

**IMPACT**  
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**IMPACT**

**Ultrasonic Pulse Velocity Tester  
CN842**

**Impact Test Equipment Ltd**  
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User Guide  
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**Chapter 1 GENERAL INFORMATION**

**1.01 WARNINGS**

The manufacturer does not accept any responsibility for direct or indirect damage to people, things or animals and use of the appliance in different conditions from those foreseen.  
 The manufacturer reserves the right to make changes to the documentary information or to the appliance without advance notice.  
 Check the machine responds to the standards in force in the state in which it has been installed.  
 All operations necessary for maintaining machine efficiency before and throughout use are the operator's responsibility  
 Carefully read the entire manual before operating the machine.  
 It is vital to know the information and limitations contained in this manual for correct machine use by the operator.  
 Interventions are only permitted if the operator is accordingly competent and trained.  
 The operator must be knowledgeable about machine operations and mechanisms.  
 The purchaser must ensure that operators are trained and aware of all the information and clarifications in the supplied documentation.  
 Even with such certainty the operator or user must be informed and therefore aware of potential risks when operating the machine.  
 Safety, reliability and optimum performance is guaranteed when using original parts.  
 Any tampering or modifying of the appliance (electrical, mechanical or other) which has not been previously authorised in writing by the manufacturer is considered abusive and disclaims the constructor from any responsibility for any resulting damage.  
 All necessary operations to maintain the efficiency of the machine before and throughout use are the responsibility of the user.

**1.02 WARNING AND DANGER INDICATIONS - SIGNS**

The machine has been designed and constructed according to the current norms and consequently with mechanical and electrical safety devices designed to protect the operator or user from possible physical damage. Residual risks during use or in some intervention procedures on the device are however present. Such risks can be reduced by carefully following manual procedures, using the suggested individual protection devices and respecting the legal and safety norms in force.  
 This manual includes "Warning" and "Danger" indications in relevant chapters. These indications are shown with the words "Danger" or "Warning" in bold font and uppercase to make them highly visible.

	<b>WARNING</b>	indicates that machine damage could be caused should indications be ignored.
	<b>DANGER</b>	indicates that machine damage and/or injury to the worker could be caused should indications be ignored.

**DANGEROUS ZONE**" indicates any zone inside or in the proximity of the appliance in which a person is exposed to the risk of injury or damage to health.

**1.03 AIM OF THE INSTRUCTIONS MANUAL**

This manual has been edited with the aim of providing all machine operators with all the necessary information on installation, use and maintenance from production to scrapping in as comprehensive and clear manner as possible.  
 All the procedures useful for any foreseeable emergency situations have been listed by the manufacturer and can be verified during use.  
 Operators, for whom this manual has been written, due to their competence must give instructions or operate the machine themselves.  
 The instructions manual must be carefully consulted by laboratory or site safety managers, equipment operators and any internal and external maintenance workers.  
 The manual is integral to the product and refers to this appliance only.  
 The manual must be safeguarded and always kept near the equipment so that it can be easily consulted whenever necessary.  
**IMPORTANT:** The manual does not substitute the experience and technical training of the worker but must be considered a guide for carrying out its functions.  
 Furthermore all the norms and rules the operator should be aware of or consult for correct use of the machine and/or test performance can be found in the manual.  
 This responsibility is entrusted to the installer and Laboratory or Site Manager where the machine is installed.  
 The Constructor is available to provide further information.

<b>1.04</b>	<b>STRUCTURE OF THE INSTRUCTIONS MANUAL</b>
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The manual can consist of a number of documents, as shown in the appropriate list.

Verify that all documents are present; otherwise request the missing parts from the Constructor before using the machine.

Instructions can be supplied with enclosures containing diagrams and designs, which are necessary for interpretation of correct machine use and maintenance.

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**1.06 MODIFICATIONS AND ENCLOSURES OF THE INSTRUCTIONS MANUAL**

This manual reflects the state at the time of the launch of the machine on its market. If any modifications, improvements or adjustments have been made since machine supply the Manufacturer does not have to intervene on the marketed machine and will not consider the machine or the manual deficient or inadequate.

