

# OPERATING INSTRUCTIONS

## Cone/Standard Penetrometer

**24-0540, 24-0545, 46-5290, 46-5295**

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<p><i>In the interests of improving and updating its equipment, ELE reserves the right to alter specifications to equipment at any time.</i> <b>ELE International 2015 ©</b></p>		

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## 1 Introduction

- 1.1 These instructions cover the use of the penetrometer only and should be read in conjunction with the appropriate method of test. This equipment is only to be used for the testing of shear strength of soil samples.
- 1.2 The penetrometer is supplied with a plunger whose weight is 47.5g and two separate weights, one of 50g and one of 100g.
- 1.3 When using the apparatus for testing a sample in a water bath, the complete head can be rotated around the column.
- 1.4 Use a spirit level to ensure that the base is horizontal; levelling screws are provided.

## 2 Setting Up

### 2.1 Weight adjustment

- 2.1.1 To adjust the weight of the plunger plus the needle or cone to that required by the method of test, remove the plunger retaining screw (see Figure 1). Depress the manual release button and withdraw the plunger.

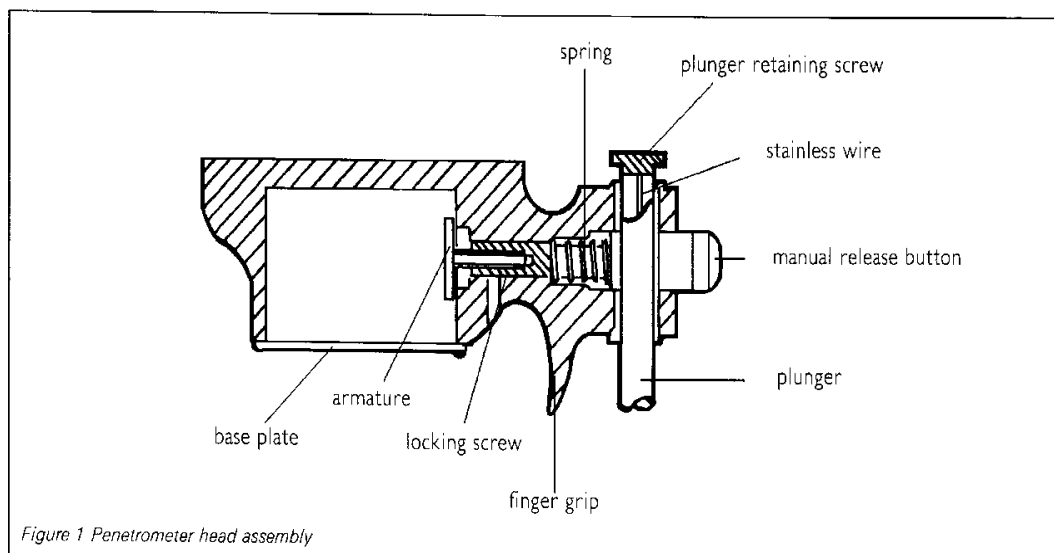
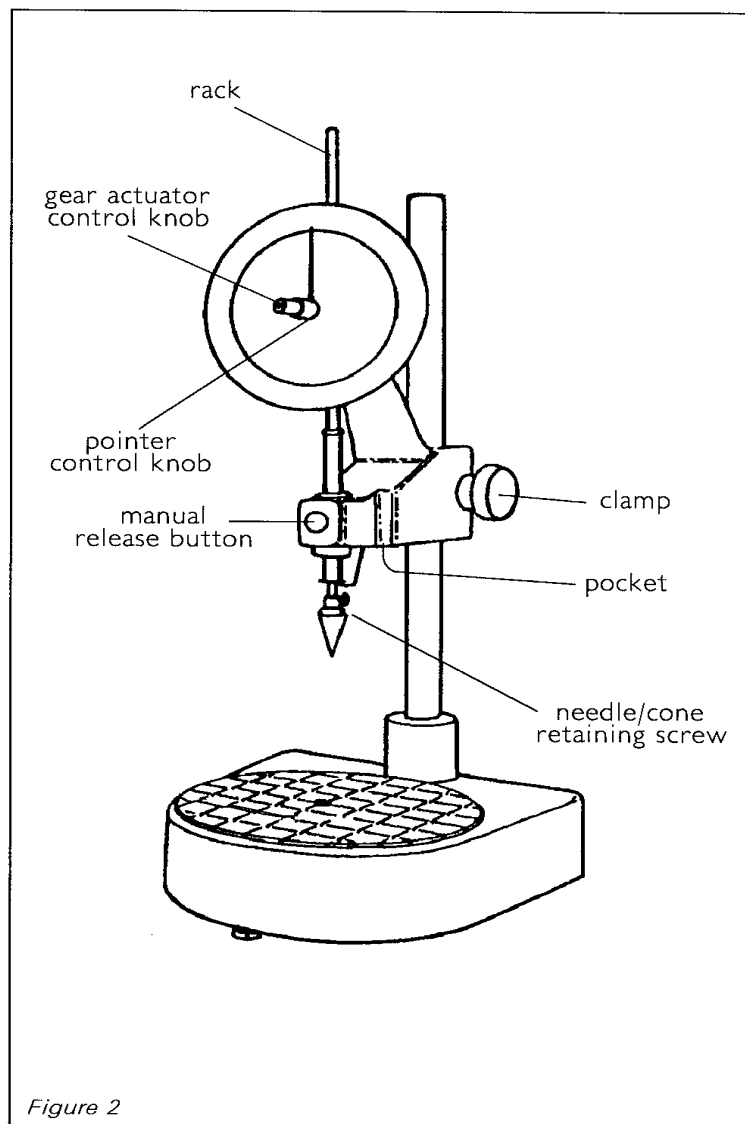


