

USE AND MAINTENANCE MANUAL

TEST.CLINOX



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1 INTRODUCTION

IMPORTANT

BEFORE CARRYING OUT ANY OPERATIONS ON THE INSTRUMENTS, THE TRAINED OPERATORS AND TECHNICIANS MUST CAREFULLY READ THE INSTRUCTIONS CONTAINED IN THIS MANUAL (AND ATTACHED DOCUMENTS) AND FOLLOW THEM WHILE CARRYING OUT THE VARIOUS OPERATIONS. IF YOU HAVE ANY DOUBTS CONCERNING THE INTERPRETATION OF THESE INSTRUCTIONS, CALL OUR AFTER-SALES ASSISTANCE SERVICE FOR THE NECESSARY EXPLANATIONS.

1.1 GENERAL INFORMATION

This instruction manual describes:

TYPE OF INSTRUMENT: **TEST.CLINOX**

SERIES AND TYPE:

YEAR OF MANUFACTURE: **20....**

This manual contains information concerning storage, transport, installation, use, supervision and maintenance of the instrument described.

This manual is an integral part of the instrument and must be kept throughout the entire service life of the same for future consultation. If your copy of the manual becomes unreadable, ask the maker for a new copy at the following address:

NITTY-GRITTY

(see address on back of manual)

<http://www.clinox.com>

specifying the instrument type and the serial or order number printed on the instrument's nameplate.

THE OFFICIAL LANGUAGE OF THE MAKER IS ITALIAN.

No responsibility is assumed for translations in other languages, which do not correspond to the original meaning.

This manual reflects the state-of-the-art the moment the instrument was supplied and cannot be considered inadequate if there have been subsequent modifications according to further experience. **NITTY-GRITTY** reserves the right to update its products and manuals without being obliged to inform the users of machinery previously supplied of these modifications.

The provision of information concerning updates of the instrument and manual is to be considered as a form of courtesy.

The Customer Assistance Department is at your disposal to provide all the information concerning upgrades that **NITTY-GRITTY** has applied to its instruments.

NITTY-GRITTY shall be relieved from any liability in the following cases:

- a) improper use of the instrument or use by untrained personnel;
- b) use contrary to the specific provisions in force;
- c) incorrect installation;
- d) incorrect energy supply;
- e) badly conducted maintenance;
- f) unauthorised modifications;
- g) use of spurious spare parts or spare parts not designed for the instrument;
- h) total or partial failure to comply with instructions;
- l) unexpected events.

1.2 GENERAL INFORMATION CONCERNING INSTRUMENT USE

- This manual has been written to allow the user to become familiar with the instrument and provides instructions for the maintenance operations that are considered to be fundamental for its correct performance.
- Before installing the instrument or carrying out maintenance and repair operations, please read this manual carefully as it contains all the information required to use the instrument correctly and prevent accidents.
- The frequency of the inspection and maintenance procedures prescribed by the manual is always intended as the minimum necessary for ensuring the efficiency, safety and long life of the instrument under normal operating conditions; supervision must in any case be constant in order to take immediate action in the event of faults.
- All routine maintenance, controls and lubrication must be carried out with the instrument stopped and the supplies (electrical and others) disconnected.
- Warning: any unauthorised modification or tampering of the instrument and its safety systems relieves the maker from any liability in terms of guarantee and safety.

1.3 GENERAL PRECAUTIONS CONCERNING THE USE OF INSTRUMENTS

These instructions fall within standard working practices that operators must observe towards the instrument. Therefore, during design and construction, the maker has considered them known to the operator.

The user must inform persons in charge in order to enable these instructions to be passed on to all those working on the system.

- Do not allow unauthorised personnel to work on the instrument.
- **DO NOT ATTEMPT TO START THE INSTRUMENT UP IF IT HAS BROKEN DOWN**
- Before using the instrument, make sure that any dangerous condition has been appropriately eliminated.
- Make sure that all guards and protections are in place at that all safety devices are present and in working order.
- Make sure there are no foreign objects in the operating area.
- Wear personal means of protection whenever prescribed.