**1.07 CONSTRUCTOR IDENTIFICATION**

**1.08 MACHINE IDENTIFICATION DATA**

MODEL: **C369N**

PRODUCTION DATA: see EC declaration

INSTRUCTIONS MANUAL CODE : **C369N.M01.EN.03**

**1.09 EC STAMP**

SEE EC DECLARATION

**1.10 USAGE**

The ultrasonic tester is used to detect the presence of faults, gaps, cracks, fissures, etc. in situ on concrete structures (or rocks or other similar manufactures) and to check stresses on them due to environmental conditions.

This appliance is for the exclusive use which it has been conceived for.

Any other use is considered improper and therefore negligent.

Machine use is allowed only in places free from danger of explosion or fire.

During operation check for conditions of danger.

immediately stop the machine should it be working irregularly, and consult the authorised dealer's Sales Service department.

It is the Client's responsibility to verify at the time of installation and use that no conditions of use arise which are different to those indicated.

Refer to the Constructor when in doubt.

**1.11 OPERATORS**

		<b>WARNING DANGER</b>	<p><b>The use, transportation, installation, maintenance, demolition and disposal of the appliance are only permitted to "QUALIFIED PERSONNEL".</b></p> <p><b>This manual is exclusively aimed at "QUALIFIED PERSONNEL" and contains the necessary information for machine use.</b></p>
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"QUALIFIED PERSONNEL" means people who, due to their training, experience and education, as well as knowledge of the relevant standards, limitations and measures, have been authorised by the "PLANT SAFETY MANAGER" to carry out any necessary activity and are able to recognise and avoid any possible danger.


The manufacturer recommends that the instructions, procedures and recommendations in this manual and the work safety legislation in force be scrupulously adhered to, even with the use of appropriate protection devices (whether individual or part of the machine).


Knowledge and respect of the instructions, safety warnings and danger in this manual are all necessary for installation, operation, management and machine maintenance with a minimal risk.

The "PLANT SAFETY MANAGER" has the following responsibilities and duties:


- To know the machine functions, its commands, safety and protection devices, possible dangers of use and all the information in this manual in detail. This knowledge can only be gleaned from detailed reading of this manual.
- To know the safety legislation in force in detail in order to operate the machine
- To recognise the "QUALIFIED PERSONNEL" for transportation, handling, installation, use, maintenance, disposal, etc.
- Correctly train and educate the "QUALIFIED PERSONNEL" before allowing them access to the machine. The personnel must also be exhaustively trained with regards to the machine's protection devices.
- Ensure the machine's safety devices are not tampered with or removed and are checked on a daily basis. Provide the operator appropriate individual protection devices according to the laws in force.
- The constructor is available for clarification, assistance and training and declines all responsibility for damage to things or people resulting from improper, incorrect and negligent use by untrained personnel.

**1.12 STORAGE**



	<b>WARNING</b>	The appliance must be stored and conserved in the original packaging and in a closed environment, protected from atmospheric agents with a minimum temperature of -15C°, and a maximum of +60C° and a maximum humidity of 70%.
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	<b>WARNING</b>	The tester, as almost all electronic appliances, must not be put in too cold or humid environments when not used; otherwise it could not work properly. Therefore, before its use, it is recommended that the appliance is kept in environments with a low level of humidity and a minimum temperature of 20°.
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**1.13 TRANSPORTATION AND MOVEMENT**

	<b>WARNING</b>	In order to avoid irreparable machine damage, move with care, do not overturn, protect from rain, do not stack, protect the packaging and its contents from bumps and sources of heat.
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During transportation and movement it is important to avoid bumps, overloading with other packages, exposure to freezing or heating atmospheric agents, or any other potentially harmful condition to the device, things or people. Machine transportation and movement must be entrusted to Qualified Personnel who can ensure correct movement.

 	<b>WARNING DANGER</b>	Do not transport or move the product should it be impossible to respect the conditions on the packaging or there be any doubts. Request information from the constructor.
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**Chapter 2 INSTRUCTIONS FOR USE**

**2.01 MAIN FEATURES**


- Measurement range: 0 – 3000 µs – resolution +/- 0,1 µs
- Selection of the ultrasonic impulse amplitude adjustable from 250 to 1000 V
- Measure of the time used by the impulse to cross the material to be tested.
- Single or continuous acquisition procedure with automatic or manual saving.
- Zero calibration with depuration of the time for the impulse to go through the probes.
- Calibration of a default time value.
- Acquisition, processing and filing of the tests data in a up to 30,000 samples storage capacity.
- Mini USB interface for PC connection.


