STARGAS

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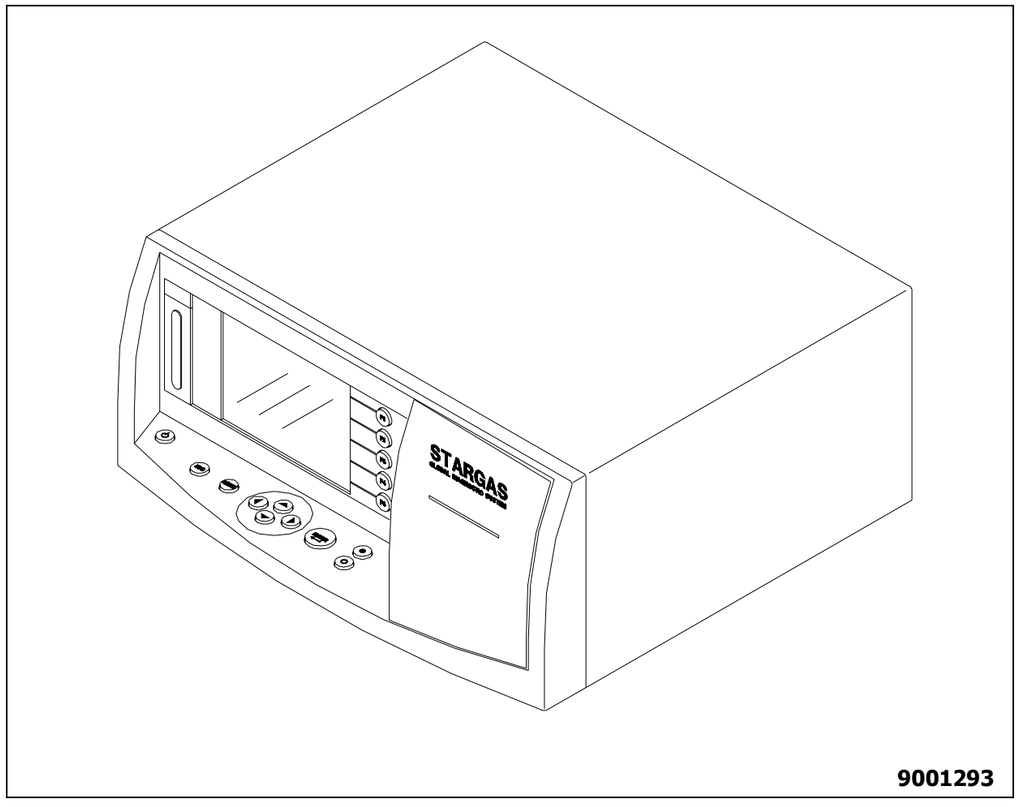

