

OPERATING INSTRUCTIONS

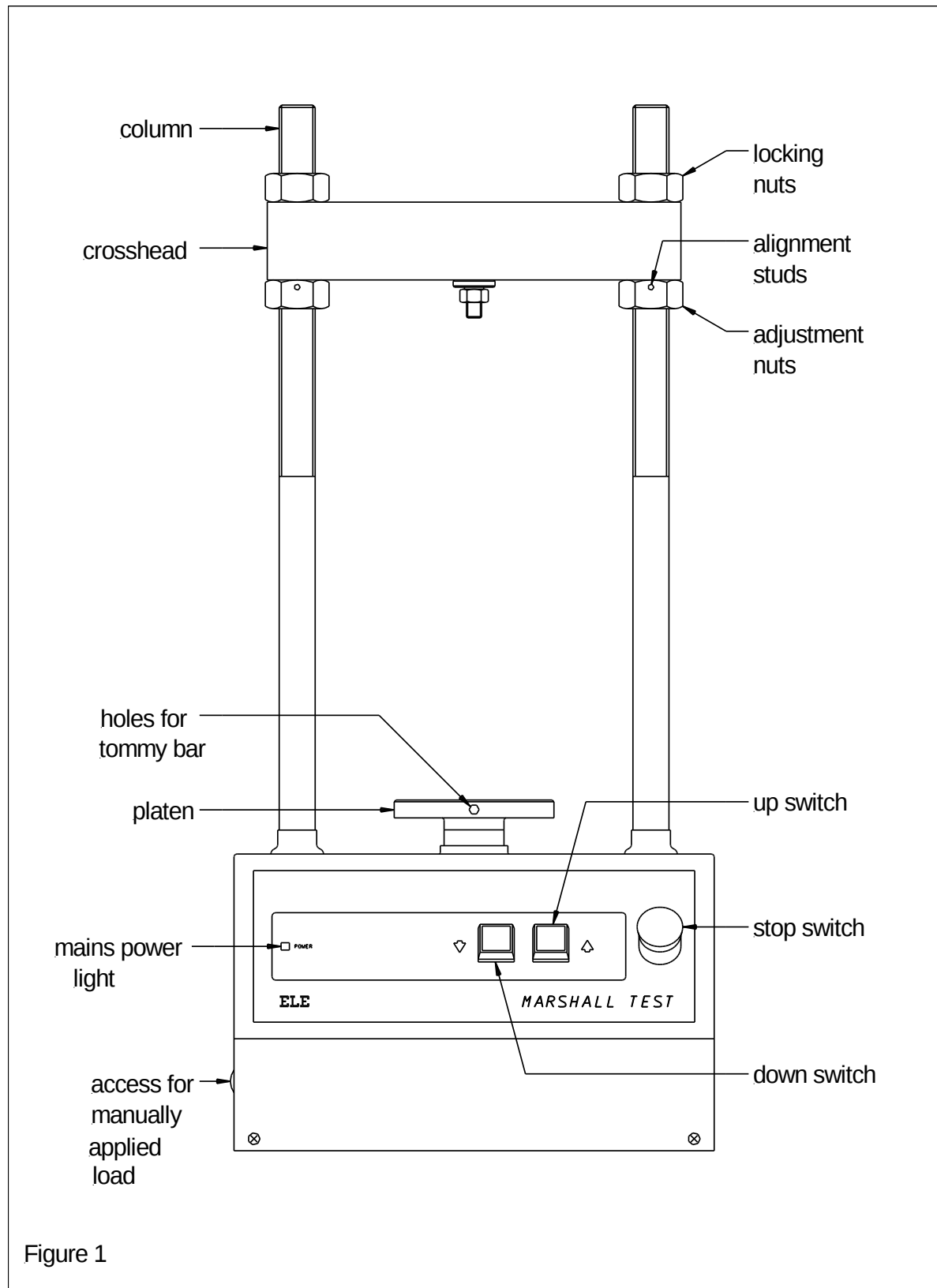
Marshall Test 50

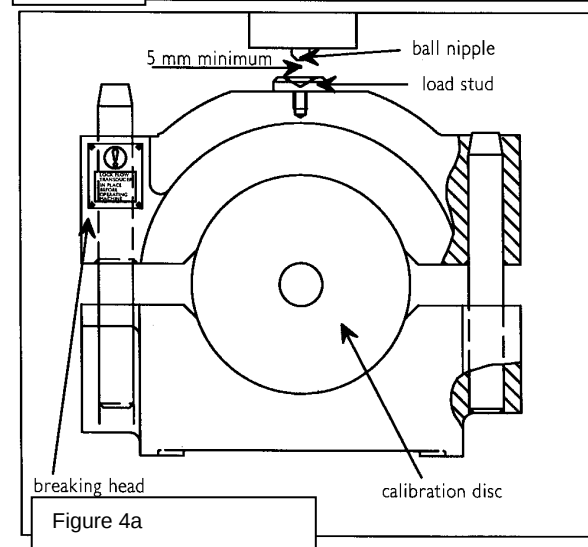
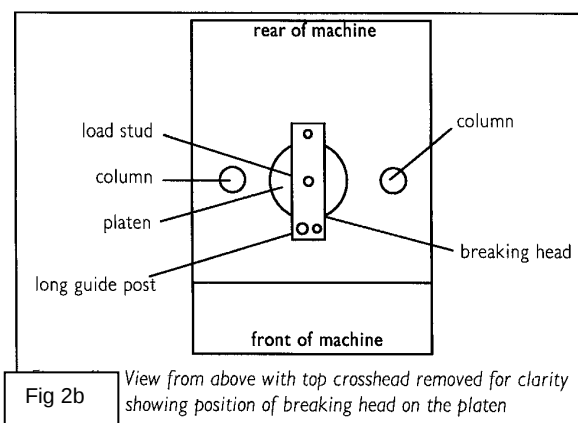
