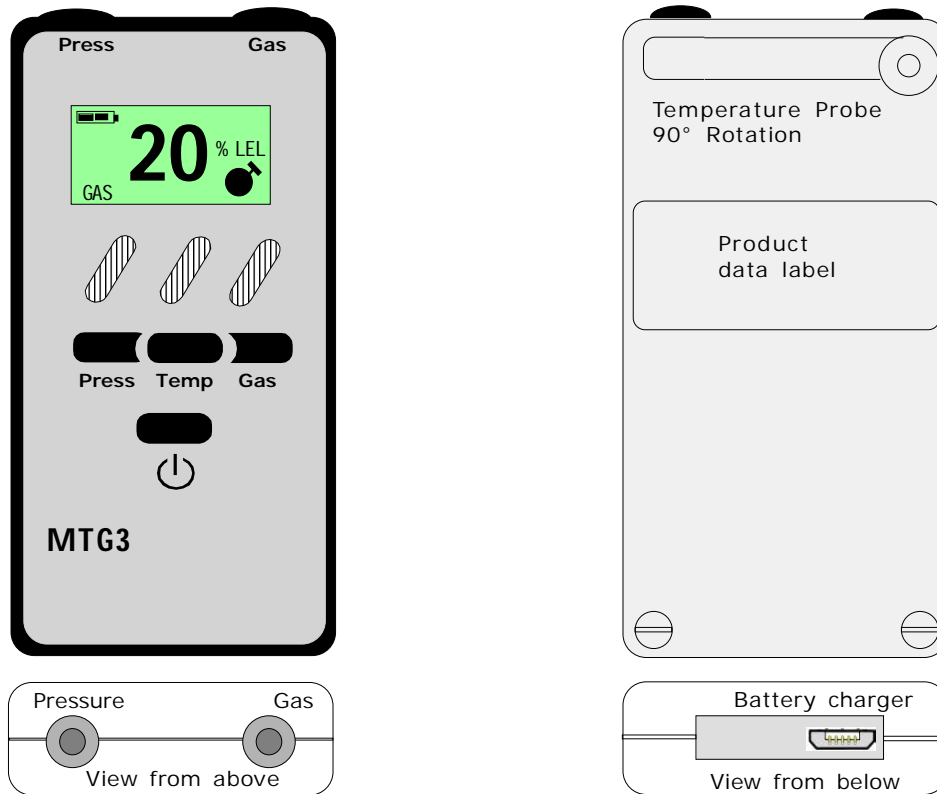
Never dispose of the battery as normal waste. Comply with local regulations on its disposal.

Voltage of charged battery **3.7V**.


