



**AGS**

**200**



**Manuale operativo**  
**Operation manual**  
**Mode d'emploi**  
**Gebrauchsanweisung**  
**Instrucciones para el uso**  
**Manual de uso**



441030000802  
CODE 441030000802

43126 - Parma (Italia) - Via Quasimodo n. 4/A  
Tel. (++39)0521 954411 - Fax. (++39) 0521 954490  
[www.brainbee.com](http://www.brainbee.com) E-mail [contact@brainbee.com](mailto:contact@brainbee.com)

I

GB

F

D

E

P



**Ver. 4**

## CHAP. 1 - GENERAL INFORMATION

Every care was taken when the information in this manual was compiled and checked. However, despite these efforts, this publication may contain inaccuracies or printing errors. Neither **BRAIN BEE®** nor any other person or company that helped to create, produce and distribute the product shall be liable for any damages deriving from use of this documentation.

**BRAIN BEE®** reserves the right to improve or modify its products at any moment without prior notice.

This manual may contain references to or information about **BRAIN BEE®** products or services that are not yet available on the market. These references or information in no way mean that **BRAIN BEE®** intends to place such products or services on the market.

This publication may neither be partly nor wholly duplicated or distributed without prior authorization from **BRAIN BEE®** (Law N° 663 of 22nd April 1941 and successive updates). Requests for further copies of this manual or further information should be addressed to an authorized dealer, a sales representative of **BRAIN BEE®** or to its e-mail address [contact@brainbee.com](mailto:contact@brainbee.com)

All technical and sales documentation is also available in the Internet website: <http://www.brainbee.com>

**BRAIN BEE®** is a registered trademark owned by **BRAIN BEE s.p.a.**, via Quasimodo 4/A - 43126 Parma, Italy. Other names of products and companies mentioned in this manual may be registered trademarks held by their respective owners.

References to programs under license for use or to other **BRAIN BEE®** products or services mentioned in this publication does not mean that only these programs and/or products and/or services may be used. Functionally equivalent products, programs or services can be used instead of those supplied by **BRAIN BEE®** so long as such action does not violate the intellectual property rights or other rights of **BRAIN BEE®**. The user is responsible for evaluating and checking whether other programs and/or products and/or services can be used, with the exception of those explicitly indicated by **BRAIN BEE®**.

**BRAIN BEE®** may have patents or applications for patents in progress involving the matters described in this publication. Supply of this publication does not imply that any license to these has been granted.

Blank page

## CHAP. 2 - INDEX

<b>CHAP. 1 - GENERAL INFORMATION .....</b>	<b>1</b>
<b>CHAP. 2 - INDEX .....</b>	<b>3</b>
<b>CHAP. 3 - SAFETY CONDITIONS.....</b>	<b>5</b>
3.1      IMPORTANT INFORMATION CONCERNING PERSONAL SAFETY.....	5
3.2      IMPORTANT INFORMATION ABOUT THE SAFETY OF THE INSTRUMENT.....	8
3.3      GENERAL NOTES .....	9
3.3.1    INSTALLATION.....	9
3.3.2    IMPORTANT INFORMATION ABOUT THE BATTERY (BOTH INTERNAL AND EXTERNAL).....	9
3.3.3    IMPORTANT INFORMATION ABOUT OPERATING SAFETY .....	11
3.3.4    WHEN THE INSTRUMENT IS NOT USED .....	12
3.3.5    CLEANING .....	12
3.4      SYMBOLS .....	13
3.4.1    SAFETY.....	13
3.4.2    MARKING.....	13
<b>CHAP. 4 - GENERAL DESCRIPTION .....</b>	<b>15</b>
4.1      EXTERNAL ASPECT OF AGS-200.....	15
4.1.1    EXTERNAL ASPECT OF AGS-200.....	15
4.1.2    ACCESSORIES.....	17
<b>CHAP. 5 - GENERAL SPECIFICATIONS.....</b>	<b>19</b>
5.1      GENERAL SPECIFICATIONS.....	19
<b>CHAP. 6 - PRELIMINARY OPERATIONS .....</b>	<b>21</b>
6.1      INSTALLATION .....	21
6.2      HOW TO INSTALL THE SOFTWARE .....	24
6.3      INSTALLATION IN THE DOS ENVIRONMENT .....	24
6.4      INSTALLATION IN THE WINDOWS ENVIRONMENT .....	24
6.5      SETTINGS.....	24
6.5.1    GARAGE DATA ENTRY.....	26
6.5.2    DATE AND TIME SETTING.....	27
6.5.3    SERIAL PORT SET-UP .....	28
6.5.4    REVOLUTION COUNTER SET-UP.....	29
<b>CHAP. 7 - USE OF THE INSTRUMENT .....</b>	<b>31</b>
7.1      USE OF THE PROGRAM IN A PERSONAL COMPUTER OR IN OMNIBUS 31	
7.1.1    GAS READING IN CONTINUOUS MODE.....	32
7.1.2    GAS VALUE READING IN COMPLIANCE WITH STANDARD CEE 92/55 34	
7.1.2.1    VEHICLE DATA ENTRY .....	34
7.1.2.2    ENVIRONMENTAL TEST CONDITIONS .....	35
7.1.2.3    RESIDUE HC TEST .....	36
7.1.2.4    VEHICLE ENGINE TEMPERATURE TEST.....	37
7.1.2.5    GAS READING.....	38
7.1.2.6    PRINT-OUT OF RESULTS .....	39
7.1.2.7    EXHAUST LIMITS.....	39
7.1.3    HOW TO CHECK THE CALIBRATION DUE DATE .....	40
7.1.4    LEAK TEST .....	41
7.1.5    RESIDUE HC TEST .....	42

7.1.6	O2 SENSOR EFFICIENCY.....	43
7.1.7	SPECIAL TESTS.....	44
7.1.7.1	CARBURATION TEST.....	45
7.1.7.2	GAS DIAGNOSIS.....	46
7.1.7.3	EFFICIENCY OF THE CATALYTIC UNIT.....	47
7.1.7.4	HEAD GASKET TIGHTNESS.....	48
7.1.7.5	ENGINE WARMING-UP EFFICIENCY.....	49
<b>CHAP. 8</b>	<b>- MAINTENANCE.....</b>	<b>51</b>
8.1	9.1 - HOW TO CLEAN THE FILTERING SYSTEM.....	51
8.2	HOW TO REPLACE THE ACTIVATED CARBON FILTER.....	53
8.3	PERIODICAL INSPECTION OF THE ANALYZER.....	53
<b>CHAP. 9</b>	<b>- ERRORS.....</b>	<b>55</b>
<b>CHAP. 10</b>	<b>- OPTIONALS.....</b>	<b>57</b>

## CHAP. 3 - SAFETY CONDITIONS

### 3.1 IMPORTANT INFORMATION CONCERNING PERSONAL SAFETY



#### DANGER OF ASPHYXIATION

##### PETROL (GASOLINE) FUELLED ENGINES

The exhaust gas of petrol (gasoline) fuelled engines contains carbon monoxide, a colourless and odourless gas which can cause serious physical problems if inhaled.

Pay particular attention if you work in a pit as some exhaust gas components are heavier than air and will thus deposit at the bottom of the pit itself.

Great care should also be taken with gas fuelled vehicles..

##### DIESEL ENGINES

The composition of the exhaust gas produced by a Diesel engine is not always the same. It can change according to: the type of engine, aspiration, the conditions of use and the composition of the fuel used.

Diesel exhaust consists of (CO, CO<sub>2</sub>, NOX and HC) gas and particulate (soot, sulphates).

The tiny particles of carbon that form the soot remain suspended in the air and can therefore be inhaled. Small amounts of toxic components are also present.

##### SAFETY MEASURES:

- Always ensure that the place in which you work is correctly ventilated and that any fumes are exhausted (particularly in pits).
- Always operate the exhaust system in closed rooms..



#### DANGER OF BEING CRUSHED

You could be crushed against a work bench unless the vehicles are correctly locked in place by mechanical means.

##### SAFETY MEASURES:

- Make sure that the vehicle is unable to move by applying the hand brake and locking the wheels.

- Allow the engine to cool.
- Do not use naked flames or components that produce sparks.
- Do not smoke.

- Clean up any spilt fuel.
- Operate exhaust fans in closed rooms..



### **RISK OF INJURIES**

There are mobile parts in stationary or running engines (belts and so forth) that could injure the hands and arms.

Amongst the various engine components, pay the greatest attention to electric fans since they may start operating unexpectedly even when the engine is off.

#### **SAFETY MEASURES:**

- Never place your hands near moving parts whilst the engine is on.
- If you must work near electric fans, first allow the engine to cool, then remove the fan plug from the motor.
- Keep the connection cables of test instruments well away from the moving parts of the engine.



### **RISK OF BURNS**

Some of the engine components (exhaust gas manifold and so forth) can become very hot, as can some of the sensors.

Take great care to avoid touching these components.

#### **SAFETY MEASURES:**

- Wear protective gloves.
- Allow the engine and any self-contained accessory heaters to cool down.
- Do not route the connection cables of test instruments over or near hot parts.
- Do not keep the engine running after the tests.



### **DANGER OF FIRE OR EXPLOSION**

There could be a risk of fire outbreak or explosion when work is carried out on the fuel system (fuel pump, injectors and carburetor, etc.) owing to the fuels used and/or the vapours they create.

**SAFETY MEASURES:**

- Disconnect the ignition system.
- Allow the engine to cool.
- Do not use naked flames or components that produce sparks.
- Do not smoke.
- Clean up any spilt fuel.
- Operate exhaust fans in closed rooms..

**NOISE LEVEL**

The noise level can exceed 90dB when vehicles are tested, particularly at high engine rates.

If a person is subjected to these noise sources for a lengthy period of time, his or her hearing could be damaged.

**SAFETY MEASURES:**

- If necessary, the user is obliged to protect the work stations near to the places where the tests are carried out, from noise.
- The operator must use personal protective equipment if necessary.

**DANGEROUS VOLTAGE**

There are dangerous voltages in both residential and industrial electricity mains and in the electrical systems of vehicles.

When a person comes into contact with test instruments or engine parts to which voltage is applied, there is a danger of electric shock due, for example, to damaged connections (e.g. an animal could have bitten through the ignition wires).

This danger exists both in relation to the primary and secondary side of the ignition system and to the test instrument connections.

**SAFETY MEASURES:**

- Connect test instruments to a socket that has a protection contact and that is correctly earthed.
- Only use the supplied cables to connect the test instrument and make sure that the insulation is not damaged.
- Make sure that the test instrument has been earthed before you turn it on.
- Always disconnect the power source (e.g. battery) before you work on the electrical system (to connect test instruments, replace parts of the ignition system).



- Make sure that you do not touch live parts of the vehicle when carrying out inspections and adjustments with the engine running. -



**DANGER OF INTOXICATION**




If subjected to high temperatures (over 250 <198>C or owing to fire outbreaks), the pipes used to sample exhaust gas release a highly toxic gas which can be harmful for the health if inhaled.

**SAFETY MEASURES:**

- Immediately consult a physician if you inhale this gas.
- Wear neoprene or PVC gloves to eliminate combustion residues.
- The remains of fire outbreaks can be neutralized with a solution of hydrated lime. This leads to the formation of calcium fluoride which can be easily removed with water.