- Two outputs for oscilloscope connection.
- Languages: Italian, English, French, German, Spanish.
- Improved use of the appliance based on a user-friendly system, thus allowing the user to operate quickly.


The standard equipment configuration includes:

- Basic configuration of the appliance in a practical carrying case.
- Two 55kw piezometric probes with connecting cables.
- Calibrating cylinder, grease coupling agent
- NiMh 4,8V 2000mA rechargeable batteries pack with automatic low battery warning.
- Shockproof carrying case for the tester and the accessories.
- 230V external power pack and 12V 500m/A battery charger.

Weight: about 2 kg


	<b><u>ATTENZIONE</u></b>	<p><b>CORRECT CONNECTION: DO NOT connect the instrument TX output to the RX input of the instrument.</b></p> <p><b>TX and RX must be connected, by means of special cables, ONLY to the two probes.</b></p>
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	<b><u>WARNING</u></b>	<p><b>BATTERIES CORRECT USE: remove the batteries' pack from its slot and keep it separated if the equipment is not used for a long time.</b></p> <p><b>If the instruction above is not respected, the batteries' pack will be damaged quickly.</b></p>
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	<b><u>WARNING</u></b>	<p><b>UNUSED OF THE EQUIPMENT: if the equipment is not used for more than 15 days, the information and memorization of the date and time will be lost.</b></p> <p><b>At the first re-start, the operator has to set the correct date and time.</b></p>
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## 2.02 CASE CONTENTS

- 2 ultrasonic probes;
- 2 cables for probes, 3,5m each;
- 42.5µs sample
- contact material
- four "AA" rechargeable batteries
- 12V 500mA battery charger

	<b><u>WARNING</u></b>	<p>Avoid to give impacts to probes or to let them fall as there is the possibility to break the quartz crystals inside them.</p>
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	<b><u>WARNING</u></b>	<p>This instrument, as almost all the electronic instruments, must not be stocked, when not used, in too cold or humid rooms, because otherwise when it is actuated, there is the possibility it does not work properly. Therefore before its utilization we suggest to keep it for some hours in a room having at least 20°C temperature and a low humidity percentage.</p>
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## 2.03 OPERATOR INTERFACE

### Switching on

In order to turn the appliance on, press the F1 key for about 5 seconds.