Working time **Approximately 30 hours**

## Dimensions

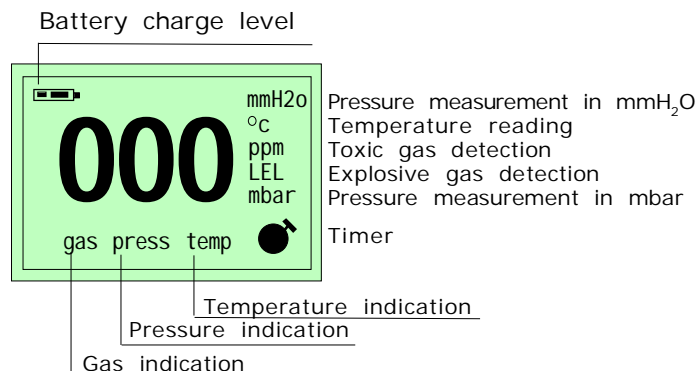


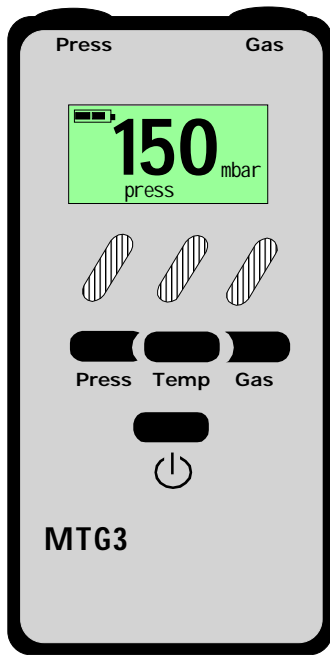


**Button functions**

- **MTG3 On/Off button.**  
To turn the instrument on or off, press the  button for 5 seconds
- **PRESSURE GAUGE Function.**  
The instrument can display 2 scales: one in **mmH<sub>2</sub>O** and the other in **mbar**,  
Keep the **"Press"** button pressed for 2" to access the Pressure Gauge function.  
When the instrument is switched on it positions itself on the **999 mmH<sub>2</sub>O** scale.  
Press the **"Press"** button again for 2" to access the **150 mbar** scale.
- **THERMOMETER Function.**  
Press the **"Temp"** button for 2" to access the Thermometer function. The instrument turns on and starts to measure the room temperature.  
Lift the probe up, by turning it, for maximum reading precision. The measurement scale is **-50 °C to +100 °C**.
- **GAS DETECTION Function.**  
Press the **"GAS"** button for 2" to access the GAS Detection function.  
The instrument can detect two types of gas: Explosive GAS expressed in **LEL** and Toxic **CO** GAS expressed in **ppm**.  
The instrument changes detection each time the **"GAS"** button is pressed.

**Display**





**Pressure Gauge Display**

The display shows a battery icon, a small 'mmH<sub>2</sub>O' label, and a large '99.9' with 'press' below it.

**Measurement display:**  
99,9 mmH<sub>2</sub>O maximum

The display shows a battery icon, a small 'mbar' label, and a large '150' with 'press' below it.

**Measurement display:**  
150 mbar.

**Battery charger status display**  
The display depicts a battery. When the battery is **charged** the figure is completely **black** and as it is used it **becomes white**. It flashes when it needs to be recharged..

**PRESSURE GAUGE Function.**

- Press the button and then the "Press" function button.

**PRESSURE GAUGE Function.**

Press the "Press" button to access the Pressure Gauge function with its **mmH<sub>2</sub>O** scale;

When the instrument is switched on it positions itself on the **999 mmH<sub>2</sub>O** scale

If the pressure measured is higher, the instrument automatically positions itself on the higher scale of **999 mmH<sub>2</sub>O**.

If you want to use the **mbar** scale, press the "Press" button again.

The instrument positions itself on the **30.9 mbar** scale.

If the pressure measured is higher, the instrument automatically positions itself on the higher scale of **150 mbar**

**SWITCH OFF.** Press the OFF button for 5 seconds.

**Checking pressure**

- 1) Turn on the instrument as above
- 2) Insert the silicon tube in the "Press" input
- 3) Use the tube to connect the instrument to the pressure or depression source, for measurement; the instrument measures both positive and negative pressure.

**Readings and Measurements**

These operations must be carried out in compliance with the methods described in this manual.

**Remember**, measurements taken with **batteries in need of recharge** can give **false measurements**.

## Calibration

The **MTG3** digital instrument leaves the factory with a testing and calibration certificate. Such calibration corresponds to that declared by the test instrument, according to **international standards**.

**N.B.** The test instrument is kept in the manufacturing plant. Measurement uncertainty is assessed as **"category B"**

Ordinary and extraordinary maintenance of the digital pressure gauge and **CALIBRATION**, whose natural validity is **ONE YEAR**, must be carried out by authorised personnel with equipment in compliance with standards.

## Pressure and Temperature Information:

Three macroscopic variables are necessary to define the state of static air, each subject to direct measurement. These variables are pressure, temperature and volume; the state of gas in the air with volume **V**, pressure **P** and temperature **T** is defined by Boyles Law:  
 $P \cdot V = n \cdot R \cdot T$ . where **n** is the number of moles composing the gas and **R** is a universal constant. The possible states of a gas with constant pressure and volume are expressed by the Gay-Lussac Law: **with constant pressure the volume of a gas increases as the temperature increases, or vice versa.**

### Example:

**Scale 99.9** mmH<sub>2</sub>O at each °C variable, the pressure varies by +/- 0.7 mm H<sub>2</sub>O

**Scale 999** mmH<sub>2</sub>O at each °C variable, the pressure varies by +/- 3.4 mm H<sub>2</sub>O

Therefore, if the instrument is connected at variable temperatures, the pressure registered at the start will definitely differ from final pressure. This is normal and is not due to malfunctioning.

## Problems and solutions

### If the appliance does not turn on.

Check that the battery is charged, by connecting the battery charger to the mains or connecting the USB cable to the PC.