2 PRESENTATION

2.1 GENERAL INFORMATION

The instrument has been designed and constructed for determining the resistance to corrosion of welded parts on stainless steel, for industrial purposes, by means of an electrochemical test.

Resistance to corrosion of passive materials, such as stainless steel, nickel-based alloys and aluminium is based on the presence of a thin film covering the surface of the metal; the electrochemical principle is based on the breakage, also localised, of this protective film.



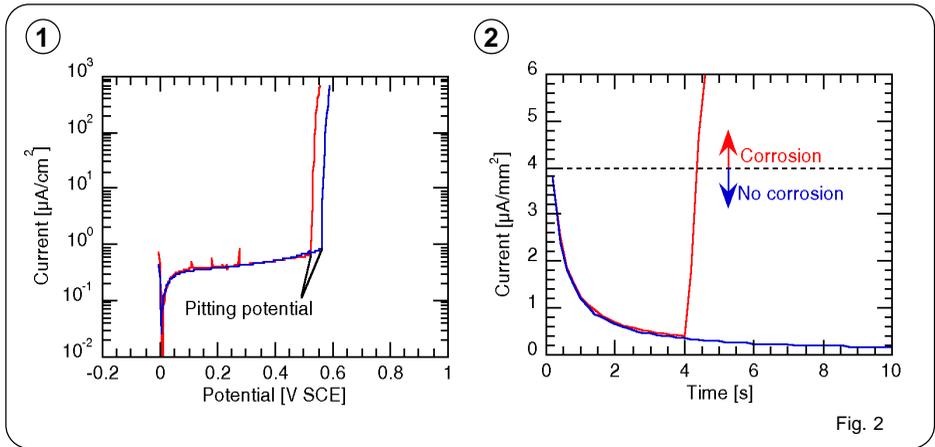
The complete marking kit (Fig. 1) is composed of:

- 1 **TEST.Clinox;**
- 2 **Electrochemical pen;**
- 3 **Cable for earthing;**
- 4 **Cable for pen connection;**
- 5 **Terminal for earthing;**
- 6 **Kit comprising a spare nib and pins for earthing.**

The resistance of a metal against corrosion is determined by the measurement of its *pitting potential*.

By performing a polarisation scan (Chart 1, Fig. 2) one can note that a high potential corresponds to a greater aggressiveness and that a high pitting potential corresponds to a high resistance to corrosion.

By exposing steel to potentials below the pitting potential, corrosion is minor and a passive behaviour is noted; on the contrary, if the potential applied is greater than the pitting potential, corrosion is considerable (Chart 2, Fig. 2). The pitting potential is not a constant; it depends on factors such as temperature, the electrolytic composition and the roughness of the surface.



Therefore the pitting potential must be determined before the test by means of calibration.

2.2 CHARACTERISTICS

2.2.1 The instrument is designed for industrial uses in normal environmental conditions, as established by point 1.4 of the EN 60204-1.

These conditions refer to machine use.

The definition of limits for the presence of personnel is the duty of the person in charge of designing the workstation(s) and may call for more restrictive measures.

2.2.2 The instrument must be run by personnel that have been trained concerning machine use and are familiar with the contents of this manual.

2.2.3 The instrument runs in manual mode only.

2.3 OPERATION

- 1 Connect the pen's cable to the instrument by putting the plug into the appropriate socket (A, Fig. 3).
- 2 Plug the other end of the cable into the appropriate socket (B, Fig. 3) on the ec-pen.