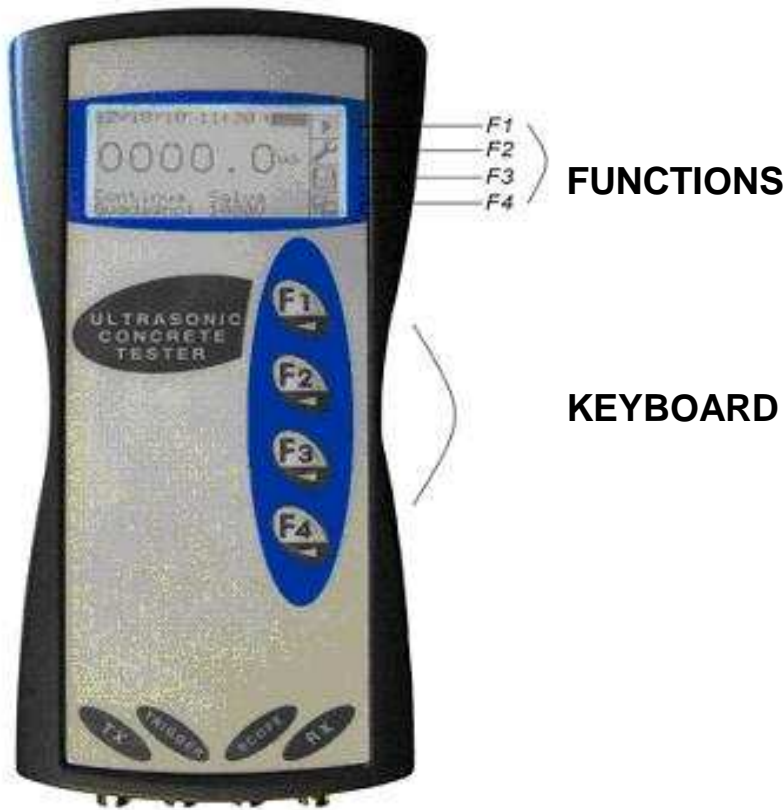


**Membrane keyboard:**

The membrane keyboard of the tester is composed of a four-keys column placed on the lower part of the device, below the display. The assigned functions vary according to the context and therefore are shown on the right column of the display.

If pressed for about five seconds, the F1 key (ON/OFF) allows the appliance switching on and off.

**LCD Display:** information and commands of the tester are shown on a 128x64 pixel LCD display.

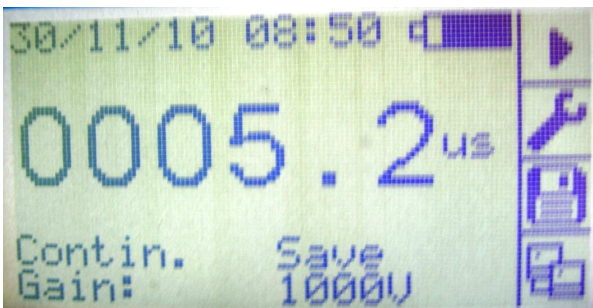


**2.04 MAIN SCREEN**

By switching the appliance on, the main screen becomes active and the operator can use the following functions (in top-down order):

- Start of the acquisition;
- Display of the configuration menu;
- Display of the saved measures;
- Download of the data through the mini USB port of the tester.

The main screen will be as the below picture:



**START OF THE MEASURING**

**CONFIGURATION MENU**

**DATA MENU**

**DATA ARE SENT THROUGH USB**

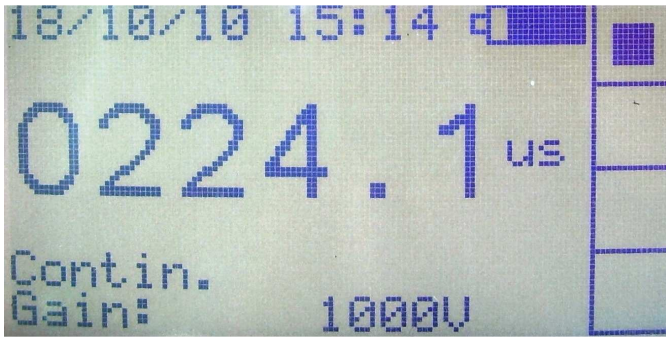
**CONTINUOUS  
MODE**

**AUTOMATIC  
SAVE**

Meanwhile, some important information concerning the functioning of the appliance are displayed:

- date and time;
- battery level;
- last measure;
- acquisition mode (single/continuous)
- automatic save
- gain (250V/500V/750V/1000V)

By pressing the F1 key to start the sampling, the commands displayed in the following screen are enabled:



**STOP OF THE MEASURING**

The system reduces the number of commands, only the F1 key is enabled to stop the acquisition in case of continuous mode.

### **SINGLE MODE**

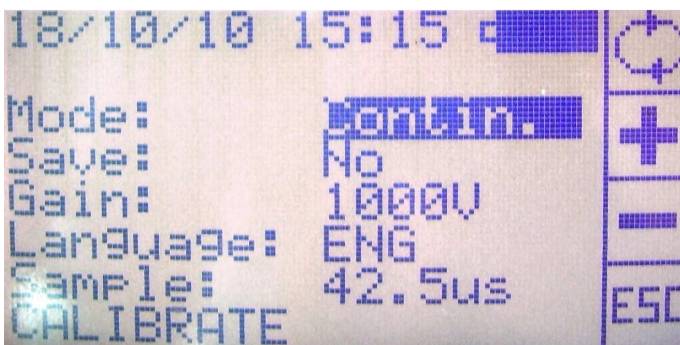
The acquisition takes place in a mediated mode; four measures are taken within a second, checking that they fall within the range of the tester and that they are consistent with each other. Otherwise the notice "NOT VALID" appears. After saving the data (if the automatic save function is active), the system completes the acquisition.