**3.2 IMPORTANT INFORMATION ABOUT THE SAFETY OF THE INSTRUMENT**

The work and operations described below are not permitted when the instrument is used as, in certain circumstances, they can endanger persons and lead to permanent damage to the instrument itself.

	<ul style="list-style-type: none"> <li>- It is forbidden to remove or obliterate the decals and/or danger signs affixed to the instrument;</li> </ul>
	<ul style="list-style-type: none"> <li>- It is forbidden to cut out the safety devices with which the instrument is equipped;</li> </ul>
	<ul style="list-style-type: none"> <li>- Only use original fuses with the indicated ampere capacity! The instrument must be immediately disconnected if the electricity supply is faulty. Defective fuses must not be repaired or cut out. They must be replaced with fuses of the same type.</li> </ul>
	<ul style="list-style-type: none"> <li>- The electrical components of the instrument must be inspected/checked at regular intervals. Defects, such as loosened connections or burnt wires, must</li> </ul>



be immediately eliminated.

### 3.3 GENERAL NOTES

#### 3.3.1 INSTALLATION

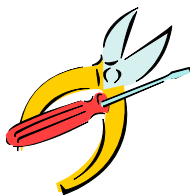


- The instrument must be installed by specialized personnel in strict compliance with the instructions in the installation manual.



Protect the instrument from the rain and excessive damp to prevent it from being irreparably damaged.

#### 3.3.2 IMPORTANT INFORMATION ABOUT THE BATTERY (BOTH INTERNAL AND EXTERNAL)



- Never attempt to demount the battery holder or to modify it in any way. The holder has safety and protective mechanisms that ensure the instrument can be safely operated. Damage to these mechanisms could result in heat or smoke escaping, leaking liquids, fire outbreaks and explosion of the battery holder itself..



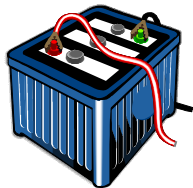
- Never allow the positive and negative terminals of the battery holder to be connected via metal. Never transport or store the battery holder near metal objects (necklaces, hair clips, etc.) which could cause a short-circuit and allow a considerable amount of energy to pass through the metal. Such action could cause the holder to explode, create heat and fumes, while the object that connects the two terminals could catch fire.



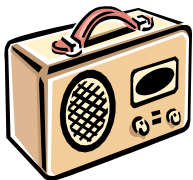
- Never use or leave the battery holder near flames, stoves or any other place where high temperatures could develop (80 °C or higher) as these could damage the seal of the battery holder itself. All this could lead to short-circuits, explosion of the holder and fire outbreaks.



- Never wet the battery holder with either fresh water, salt water or any other liquid. Water can damage the safety mechanism of the battery holder causing heat and fumes to escape, explosion of the holder and fire outbreaks.



- Never use the battery holder if its outer part is very damaged or deformed. Use of a holder in these conditions could cause heat and fumes to escape, explosion of the holder and fire outbreaks.



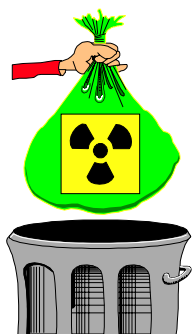
- Never use the battery holder for any purpose other than that for which it has been explicitly designed and produced. Such action could impair the performance of the battery holder, shorten its working life and lead to a power fault which could damage the battery holder itself and cause heat and fumes to escape, explosion of the holder and fire outbreaks..



- When the battery holder is charged, only use the supplied battery charger and carry out the recharging operation in a place where the temperature is between 10 °C and 45 °C. Use of a different type of battery charger could overload the batteries..



- If the battery acid comes into contact with your eyes, do not rub them. Rinse the affected part with tap water and immediately consult a physician. Failure to rinse out all the battery acid could seriously damage the eyes.



- Batteries are considered hazardous urban waste and must be disposed of in compliance with the local laws in merit.

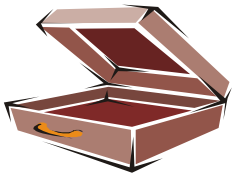
**3.3.3 IMPORTANT INFORMATION ABOUT OPERATING SAFETY**

	<p>When you work on engines, always protect your face, hands and feet by wearing adequate clothing. Do not touch hot components such as spark plugs, radiators, pipes of the cooling system and exhaust pipes. Catalytic silencers become extremely hot and can cause burns or fire outbreaks.</p>
	<p>- Do not smoke or use naked flames when working on engines.</p>
	<p>- If inhaled, exhaust gas (carbon monoxide) can be lethal or cause serious damage to vital parts of the organism.</p>
	<p>- Thanks to a temperature sensor, the cooling fan of vehicles can operate on its own even when the engine is off. Take the utmost care when working near this component and disconnect it if necessary.</p>
	<p>- Never move the instrument by pulling the cables to which it is connected.</p>

### 3.3.4 WHEN THE INSTRUMENT IS NOT USED



- Turn off all the power switches or unplug the power cable when the instrument is not to be used for a long period of time..



- It is advisable to store the instrument in its case if it is not going to be used for a long period of time.

### 3.3.5 CLEANING








- When necessary, clean the outer surfaces of the BrainBee( mod. 7000 Universal Revolution Counter with neutral detergents and a soft, slightly damp cloth. Do not use detergents containing spirits, ammonia or petrol.

### 3.4 SYMBOLS

The safety symbols are described in this section.

#### 3.4.1 SAFETY

	ALTERNATE CURRENT
	EARTH
	CONSULT THE INSTRUCTION MANUAL
	DANGER! RISK OF ELECTRIC SHOCK
	WARNING! DO NOT REMOVE COVER (this may only be done by a qualified electrician)

#### 3.4.2 MARKING

	CE CONFORMITY MARKING
---	-----------------------

**Blank Page**

## CHAP. 4 - GENERAL DESCRIPTION

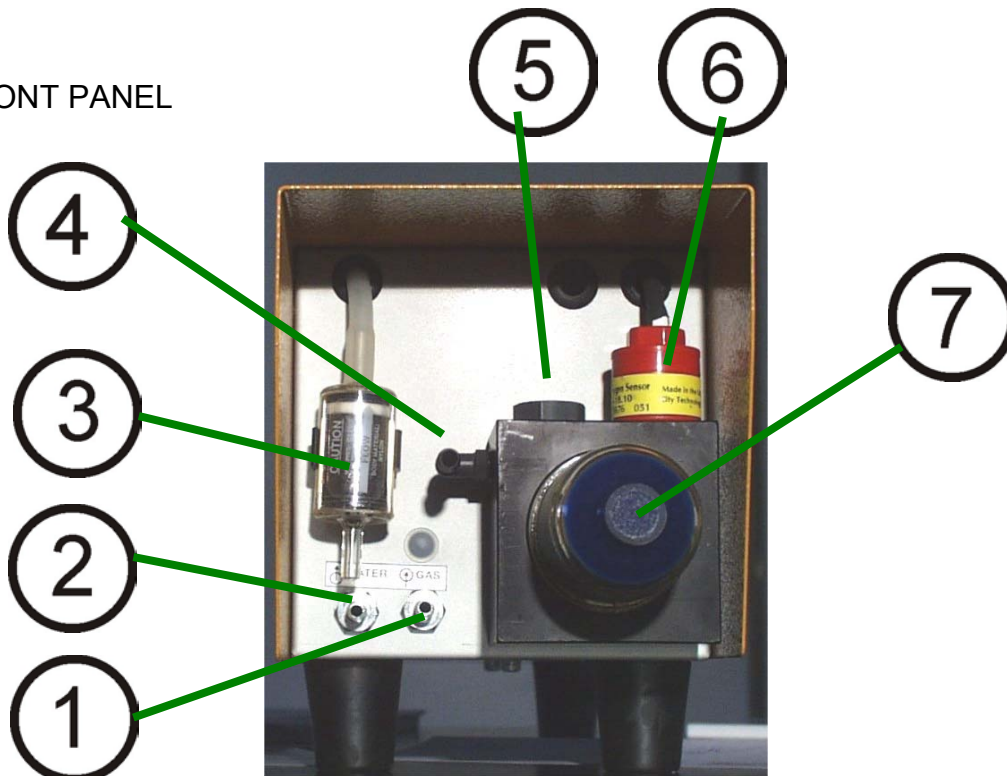
### 4.1 EXTERNAL ASPECT OF AGS-200

#### 4.1.1 EXTERNAL ASPECT OF AGS-200

##### OVERALL VIEW

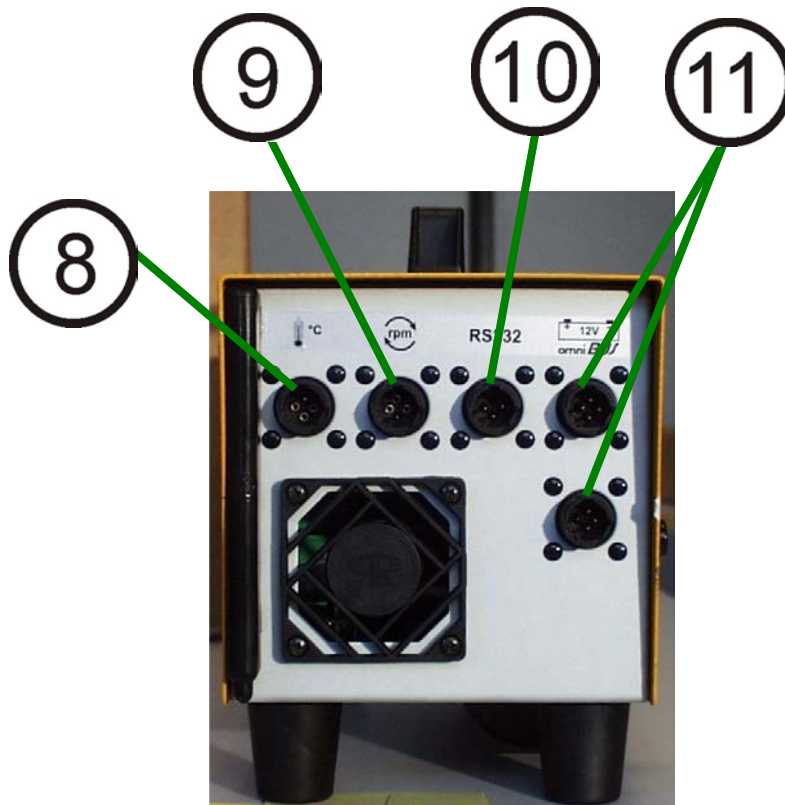


##### FRONT PANEL





REAR PANEL



- 1) GAS INLET
- 2) WATER OUTLET
- 3) ACTIVATED CARBON FILTER
- 4) GAS OUTLET
- 5) HOUSING FOR NO<sub>x</sub> SENSOR
- 6) O<sub>2</sub> SENSOR
- 7) COALESCENT FILTER
- 8) ENGINE TEMPERATURE SENSOR INPUT
- 9) ENGINE RPM SENSOR INPUT
- 10) SOCKET FOR RS-232 SERIAL LINK
- 11) 12 Vdc POWER SUPPLY AND COMMUNICATION WITH omniBUS INSTRUMENTS

#### 4.1.2 ACCESSORIES

AGS-200 is supplied with the following accessories



GAS SAMPLING PROBE



SAMPLING PROBE TUBE



SAMPLING PROBE FILTER

**Blank Page**

## CHAP. 5 - GENERAL SPECIFICATIONS

### 5.1 GENERAL SPECIFICATIONS

\* Measuring ranges :