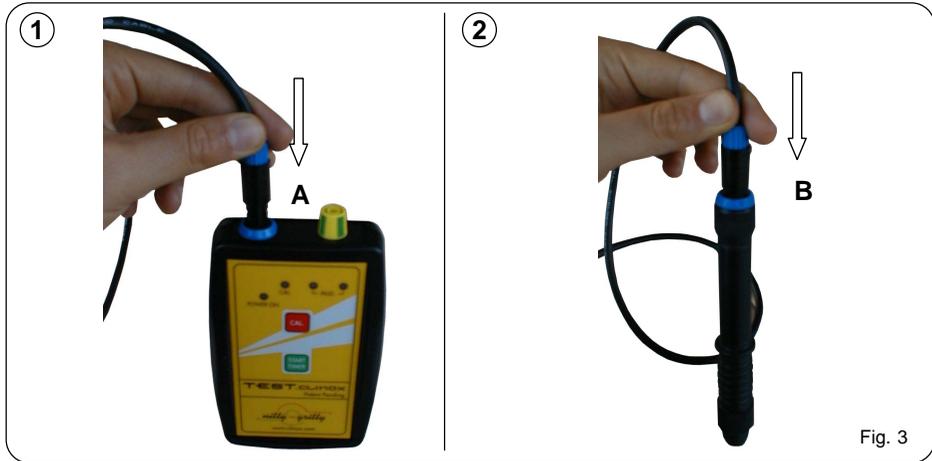


Fig. 3

- 3 The ec-pen is automatically activated when it is connected to the TEST.Clinnox instrument; the red "POWER ON" LED will come on to signal that the ec-pen is connected (C, Fig. 4). *Before the LED comes on, the instrument will run a self-calibrating cycle.*



Fig. 4

- 4 Connect the earthing cable to the instrument by fitting the plug into the second socket (D, Fig. 5).
- 5 Plug the other end of the cable into the appropriate socket (E, Fig. 5) for the earthing terminal;
- 6 Clip the earthing terminal (F, fig. 5) onto the conductive metal on which you wish to calibrate the instrument.

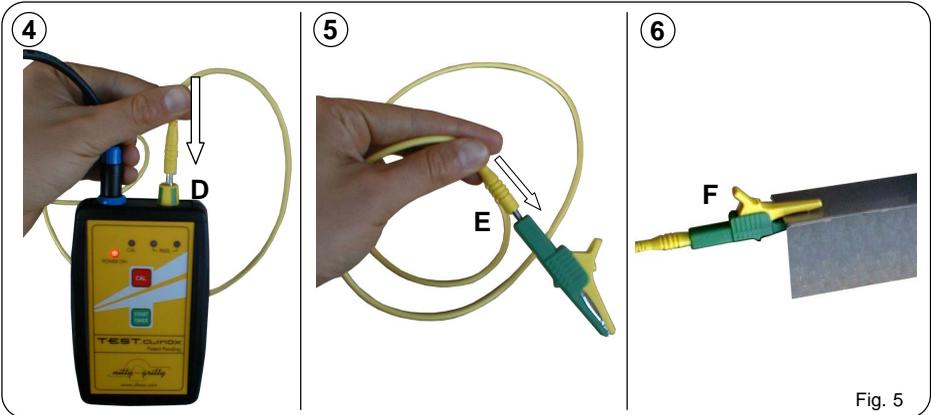


Fig. 5

- 7 If it is not possible to clip the earthing terminal on the material to test (e.g. the surface is round), the earthing connection is obtained by connecting conductive pins to the rear side of the instrument so that it can be directly earthed (fig. 6).
- 8 Place the instrument on the material to test using the earthing pins as support base (Fig. 6).

