

OPERATING INSTRUCTIONS

Cleveland Flash Cup Apparatus

46-3310

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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> ELE International 2013 ©</p>		

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SAFETY NOTICES

- [1] READ THIS MANUAL BEFORE INSTALLING OR OPERATING THE INSTRUMENT.**
- [2] THIS INSTRUMENT IS USED TO TEST MATERIALS THAT MAY BE FLAMMABLE, TOXIC OR GIVE OFF VAPOURS AND FUMES.**
- [3] THIS INSTRUMENT CONTAINS HOT LIQUIDS AND PARTS OF THE CASE MAY BECOME HOT.**
- [4] IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE THAT LOCAL AND NATIONAL HEALTH AND SAFETY LEGISLATION ARE COMPLIED WITH DURING INSTALLATION AND OPERATION OF THIS INSTRUMENT AND WHEN STORING, HANDLING OR DISPOSING SAMPLES.**
- [5] THIS INSTRUMENT SHOULD ONLY BE INSTALLED AND OPERATED BY TRAINED STAFF, WHO ARE FAMILIAR WITH THE RELEVANT LABORATORY AND ENGINEERING PRACTICES.**
- [6] ALWAYS WEAR SAFETY GLASSES AND PROTECTIVE CLOTHING WHEN OPERATING THIS INSTRUMENT.**

REGULATORY CONFORMANCE

This instrument conforms to the EMC requirements of BS EN61326 and related standards. This instrument is CE tested and marked.

All instruments supplied by ELE International are in conformance with RoHS (Restriction of the use of certain Hazardous Substances) in Electrical and Electronic Equipment Regulations.

ELE International operates in conformance with WEEE (Waste Electrical and Electronic Equipment) Directives, (registration WEE/AD0054TQ) and will provide advice on disposal of ELE instruments on request.

QUALITY ASSURANCE

Each instrument has been fully tested, validated and calibrated by ELE International in accordance with an ISO9001 Quality Assurance System.

All parts and sub-assemblies have been checked against test procedures and specifications before final assembly.

Each instrument has been subjected to PAT (Portable Appliance Test) tests.

EQUIPMENT IDENTIFICATION

The model number and serial number of the instrument are marked on an identity plate mounted on the instrument.

The power supply voltage and frequency are also shown. This information must be quoted in any technical query, or when ordering accessories and spare parts.

1 OVERVIEW

1.1. Specifications

Temperature range:	Ambient +10 to 370°C
Supply voltage:	220/240V 50/60Hz 110/120V 50/60Hz
Power:	500W
Fuses:	110/120V: 7.5A, 1.25in HBC type 220/240V: 5A, 1.25in HBC type
Gas connection:	10mm diameter riffle
Dimensions (HxWxD):	320 x 310 x 290mm
Weight	6.5kg

1.2. Applicable Methods of Test

ASTM D92

IP 36

AASHTO T48

BS 2000 Parts 36 & 403

EN 2592

FTM 791 1103.7

ISO 2592

JIS K2265

NF T60-118

1.3. Description

The 46-3310 is a semi automatic Cleveland Open Cup Flash Point Tester. The test flame is swept across the surface of the heated sample by a motor driven arm actuated by a push button. The user observes the cup to determine whether a flash has occurred and notes the temperature shown on a thermometer suspended in the sample. The heater has a temperature range of ambient +10 to 370°C and is adjusted by a manual power control on the front panel. A fully automatic temperature controller with display is available as an accessory.

The electric **Heater Assembly** comprises a Hot Plate type heater mounted on ceramic insulating rings and surrounded by stainless steel Heat Shields. The temperature of the Heater Assembly is controlled by the **Heater Control** on the front panel. A **Heater Indicator Lamp** is illuminated when the Hot Plate is using power. The temperature of the sample is measured by a thermometer (not supplied) inserted into the **Thermometer Support**.