### **CONTINUOUS MODE**

The acquisition takes place in a mediated mode; four measures are taken within a second, checking that they fall within the range of the tester and that they are consistent with each other. Otherwise the "NOT VALID" notice appears. The operation is repeated three times, checking the data consistency again. Only in this case, if the automatic save function is active, data are saved (a short blink of "SAVE" sign indicates that data have been correctly saved).

## **2.05 CONFIGURATIONS**

The configuration screen is the following:



**MOVE THROUGH THE FIELDS**

**INCREASE / OK**

**DECREASE**

**EXIT**

Press the F1 key many times to move through the different parameters of the tester, while the values can be modified through the F2 (+) and F3 (-) keys.

- **MODE:** the appliance includes two operating modes: a single mode, through which only a set of four mediated readings is performed (thus creating only one value of measuring); a continuous mode, through

which a set of independent measures is launched, which can be stopped by the operator.

- **SAVE:** enables/disables the automatic save of the measures. As already mentioned above, the tester saves every set of measures when the single mode is activated, while only one value per any set of three consistent measures is saved when the continuous mode is used. Moreover, in this case, the measure is connected with an identification character that matches the measure to a “test”. Anytime a continuous test begins, this character is increased.
- **GAIN:** it adjusts the intensity of the ultrasonic impulse according to four different values (250V, 500V, 750V, 1000V)
- **LANGUAGE:** it sets the active language by selecting it among the available ones (Italian, English, French, German, Spanish)
- **SAMPLE:** it sets the length (in units of time) of the sample to be used for the calibration.
- **CALIBRATION:** it starts the calibration process hereunder described. It is activated by pressing the F1 key until the cursor places itself on the writing provided and then by pressing F2. The F4 key brings back to the main screen.

**2.06 CALIBRATION**

By selecting the appropriate entry of the configuration menu and by pressing the F2 key, it is possible to perform a two-points calibration in order to achieve the highest possible level of precision on the performed measures.

By starting the calibration, the following screen appears:



This screen suggests the operator should bring the probes in contact to measure the “zero” point of the tester. In order to achieve a better mechanical contact between the probes, it is necessary to sprinkle the contact surfaces with the appropriate product provided with the kit. Afterwards, press the F1 key to start the reading or the F4 key to cancel the calibration. As by a normal measure, the main screen will be displayed and the zero value which has been measured is superimposed on it. In order to validate the measure, press the F1 key after that the reading has stabilized.

Afterwards the following screen is displayed:

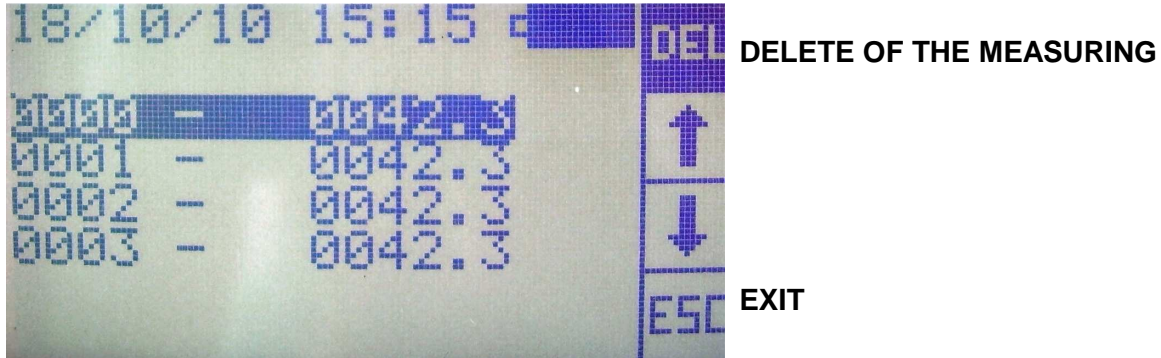


This screen suggests the operator should put the cylindrical sample (provided with the kit) between the probes in order to measure the second point of the characteristic curve. In order to obtain a better

mechanical contact, the operator is again advised to put the appropriate product provided with the kit between the two contact surfaces.  
Afterwards press the F1 key to start the reading or the F4 key to cancel the calibration. Validate the measure again by pressing the F1 key after the measure itself has stabilized.