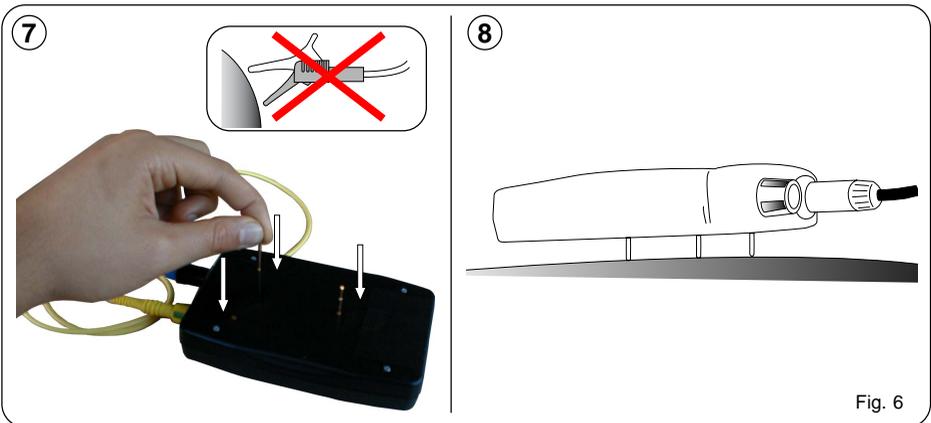


Fig. 6

CALIBRATION:

- 9 Place the ec-pen's nib on the blotting paper and make sure the liquid is seeping out correctly (G, Fig. 7).
- 10 Clean the steel surface that will be tested. Grease has to be removed by a solvent, such as alcohol. Place the nib on the steel surface in a representative area (at least 2 cm from the weld). The ec-pen should be as perpendicular to the surface as possible. Now press the "CAL" (H) key and hold it down until the yellow "CAL." LED (I) goes off and the green "PASS" LED (L) comes on.
The time needed for calibration may vary depending on the passive state of the material (from 30 to 60 seconds).

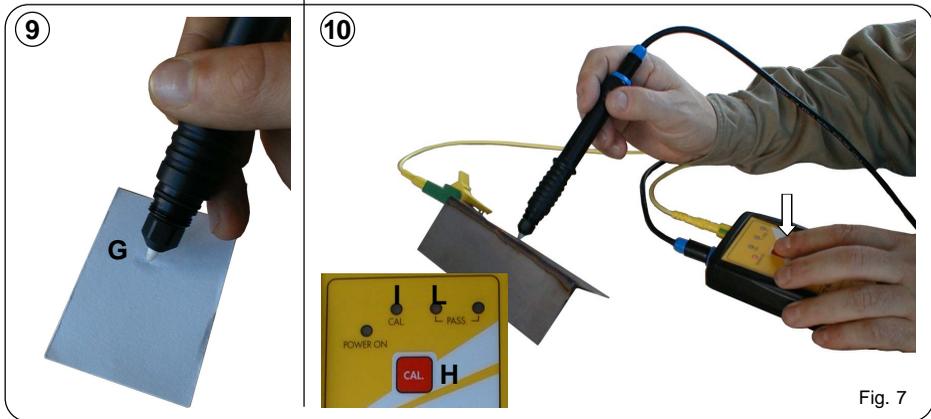


Fig. 7

The geen-red "Pass" lights blinking: This means that the calibration has not been performed; this can be caused by any of the following reasons

- 1 Metal is not earthed.
- 2 The liquid in the ec-pen is not aggressive enough with respect to the steel. It has to be replaced by a more aggressive one.
- 3 The ec-pen has run out of liquid.
- 4 The ec-pen has not been cleaned and the nib is soiled.

In the later case, resume the initial conditions and repeat the test.

The red "Pass" lights blinking: This means that the calibration has not been performed, because the liquid in the ec-pen is too aggressive. The ec-pen has to be replaced by a less aggressive one.

It is recommended, repeat the calibration operations.

Hold the CAL key down for a second and make sure the yellow "CAL." LED comes on; put the pen on another significant portion of the metal and hold the CAL key down until the "CAL." LED goes off and the "PASS." LED comes on (see previous calibration instructions).

The two calibration results have now been memorised and you can use the instrument for your tests.

After each calibration the nib has to be cleaned by placing it on the blotting paper.