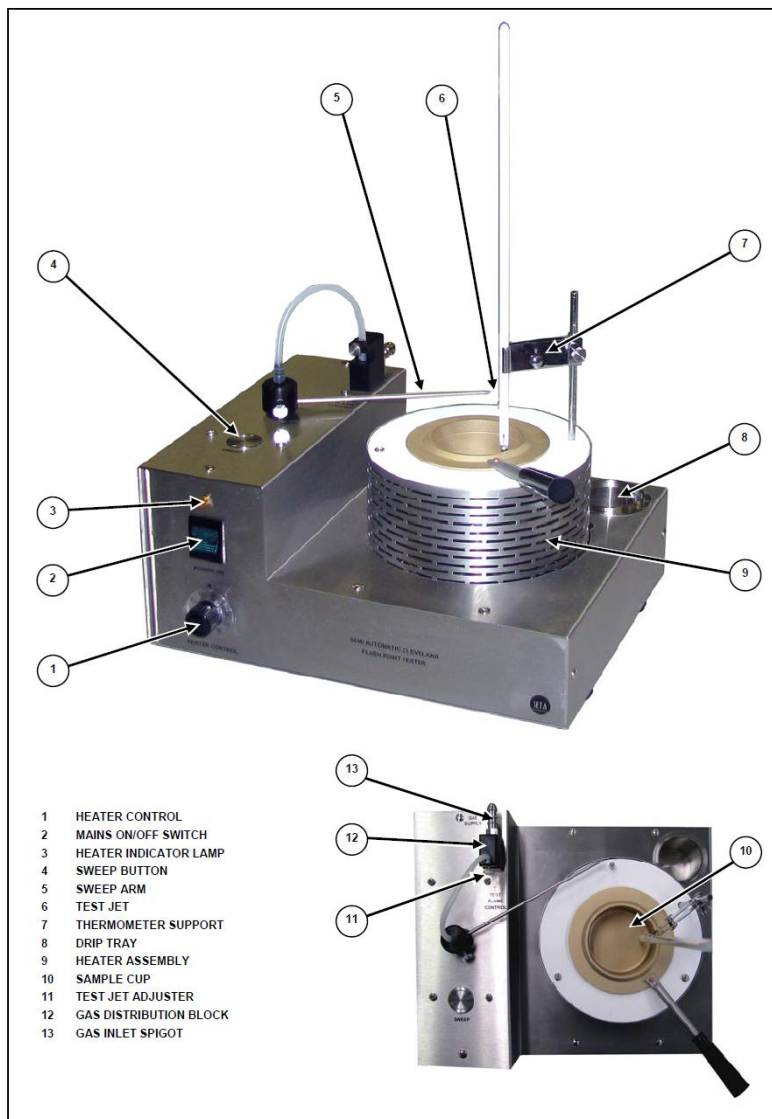
The **Test Jet** is an open gas flame at the end of the **Sweep Arm**. The size of the flame from the Test Jet is regulated by the **Test Jet Adjuster** on the **Gas Distribution Block**. The Sweep Arm is moved across the the **Sample Cup** by means of a stepper motor. The time taken for each sweep of the arm is approximately one second.

A single momentary press of the **Sweep Button** will cause the Sweep Arm to move in one direction across the surface of the sample. The next press of the Sweep Button causes the Sweep Arm to return to its start position.

A **Drip Tray** is provided to catch drops of sample when the thermometer is swung away from the Sample Cup.

The combined Mains Power Socket and Fuse Holder is situated on the rear of the unit, and the gas supply connects to the **Gas Inlet Spigot** on the Gas Distribution Block.

Figure 1.3. Component Parts



2 INSTALLATION

WARNING: BEFORE INSTALLATION, REFER TO THE SAFETY NOTICES ON PAGE 3.

2.1. Unpacking

The instrument should be unpacked and inspected immediately upon receipt.

- [1] Check the instrument visually for damage, particularly if the packaging is damaged.
- [2] Verify that the operating voltage and frequency marked on the instrument matches the local power supply.
- [3] Check the contents against the packing list.
- [4] Any damage, shortfall, or problems with compatibility to local power supply must be notified to ELE International at the earliest opportunity.

Note: There may be some slight evidence of the instrument having been used. This is perfectly normal and is caused by pre-delivery calibration and testing at our factory.