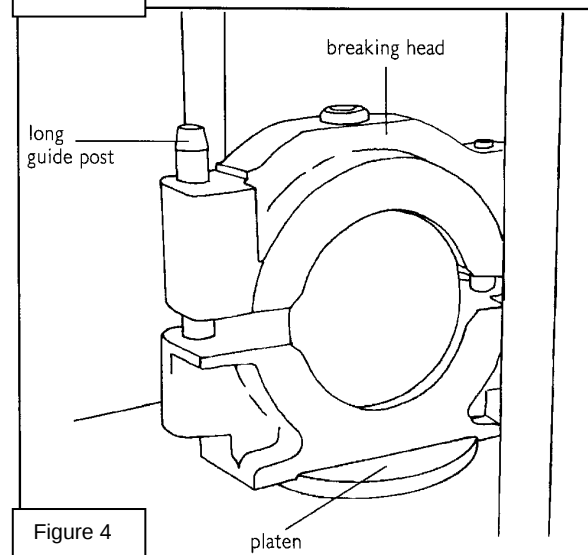
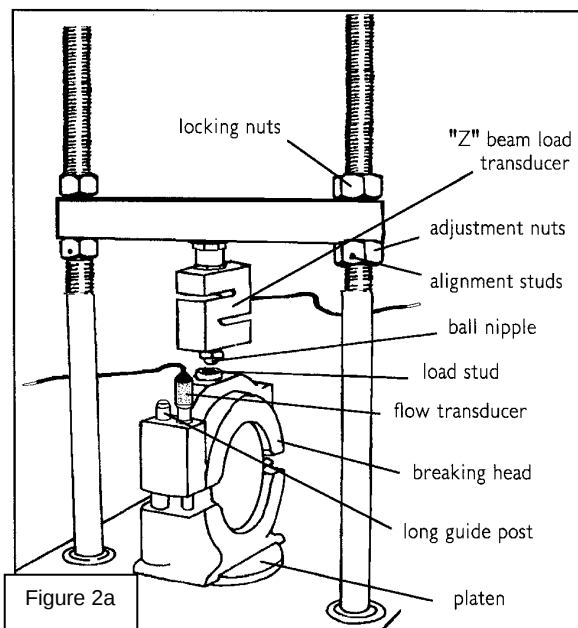
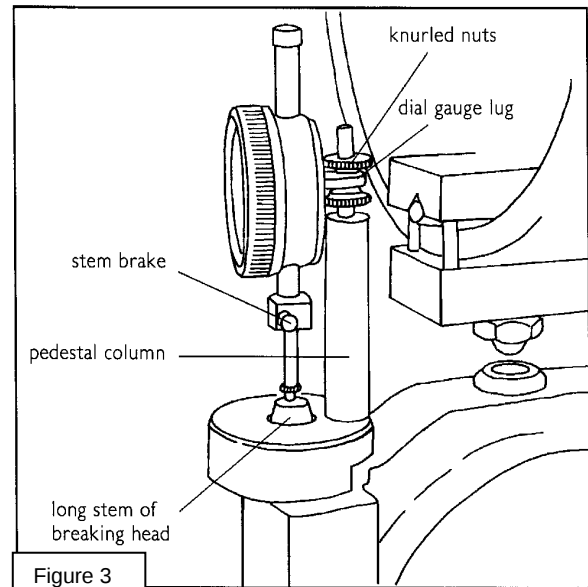
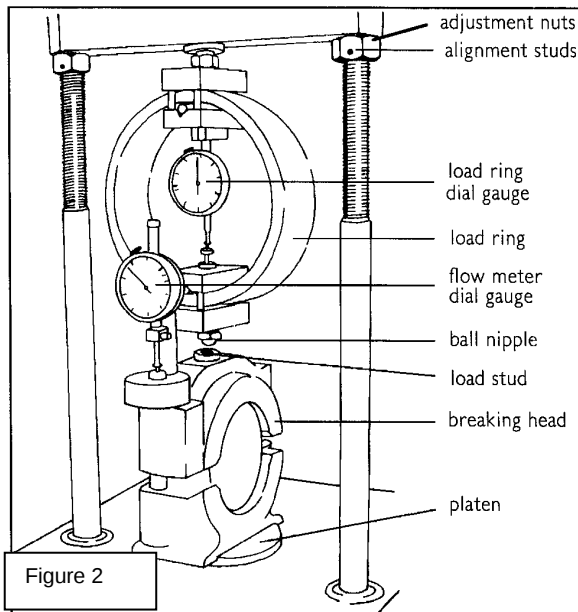
45-6810