TESTING

During the testing stage, one checks the points that have gone subject to abrasion, welding or heat treatments that may limit the resistance of the metal.

11 Place the nib on the area you are testing and press the green “START TIMER” key (M, Fig. 8).

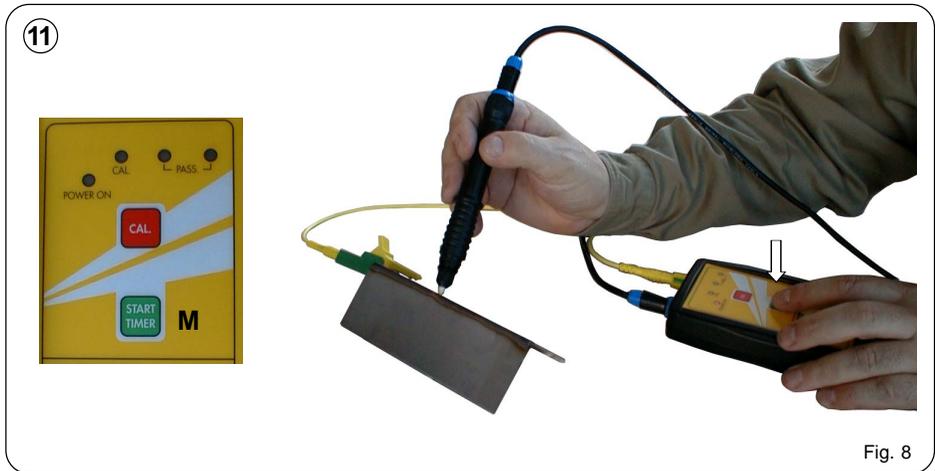


Fig. 8

12 The green and yellow “CAL” LED will blink for a few seconds and the result of the test will thus be given:

- **green steadily lit “Pass”** light: excellent resistance to corrosion;
- **red steadily lit “Pass”** light and an **acoustic alarm**: considerably reduced resistance to corrosion;

After each test the nib has to be cleaned by shortly placing it on the blotting paper. Instead of the blotting paper any absorbent clean paper can be used.

After testing the steel component, the entire investigated area has to be cleaned with a humid cloth. In the case of corrosive application of the component, the steel surface is to be passivated additionally.



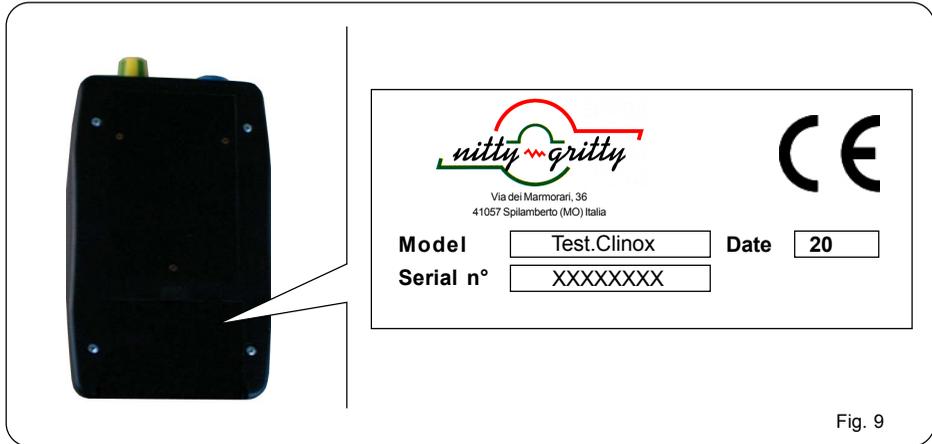
The temperature influences the results of the instrument. It is important that the temperature of the steel component is not changed after calibration. Else the calibration has to be run again in the area with changed temperature.