- [5] Retain all packaging for future use in shipping or long term storage of the instrument.

2.2. Location

The instrument should be located;

- [1] On a flat level bench.
- [2] In a draught free and well ventilated position.

2.3. Power Supply Connection

This instrument requires connection to a suitable mains power supply.

- [1] Verify that the voltage and frequency shown on the Identity Plate matches the local power supply.

CAUTION: CONNECTION TO THE INCORRECT VOLTAGE SUPPLY MAY RESULT IN EXTENSIVE DAMAGE TO THE EQUIPMENT.

- [2] If there is no plug attached to the mains lead, install a suitable plug using the following colour convention:-
 - [2.1] Connect the BROWN wire to LINE/LIVE
 - [2.2] Connect the BLUE wire to NEUTRAL
 - [2.3] Connect the GREEN/YELLOW wire to EARTH/GROUND
- [3] The Mains ON/OFF Switch is located on the front of the instrument.
- [4] The Mains Power Socket is located on the rear of the instrument.

2.4. Gas Supply Connection

- [1] Check that the distance between the test flame orifice and the cup rim is within the method specification and does not exceed 2mm. This is correctly set during manufacture but may have changed in transit.
- [2] Connect a low-pressure (3kPa maximum) gas supply to the Gas Inlet Spigot, using suitable plastic or rubber hose.

2.5. Fitting the Thermometer

- [1] This instrument requires a thermometer. Select from ASTM11C / IP28C or ASTM 11F / IP28F.
- [2] Mount the thermometer into the spring loaded clip-on the Thermometer Support. Ensure that the bottom of the Thermometer bulb is located as specified in the Test Method.

2.6. Sweep Arm Height

- [1] The centre-line of the Sweep Arm must be less than 2mm above the top of the Sample Cup. Loosen the knurled Arm Locking Screw and move the Sweep Arm up or down the motor spindle. Re-tighten the screw.

3 OPERATION

WARNING: BEFORE OPERATION, REFER TO THE SAFETY NOTICES ON PAGE 3.

- [1] Adjust the test flame
 - [1.1] Turn on the gas at the supply.
 - [1.2] Ignite the test flame. (It may be necessary to open the Test Jet Adjuster).
 - [1.3] Adjust the Test Jet Adjuster until the test flame is 4mm in diameter.
- [2] Place the sample in the cup
 - [2.1] Remove the Sample Cup from the Heater Assembly.
 - [2.2] Fill with sample up to the line engraved around the inside of the sample Cup.

Note: The sample level must not exceed the engraved line on the cup.

- [2.3] Remove any excess with a pipette (not by pouring away).
- [2.4] Burst any air bubbles present on the surface.
- [2.5] Replace the Sample Cup into the Heater Assembly.

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- [3] Adjust the Heater Control.
- [3.1] Set the Heater Control to zero.
 - [3.2] Switch the 46-3310 ON at the Mains ON/OFF Switch.
 - [3.3] Rotate the Heater Control clockwise to apply heat then make any adjustments necessary to maintain the required rate of temperature rise as indicated by the thermometer.
 - [3.4] The yellow Heater Indicator will be illuminated when the controller is delivering power to the Hot Plate.
 - [3.5] Apply heat initially so that the rate of temperature rise of the sample is 14 to 17°C per minute.
 - [3.6] When the sample temperature is approximately 56°C below the expected flash point, decrease the heat so that the rate of temperature rise for the last 28°C before the flash point is 5 to 6° per minute.
 - [3.7] When the temperature of the sample has reached at least 28°C below the expected flash point, the test may be started.
- [4] Start the test
- [4.1] Activate the motor-driven Sweep Arm by a single momentary press of the Sweep Button.
 - [4.2] As the Sweep Arm passes over the sample, observe whether a flash occurs.
 - [4.3] If no flash occurs, allow the sample to reach the next 2°C temperature interval as indicated by the thermometer and repeat [4.1] to [4.3] until a flash is observed.
 - [4.4] Record the Flash Point as the temperature read on the thermometer when a flash appears at any point on the surface of the oil.

Note: Do not confuse the true flash with the blueish halo that sometimes surrounds the test flame.