• CO.....	from 0 to 9.99	%	Res. 0.01
• CO <sub>2</sub> .....	from 0 to 19.9	%	Res. 0.1
• HC hexane.....	from 0 to 10000	PPM	Res. 1
• O <sub>2</sub> .....	from 0 to 100	%	Res. 0.01
• No.....	from 0 to 5000	PPM	Res. 10
• Lambda.....	from 0.5 to 2		Res. 0.001
• Revolutions.....	from 300 to 9990	rpm	Res. 10
• Oil temp.....	from 20 to 150	°C	Res. 1

- Measuring gas intake 4 l/min.
- Automatic continuous condensation discharge
- Semiautomatic leak test
- Automatic flow monitoring
- Automatic O<sub>2</sub> sensor exhausted monitoring
- Automatic compensation of environmental pressure from 850 to 1050 mB
- Automatic calibration (with sample gas bottle)
- Automatic autozero
- Time to warm up to 20°C - 10 minutes.
- Response time < 10 sec.
- Revolution counter pulse reception via cable or via wireless radio system
- Oil temperature input for PT100, or via wireless radio system
- RS 232 serial link
- 485 serial link in network
- 12 Volt DC power supply
- Power draw 1.5A DC
- Operating temperature from 5° to 40° C
- Dimensions 220 x140 x 430 mm
- Weight 5 Kg

**Blank Page**

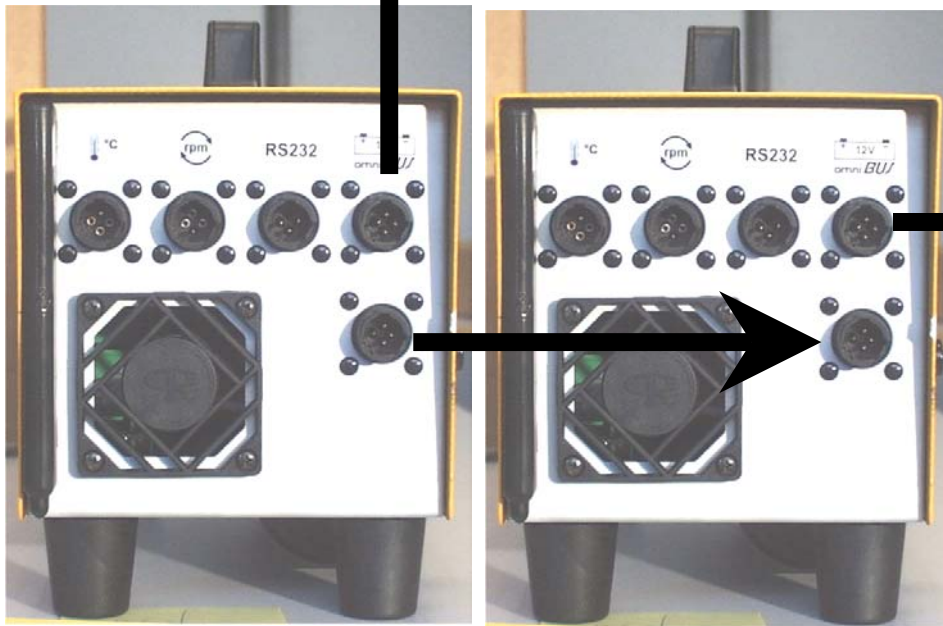
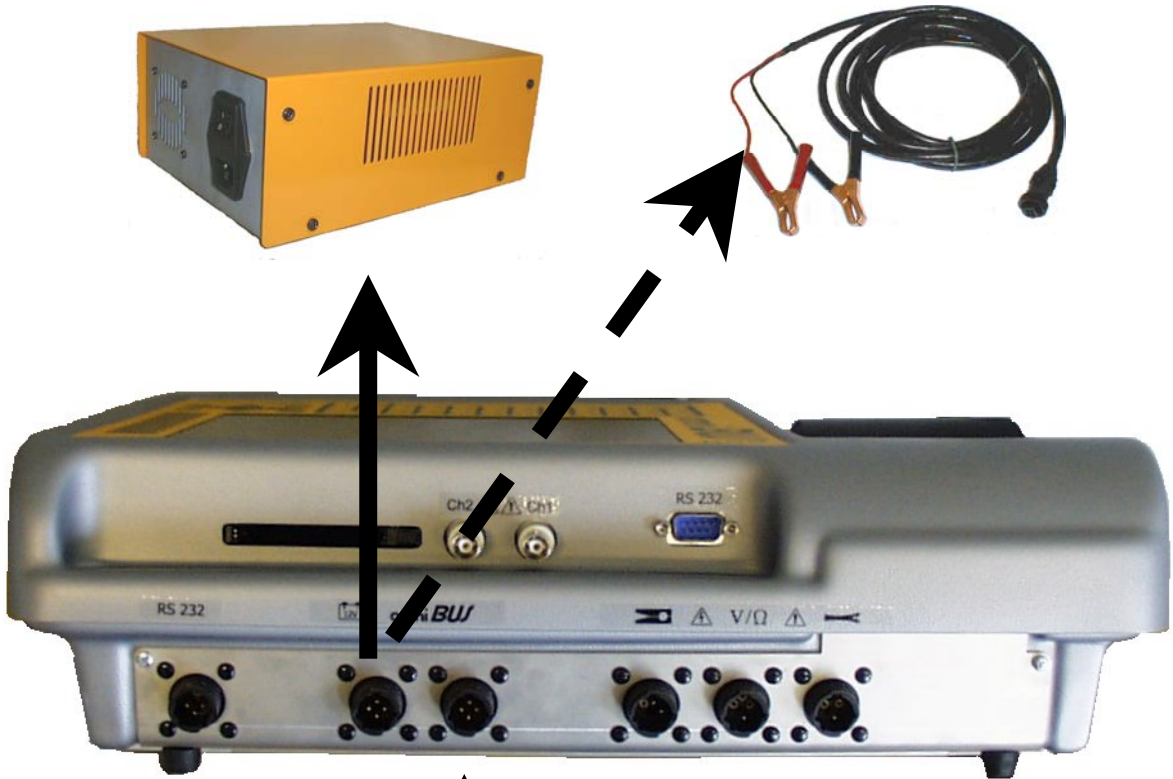
## CHAP. 6 - PRELIMINARY OPERATIONS

### 6.1 INSTALLATION

AGS-200 is supplied in a cardboard box. To open the box, cut the adhesive tape with a cutter and take out the instrument, which is protected by two pieces of moulded polystyrene.

If you have a TRO-040 or TRO-010 trolley, place AGS-200 in the relative support as shown in the figure.

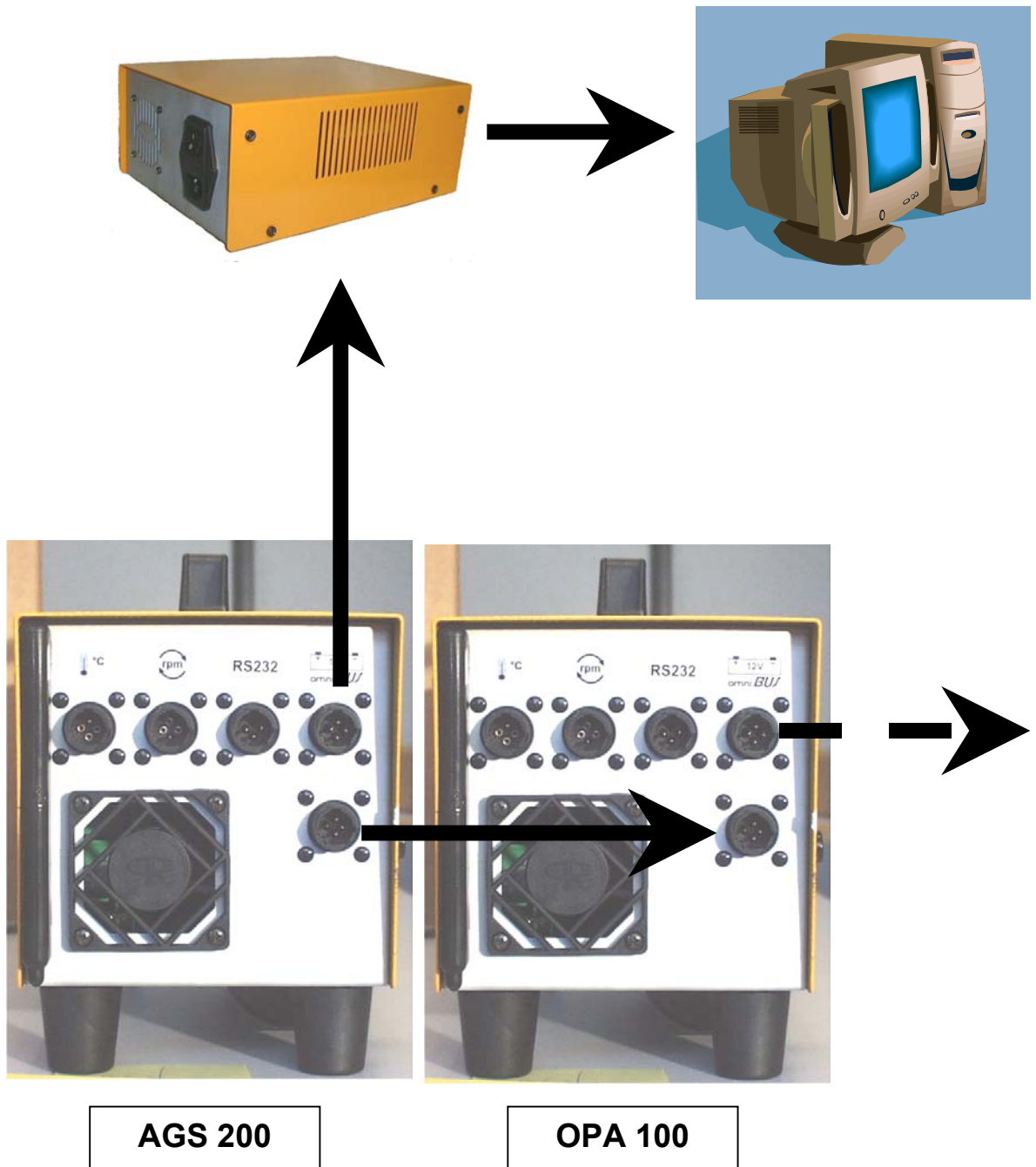




**AGS 200**

**OPA 100**

# PERSONAL COMPUTER





---

## 6.2 HOW TO INSTALL THE SOFTWARE

---

If you have an OMNIBUS-500, OMNIBUS-500/S or OMNIBUS-400 instrument there is no need to install any particular software as these instruments already have programs able to operate with AGS-200 (refer to the instruction manuals of the instruments for the necessary settings).

If you have a computer, you will need to install the program used to display the data transmitted by AGS-200 and pilot the instrument itself.

The software allowing use of a Personal Computer comes in a suite that also includes the programs that handle the other Brain Bee instruments and is supplied in two formats: Software for use in the Windows environment and Software for use in the DOS environment. The programs act in a perfectly identical way both in relation to the functions carried out and the masks displayed.

---

## 6.3 INSTALLATION IN THE DOS ENVIRONMENT

---

The software required to operate AGS-200 in the DOS environment is supplied in two different media: Floppy disk and CD-ROM.