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Manuale operativo - Operating instructions - Manuel d'utilisation
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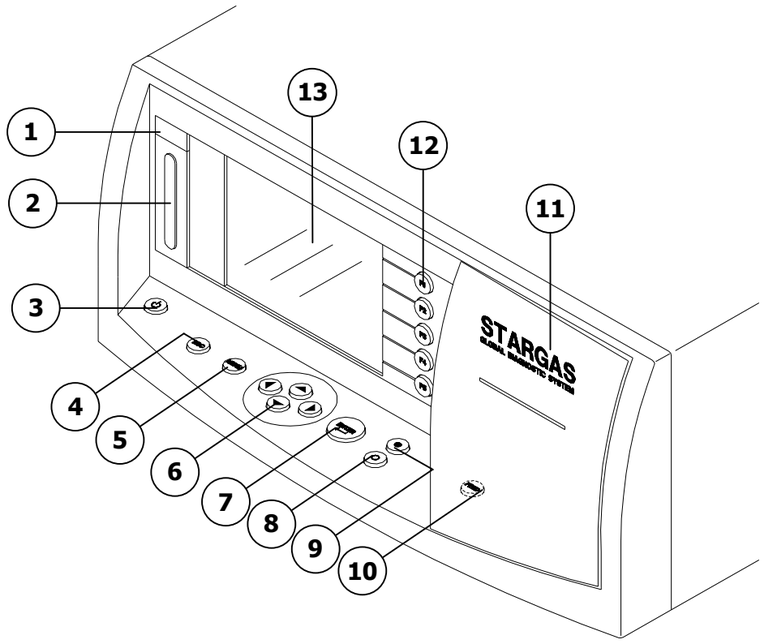
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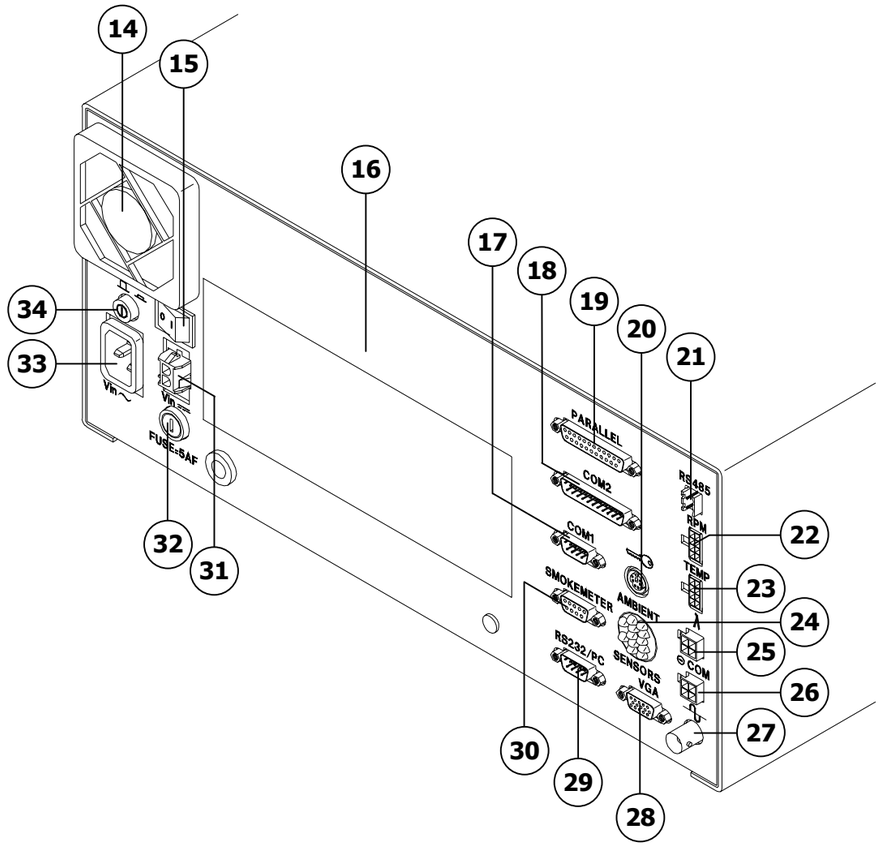
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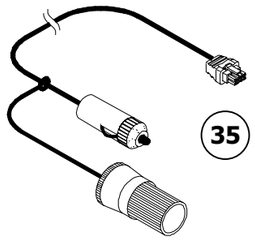
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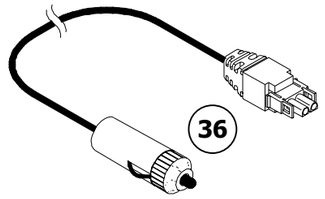
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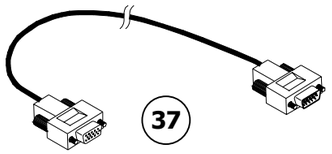
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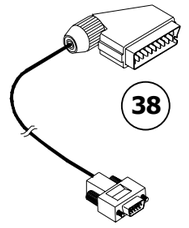
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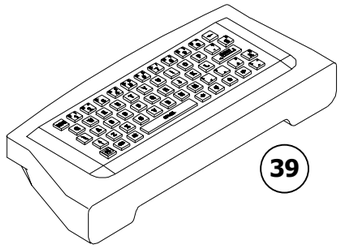
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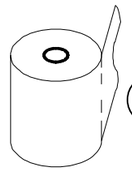
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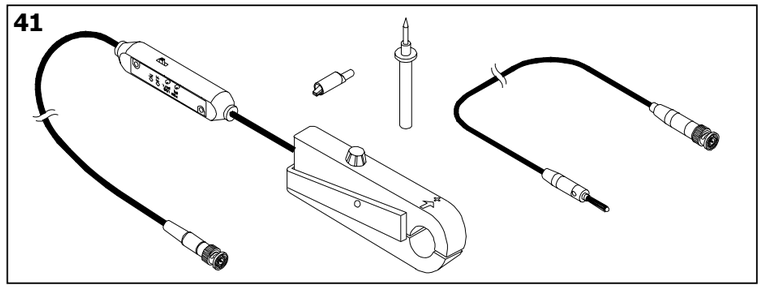
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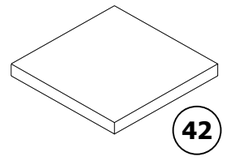
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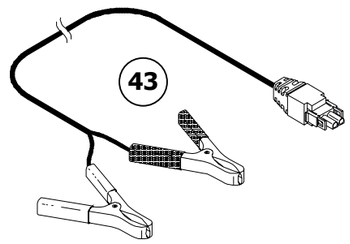
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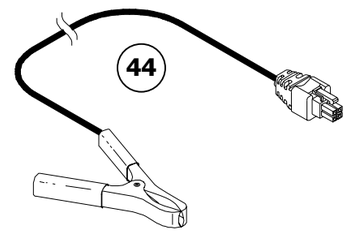
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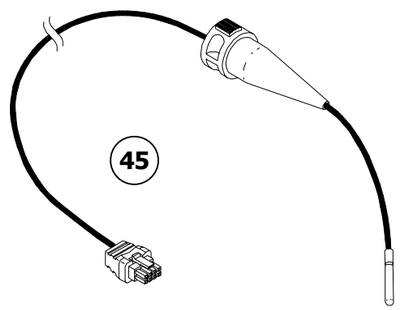
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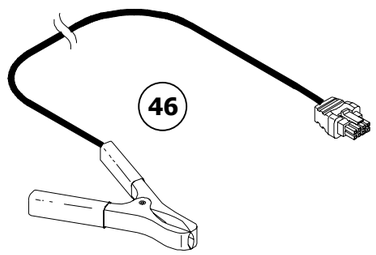
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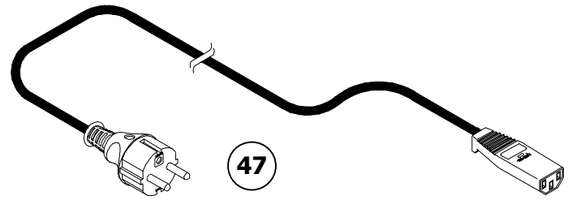