- [5] Turn off the gas supply
- [5.1] After a Flash Point value has been obtained, turn off the gas at the external supply control valve and not at the pinch valve.

4 CALIBRATION

Calibration of the 46-3310 is not required.

5 VERIFICATION

- [1] Verify the performance of the 46-3310 every 12 months.

6 MAINTENANCE

- [1] After every test;
 - [1.1] Clean the Sample Cup thoroughly.
 - [1.2] Clean the thermometer.
 - [1.3] Wipe the case clean of any spills.
- [2] Every 6 months;
 - [2.1] Visually check the mains cable and socket for damage.
 - [2.2] Visually check the condition of the gas tubing for signs of hardening, cracks and deterioration.
 - [2.3] Examine moving parts for damage.
 - [2.4] Check that the Sweep Arm height is correct.
 - [2.4.1] The centre-line of the Sweep Arm must be less than 2mm above the top of the Sample Cup.
 - [2.4.2] To adjust, loosen the knurled Arm Locking Screw and move the Sweep Arm up or down the motor spindle. Re-tighten the Arm Locking Screw.
 - [2.5] Check the operation of the arm mechanism.

7 REPAIR

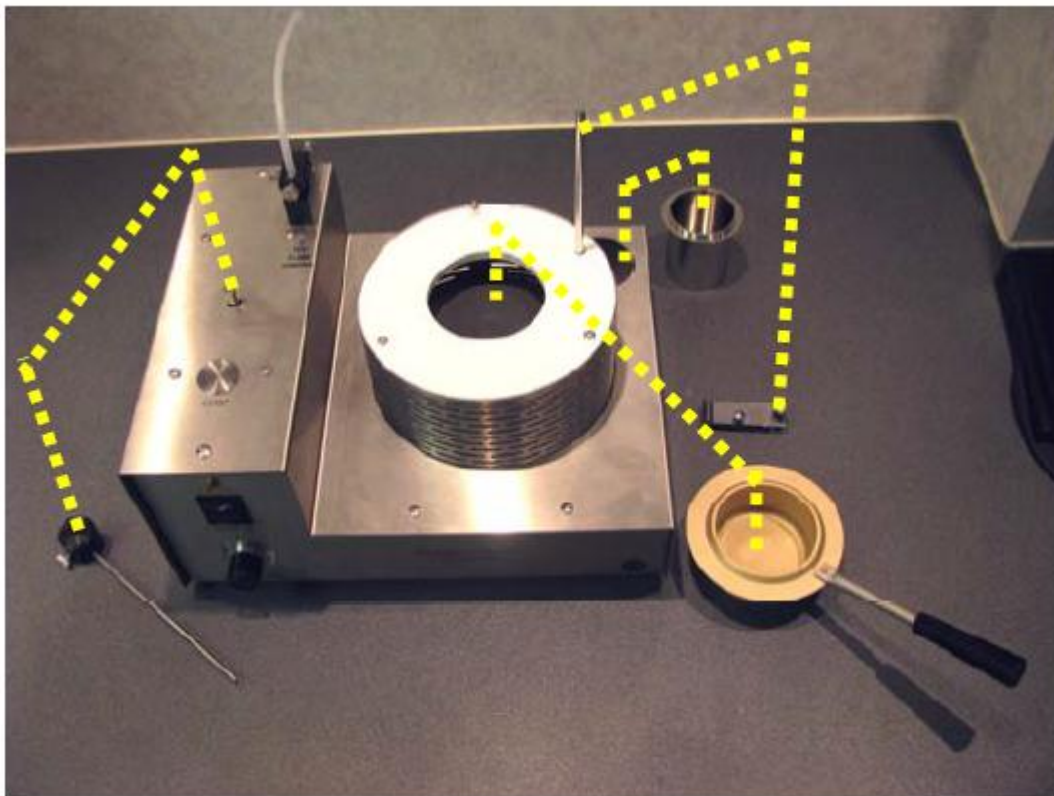
7.1. General

- [1] The spares section details parts that are available.
- [2] In the case of any queries, please contact ELE International, quoting the Model Number, Serial Number, Operating voltage and frequency.
- [3] If the instrument has to be returned to ELE International, please package well (preferably in the original packaging) to prevent damage in transit.