To install the software using diskettes, just insert the first disk, open the install.bat file and change the disk when requested.

If the Windows program is installed in the computer, you can still install the software in the DOS environment. Just insert the CD-ROM in the relative driver and open the index.htm file (this file will be automatically opened if the autorun function is activated). As soon as the installation mask appears, press the key on a level with the words omniBUS-800 DOS and installation will take place in a fully automatic way.

---

## 6.4 INSTALLATION IN THE Windows ENVIRONMENT

---

The software required to operate AGS-200 in the Windows environment is supplied on CD-ROM.

To install the software, just insert the CD-ROM into the relative driver and open the index.htm file (this file will be automatically opened if the autorun function is activated). As soon as the installation mask appears, press the key on a level with the words omniBUS-800 Win and installation will take place in a fully automatic way.

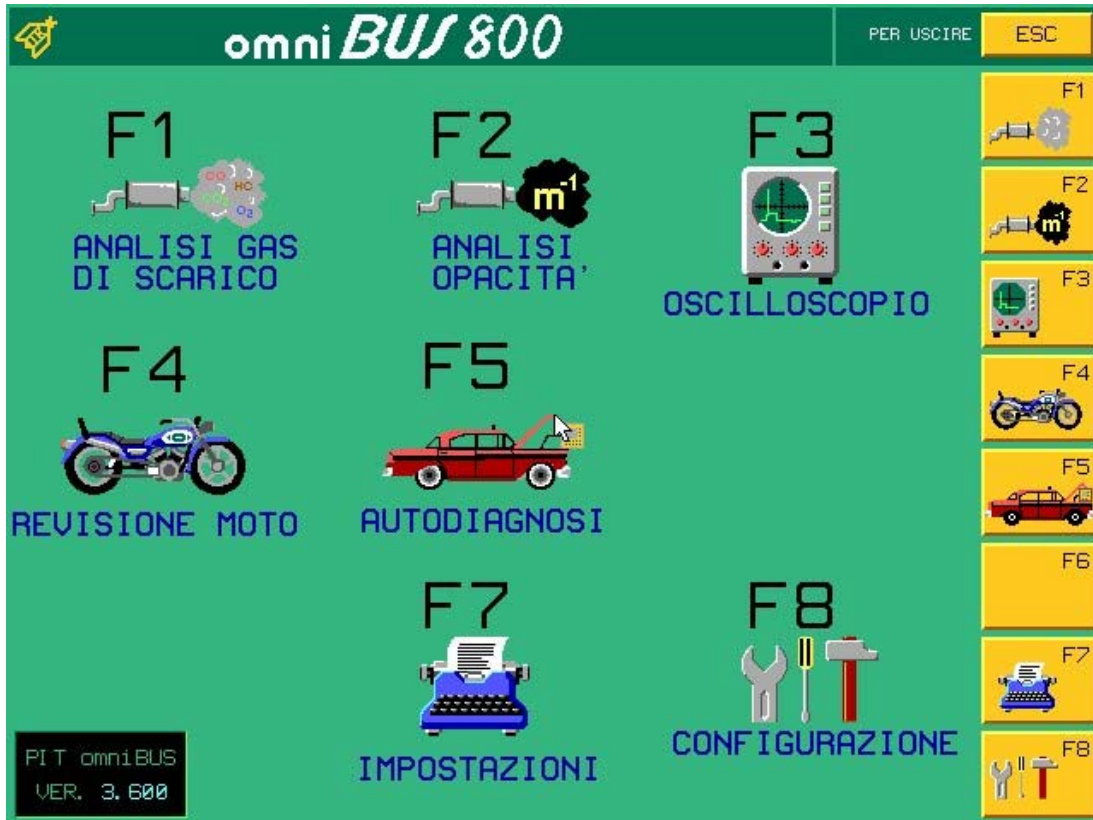
---

## 6.5 SETTINGS

---

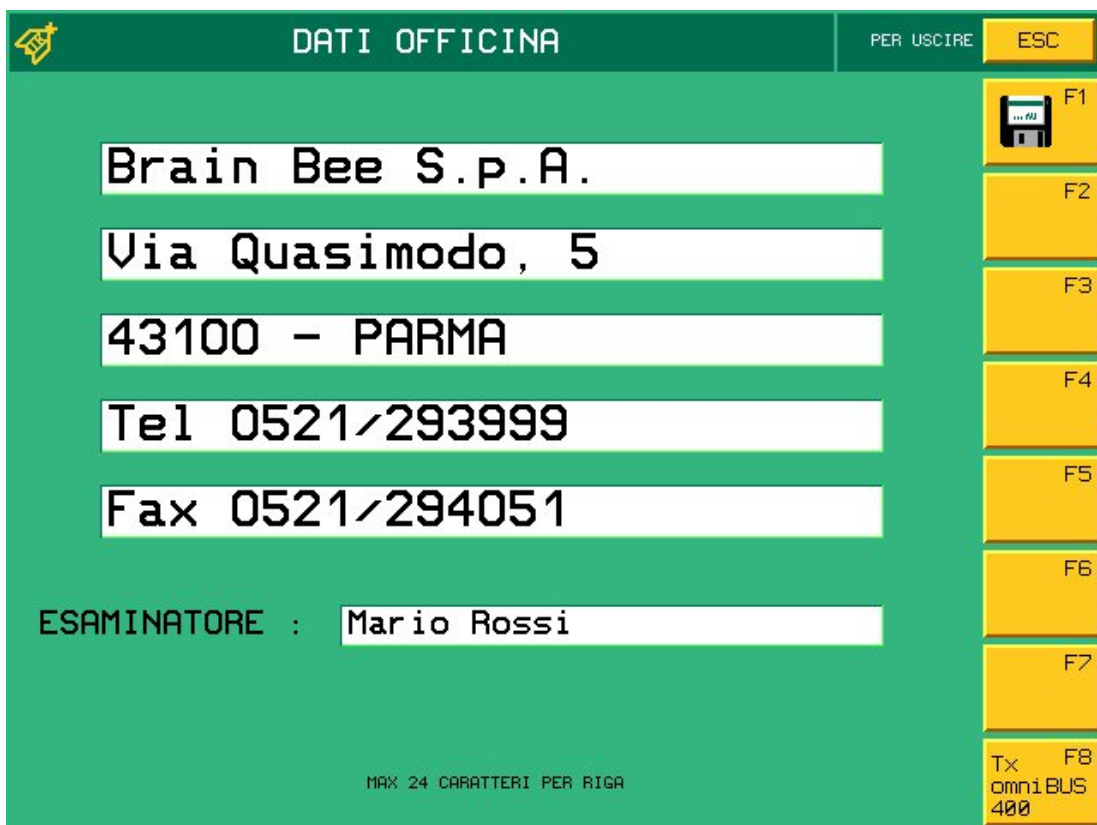
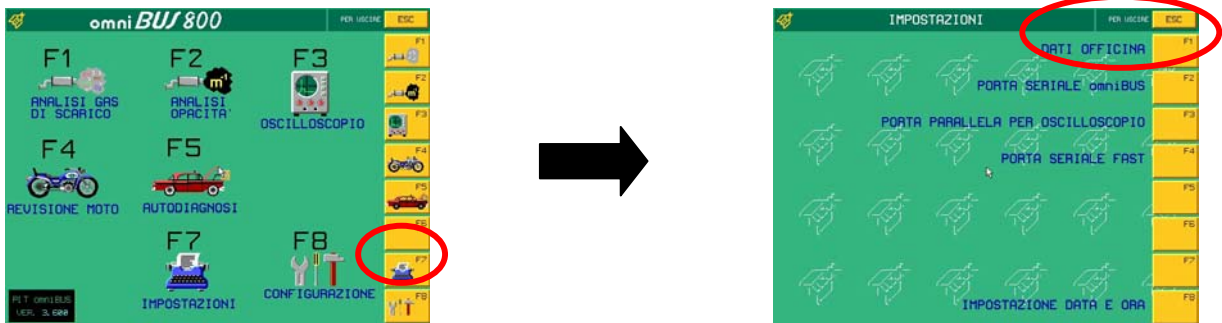
Once the software has been installed, a few settings are required which can also be varied by the operator. All the indications on the keys described below are valid for both the "Omnibus" version and the Personal Computer version where the mouse can also be used.

After a presentation mask which can be quitted by pressing any key or by clicking with the mouse, the management program displays the main menu. This allows all the monitoring programs to be accessed and all the necessary settings to be made.



### 6.5.1 GARAGE DATA ENTRY

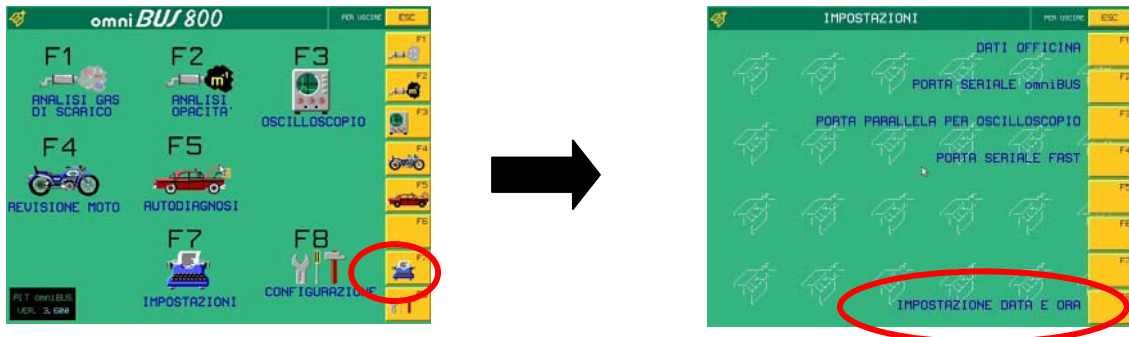
Press F7 "SET-UP" in the main menu and then press F1 "GARAGE DATA"



This mask allows you to enter the name and address of the garage where the instruments are used, so that the information is printed on all the test reports. Five lines of 24 characters each are available, plus a line where the test technician's name can be written. Press "ENTER" to move the cursor to the field to be edited. Press F1 to memorize all the values.

### 6.5.2 DATE AND TIME SETTING

Press F7 "SET-UPS" in the main menu and then press F8 "DATE AND TIME SET-UP"



This mask allows you to enter the date and time so that this information is automatically printed when the instruments are used.

Press F1 to memorize all the values.

This data is only necessary if you have an OMNIBUS-500 or an OMNIBUS-500/S since the program that runs in a Personal Computer uses the date and time of the system.

### 6.5.3 SERIAL PORT SET-UP

The program must be informed about the serial port of the computer to which AGS-200 will be connected. Press F7 "SET-UPS" in the main menu and then press F1 "GARAGE DATA"



Using the arrows “ ↑ ” and “ ↓ ” select the correct serial port and press 'ENTER' to confirm and save the set-up.



#### IMPORTANT !!!!

The serial port must be selected whenever the software is upgraded.

**6.5.4 REVOLUTION COUNTER SET-UP**

AGS-200 must be informed whether radio revolution counter MGT-300, MG-7000 with accessory MG-7011 or a normal piezo sensor are to be used. Access the main menu, press F1 "EXHAUST GAS ANALYSIS", then F6 "CONTROLS" and lastly F2 "TYPE OF REV COUNTER".



Use the arrows “ ↑ ” and “ ↓ ” to select the type of revolution counter required and then press 'F1' to confirm and save the set-up.