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

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1 Safety

This equipment has been tested by ELE International and is safe to use providing that the proper safety precautions are observed:

Do not use this equipment in any manner, other than as specified in this user manual; misuse may result in serious injury to personnel.

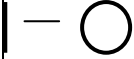
Do not attempt to operate the equipment with covers removed. Only connect to the correct electrical supply.

Refer to Installation section before installing machine.

Do not operate machine with wet hands.

Please read this entire manual before unpacking, setting up, or operating this equipment. Pay particular attention to all **DANGER** and **CAUTION** statements. Failure to do so could result in serious injury to the operator, or other personnel, or damage to the equipment. Ensure all moving parts are thoroughly secured before attempting any maintenance.

1.1 Symbols

	Green or Black	PROTECTIVE CONDUCTOR TERMINAL Equipment safety earthing point
	Any contrasting Color	"I" = SUPPLY SWITCHED "ON" "O" = SUPPLY SWITCHED "OFF"
	Any contrasting Color	FUSE, FOR SAFE OPERATION OF THE EQUIPMENT, USE ONLY FUSES WITH RATINGS SPECIFIED
	Green or Black	Earth (ground) TERMINAL Not for safety earthing purposes but provide an earth reference point.
	Background Yellow; symbol and outline - Black	Caution, risk of electric shock
	Background Yellow; symbol and outline - Black	Caution - refer to accompanying documents
	Any contrasting Color	Equipment conforms to the requirements of European CE Directives, as stated on the Declaration of Conformity

2 Introduction

This machine consists of a load frame with an adjustable crosshead mounted on columns attached to a sturdy base casting.