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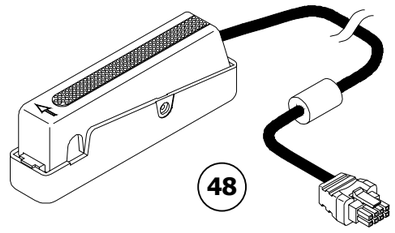

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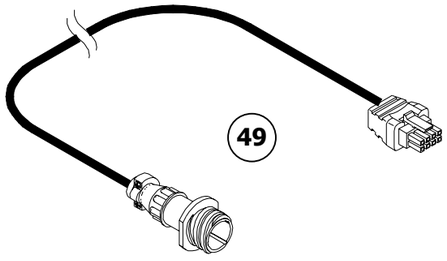

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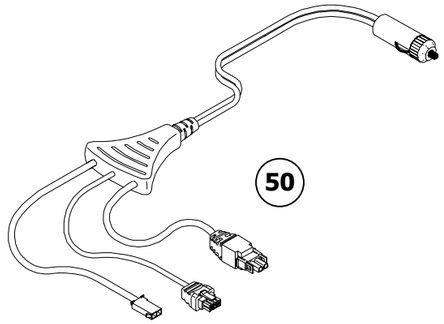

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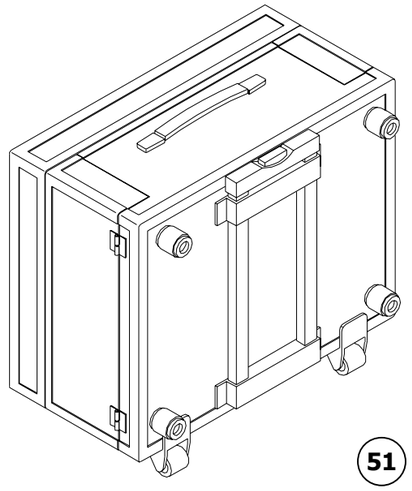

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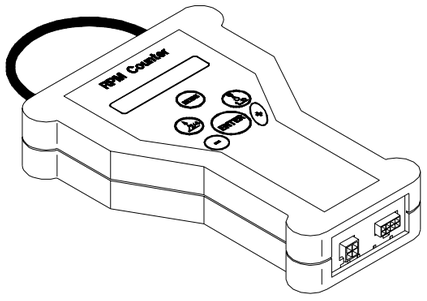

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Dear garage owner,

Thank you for having chosen one of our instruments for your workshop. We are certain that it will give the utmost satisfaction and be a notable help on the job.

Please become fully familiar with the instructions in this user's manual. It should be kept ready to hand for consultation whenever required.