The other set-ups in the software are not described as they are reserved to the technical service.

**Blank Page**

## CHAP. 7 - USE OF THE INSTRUMENT

### 7.1 USE OF THE PROGRAM IN A PERSONAL COMPUTER OR IN OMNIBUS

Access the main menu and press F1 "EXHAUST GAS ANALYSIS"



The GAS ANALYSER menu will appear on the display.



The software version that resides in AGS-200 is displayed in the indicated box.

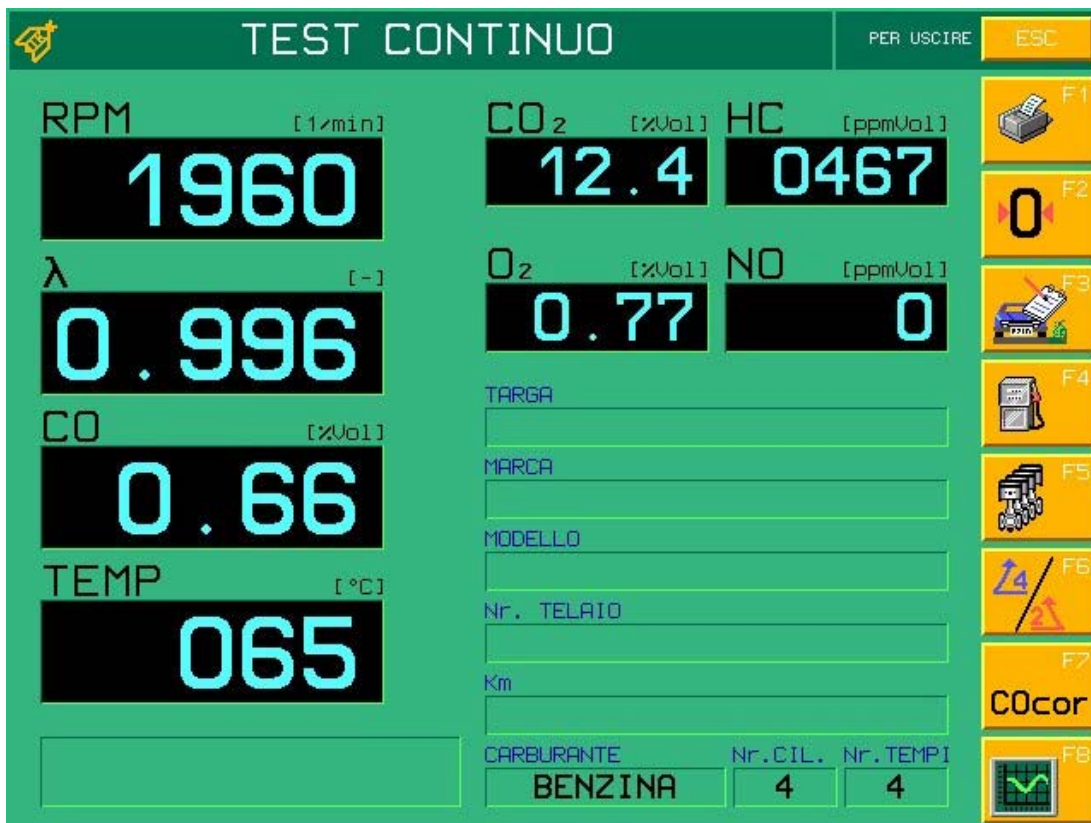


### 7.1.1 GAS READING IN CONTINUOUS MODE

Access the main menu of the EXHAUST GAS ANALYZER and press F1 "CONTINUOUS TEST"



This accesses the CONTINUOUS TEST mask.



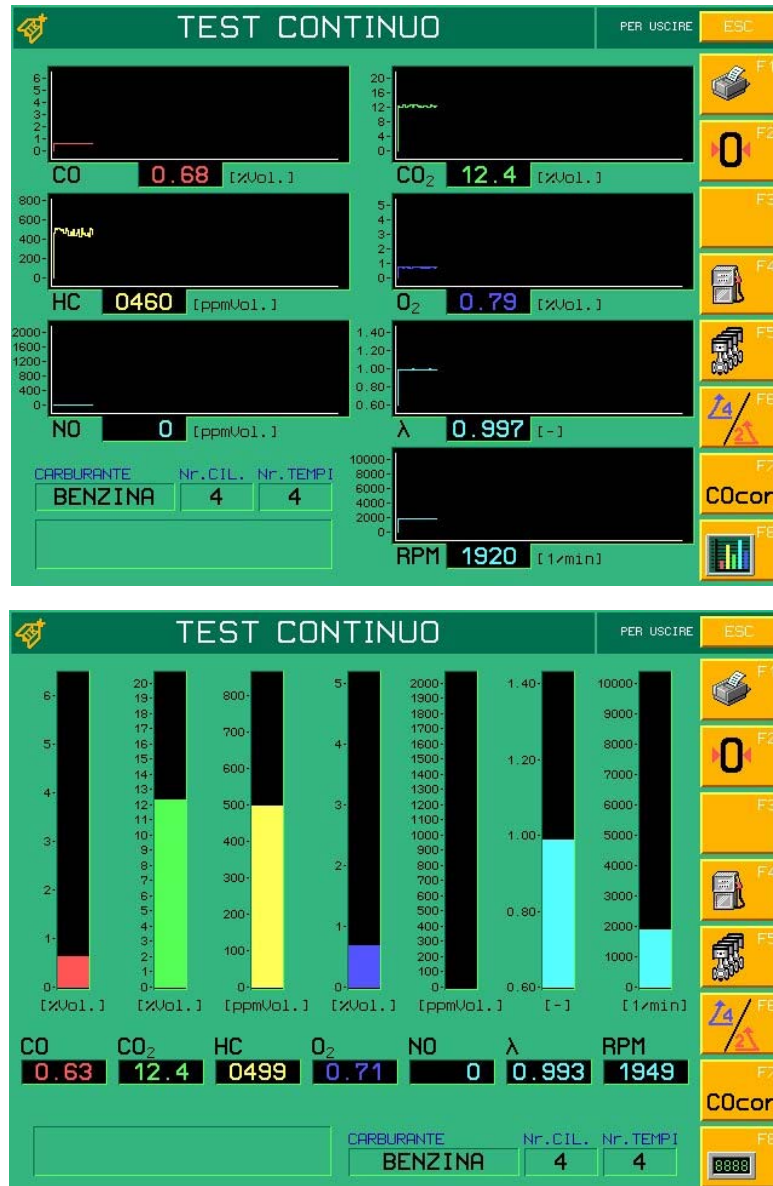
The gas reading can only be made at the end of the warming up period and the auto-calibration procedures.

The following parameters are displayed in this mask:

- GAS VALUES: CO, CO<sub>2</sub>, O<sub>2</sub>, HC, NO (optional)
- CORRECT-CO,
- LAMBDA factor
- Engine oil temperature
- Engine rpm
- Vehicle data

There are no time limits to this type of test since the instrument can be used for as long as it is required.

The measurements can also be displayed in graphic form in two different formats: continuous linear graph or histograms.



The functions of the keys that appear on the right hand side of the display are listed below:

- F1 Immediately prints the displayed values
- F2 AUTOZERO execution
- F3 Vehicle data entry (only during numeric display phase)
- F4 Selects the type of fuel used by the tested vehicle
- F5 Selects the number of cylinders in the tested vehicle
- F6 Selects the number of strokes of the tested vehicle
- F7 Selects display of the Carbon Monoxide CO or Correct CO parameter
- F8 Used to change the type of display: Numeric -> Graphic -> Histograms

### 7.1.2 GAS VALUE READING IN COMPLIANCE WITH STANDARD CEE 92/55

Access the main menu of the EXHAUST GAS ANALYZER and press F2 to access the "OFFICIAL TEST" mask.

The parameters required by CEE 92/55 are displayed in this mask.



#### 7.1.2.1 VEHICLE DATA ENTRY



The screenshot displays the "TEST UFFICIALE - DATI AUTO IN PROVA" screen. It contains the following fields and values:

TARGA	:	<input type="text"/>	F1				
MARCA	:	<input type="text"/>	F2				
MODELLO	:	<input type="text"/>	F3				
Nr. TELAIO	:	<input type="text"/>	F4				
Km	:	<input type="text"/>	F5				
CARBURANTE	:	1 (1=BENZINA / 2=GPL / 3=METANO)	F6				
Nr. TEMPI	:	4 (2=2 TEMPI / 4=4 TEMPI)	F7				
Nr. CILINDRI	:	4	F8				
MOTORE	:	1 (0=NON CATALIZZATO / 1=CATALIZZATO)					
DATA PRIMA IMM.:	GIORNO	<input type="text"/>	MESE	<input type="text"/>	ANNO	<input type="text"/>	
REGIME MIN.	:	min	<input type="text" value="500"/>	max	<input type="text" value="1000"/>		
REGIME MIN.ACC.:	:	min	<input type="text" value="2000"/>	max	<input type="text" value="2500"/>		

It is obligatory to enter the data in this mask as they determine the type of procedure that will be used during the test.

Enter all the required values and press **F2** to proceed.

**7.1.2.2 ENVIRONMENTAL TEST CONDITIONS**

To conduct a test in compliance with CEE 92/55, the environmental conditions must be within the following limits:

- TEMPERATURE :           between 5 and 40 C°
- PRESSURE :                between 850 and 1025 mbar



The environmental data can be entered in this mask. If they are not entered, they can be written on the print-out at the end of the test.

### 7.1.2.3 RESIDUE HC TEST

The next step is to check for any residue HC that may have remained in the measuring circuit after the previous test.



At the end of this phase, the following mask will appear:



## 7.1.2.4 VEHICLE ENGINE TEMPERATURE TEST



At this stage, you must wait until the engine warms up according to the manufacturer's instructions or, in the absence of these, proceed with the test when the temperature exceeds 80 degrees.

To measure the temperature, insert the supplied probe in place of the dipstick.

Once the minimum temperature has been reached, the test will automatically pass on to the next mask.

### 7.1.2.5 GAS READING

Before beginning the test, make sure that the probe has been correctly inserted into the exhaust pipe of the vehicle and that it has not encountered any impediments or obstructions



The test will now proceed in different ways, depending on the type of vehicle:

- \* Only at idling rate if the vehicle does not have a catalytic silencer.
- \* At idling rate and at accelerated idling rate for vehicles with catalytic silencer.

"Idling rate" means the rate at which the engine operates (never more than 1000 rpm) with the accelerator and enrichment jet controls in the hold position, all electrical users disconnected, the gearshift in the neutral position and the clutch disengaged.

"Accelerated idling rate" means a 2000 to 2500 rpm engine rate with the accelerator and enrichment jet controls in the hold position, all the electrical users disconnected, the gearshift in the neutral position and the clutch disengaged.

**7.1.2.6 PRINT-OUT OF RESULTS**

The test results can be printed by means of the printer connected to your system or with the 24-column printer if you are using OMNIBUS-500



TEST UFFICIALE - STAMPA RISULTATI		PER USCIRE	ESC
<b>PROVA AL MINIMO</b>		<b>PROVA AL MINIMO ACC.</b>	
RPM	: 650	RPM	: 2300
*TEMP	:	*TEMP	:
CO corr.	: 0.0	CO corr.	: 0.0
CO <sub>2</sub>	: 0.0	CO <sub>2</sub>	: 0.0
HC	: 0	HC	: 0
O <sub>2</sub>	: 20.7	O <sub>2</sub>	: 20.8
NO	: ----	NO	: ----
LAMBDA	: 0.00	*LAMBDA	: 0.00
I VALORI FUORI NORMA SONO CONTRASSEGNA TI DA UN ASTERIS CO			
<b>RISULTATO DEL TEST : NEGATIVO</b>			
ESAMINATORE : Mario Rossi			

The name of the operator who conducted the test can be entered in the official print-out.