### If measurements are not read

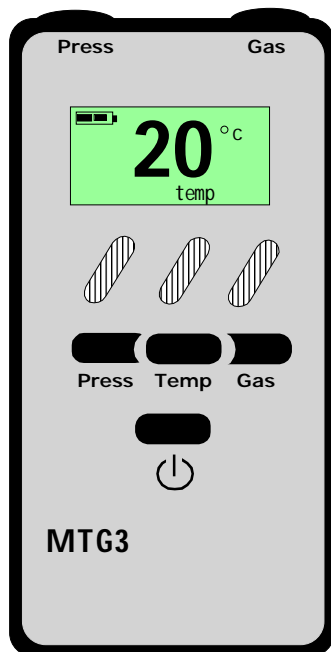
Ensure higher pressure was not set last time the appliance was used. Remember the **excess pressure limit is 7000 mmH<sub>2</sub>O**.

Check the pneumatic connection tubes are not blocked.

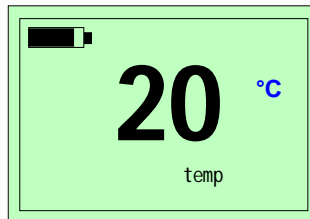
### The battery is not recharging.

Check voltage is arriving from the power supply

**In the event** other problems arise, directly contact a specialist and/or authorised **technician** or your **BEINAT S.r.l. dealer**.



### Thermometer Display




Measurement display:  
from -50 to + 100 °C

#### Battery charger status display

The display depicts a battery.  
When the battery is **charged** the figure is completely **black** and as it is used it **becomes white**.  
It flashes when it needs to be recharged.

### THERMOMETER FUNCTION.

● Press the  button, followed by the "Temp" function button.

#### THERMOMETER Function.

Press the "**Temp**" button to access the thermometer function.  
When the instrument is turned on it starts to read the room temperature.  
Lift the probe up, by turning it, for maximum reading precision.  
**SWITCH OFF.** Press the OFF button for 5 seconds.

#### Temperature

Measurement range	-50+100 °C
Precision	1% F.S
Resolution	0.5 °C

#### Temperature Readings

These operations must be carried out in compliance with the methods described in this manual. **Remember,** measurements taken with **batteries in need of recharge** can give **false measurements**

## Problems and Solutions

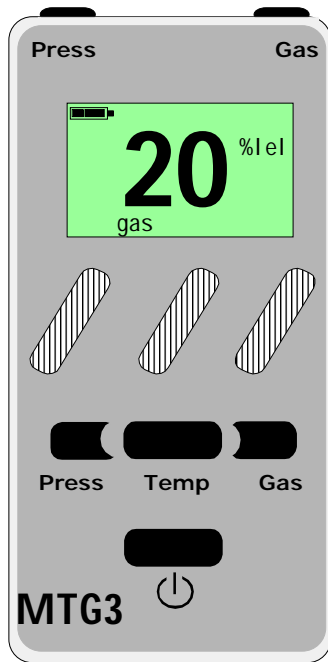
#### If the appliance does not turn on.

Check the battery is charged. If not, recharge it.

#### The battery is not recharging.

Check voltage is arriving from the power supply.

In the event other problems arise, directly contact a specialist and/or authorised **technician** or your **BEINAT S.r.l. dealer**.



**Gas Detection Display**

**Measurement display:**  
from 5 to 100% of LEL

**Measurement display:**  
from 25 to 350 ppm.  
referring to CO

**Battery charger status display**  
The display depicts a battery.  
When the battery is **charged** the figure is completely **black** and as it is used it **becomes white**.  
It flashes when it needs to be recharged.

**GAS detection function**

● Press the button, followed by the “Gas” function button.

Press the “**Gas**” button to access the Detection function;

The instrument can detect two types of gas:

- 1) Explosive GAS expressed in **LEL**
- 2) **CO** Carbon Monoxide gas expressed in **ppm**

The instrument changes the Detection type each time the “**GAS**” button is pressed.

**Explosive GAS detection**

When you turn on the appliance you will see a ● **COUNT DOWN** starts on the display lasting about 45 seconds (pre-heating). When complete, the instrument is ready for use.

Gas can be detected in two ways:

- 1) Holding the detector in your hand, at an average height from the ground, based on the type of gas.
- 2) Inserting a manual pump with a hard tube and bringing it close to a possible leak. Start to pump.

If the instrument detects a leak, the percentage of **LEL GAS** appears on the display, along with an intermittent sound that is more or less frequent depending on the amount detected.

**Note:** When the explosive GAS detection function is selected, automatic switch-off is activated for 10 minutes; when connected to the charger, this function is disabled.

CO Carbon Monoxide GAS detection.

Once turned on, the instrument is ready for use.