Figure 1 Penetrometer head assembly

- 2.1.2 To increase weight, place lead shot into the recess. To reduce weight, cut the stainless steel wire attached to the screw until the required weight is obtained.
- 2.1.3 To add 50g or 100g weights to the plunger, remove the plunger retaining screw, depress the manual release button and withdraw the plunger. Place the required weight on the plunger and re-insert it in the holder.
- 2.1.4 Replace plunger retaining screw and tighten needle/cone retaining screw of plunger.
- 2.2 Tension adjustment of pointer control knob.
  - 2.2.1 To adjust the tension on the pointer control knob proceed as follows:  
Holding the gear actuator control knob (see Figure 2), insert the allen key provided through the centre hole and loosen the locking screw. Engage a screwdriver with the slot provided in the gear actuator shaft at the rear of the boss, turn the gear actuator control knob clockwise to increase and anti-clockwise to decrease tension. Re-tighten locking screw.
  - 2.2.2 Care must be taken in adjustment so that the pointer control knob and the gear actuator knob do not rotate together when turned.



### 3 Operation

#### 3.1 Height adjustment

3.1.1 With the pointer at zero/400 divisions, bring the needle/cone approximately to, but not below, the surface of the sample by adjustment of the clamp on the main column (see Figure 2).

3.1.2 Lower the needle/cone by means of the gear actuator control knob (see Figure 2) on the dial, until the tip is exactly in contact with the surface of the sample.

#### 3.2 Dial adjustment

3.2.1 When the needle/cone is in place with the tip in contact with the surface of the sample, set the pointer to the zero/400 division on the dial by turning the pointer control knob in the dial centre (see Figure 2).

#### 3.3 Manual release

3.3.1 Unlock the plunger assembly by depressing the manual release button (see Figure 1).

3.3.2 Using the finger grip (see Figure 1) press thumb on manual release button and hold depressed for the timed period of the test. This will allow free fall of the plunger assembly with the needle/cone into the sample.

3.3.3 At the end of the timed period remove pressure on the manual release button, thus locking the plunger.

**Caution:** do not allow the plunger to drop onto the plunger retaining screw. This can cause damage to the screw and the bearing.

To test the machine without a sample, place a rag or other very soft material such as 'Plasticine' under the cone and allow plunger to drop onto this.

3.3.4 **IMPORTANT! Do not oil the plunger in any way as this will cause it to stick. Wipe the plunger with a clean cloth before use.**

3.4 Penetration measurement

3.4.1 After completion of the fall of the plunger, measure the depth of the penetration by bringing the rack into contact with the top of the plunger by means of the gear actuator control knob (see Figure 2).

#### 4 Automatic Controller

4.1 This item provides automatic control of the penetration period and consists of an electromagnetic head and control unit.

4.2 The control unit contains a solid state timing module, allowing selection of 0-99 seconds.

4.3 Electromagnetic head: adjustment to air gap.

4.3.1 Should the plunger fail to fall when the controller is operating, it may be due to maladjustment of the air gap (Figure 3).

4.3.2 If the plunger is difficult to release by hand, the gap is too small.

If the manual release button can be depressed further after the plunger has fallen, the gap is too large.

4.3.3 To adjust the air gap, loosen the two adjusting screws in the base plate of the head (Figure 3) and increase or reduce the air gap by moving the electromagnetic assembly. Tighten screws.

4.4 Operation

4.4.1 Check voltage requirements of the control unit provided and confirm these meet the local conditions. Connect timer to mains power.