Stargas is a Multi-function center for centralized management of smoke analysis, autodiagnostics and Osclilloscope/Volt-Ammeter.
Check operations are controlled by a Central Unit to which peripherals are linked: partial flow Smokemeter, EOBD/Ecureader module etc.

TTPR - April 2004

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GENERAL RULES FOR THE SAFETY OF THE OPERATOR

Read carefully the instructions for the installation, use and maintenance contained in the operative manual.

Do not allow unskilled personnel to use this equipment, in order to avoid accidents to the people or damages to the equipment.

The work place must be dry, sufficiently bright and well aired.

Particularly, vehicle diagnosis operations involving engine ignition must be carried out in a room provided with an exhaust fan.

We remind you that inhalation of carbon oxide (which is odourless) causes serious health damages.

When operating on engines or other parts of the vehicle it is necessary:

- To wear suitable clothes and to keep a proper attitude in order to prevent accidents.
- Before going on with the test, to make sure that the car gear is in neutral position (or in parking position if the vehicle is an automatic transmission one), to put on the emergency or parking brake in the vehicle which is going to be tested and to verify if the wheels are locked.
- To protect face, hands and feet and avoid any contact with hot surfaces such as sparking plugs, exhaust pipes, radiators, cooling system connections.
- Not to smoke and not to light flames when working on the vehicle.
- To check that all electrical connections are insulated and firm.
- Not to look directly and at a close distance into the carburettor suction pipe when the engine is on.
- To keep one's hands and hair off the moving parts. Never to wear ties, large clothes, wrist pieces of jewellery and watches when working on a vehicle, especially if the engine is on.
- To keep off the fan; the cooling fan is controlled by a thermal switch which is linked to the coolant temperature: thus disconnect the fan cable when working on a still hot engine, in order to prevent the fan from starting to work suddenly even if the engine is off.
- Not to pour fuel directly in to the carburettor in order to ease the engine starting.
- Not to unscrew the radiator plug before the engine temperature and consequently the cooling system pressure have lowered.
- Not to touch the high voltage cables when the engine is on.

- To handle portable lamps carefully and use only the ones that are provided with metallic protection.
- To wear protective glasses in order to protect the eyes from gasoline, dust or metals.
- To remember that the catalytic muffler reaches very high temperatures that can cause serious burns or fires.
- Hence check that near the muffler there are no oil stains, wipers, paper or other easily inflammable materials.

When working on batteries it is necessary to remember:

Car batteries contain sulphuric acid and produce explosive gases; hence pay attention to the following instructions:

- Always wear protective glasses.
- Never leave tools onto the battery since they could cause accidental contacts.
- Before carrying out the test or the recharge, cover with a wet wiper the battery openings so as to choke the explosive gases.
- Avoid the sparking when connecting the cables to the battery.
- Avoid electrolyte sprinkles on the skin, on the eyes and on cloths, since it is a corrosive and highly toxic compound.

When working with a mains voltage fed equipment it is necessary:

- To verify if the equipment is earthed.
- To avoid touching it with wet hands.
- To work beeing insulated from earth.

FOR A CORRECT USE OF THE STARGAS

In order to use the **STARGAS** safely it is necessary to comply with the following rules:

- The tool must be used in dry places. Its exposure or use near sources of heat or polluting emissions (stoves, ovens, etc...) must also be avoided.
- In order to connect the tool to the feeding mains make sure that the mains voltage/frequency corresponds to the ones which are suggested for the tool.
- Do not expose the tool to shocks.
- Do not wet the tool with water or other liquids.
- Avoid to touch it with wet hands.
- Replace the burnt fuses with fuses having the same features.
- Do not lean objects on the supply cable and never bend it sharply.

1.0 - DESCRIPTION OF STARGAS

1.1 - Tool front view

1. **Lens**: Infrared rays conveying filter for the remote control receiver.
2. **Memory card slot**: To update and install new programs for the direct use of the Autodiagnosis and for future functions.
3. **STAND-BY key**:
   - ✓ Slightly press the key to turn off the LCD display back-light (sleep mode).
   - ✓ Press again to go back to the previously displayed function.
   - ✓ Hold down the key for more than 2 seconds to put the tool in the stand-by mode.
   - ✓ Press the key again to reset and to take the tool back to the stand-by position ready for the use. The function is indicated by the red colour of the key.
4. **ESC key**: To quit the various pages of the test measurement, enabling and setting.
5. **MENU key**: To enable or disable the FUNCTIONS BAR display, or to scroll the display of many FUNCTIONS BAR in a decreasing way (from the last to the first).
6. **Cursor shift keys**: Allow to shift selection to the four directions (low, up, right and left).
7. **ENTER key**: To confirm key.
8. **Contrast key**: To decrease the contrast the LCD.
9. **Contrast key**: To increase the contrast the LCD.
10. **FEED key**: To feed the printer paper.
11. **Printer**: It prints the test results on a ticket.
12. **F1, F2, F3, F4 and F5 keys**: Press the keys when prompted on the display or to enable the FUNCTIONS BAR icons.
13. **Display LCD**: Enables the operator to follow the test phases and to read immediately the results.