The forces applied are generated by a screw jack via a worm reduction unit housed in the base casting. Motive power is from an electric motor via a multi-vee drive belt and provides a platen speed of 50.8 mm/min. The worm reduction unit is grease packed on assembly and should not normally require further lubrication.

Platen movement is controlled by 3 pushbutton switches, up, down and stop, situated on the front panel.

Limit switches are fitted to prevent over travel on the up and down stroke of the platen.

A ball seated screw fitting located on the crosshead accepts ELE load rings and load transducers up to and including 50 kN. .

A thermal overload type ON/OFF switch at the rear of the machine provides electrical protection.

To increase or decrease the load manually use a 6 mm AF hexagon wrench.
Clockwise to load, anticlockwise to unload.

Note: Always disconnect the machine from the power supply when manually increasing or decreasing the load.

A socket at the rear of the machine to provides a connection for the Electronic Control and read-out Unit (DSU) for use when transducers to record load and displacement are required.

3 Specification

Dimensions	(l x w x h) 550 mm x 400 mm x 890 mm
Max. vertical clearance (platen down crosshead up)	470 mm
Min. vertical clearance (platen up crosshead down)	250 mm
Horizontal clearance	265 mm
Platen diameter	133.3 mm
Platen travel	25 mm (nominal)
Platen speed	50.8 mm/min
Weight	58 kg
Voltage	230 VAC $\pm$ 10%
Frequency	50 or 60 Hz, model dependent
Power	1150 VA

4 Installation

- 4.1 ***DANGER: The Marshall Test 50 is very heavy; it weighs more than 58 kg (130 lbs.). Do not attempt to unpack, carry or move without proper equipment and sufficient people to do so safely. Remember, always lift with your legs, not with your back. If you have a history of back or cardiovascular problems, do not attempt to unpack or lift the Marshall Test 50.***

The machine should be installed on a level bench capable of supporting Marshall Test 50's gross weight, and with sufficient space for safe operation of the equipment. The machine is provided with adjustable feet to compensate for any out of level, or unevenness, of the bench surface.

4.2 Power Supply

Electrical safety

Warning: Before removing any covers or performing maintenance repair and service, isolate from electrical supply by removing mains plug. 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 in accordance with IEE regulations or to local requirements.

The power cable is coded as follows: -

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

Note: exercise extreme caution when using the machine with wet hands. Dry hands before operating machine.

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 mains input socket).

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 continues to be electrically safe.

Important: do not connect PAT leads to sensitive components such as PCBs, control switches and the like.

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 ELE Service Department for assistance.

5 Controls (refer to figure 1)

5.1 Mains ON/OFF thermal trip switch (at the rear of the machine).

The thermal trip will fail repeatedly if an electrical fault occurs within the machine. The fault must be located and rectified before commencing work with the machine.

5.2 Mains POWER light.

This illuminates to indicate that there is mains power to the machine and the Mains ON/OFF switch is switched to ON.

5.3 UP switch

Pressing this will cause the platen to travel upwards.

5.4 Down switch

Pressing this will cause the platen to travel downwards

5.5 STOP switch

Pressing this stops the platen from travelling in either direction.

As a safety feature, once this switch has been depressed, it latches in the off position and must be pulled out before the UP or DOWN switches will function.

Important: In order to change platen direction, the stop switch must first be pressed **and the motor allowed to stop** before pulling out the stop switch and pressing the opposite direction button.

Failure to allow the motor to stop when changing platen direction may cause severe damage to the machine.

6 Setting up

6.1 Refer to relevant national or international standards for full details of Marshall test procedures.

6.2 Before commencing tests it is necessary to set the height of the platen to obtain the optimum clearance between the ball nipple on the load measuring device and the load stud on the braking head.