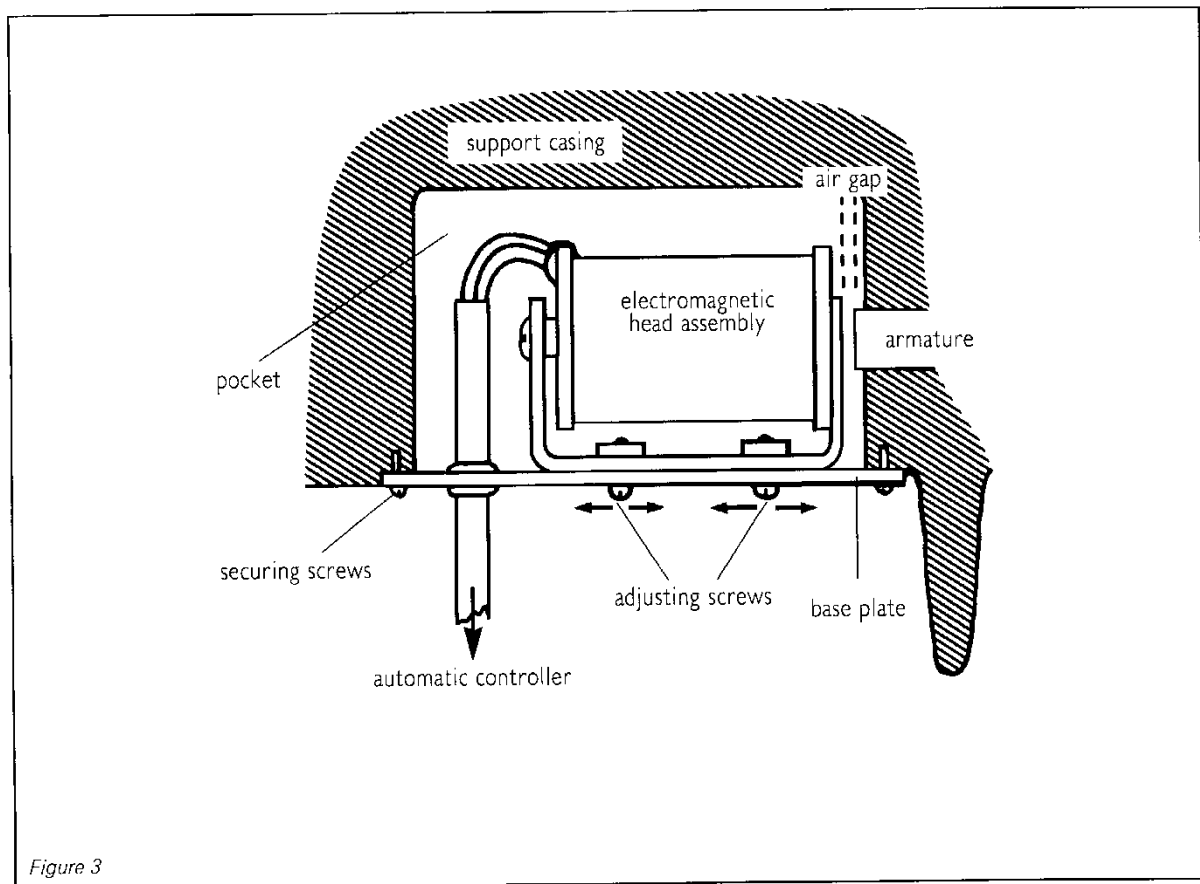
4.4.2 Adjust the 'Set' knob to set the duration of the test in seconds.

4.4.3 Press the 'Start' button to start the test, the plunger will be released, and the display will commence counting down to zero.

4.4.4 Upon reaching zero the test will be stopped automatically and the display will reset to the previously set value.

**Caution:** Do not allow the plunger to drop onto the plunger retaining screw. This can cause damage to the screw and the bearing.

To test the machine without a sample, place a rag or other very soft material such as 'Plasticine' under the cone and allow plunger to drop onto this.



**4.4.5 IMPORTANT! Do not oil the plunger in any way as this will cause it to stick. Wipe the plunger with a clean cloth before use.**

There are no other Operator maintenance requirements.

**4.4.6 Electrical specification**

The unit is protected with an anti-surge 200mA fuse and is powered from a single phase AC voltage, 230VAC 50/60Hz. A 115VAC 50/60Hz version should use a 400mA anti-surge fuse.

**Safety**

Whilst the unit is in operation do not remove any covers.

**Electrical Safety**

**Warning**

**Danger: Electrocuting hazard**

Before removing any covers for performing maintenance, repair and service, isolate from the electrical supply by disconnecting the mains supply. Where mains supply is required during these activities, only competent persons should perform the work.

Check that the power supply is compatible with the requirements stated on the label and connect up in accordance with IEE regulations or to local requirements.