1.2 - Tool rear view

14. **Filter-holder with internal cooling air filter that can be washed**.
15. **Main switch**: to turn on and off the tool if plugged to a battery.
16. **Certification plate**: All of the technical features can be found there.
17. **COM1 Port**: serial port for the connection to the autodiagnosis interface.
18. **COM2 Port**: serial port for the connection to the autodiagnosis interface.
19. **PARALLEL port**: Port for the connection to a 80-column standard printer.
20. **Port for special activations by electronic key**.
21. **RS485 port**: Port for industrial standard serial connection.
22. **RPM Socket**: Socket for the connection of the RPM clamp from battery or of induction clamp (option).
23. **TEMP Socket**: Socket for the connection of the oil temperature probe (option).
24. **Ambient sensors**: Sensors to detect environment data (relative humidity and temperature).
25. **λ Socket**: Socket for the connection of the lambda probe 1 Volt/5 Volt. It cannot be used in this version (STARGAS LIGHT).
26. **⊖ COM port**: Port for the vehicle ground connection; battery negative.
27. **Oscilloscope connector BNC**: It allows the inlet of the measured signal through the relevant wire connection.
28. **VGA port**: Port for the connection to a standard monitor or to a TV color (PAL/NTSC systems).
29. **RS232/PC port**: Port for the connection to a Personal Computer.
30. **SMOKEMETER port**: Port for the connection to a partial flow smoke analysis cell combined with external supplier.
31. **Battery Socket**: Tool power socket by the connection of the relevant battery cable (12 Volt).
32. **Fuse compartment with a 5 A quick fuse**.
33. **Mains Socket**: Tool power supply socket by the connection of the relevant cable to the power mains.
34. **Main switch**: to turn on and off the tool if plugged to the mains supply.

2.0 - HOW TO CONNECT THE STARGAS

To connect the STARGAS:

- Remove the tool form the package and place it in the special trolley housing (option).

The package should be kept in case that you need it again subsequently to transport the tool.

- Connect the RPM battery cable (**46**) to the **RPM** socket (**22**).
- Connect the ground cable (**44**) to the ⊖**COM** port (**26**).
- Connect the temperature probe (**45**) (option) to the **TEMP**.**°C** tap (**23**).
- Attach the battery supply cable (**43**) to the **battery socket** (**31**) and to the tested vehicle battery (in case the vehicle is not already supplied by the mains cable).
- Attach the mains cable (**47**) to the **mains socket** (**33**) and to the supply source of the power mains (in case the vehicle is not already supplied by battery cable).
- For the connection to the feeding mains, make sure that the tap has the same VOLTAGE/FREQUENCE features as those that are written on the plate which is located on the tool back side. **The earthing is absolutely necessary**.

3.0 - USE OF THE STARGAS

Error messages are displayed on the tool LCD simultaneously to the emission of a sound warning.

3.1 - Test Conditions

Once the connections have been performed, before starting the test check:

- The ambient temperature ranges between **+5 °C** and **+40 °C** (degrees Centigrades).
- The exhaust pipe of the vehicle is tight. This condition has to be checked by hermetically occluding the exhaust pipe while the engine is idling; in such a condition no gas leakages from the pipe joints should be detected.
- The following car parameters are correct, as per the manufacturer's indications.
  - ✓ IDLING
  - ✓ DWELL ANGLE (DWELL)
  - ✓ IGNITION ANGLE (ADVANCE)
  - ✓ PLAY OF THE VALVES
- Engine temperature conditions comply with the manufacturer's specifications.
- The cold starting devices (automatic and manual) are disconnected.

3.2 - Temperature measurement

The temperature probe (**45**) (option) has to be introduced at the place of the oil dipstick.
In order to introduce it deeply enough, adjust the rubber plug by using as a reference the original dipstick length.

ATTENTION:
When introducing the temperature probe, do not bring the connecting cable near sources of strong interferences (coil, spark plug cables, distributor). **Moreover do not twist the cables inside the engine compartment**.