6.3 Operate the machine so that the platen travels to its lowest position.

- 6.4 Attach the load measuring device to the underside of the crosshead and ensure that the ball nipple is fitted as shown in figures 2, 2a and 4a.
- 6.5 Position the breaking head onto the platen and fit the calibration disc as shown in figure 4a

Note: do not under any circumstances load the machine with the calibration disc in position.

Important: It is vital that the breaking head is inserted in the machine as shown in figures 2, 2a and 2b. The breaking head must be positioned with the long guide post at the front facing the operator.

- 6.6 Adjust the crosshead by means of the adjustment nuts until the clearance shown in figure 4a is achieved. To ensure the crosshead is level, the alignment studs should be located centrally and at the front of the machine. Tighten the locking nuts with a spanner.
- 6.7 It should be possible to replace the breaking head complete with its sample without disturbing the ball nipple
- 6.8 Raise the platen until the ball nipple of the load measuring device is fully engaged in the cone of the load stud on the breaking head, but does **not apply load**. Stop the platen.
- 6.9 This is the datum position for both load and flow.
- 6.10 With the load ring dial gauge set at zero, set the flow meter dial gauge as follows:-
- 6.11 Assemble the dial gauge onto the pedestal column, clamping the lug of the gauge between the knurled nuts, figure 3.
- 6.12 With the apparatus at the datum position, place the flow meter pedestal over the long stem of the breaking head so that it sits squarely on its machined seat, figure 3.
- 6.13 Move the body of the dial gauge up and down keeping the stem brake, figure 3, disengaged, until zero is achieved. Lock securely in place with the knurled nuts

7 Operation Notes

Important: It is vital that the breaking head is inserted in the machine as shown in figures 2, 2a and 2b. The breaking head must be positioned with the long guide post at the front facing the operator.

- 7.1 Ensure the platen is fully down
- 7.2 Position the breaking head on the platen as shown in figures 2, 2a and 2b with the flow device fitted as shown. If a load ring and dial gauges are used ensure both are set to zero before commencing the test.
- 7.3 Press the UP switch and if necessary steady the flow meter pedestal as the platen is raised.
- 7.4 If using a load ring and dial gauge observe the maximum load indicated on the load ring dial gauge, lift off the flow meter pedestal and press the STOP switch.
The brake stem on the flow meter dial gauge will hold the flow value as recorded.
- 7.5 Allow the motor to stop before pulling out the STOP switch and pushing the DOWN switch to return the platen to its fully down position.

Failure to allow the motor to stop when changing platen direction may cause severe damage to the machine

- 7.6 Refer to relevant national or international standards for full details of Marshall test procedures

8 Maintenance

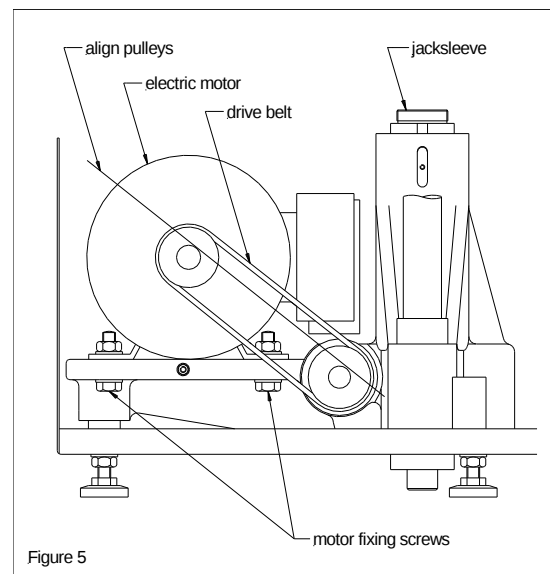
- 8.1 After each series of tests raise the platen to its maximum height and clean the platen and case removing all debris, spots of binder etc., particularly from under the platen.
- 8.2 Apply a smear of medium grease to the shaft under the platen where it runs into the base casting. This is particularly important where a solvent is used for cleaning in this area.