## Connections

**This unit is supplied with a standard 13 amp UK type plug which should be fused at 5A.**

**The power socket should be switched with the switch appropriately labelled and within easy reach of the operator.**

## Warning

### **Danger: Electrocutation hazard**

The unit is only fused on the live/power input. Connection via a non-polarised connector is not recommended.

**Note:** connect cable to plug as follows:

Brown wire	L	Live or Power
Blue wire	N	Neutral
Green/Yellow wire	E	Earth or Ground

## Portable Appliance Tests (PAT)

All ELE designed products are tested for electrical safety prior to sale.

An electrical safety test label is fitted (usually adjacent to the AC power input).

Should no label be found, please contact ELE Service Department quoting the serial number of the equipment.

Organisations have an obligation to ensure equipment is maintained and is safe for use. Regular PAT testing is one means of ensuring equipment remains electrically safe.

**Important: do not connect PAT leads to sensitive components such as PCB's, control switches and the output connectors.**

### **DO NOT FLASH TEST ELECTRONIC EQUIPMENT!**

**If in doubt as to the most suitable connection point (which will usually be an earth stud or an external earth connection), contact the ELE Service Department for assistance.**

**Warning : If the equipment is used in a manner not specified in this manual, the protection provided to the user may be impaired.**

#### 4.4.7 Electronic Timer Unit Specification

Input supply voltage	230VAC $\pm$ 10% 50/60Hz or 115VAC $\pm$ 10% 50/60Hz
Current/Power	Fused at T200mA (230V) or T400mA (115V)
Solenoid supply output	24VDC fused at T500mA
Degree of protection	<IP40, Pollution degree 2
Ambient temperature	0°C.....40°C
Transport and storage	-40°C.....70°C
Humidity	10%...90% (with no condensation)
Weight	1Kg
Altitude	to 2000m
Installation	Overvoltage/installation category II



## EC DECLARATION OF CONFORMITY

Name : **ELE International**  
Address: Chartmoor Road  
Chartwell Business Park  
Leighton Buzzard  
Bedfordshire LU7 4WG  
UK

We hereby declare that the following product is in conformity with the requirements of the following EC Directives:

Title and No. of Directive : Machinery Directive, 2006/42/EC

**Product :** Cone/Standard Penetrometer  
**Catalogue Number :** 24-0540, 24-0545, 46-5290, 46-5295  
**Description :** Test equipment designed to test soil shear strength

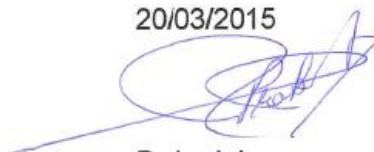
The product is designed and manufactured in accordance with the following standards:

EN61326-1:2013	EMC (General)
EN61000-3-2:2014	EMC (Emissions)
EN61010-1:2010	Safety requirements for electrical equipment for measurement, control and laboratory use.

The year in which the CE marking was affixed : 2015


Date : 20/03/2015

Signed :



Prakash Iyengar  
Managing Director

## DIRECTIVE ON WASTE ELECTRICAL & ELECTRONIC EQUIPMENT (WEEE)

	<p>Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user.</p> <p><b>Note:</b> For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.</p> <p><b>Important document. Retain with product records.</b></p>
<p><b>GERMAN</b></p> <p>Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben.</p> <p><b>Hinweis:</b> Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.</p> <p><b>Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.</b></p>	
<p><b>FRENCH</b></p> <p>A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur.</p> <p><b>Remarque :</b> Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.</p> <p><b>Ce document est important. Conservez-le dans le dossier du produit.</b></p>	
<p><b>ITALIAN</b></p> <p>Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore.</p> <p><b>Nota:</b> Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.</p> <p><b>Documento importante. Conservare con la documentazione del prodotto.</b></p>	
<p><b>DANISH</b></p> <p>Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren.</p> <p><b>Bemærk:</b> I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.</p> <p><b>Vigtigt dokument. Opbevares sammen med produktdokumenterne.</b></p>	

#### SWEDISH

Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller uttrangerad utrustning till tillverkaren för kassering utan kostnad för användaren.

**Obs!** Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.

**Viktigt dokument. Spara tillsammans med dina produktbeskrivningar.**

#### SPANISH

A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario.

**Nota:** *Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.*

**Documento importante. Guardar junto con los registros de los equipos.**

#### DUTCH

Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen.

**Nota:** *Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.*

**Belangrijk document. Bewaar het bij de productpapieren.**

#### POLISH

Sprzęt elektryczny oznaczony takim symbolem nie może być likwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji.

**Uwaga:** *Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkowania.*

**Ważny dokument. Zachować z dokumentacją produktu.**

#### PORTUGUESE

Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador.

**Nota:** *No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.*

**Documento importante. Mantenha junto dos registos do produto.**