**2.07 MEASURES MANAGEMENT**

The measures management screen appears as follows:



The list of the valid measures saved in the EEPROM of the appliance is displayed. By pressing the F2 (up) and F3 (down) keys it is possible to select the values, while through the F1 key two functions are provided: a single pressure deletes the selected value, while a longer pressure (for about five seconds) resets the memory contents.

	<b>WARNING</b>	The deletion operations are definitive and they cannot be cancelled, implying the irreversible deletion of the above-mentioned data.
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Every single line represents a different stored measure and it is composed by the following data:

- Progressive: it represents the progressive number of the measure under consideration, some values can be missing because of the deletion of one or more measures.
- Tests identification: in order to make the continuous-mode tests more evident, every single test is identified by a character, which is gradually increased at the starting of any new test;
- Time to fly: it represents the elapsed time between the ultrasonic signal emission in the TX channel and the signal reception in the RX channel, properly adjusted in relation to the calibration values.

The F4 key brings back to the main screen.

**2.08 DATA COMMUNICATION**

Starting up the right function from the main screen, by pressing F4 key, all the data saved in the memory can be sent to a PC through the USB connection placed on the upper side of the equipment.

Data are transmitted through a virtual and serial connection when the equipment is connected to a PC Host, upon installation of the driver provided on a CD (if enclosed) or downloadable from manufacturer website at:

[http://www.prolific.com.tw/US/ShowProduct.aspx?p\\_id=225&pcid=41](http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41)

The transmission can be captured by any terminal emulator (such as Hyper Terminal) with the following configuration:

- Baud: 115200;
- data bits: 8

- Parity: none
- Stop bit: 1
- Flow control: none.

An example of transmission is shown here below:

Pocket ultrasonic tester – Ver Version 00.01.001

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N. Date   Time   S Measure
0000 07/10/10 16:03.00 X 0055.0
0001 07/10/10 16:03.00 X 0050.6
0002 07/10/10 16:03.00 X 0050.7
0003 07/10/10 16:03.00 X 0050.7
0004 07/10/10 16:04.00 Y 0055.4
0005 07/10/10 16:04.00 Y 0055.3
0006 07/10/10 16:05.00 Y ----.-
0007 07/10/10 16:05.00 Y 0050.6
0008 12/10/10 10:34.00 A 0004.8
0009 12/10/10 10:34.00 A 0004.6
0010 12/10/10 11:29.00 C 0000.0
#####
```

The list of measures is more complete than the one that is displayed on the appliance because, in addition to the previously mentioned values, it shows also when (the time) the measures have been taken. Moreover, the measures with negative results are also listed.

After the transmission, **the data are not deleted** from the tester and, therefore, they remain at disposal for further uses. However, they can be manually deleted through the proper menu.

To avoid interferences with the results, it is advisable to keep the mini USB cable always disconnected from the tester during the measuring phase.

<b>2.09</b>	<b>CONNECTIONS</b>
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The tester is provided with two sets of outwards connections. In the upper part there are:


- **Mini USB connector:** for the communication with the host PC and for the data download;
- **6 mm circular connector:** for the connection with the battery charger provided with the equipment.

In the lower part there are the signal connectors:

- **TX:** terminal for the connection of the transmitting probe;
- **RX:** terminal for the connection of the receiving probe;
- **Trigger:** synchronization signal for the oscilloscope visualization
- **Scope:** analog signal visualization received by the tester.

**N.B. PLEASE DO NOT CONNECT THE TERMINAL TX WITH RX USING THE CABLES OF THE PROBES.**

	<p>⇒ In order to recharge the batteries, always and only use the battery charger provided with the kit. In case of fault or malfunction, contact the manufacturer/reseller to change the battery charger itself.</p> <p>⇒ Never connect the battery charger to the appliance if the batteries are not</p>
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 <b>WARNING</b>	<p>present or are different from the ones provided with the tester itself. In case of fault or malfunction contact the manufacturer/reseller to change the batteries.</p> <p>⇒ Never connect the battery charger to the appliance if unchargeable batteries are inserted in it. Danger of explosion.</p>
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**Chapter 3    MAINTENANCE**

**3.01    PERIODIC CHECKS**

Before using the tester always verify that it is undamaged, that there are no visibly damaged or worn parts as well as no damaged or defective connections: always keep the appliance clean and, in particular, the contact surfaces of the 2 ultrasonic probes.

**3.02    ORDINARY MAINTENANCE**

  <b>WARNING DANGER</b>	<p>Do not perform maintenance – interventions on the machine which have not been quoted and described in this instructions manual without first contacting the manufacturer.</p> <p>Periodically clean all machine parts and oil the unpainted parts in order to preserve the machine and its efficiency.</p> <p>Avoid the use of solvents which damage paint and parts in synthetic material.</p>
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**3.03    AUTHORISED MAINTENANCE CENTRES**

For information on the nearest authorised help centre it is essential to contact the manufacturer

**Chapter 4    SPARE PARTS**

**Accessories:**

- **C370-08:** Exponential couple of transmitting and receiving **PROBES**, nominal frequency **55kHz**
- **C372-10:** Couple of transmitting and receiving **PROBES**, nominal frequency **150 kHz**. Suitable for very homogeneous, compact and high-density concretes.
- **C372-11** Couple of transmitting and receiving **PROBES**, nominal frequency **24 kHz**. Suitable for heterogeneous and low-density concretes.
- **C370-09** Couple of **CABLES** (each 10 metres long) to connect the probes with the tester. Used with voluminous/cumbersome structures.

**Spare parts:**

- **C370-02** Couple of transmitting and receiving probes, 55KHz.
- **C370-06** Couple of cables (each 3.5 mt long) to connect the probes.
- **C370-07** Tube of grease to better coupling the probes and the material under test.

	<p><b>WARNING DANGER</b></p>	<p>Do not perform maintenance – interventions on the machine which have not been quoted and described in this instructions manual without first contacting the manufacturer. Periodically clean all machine parts and oil the unpainted parts in order to preserve the machine and its efficiency. Avoid the use of solvents which damage paint and parts in synthetic material</p>
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**Chapter 5    INACTIVITY**

Ensure all machine parts are in safe working order before operating it again should the machine be inactive for a long period of time. When in doubt contact the Manufacturer.

	<p><u><b>WARNING</b></u></p>	<p><b>BATTERIES CORRECT USE: remove the batteries' pack from its slot and keep it separated if the equipment is not used for a long time. If the instruction above is not respected, the batteries' pack will be damaged quickly.</b></p>
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	<p><u><b>WARNING</b></u></p>	<p><b>UNUSED OF THE EQUIPMENT: if the equipment is not used for more than 15 days, the information and memorization of the date and time will be lost. At the first re-start, the operator has to set the correct date and time.</b></p>
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**Chapter 6    DECOMMISSIONING THE MACHINE**

Should it be decided that the machine is to be no longer used, proceed as follows:

- Disconnect the electrical supply network by removing the connecting cable therefore making it unusable.
- Make the potential sources of danger harmless, such as sharp or protruding parts.
- Dismantle the machine; divide it into similar parts and dispose of according to the standards in force

**Recycling notice for the disposal of electrical and electronic devices**



This symbol, shown on the device or on the package and/or the documentation, suggests that the device should not be disposed together with other home garbage at the end of its life cycle.

To avoid further environment, or health-care damage, caused by the unsuitable disposal of garbage, the user should separate this device from other different types of garbage and recycle it in responsibly to avoid the reuse of material resources. Users must take care at the disposal of the equipment by taking it to the nearest recycling site for appropriate recycling treatment for electrical and electronic devices. Gathering and Recycling deplete devices allow the preservation of natural resources and grant them the adequate treatment by respecting health and environment.

For further information on your local recycling site please contact your local council or city waste treatment department. The developer, as producer of electrical and electronic devices, will provide to finance the recycling and treatment services for deplete devices that will come back through these recycling sites, according to the local statement.