3.3 - Revolution counter use

To measure the rpm you can use the internal revolution counter of the tool that processes a signal from the battery positive terminal and detects the rpm. That is set for 4-cylinder engines, but also 1, 2, 3, 5, 6, 8, 10, 12 cylinder can be set.

Connect cables as follows:

- Connect the RPM cable from battery (**46**) to the battery **positive** pole.
- Connect the ground cable (**44**) to the vehicle **chassis**.
- Start the engine.

NOTA BENE:
If the programme displays the RPM RANGE SELECTION page, usually when the engine rpm number is lower than 700 RPM or when it exceeds 900 RPM, it is necessary to select the RPM value being nearest to that of the tested engine. The programme processes the data by setting as predefined value the measure it deems to be more correct.
After carrying out the relevant checks the operator shall select the most reliable measure (by using the cursor shifting keys) and confirm by **ENTER**.

If during the tests the rpm is unstable (anomalous values) the problems are due to the generator charge pulses or to the charge current pulses interfering with the continuous current of the electrical system.
These currents cause a voltage drop on the electrical system lines that can be measured by the tool revolution counter.

In case you have problems during tests check:

- Measuring the speed functions better with a partially discharged battery than with a fully charged one. It is, therefore, worthwhile switching on several loads for a few minutes before starting the engine.
- During measurement switch on several loads such as the lights, rear window heating etc.
- Once the engine is on, press down fully on the accelerator, the generators regulator can only be activated through this.
- Be sure that the V-belt used to drive the generator does not slip off, otherwise faulty measurements could occur whilst the engine is accelerating.
- In some vehicles a switched on fan can distort measurement. In this case, switch off the fan.

The rpm reading can be carried out by suing the RPM cable from the electric lighter (option) or the cable with induction clamp (option). The latter is set to 4-time engines, but can be set to 2-time/DIS engines too.

ATTENTION:

At the end of measurement disconnect the RPM cable from the battery and short circuit the clamps one another to avoid the display of a wrong rpm due to the high sensitivity of the system. If a RPM cable from car lighter is used (option) short circuit it through the special hook connected to it.

If during the tests with induction clamp the revolution number is unstable (showing a trend towards anomalous values), probably some parasitic signals or some other signals coming from the ignition system of the other non concerned cylinders get into the induction clamp.

The reasons for these drawbacks are numerous, for instance:

- Spark plug contacts blinked with an excessive resistance.
- Coil high output.
- Excessive distance of the spark plug electrodes.
- Spark plug cables too close one another and non perfectly insulated.
- Humidity of the cables, of the spark plugs, etc…

In case of tests on motorcycles with mechanic ratio gearbox we suggest the use of the 2035 (**52**) revolution counter with antenna setup for measurement on 4-stroke engines.

ATTENTION:

Check that no electrical discharges occur between the spark plug cable and the clamp, which could seriously damage the tool.

3.4 - Use of the STARGAS keyboard

To set the workshop data pr any other value by means of the keyboard of the STARGAS follow indications below:

- Press **MENU** and at the same time the **arrow up** or **down cursor keys** to select a setting (lowercase, capital letters, digits and space).
- Press many times the **arrow up cursor key** to scroll letters or digits increasingly (from A to Z or from 0 to 9).
- Press many times the **arrow down cursor key** to scroll letters or digits decreasingly (from Z to A or from 9 to 0).
- Press the **right** and **left cursor keys** to scroll the cursor along letters or digits or to set a space, after positioning the cursor on the last character (letter or digit) of the message.
- Press **MENU** and at the same time **the arrow up** or **down cursor keys** (many times) to select the space setting that erases the selected character.
- Press **ENTER** to toggle between fields or to go to the following selection.

3.5 - How to use the remote control

The Infrared remote control (**39**) enables the operator to conduct the main tests without using the buttons of the STARGAS.

To correctly use the remote control, point it towards the front of the STARGAS from a distance of not more than **10 meters**.

If the remote control effectiveness diminishes remarkably with reference to the distance, it is necessary to replace the cells, located in the special housing.