**7.1.2.7 EXHAUST LIMITS**

**VEHICLES WITH CATALYTIC SILENCERS**

- Correct-CO limit at idling rate  $\leq 0.5$  % vol.
- Correct-CO limit at 2000/2500 rpm  $\leq ( 0.3$  %)
- Lambda factor limit at 2000/2500 rpm  $1 \pm ( 0.03)$

**VEHICLES WITHOUT CATALYTIC SILENCERS TYPE APPROVED FROM OM9439 OF 1971 AND REGISTERED BEFORE 1.10.1986**

Correct CO limit  $\leq 4.5$  % vol.

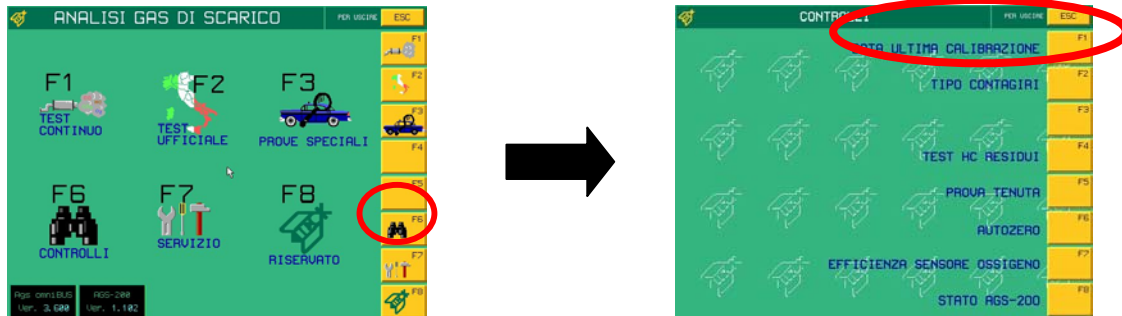
**VEHICLES WITHOUT CATALYTIC SILENCERS REGISTERED AFTER 1.10.1986**

Correct CO limit  $\leq 3.5$  % vol.



### 7.1.3 HOW TO CHECK THE CALIBRATION DUE DATE

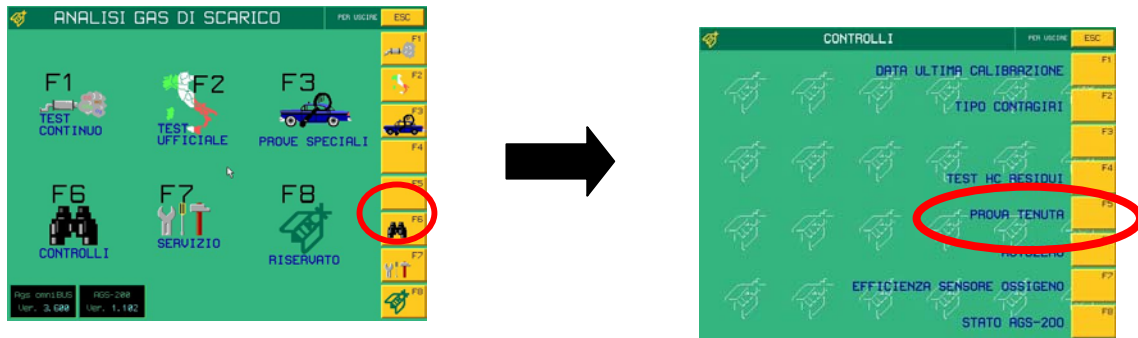
Access the main menu OF THE exhaust gas analyzer, press F6 "SET-UPS" and then "CALIBRATION DUE DATE".



Press 'ESC' to return to the previous menu.

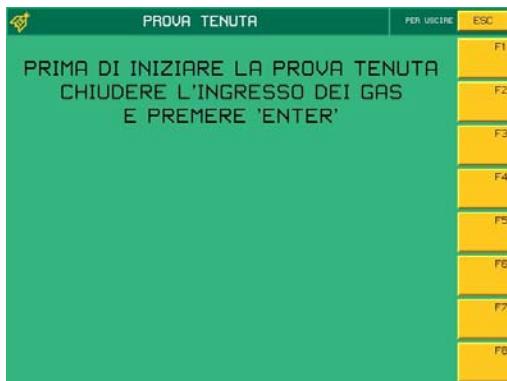
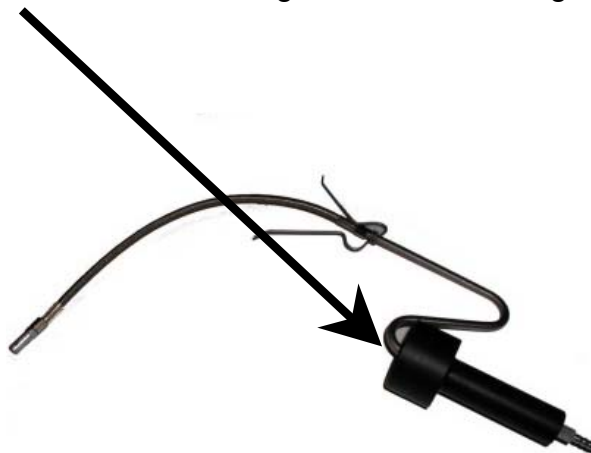
### 7.1.4 LEAK TEST

Access the main menu of the EXHAUST GAS ANALYZER, press F6 "CONTROLS" and then F5 "LEAK TEST"

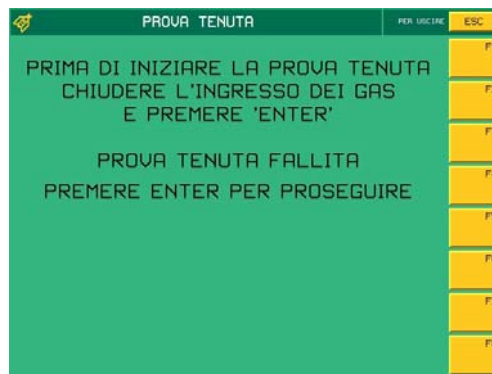
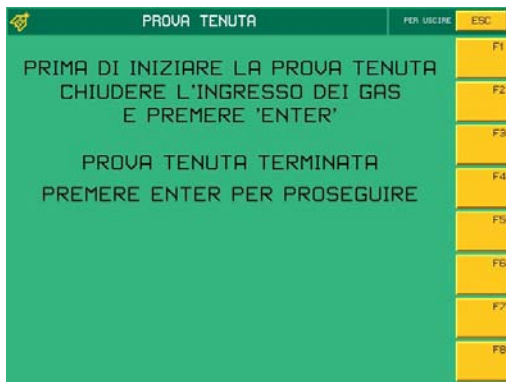


The following mask will appear with instructions on how to carry out the leak test.

Fit the probe tube into the relative housing as shown in the figure.

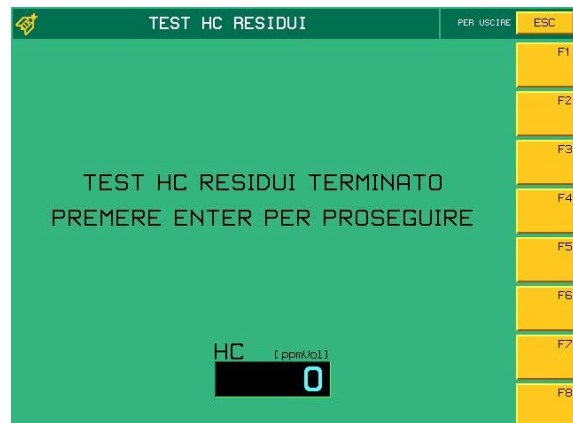


If the result of the leak test is positive, the analysis program will proceed in the normal way, failing this a message will appear to indicate that the test has not been successful.



### 7.1.5 RESIDUE HC TEST

The residue HC test activates automatically during the official test or can be activated by accessing the CONTROLS menu (F6) and then pressing F4.



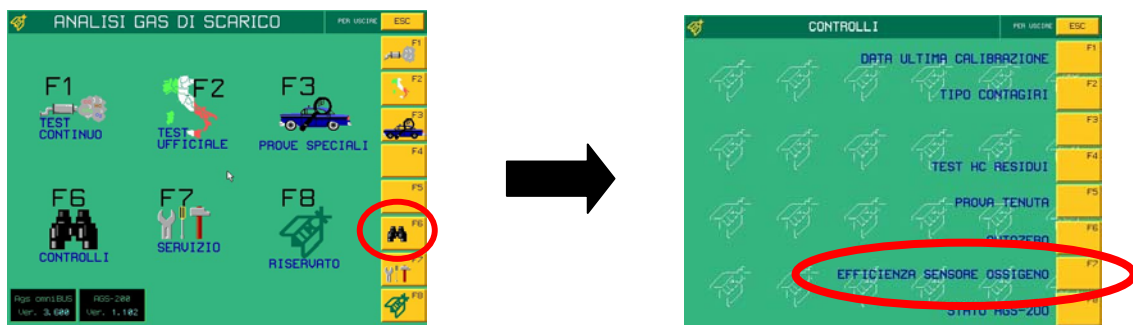
The following mask with the message WAIT PLEASE will appear during the test. This gives the analyzer sufficient time to carry out the "autozero" operation. After this, the HC value measured will be displayed in the window.

If this value exceeds 20 PPM the test will have failed, otherwise the program will proceed in the normal way..