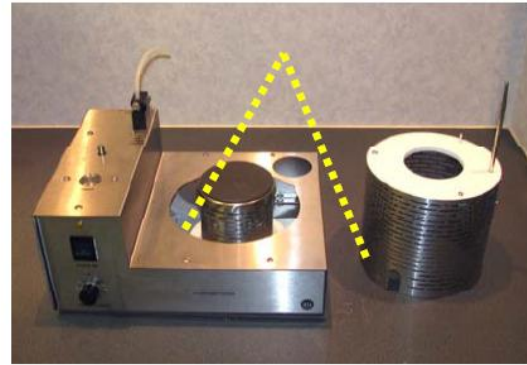
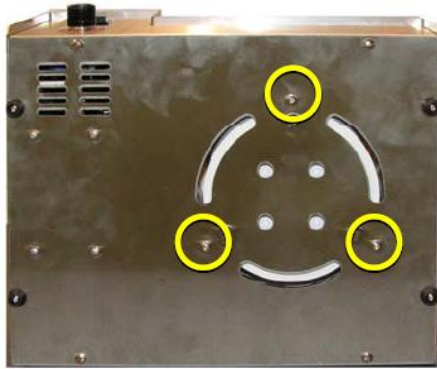
7.2. Heater Replacement

- [1] Disconnect the unit from the electrical mains.
- [2] Remove the Spring Clip from the Thermometer Support.
 - [2.1] Loosen the screw that secures the Spring Clip to the Thermometer Support Shaft.
 - [2.2] Slide the Spring Clip up and off the Thermometer Support Shaft.

- [3] Remove the Sample Cup.
- [4] Remove the Sweep Arm.
 - [4.1] Disconnect the silicon tubing at the Sweep Arm.
 - [4.2] Loosen the knurled Arm Locking Screw that locates the Sweep Arm onto the motor spindle.
 - [4.3] Lift the Sweep Arm up and off the motor spindle.
- [5] Remove the Drip Tray.



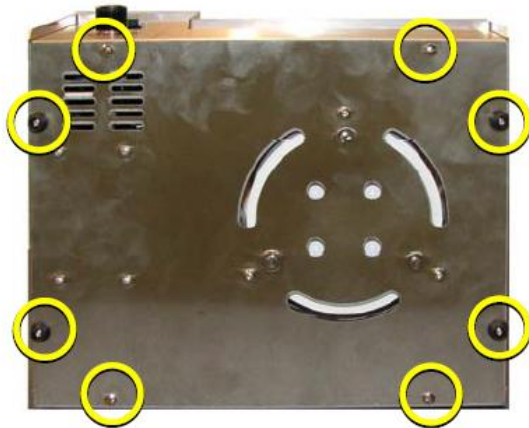
- [6] Remove the Outer Heat Shield
 - [6.1] Carefully lay the unit on its side.
 - [6.2] Remove three screws and washers that secure the Outer Heat Shield.
 - [6.3] Carefully draw the Outer Heat Shield from the top of the case.



[7] Remove the Base Plate.

[7.1] Remove the four rubber feet and four retaining screws.