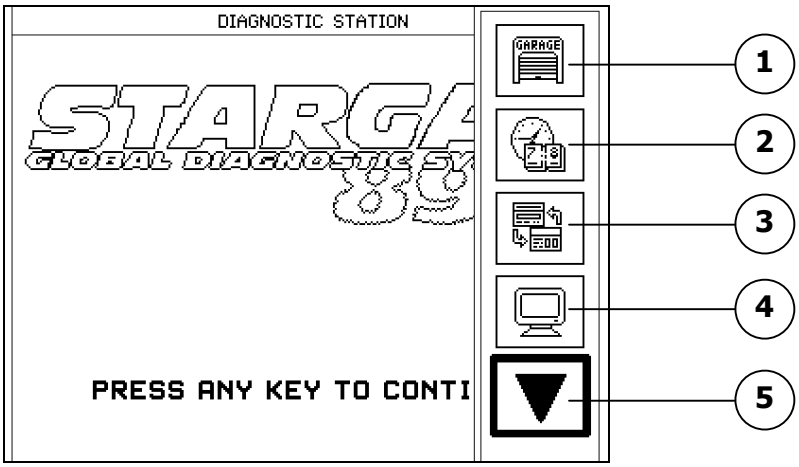
NOTA BENE:
To favour the correct operation of the remote control inside the vehicle, for some types of cars using shielded windows it is necessary to slightly lower the window on the aiming side.

3.6 - Use of the memory card

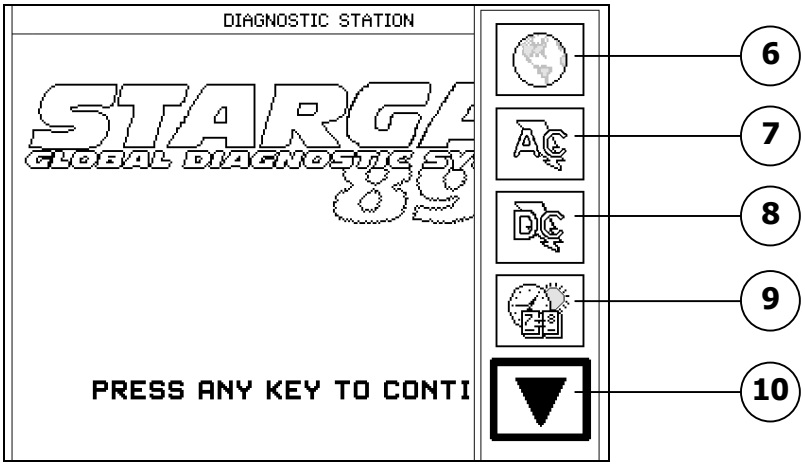
The memory card has to be introduced and removed from the reading slot (**2**) of the STARGAS when the tool is off or in the stand-by mode.

4.0 - BEFORE THE TEST

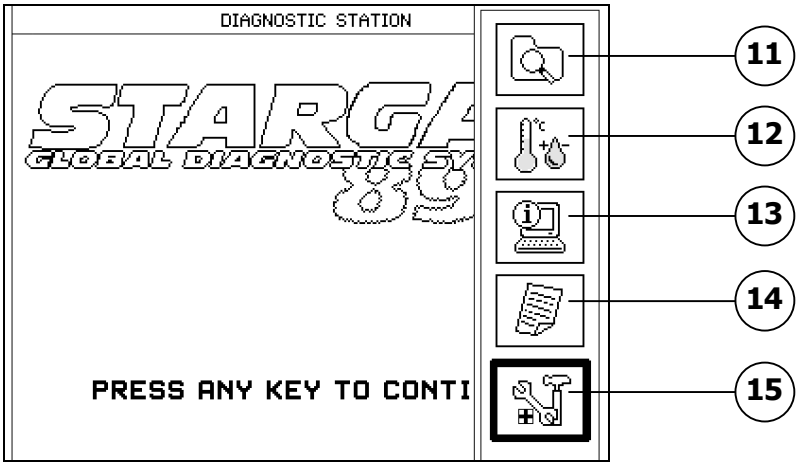
- Turn on the STARGAS by means of the **ignition** key (**15**) or (**34**).
- The LCD shows the presentation page.
- Press **ENTER** to display directly the application programs page.
- Press **MENU** to enable or disable the FUNCTIONS BAR displayed as icons (workshop data entry, installed program version, limit voltage setting, etc.).



1. **Garage data**: To insert the workshop data.
2. **Date and time**: Function for the Technical Service staff only.
3. **Application manager**: To return to the page of the application programs.
4. **Video settings**: To set-up the signal for the type of required display: monitor or TV color (PAL/NTSC system).
5. **Following**: To display the following FUNCTIONS BAR.



6. **Language selection**: To set-up the desired language.
7. **Mains voltage limits**: Function for the Technical Service staff only.
8. **Battery voltage limits**: Function for the Technical Service staff only.
9. **Summer-time min. and hour.**: To set-up the solar or summer time and relevant minutes. Select the icon showing the hands of a clock and press **ENTER** to switch from the summer time to the solar time and vice versa. The switch to the summer time is indicated by the sun displaying on the icon itself.
10. **Following**: To display the following FUNCTIONS BAR.