2.4 NAMEPLATE

An exact description of the **model**, **serial number** and **year of manufacture** of the instrument will facilitate rapid and effective replies by our Customer Assistance Service. This information can be read on your machine's nameplate.

N.B.: *for no reason may the information printed on the nameplate be altered.*



Apart from the CE mark, the nameplate bears the following information (Fig. 9):

- Name and address of the manufacturer
- Type of instrument
- Serial number
- **CE** marking and year of manufacture of the instrument
- Voltage in Volts

2.5 TECHNICAL DATA

The TEST.CLINOX instrument has the following main features:

Machine data:	Dimensions of the case	360 x 300 x 80 mm;
	Dimensions of TEST.Clinox	140 x 100 x 60 mm;
	Weight of TEST.Clinox	0.2 kg;
	Weight of the case and instrument	0.8 kg;
	Electrical Power Supply	9 V battery.

Room temperature for use 0 - 30°C.

3 DANGERS AND GUARDS

3.1 PROHIBITED USES

The TEST.Clinox must be only be used for the purposes envisaged by the maker (see chapter 2).

In particular, the system cannot be used:

- unless it has been correctly installed;
- in environments where there is a risk of explosion;
- in dangerous conditions or when the instrument is malfunctioning;
- improperly or by untrained personnel;
- for uses not complying with the specific standard;
- in the event of supply defects;
- after unauthorised modifications;
- unless all instructions are observed;
- with materials and tools differing from those envisaged by the maker.

IMPORTANT

Any deviation from the above mentioned specifications calls for a specific written authorisation by **NITTY-GRITTY**.



Any modification that has not been authorised by the Maker, that alters the functions of the instrument and consequently modifies the risks and/or generates additional ones, will be made at the exclusive responsibility of the person/company making that modification. Should these modifications be made without the maker's authorisation, any guarantee, and the declaration of conformity issued by the Maker in accordance to Machine Directive 98/37/CE will be invalidated.



3.1.1 Accident-prevention systems

The instrument is extremely safe to use, since it handles neutral chemicals that do not call for any particular operator qualification.

4 TRANSPORT AND STORAGE

4.1 TRANSPORT

TEST.Clinox can be transported in its special case, featuring soft protective elements inside, for each component (Fig. 10).

The instrument must be in any case lifted and transported with care to prevent it falling or overturning.



Fig. 10

4.2 STORAGE

If you intend to store the instrument for long periods of time, keep it in its case, in a covered environment, sheltered from bad weather. The environment must be free from aggressive chemicals.

The instrument must be kept in environments with a suitable temperature (from -0 to 40°C).

5 INSTALLION

5.1 AT THE USER'S CARE

The user must provide the following:

- installation area complying with the local standards in force concerning health and safety at work;
- the area to test must be clean.

5.1.1 Lighting

The place where the instrument is installed must feature sufficient lighting either natural and/or artificial, and comply with the standards in force in the relevant country.

All areas must be equally lit. There must be no area of shadow likely to cause nuisance, no irritating dazzle and no stroboscopic effects.

An average lighting of 300-500 lux/m is recommended.

5.1.2 Space requirements

Provide installation areas, which enable the instrument to be easily accessed.

Once it has been installed, place the instrument on a workbench near the pieces to test.

5.1.3 Battery power supply

Make sure the batteries are in the instrument.

Before operation, the instrument performs a test to evaluate its power supply status:

- Red "POWER ON" LED on means that the instrument is in working order;
- Red "POWER ON" LED off means that the battery is flat; replace the battery (chap. 6).

Before using the TEST.Clinox, check the integrity of the insulation of cables, pen sensor, sockets and plugs composing the machine.

Power failures

When the batteries run flat, the instrument will not come to an immediate stop.

Once the supply is resumed, the instrument starts automatically and immediately.

5.2 NORMAL STOP

Isolate the power supply by pulling the pen's plug out of its socket.