- 8.3 After a prolonged period of use, or at least annually, the following internal maintenance should be carried out.

- 8.4 Remove the load measuring device from the crosshead. Raise the platen to its maximum height.

Warning: always disconnect the machine from the power supply before carrying out maintenance work or making any adjustment.

- 8.5 Using the tommy bar provided, unscrew the platen from the jacksleeve (anticlockwise).
- 8.6 Remove the two screws at the front and six screws at the rear of the machine. And lift the case evenly towards the top of the columns. A smear of grease on the columns will assist the grommets to slide smoothly. Support or suspend the case as convenient or totally remove the crosshead and case. If the case is to be removed, the earthing cable will need to be disconnected and the lead from the control switches to the PCB will need unplugging at the PCB.
- 8.7 Check for any undue play in the drive belt. If there is, slacken the four M10 screws holding the motor to the main casting. Slide the whole motor assembly until the belt is just taut, figure 5.
- 8.8 Check the alignment of the pulleys by laying a steel rule across their faces. Retighten the fixing screws.
- 8.9 If the belt shows any signs of cracking, fretting or other signs of wear, it must be replaced immediately.



- 8.10 Refit the case ensuring that any disconnected wires have been reconnected and do not foul on the drive mechanism. Replace the case fixing screws.
- 8.11 Screw the platen back onto the jacksleeve and tighten with the tommy bar.

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 : Marshall Test 50
Catalogue Number : 45-6810
Description : Test equipment designed to test asphalt strength

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

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 : 06/05/2015

Signed :



Prakash Iyengar
Managing Director

BS EN ISO9001: 2008 approved
Certificate number 860461

Noise Test Certificate

Issued By: **ELE International**

Date of Issue: 12 November 2001 ELE doc ref: 9901X0238

Date of Test: 12 November 2001

ELE
International

Page 1 of 1

Approved
Signatory



We, ELE International, Chartmoor Road, Chartwell Business Park, Leighton Buzzard, Beds, LU7 4WG, England declare under sole responsibility that the following product(s) to which this declaration relates is (are) in conformity with the provisions of:

2006/42/EC Machinery Directive.

Product Description		Serial No. (See details on product identification plate)																		
45-6810 series	Marshall Test 50																			
1 Metre A 1 Metre 1 Metre D 1 Metre B 1 Metre C Measurements/recorded noise level <table><tr><td>Position A</td><td>64</td><td>dB</td></tr><tr><td>Position B</td><td>64</td><td>dB</td></tr><tr><td>Position C</td><td>64</td><td>dB</td></tr><tr><td>Position D</td><td>64</td><td>dB</td></tr><tr><td>Position E (Normal operator position)</td><td>64</td><td>dB</td></tr><tr><td>Background Noise level</td><td>58</td><td>dB</td></tr></table>			Position A	64	dB	Position B	64	dB	Position C	64	dB	Position D	64	dB	Position E (Normal operator position)	64	dB	Background Noise level	58	dB
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Position D	64	dB																		
Position E (Normal operator position)	64	dB																		
Background Noise level	58	dB																		



BS EN ISO9001: 1994 approved
Certificate number 860461

Noise tests were carried out using Test Meter, serial No.

N30863

which has been calibrated using calibrated standards
traceable to national standards of measurement.

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DIRECTIVE ON WASTE ELECTRICAL & ELECTRONIC EQUIPMENT (WEEE)



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.

Note: For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.

Important document. Retain with product records.

GERMAN

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.

Hinweis: 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.

Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.

FRENCH

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.

Remarque : 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.

Ce document est important. Conservez-le dans le dossier du produit.

ITALIAN

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.

Nota: 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.

Documento importante. Conservare con la documentazione del prodotto.

DANISH

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.

Bemærk: I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.

Vigtigt dokument. Opbevares sammen med produktdokumenterne.

SWEDISH

Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopsstationer 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.