11. File manager: To display the name of all files installed, with their size, date, version and type.

12. Ambient temperature and humidity calibration: Function for the Technical Service staff only.

13. System information: To display the tool system resources.

14. Printer selection: For a print test and to select the external printer (80 columns) to be used.

15. Self test: To check some functions of the tool.

- Press the **MENU** key until the FUNCTIONS BAR display is disabled; or press **ESC** to disable directly more levels of the FUNCTIONS BAR.

5.0 - MAINTENANCE

5.1 - Printer paper change

Open the printer front panel (**11**) and go ahead with the replacement only when the tool is on.

- Remove the exhausted roll.
- Fit the new roller edge (**40**) into the printing mechanism moth, after opening the mechanism the paper is fed automatically.
- Introduce the paper roll in its housing and close the panel.

The printer writes on thermal paper. The spare rollers can be ordered directly at our resellers. The use of original paper is recommended.

5.2 - Filter cleaning

The filter allows to work in dusty places without having operating problems over time.

A periodical cleaning with water and soap is suggested. In case the filter is still dirty after cleaning, replace it.

To dismount the filter:

- Remove the filter support (**14**) on the back of the tool containing he filter (**42**).
- Clean or replace the filter as needed.
- Replace the filter inside the filter holder and then fit the assembly inside the housing by pressing it by the hand.

6.0 - TECHNICAL FEATURES

CONTROL UNIT

Power supply:

Supply options:

- ✓ **Mains** 90 ÷ 270 V, 50 ÷ 60 Hz.
- ✓ **Battery** 10 ÷ 16 Volt (5 [A] F fuse).

Mains supply voltage (110/220/240 Volt), automatic indication with print out of the error code for variations > -15% +10%.

Max power 70 W.

Display:

LCD graphical colour 320 × 240

Keyboard:

11 basic keys + 5 function keys in silicone rubber with special coating

Slot memory card:

PCMCIA (up to 64 Mbyte)

Printer:

thermal 24 column (option to set the workshop address)

6-Way miniDIN socket:

For special enablings with electronic key

Serial port:

COM1 - **COM2** for connection to the autodiagnosis interface

SMOKEMETER for connection to partial flow smoke cell combined with external supplier

standard serial port **RS232/PC** for connection to a PC or to other diagnosis stations

RS485 standard industrial serial connection

Printer port:

PARALLEL for connection to 80-column standard printer (colour too)

Socket video:

VGA for connection to standard monitor or to a TV color (PAL - NTSC system)

Socket ⊖ COM:

grounding of the tested vehicle (battery negative pole) for revolution counter signals from battery, lambda prove and oscilloscope

Tested environment parameters measurement:

automatic measurement of:

✓	ambient temperature	-40	÷	+60 °C	res. 1
✓	ambient pressure	75.0	÷	106.0 KPa	res. 0,1
✓	ambient relative humidity	0	÷	100 %	res. 1

Operation temperature:

+5 °C ÷ +40 °C

Stocking temperature:

Min. -25 Max. +70 °C

Clock:

print date and time

LITHIUM rechargeable cell

Dimensions:

400 × 180 × 450 mm

Weight:

8,6 Kg (approximately)

Remote control - Alpha numerical keyboard (option):

IR supplied by 3 AAA LR03 cells

7.0 - SPARE PARTS

35.	Lighter socket RPM cable (option)	**2303159**
36.	Lighter supplying cable (option)	**2303151**
37.	Monitor extension cable (option)	**2303156**
38.	Scart cable for TV (option)	**2303157**
39.	IR alpha numerical keyboard (option)	**SL31198**
40.	Paper for thermal printer	**5607062**
41.	Oscilloscope cables Kit for STARGAS (option)	**SL31205**
42.	N. 2 Filters for fan	**5119031**
43.	Battery supply cable	**2303152**
44.	Ground cable	**2303155**
	✓ Ground cable 5 mt (option)	**2303155/5**
45.	Temperature Probe (option)	**SL51080**
46.	Battery RPM cable	**2303154**
	✓ Battery RPM cable 5 mt (option)	**2303154/5**
47.	Mains cable	**3119066**
48.	Induction clamp (option)	**SL06033**
49.	STARGAS-2033 adapter cable (option)	**2303189**
50.	RPM/SUPPLY/ECUreader shunt electric lighter cable (option)	**2303171**
51.	Aluminium case for STARGAS (option)	**4101036**
52.	RPM measuring adapter (option)	**2035**