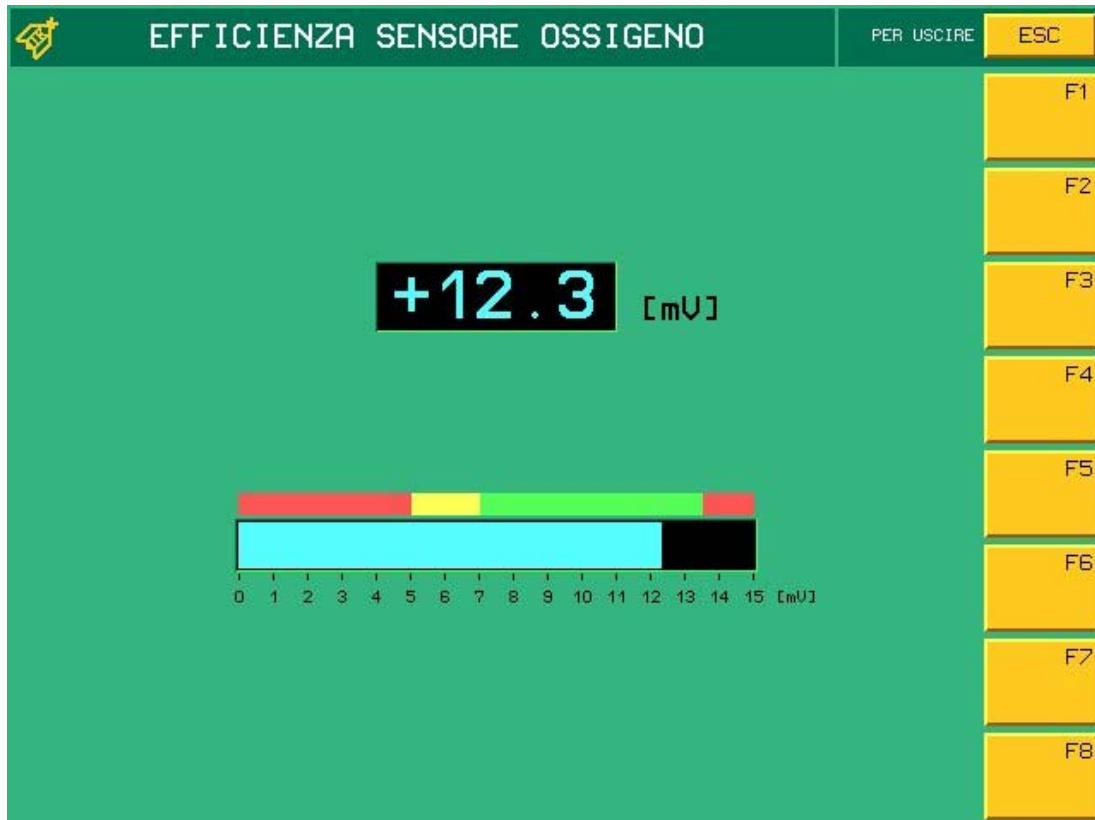
If the test fails, it can be repeated to bleed the probe filters and tubes. If the test repeat is also unsuccessful, the filters must be changed and the tubes and sampling probe adequately cleaned.

### 7.1.6 O2 SENSOR EFFICIENCY

Access the main menu of the EXHAUST GAS ANALYZER, press F6 "CONTROLS" and then F7 "OXYGEN SENSOR EFFICIENCY"



The oxygen sensor output voltage monitoring mask will appear



If the measurement range is within the green zone, the sensor can be considered efficient.

If the measuring range is in the yellow zone, the sensor is becoming exhausted but can still be used for a short while.  
 If the measuring range is in the red zone, the sensor is exhausted and must be replaced.

### 7.1.7 SPECIAL TESTS

Access the main menu of the EXHAUST GAS ANALYZER and press F3 "SPECIAL TESTS"

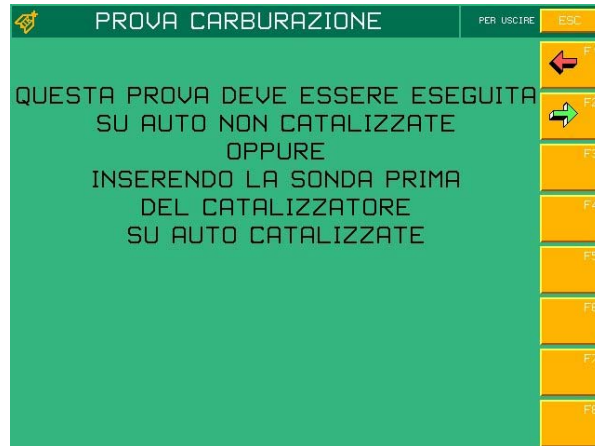


The list of special tests will appear

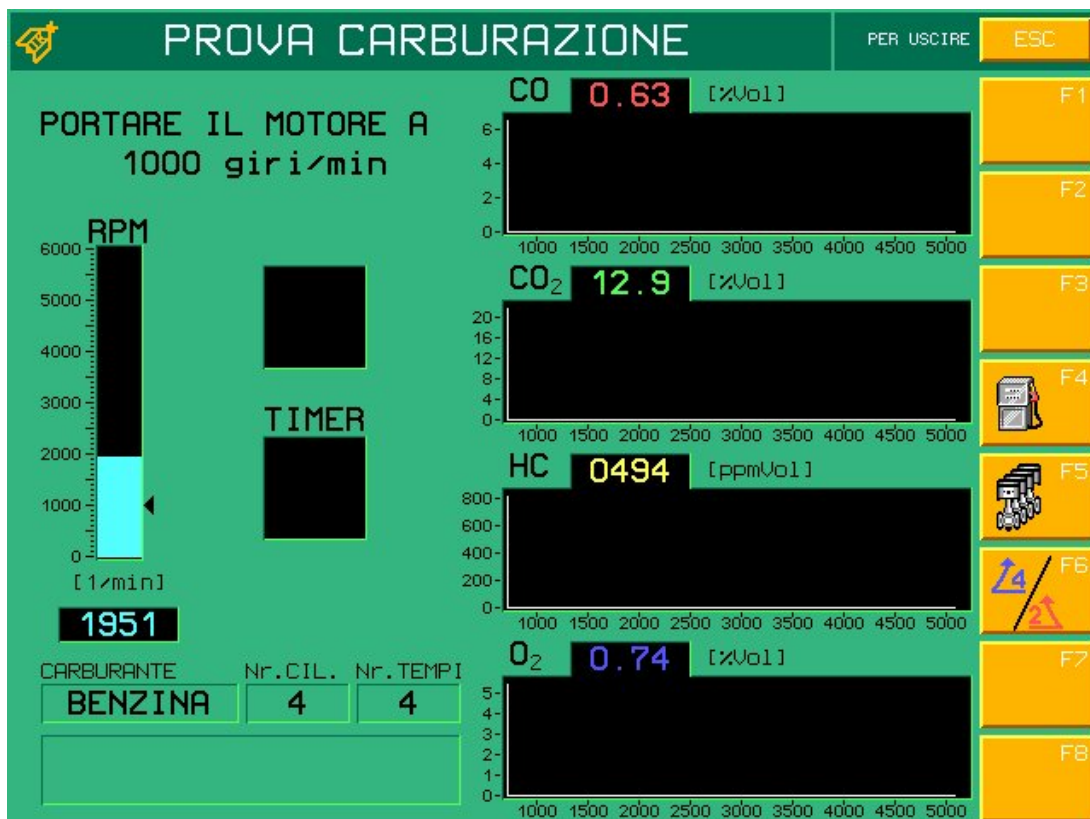


### 7.1.7.1 CARBURATION TEST

This test begins with a warning for the operator.

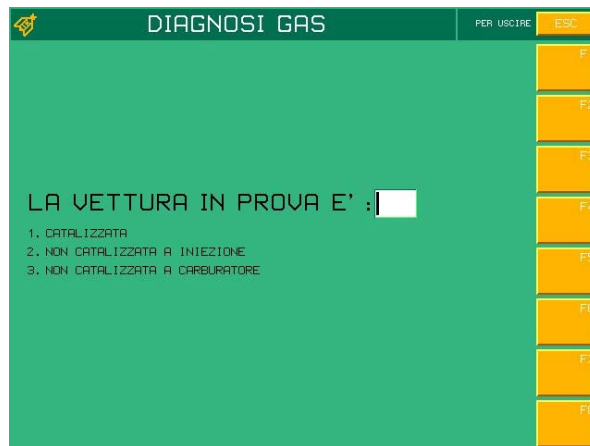


The test involves sampling the exhaust fumes at various engine rates. The operator must comply with the instructions that appear on the screen. The test result will appear at the bottom left of the window at the end of the procedure.

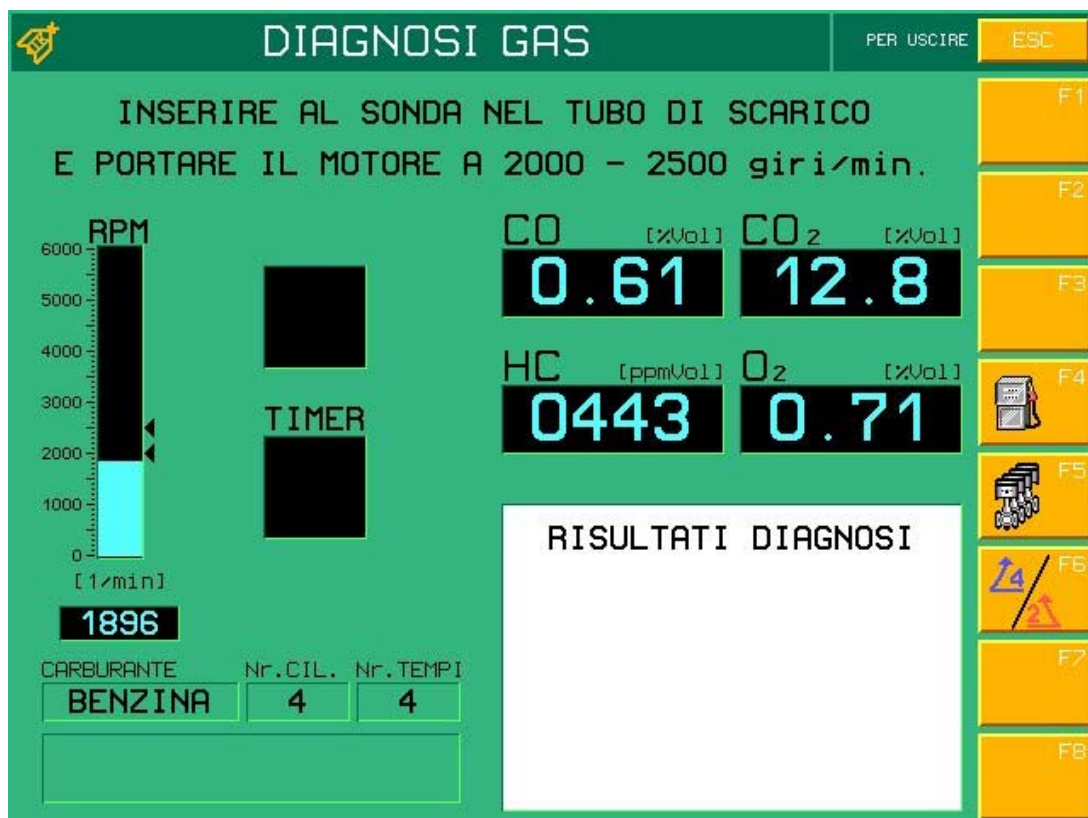


### 7.1.7.2 GAS DIAGNOSIS

This test begins with a request for the operator about the type of vehicle tested.