AFTER testing, remember to clean the surface with a moist cloth. In the case of corrosive application of the component, the steel surface is to be passivated additionally.



6 MAINTENANCE

Carefully read these instructions, before performing any maintenance and adjustment on the accessories; this will guarantee safer working conditions for the personnel involved and a greater reliability of the interventions made.

During maintenance operations, observe the following rules:

- Maintenance operations must be effected by qualified and authorised personnel only.
- Make sure the work environment is suitable and equipped with the items needed.

Correct periodic maintenance will maintain your accessories in perfect working order. Apart from periodic maintenance on the various accessories, it is recommended to keep the instrument and surrounding area clean and tidy.

6.1 PERIODIC MAINTENANCE SCHEDULE

ROUTINE MAINTENANCE SCHEDULE			
INTERVENTION	RECOMMENDED FREQUENCY		
	Daily	Monthly	Yearly
Clean the machine	after every test	-	-
Clean the nib	after every test	-	-
Replace the batteries	-	if flat	-
Replace the nib	-	if worn	-
Replace the pen	-	-	when the liquid has run out
Replace the cables	-	-	if worn

Daily maintenance

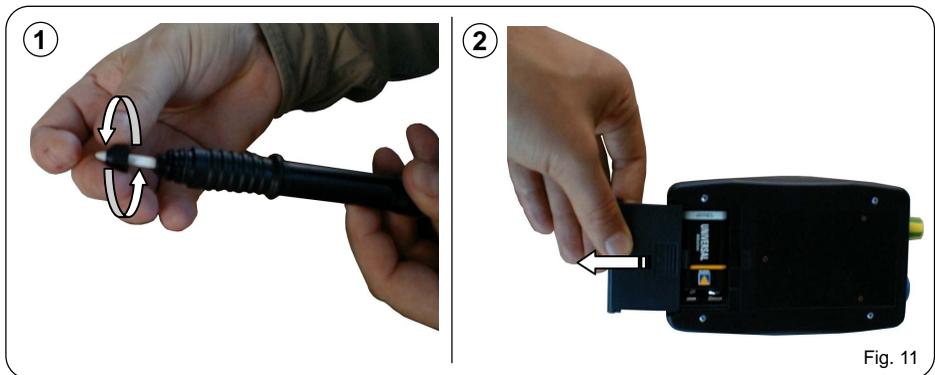
- At the end of the work shift, clean the instrument.
- Once it has been cleaned, put the machine and its accessories back into their case.
- After every test, clean the electrolyte by wiping the pen's nib on the blotting paper you will find in the kit; if this is not done, the nib may not be able to perform its testing function correctly.

Weekly/monthly/yearly maintenance

- Check the components for wear and replace as is the case; use only products supplied by **NITTY-GRITTY**.

N.B.: NITTY-GRITTY will not accept any responsibility in the event that other products are used.

- Check the nib for wear and replace if necessary; the kit includes a spare nib: unscrew the worn nib and screw on the new one (1, Fig. 11).
- When the batteries are flat replace them: slide off the cover on the back of the instrument and replace the old batteries (2, Fig. 11).



- Check the ec-pen for wear and replace if necessary; the ec-pen needs to be replaced when its liquid runs out.
Place the nib on the blotting paper you will find in the kit to check its condition: if the electrolyte does not moisten the paper or moistens it too little, the pen should be replaced.

6.2 EXTRA-DUTY MAINTENANCE

Extra-duty maintenance is generally effected by qualified technicians of **NITTY-GRITTY**.

7 DISPOSAL AND SCRAPPING

The machine is neither pollutant nor harmful for the environment. However, waste materials may be produced during installation, maintenance or disposal, which may become dangerous for the environment if not disposed of correctly.

The objective of these operations is the utmost concern for the environment.

Packaging materials

These wastes are considered standard urban litter and can thus be disposed of in disposal centres for urban litter (dumps) without creating any dangerous situation for man or the environment (e.g.: straps, cardboard, plastic).