Gas can be detected in two ways:

- 1) Holding the detector in your hand, at an average height from the ground.
- 2) Pumping air using the supplied suction pump.

If the instrument detects a leak, the percentage of GAS expressed in **ppm** appears on the display along with an intermittent sound that is more or less frequent depending on the amount detected. The instrument does not require manual calibration as it is supplied with self-calibration.

**Note:** It can occur, when first turning on or after a long period of inactivity, that the appliance goes into “standby” ● to set the electrochemical capsule to fully operational mode.

**If the appliance does not turn on.**

Check the battery is charged. If not, recharge it.

**The battery is not recharging.**

Check voltage is arriving from the power supply.

**Gas is not being detected.**

Check that the capsule is working. If burnt, “**FAU**” appears on the display.

In the event other problems arise, directly contact a specialist and/or authorised **technician** or your **BEINAT S.r.l. dealer**.



## Technical specifications

Powered by Lithium Polymer battery .....	3.7 V.cc built-in
Consumption during explosive gas detection.....	80 mA
Consumption during other detection.....	30 mA
Consumption in standby .....	150uA
Battery autonomy according to functions .....	8 to 20 hour approx
Battery charging .....	Via USB port from PC
Battery charging .....	External from 5 V. cc 350mA
Recharge control .....	Controlled by micro-processor
Time to recharge exhausted batteries .....	7 hours
Battery charging and consumption control.....	On Display

### Pressure Gauge

#### Pressures: from 0 to 150mbar

1 <sup>st</sup> measurement range .....	from 0 to 999mmH <sub>2</sub> O
2 <sup>nd</sup> measurement range.....	from 0 to 150mbar
Pressure overload .....	7000mmH <sub>2</sub> O
Precision scale 99.9 mmH <sub>2</sub> O .....	1% F.S
Precision scale 1000 mmH <sub>2</sub> O .....	2 % F.S
Precision scale 150mbar.....	2 %F.S

### Thermometer

NTC temperature detector.....	from -50 to +100 °C
Scale precision .....	1% F.S

### Explosive Gas Detector for Methane

Catalytic detection probe.....	Built-in
Explosion safety device.....	Sensor protected with flameproof
Measurement range .....	From 5% to 100% of LEL
Resolution.....	1% of LEL
Detector precision.....	1% FS
Response time .....	1"
Calibration .....	Automatic according to detection requirements

### Toxic Gas Detection for Carbon Monoxide

Electrochemical cell detection probe.....	Built-in
Measurement range.....	From 25ppm to 350
ppm Resolution.....	1 ppm
Calibration .....	Automatic
Detector precision.....	1% FS
Response time .....	1"

Display .....	LCD 3 digit
Operating temperature .....	-20° C ÷ + 45° C
Automatic switch off, based on explosive gas detection.....	After 60 minutes
Electromagnetic compatibility-EC reference standard.....	EN 50270
Dimensions and weight .....	60 * 140 *24mm 70g

### Readings and Measurements

These operations must be carried out in compliance with the methods described in this manual.

**Remember** measurements taken with **batteries in need of recharge** can give **false measurements**.

**CERTIFICATE OF CALIBRATION** Digital manometer +/- 200mmH<sub>2</sub>O +/-1529,57mmH<sub>2</sub>O

**PRESSURE**

Reference instrument	Serial number	Range of measure	Uncertainty	Resolution
DRUCK DPI 530 - 4bar	0745/99-09	0 ÷ 100 mbar	± 0.1% F.S.	1 mbar (100Pa)

**Test of PRESSURE**

Pressure	Reading instrument	Tolerance allowed
P1 250 mmH <sub>2</sub> O	252 mmH <sub>2</sub> O	± 1 % F.S.
P2 600 mmH <sub>2</sub> O	580 mmH <sub>2</sub> O	± 1 % F.S.
P3 990 mmH <sub>2</sub> O	970 mmH <sub>2</sub> O	± 1 % F.S.
P4 1529,57 mmH <sub>2</sub> O	1540,00 mmH <sub>2</sub> O	± 1 % F.S.

**TEMPERATURE**

Reference instrument	Serial number	Range of measure	Uncertainty	Resolution
VEMER VE 305 K	100764	-30°C ÷ 1300°	± 0.3% let.	+1°C 0.1°C

**Test of TEMPERATURE**

Test of TEMPERATURE	Reading instrument	Tolerance
T1 20 °C	20,05 °C	± 2 % F.S.
T2 60 °C	61 °C	± 2 % F.S.
T3 100°C	100,05 °C	± 2 % F.S.