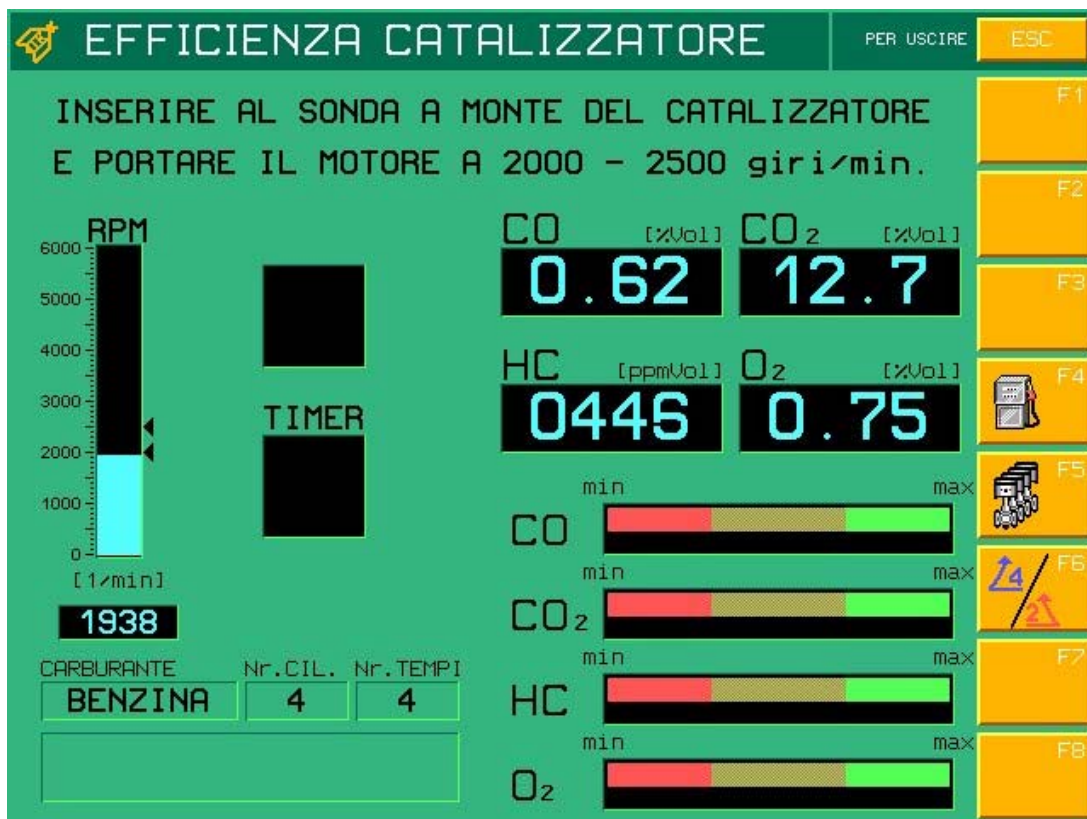


The test involves measuring the exhaust fumes at 2000-2500 rpm and idling engine rates. The operator must comply with the instructions that appear on the screen. The test result will appear at the bottom right of the window at the end of the procedure.



**7.1.7.3 EFFICIENZA OF THE CATALYTIC UNIT**

During the test, the exhaust fumes are measured at 2000-2500 rpm and idling engine rates with the gas sampling probe inserted first prior to the catalytic unit and then after it. The operator must comply with the instructions that appear on the screen. The efficiency of the catalytic unit will appear in graphs at the end of the procedure in relation to the four gases: CO, CO<sub>2</sub>, HC and O<sub>2</sub>.





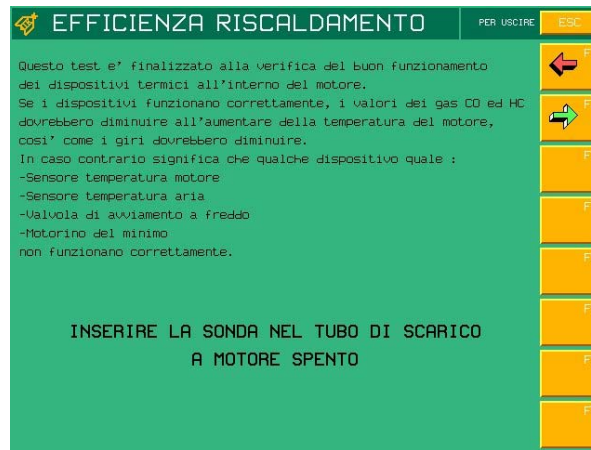
**7.1.7.4 HEAD GASKET TIGHTNESS**

The test checks for carbon monoxide (CO) in the cooling circuit. The operator must comply with the instructions that appear on the screen. The test result will appear at the bottom left of the window at the end of the procedure.



**7.1.7.5 ENGINE WARMING-UP EFFICIENCY**

This test begins with a warning for the operator



The exhaust fumes are sampled at regular intervals after the engine (which must idle) has started.

At the end of the test, which lasts 15 minutes, the operator must visually check that emissions of the four gases have dropped between the instant the engine fired to the time when the correct engine operating temperature has been reached.



**BLANK PAGE**

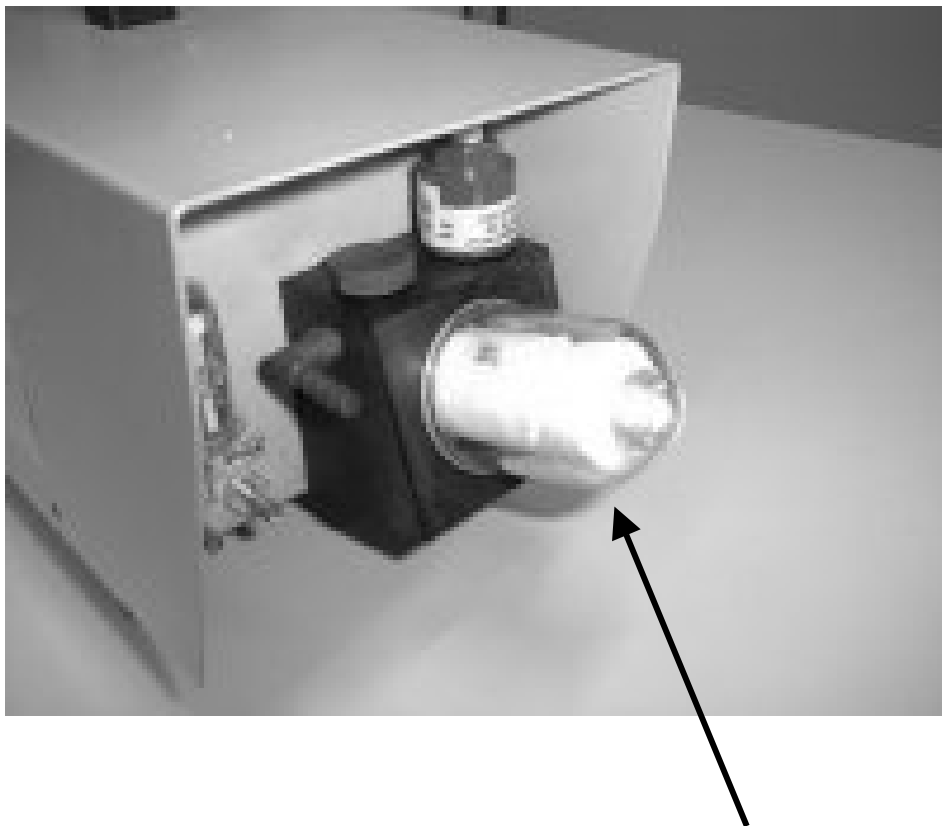
## CHAP. 8 - MAINTENANCE

This chapter contains all the instructions you require to keep your instrument in a perfectly efficient condition.

The BRAINBEE Assistance Department will be happy to supply you with all the information and means required to achieve this result in a rapid and efficient way.

### 8.1 9.1 - How to clean the filtering system

The filters installed in the system are very important since they protect the delicate internal devices from dirt and impurities. This is why it is essential to clean them when required.

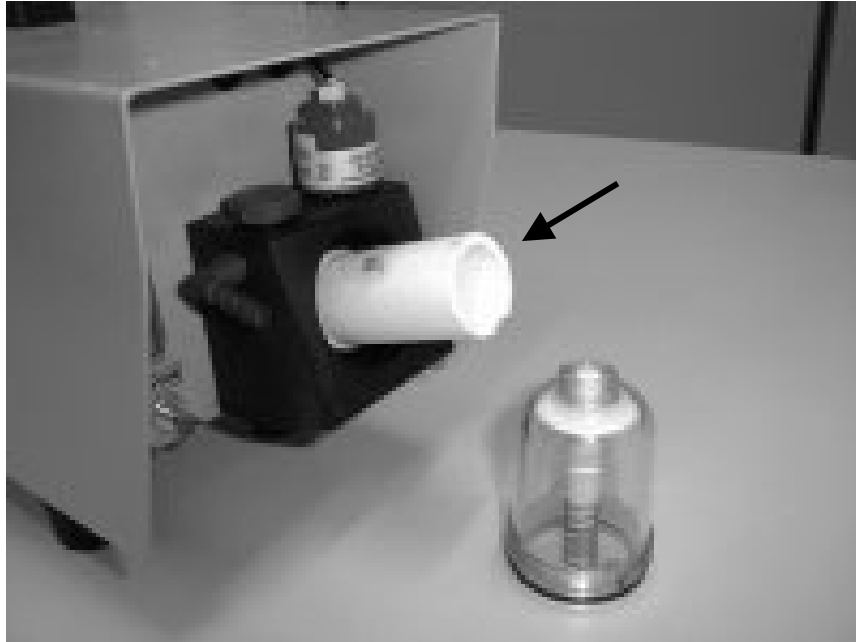


The arrow points to the cup which must be unscrewed to access the filters.

Two types of filter are housed in the cup:

- Coalescent, which must be replaced when its white surface becomes black, or at least once a month.
- Gauze, which must be washed at least once a month and replaced at least once every six months.

Unscrew the cup to replace the coalescent filter, indicated by the arrow.



Once the coalescent filter has been removed, the gauze filter indicated by the arrow can be replaced (or washed with soap and water).



## 8.2 HOW TO REPLACE THE ACTIVATED CARBON FILTER

This filter eliminates the dust and unburnt hydrocarbons in the environment from the air used to autozero the instrument.

When the instrument is used in optimum conditions, this filter should be replaced once a year.

To replace the filter, just disconnect the tube that holds it in place and, after fitting a new filter, set it in the right position in the relative clip.

## 8.3 PERIODICAL INSPECTION OF THE ANALYZER

It is obligatory to have the instrument checked at least once a year and not beyond 12 months from the date of the last inspection.

These operations are official, thus all the procedures described in the Circular must be complied with.

These periodical inspections may only be carried out by Authorized Laboratories and must be reported in the "Metrological Book" which must be kept ready to hand with the instrument.

The program warns the user when the periodical inspection period is due by means of a mask at the beginning of the OFFICIAL TEST FOR ITALY.



At the end of this period, the instrument can still be used, but the tests could be annulled if the vehicles are to be type approved.



This is why users are strongly urged to always comply with the required inspections.

These periodical inspections must be carried out by specialized personnel authorized by the manufacturer.

**BLANK PAGE**

## CHAP. 9 - ERRORS

This chapter lists all the errors that may appear as the instrument is used. Full comments to all the errors displayed appear on the screen, thus further descriptions are not considered necessary.

ERROR	Cause	Remedy	Ref.
	No connection between interface board and PC	<ul style="list-style-type: none"> <li>▪ Check serial connection cables</li> </ul>	
	Periodical inspection due	<ul style="list-style-type: none"> <li>• Call the technical service</li> </ul>	



**BLANK PAGE**

**CHAP. 10 - OPTIONALS**

	<p><b>NOX-010</b> NO sensor for gas analyzer AGS-200 and MANAGER-600</p>
	<p><b>RPM-010</b> Cable to test Otto cycle and moped engine rpm for AGS-200 and MANAGER-600</p>
	<p><b>CPI-020</b> Induction clamp to test Otto cycle engine rpm for AGS-200 and MANAGER-600</p>
	<p><b>CA-020</b> 12V battery power cable, with clamps, for OPA-100, AGS-200 and MANAGER-600.</p>
	<p><b>ST-010</b> Temperature probe for MGT-300, AGS-00, OPA-100 and MANAGER -600 (Length 2m.)</p>

For up to date information, contact your dealer or our website [www.brainbee.com](http://www.brainbee.com) .

**BLANK PAGE**