Flat batteries

These are special wastes and must therefore be disposed in accordance to the laws in force.

Deteriorated and obsolete machinery

These are special wastes that must be handed over to the appropriate waste disposal centres.

Troubleshooting

PROBLEM	CAUSE	REMEDY
Red green blinking Pass light	The earthing terminal is not connected	Connect the earthing terminal
	The ex-pen is empty or not enough aggressive	Replace the ec-pen with a now or more aggressive one
	The metal surface is dirty	Clean and degrease the metal surface
Red blinking Pass display	The ec-pen is too aggressive	Replace the ec-pen by a less aggressive one
The instrument is not working properly (Power on light is not on)	Battery power is low	Replace battery
The instrument is not working properly	The temperature of the investigated component has changed	Perform new calibration
The instrument is not working properly (There is only little liquid leaving hte nib when placed on the blotting paper)	The ec-pen is empty	Replace the ec-pen

8 TEST.CLINOX ACCESSORIES

	DESCRIPTION	CODE
	COMPLETE TEST. CLINOX**	CLXTST000005
	TEST.CLINOX	CLXTSTPASNGIT
	TESTER PEN Aggressivity: weak Composition: 0.1 M NaCl Colour code: blue	CLXTSTPEN001
	TESTER PEN Aggressivity: medium Composition: 1 M NaCl Colour code: green	CLXTSTPEN002
	TESTER PEN Aggressivity: aggressive Composition: 5 M NaCl Colour code: yellow	CLXTSTPEN003
	COMPLETE EARTHING CABLE	CLXTST000003
	TESTER PEN CABLE	CLXTST000004

	DESCRIPTION	CODE
	<p>NIB FOR TEST.CLINOX PEN</p>	<p>CLXTST000001</p>
	<p>EARTH TEST PROD FOR TEST.CLINOX</p>	<p>CLSTST000002</p>

- **KIT
- 1 TEST.Clinox instrument
 - 1 Tester pen
 - 1 pen/tester cable
 - 1 earthing cable
 - 1 earthing terminal
 - 1 kit comprising a spare nib and pins for earthing

9 SPECIAL INSTRUMENT

9.1 INSTRUMENT WITH VOLTAGE OUTPUT

Determination of the pitting potential

During calibration of the instrument a multimeter can be connected to the voltage output. Hence it is possible to determine the pitting potential of the steel. During the calibration the potential is continuously increased. After the calibration is finished the instrument shows the testing potential. This value allows to calculate the pitting potential versus calomel electrode according to the following table.

EC-PEN	PITTING POTENTIAL VS. CALOMEL
0.1 M NaCl (blue)	testing potential + 180 mV
1 M NaCl (green)	testing potential + 140 mV
5 M NaCl (yellow)	testing potential + 120 mV

MIG

JET

TIG



CLINOX



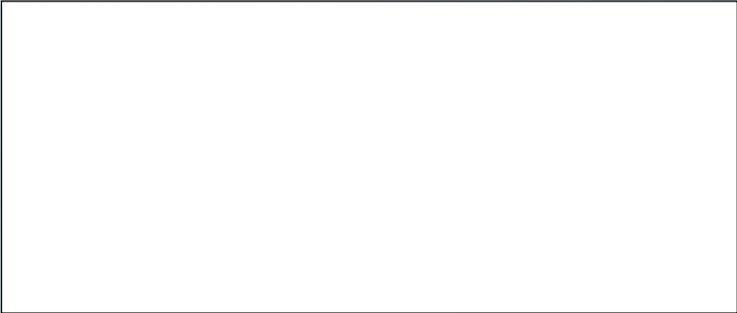
MARK
MARKING SYSTEM



TEST
PASSIVATION TEST



NITTY-GRITTY - web: www.clinox.com



CAL.

START
TIMER

TEST.CLINOX

Patent Pending



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