The tests described above were carried out with the following references:

Temperature:	20°C ± 2°C
Atmospheric Pressure:	100 kPa ± 0,1 kPa
Relative humidity:	50% ± 15%

**This certificate is valid for one year** and may not be reproduced without our permission, in any case, may not be reproduced in part.

In order to define the stationary state of air, **three macroscopic variables** are necessary; each of them can be measured directly.

These variables are **pressure, temperature** and **volume**; the state of an air gas with volume **V**, pressure **P**, and temperature **T** is then defined by the Law of Boyle:

**$P \cdot V = n \cdot R \cdot T$**  where **n** is the number of gram molecules making up the gas and R is an universal constant. The possible states of a gas with constant pressure and volume are expressed by the law of boyle and gay lussac: **The pressure being constant, the volume of a gas varies directly as its temperature, or vice versa.**

Therefore if you connect an instrument with **variable temperatures**, the instrument will certainly record a different final pressure compared to the initial one.

This is normal and is not the result of the instrument's wrong functioning.

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**Test of GAS**

we self-certify that the equipment mentioned above is manufactured according rules UNI - CEI - CIG - EN 50194 and comply with all CE EN 50270.

**For Explosive Gas.**

**Power Supply:** 3,7V cc within 2% of rating  
**Volume ratio of gas liters:** input up to 20% of LEL +/- 3%  
**Temperature:** 23°C for the entire duration of the test +/- 2% of rating  
**Relative Humidity:** 45% for the entire duration of the test +/- 10%  
**Barometric Pressure:** constant air for the entire duration of the test +/- 1 kPa  
**Gas Speed:** 0.35 m/s  
**Calibration:** at 20% of L.E.L. +/- 3% tolerance

**Methane** LEL=5.0%=  
**Propane** LEL=2.1%  
**Isobutane (LPG)** LEL=1.8%

**For Toxic Gas**

**Power Supply:** 230VAC within 2% of rating  
**Volume ratio of gas liters:** input until reach the desired ppm value  
**Temperature:** 23°C for the entire duration of the test +/- 2% of rating  
**Relative Humidity** 45% for the entire duration of the test +/- 10%  
**Barometric Pressure** constant air for the entire duration of the test +/- 1 kPa  
**Gas Speed** 0.35 m/s  
**Calibration:** according to the rules

**This device passed all functioning tests, performed at our laboratories, in agreement with the predefined values and and the relative tolerances of detection**

These parameters correspond to the characteristics outlined in the instruction booklet supplied with each product.

**This certificate is valid for one year** and may not be reproduced without our permission, in any case, may not be reproduced in part..



**INSURANCE.**This device is insured by the SOCIETÀ REALE MUTUA for the PRODUCT'S GENERAL LIABILITY up to a maximum of 1.500.000,00 EURO against damages caused by the device in case of failures in functioning.

**WARRANTY.**The warranty term is 3 years from manufacturing date, in agreement with the following conditions. The components acknowledged as faulty will be replaced free of charge, **excluding** the replacement of plastic or aluminium cases, bags, packing, batteries and technical reports.

The device must arrive free of shipment charges to **BEINAT S.r.L.** Defects caused by unauthorized personnel tampering, incorrect installation and negligence resulting from phenomena outside normal functioning shall be excluded from the warranty.

The **BEINAT S.r.L.** company is not liable for possible damage, direct or indirect, to people, animals, or things; from product faults and from its enforced suspension of use.



**DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT.**

This symbol on the product or its packaging indicates that this product shall not be treated as household waste. Instead, it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment, such as for example:

- sales points, in case you buy a new and similar product
- local collection points (waste collection center, local recycling center, etc...).

By ensuring this product is disposed of correctly, you will help prevent potential negative consequence for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

**Attention:** in some countries of the European Union, the product is not included in the field of application of the National Law that applies the European Directive 2002/96/EC and therefore these countries have no obligation to carry out a separate collection at the "end of life" of the product.



Multifunctions tool <b>MGT3</b>	<i>Lo styling è della b &amp; b design</i>				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Purchase Date</td> </tr> <tr> <td style="padding: 5px;">Registration Number</td> </tr> </table>	Purchase Date	Registration Number	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px; text-align: center;">Stamp of the Dealer</td> </tr> <tr> <td style="height: 80px;"></td> </tr> </table>	Stamp of the Dealer	
Purchase Date					
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In agreement with our continuous development policy, we reserve the right to modify our products without notice.

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