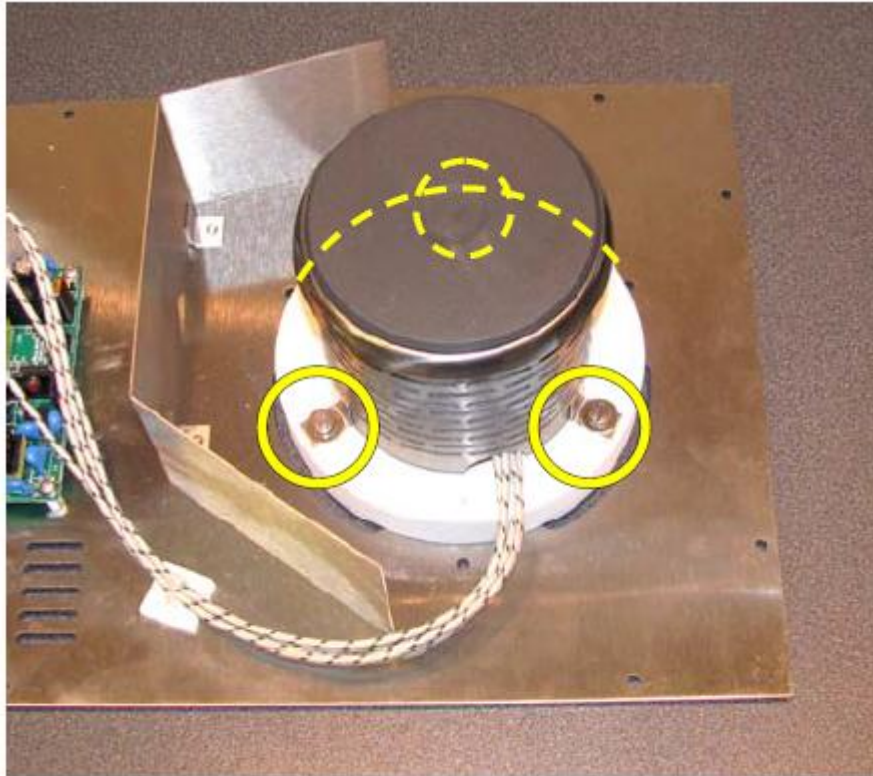
[7.2] Pivot the Case away from the Base Plate. Take care not to strain any cables.



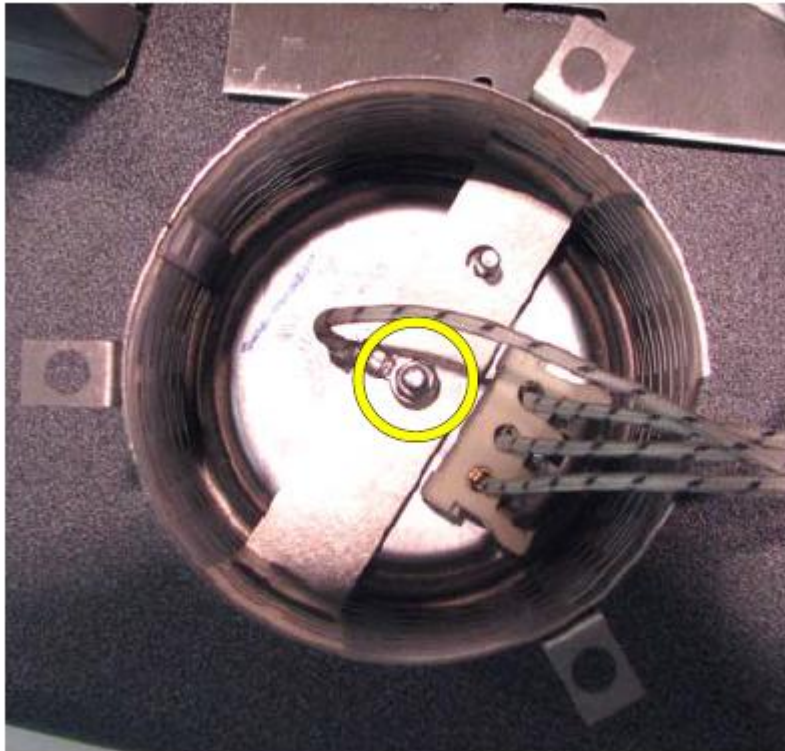
[8] Remove the Inner Heatshield and Heater Element.

[8.1] Remove three screws and washers that locate the Inner Heat Shield to the Ceramic Ring.

[8.2] Lift the Inner Heatshield, complete with Heater Element, from the Case.




- [9] Separate the Heater Element from the Inner Heat shield.
 - [9.1] Invert the Inner Heatshield and Heater.
 - [9.2] Remove the small nut and washer from the Support Bar.
 - [9.3] Lift the Inner Heatshield away from the Heater Element.
 - [9.4] Disconnect the leads from the Heater Element. Make a note of which wire is connected to which terminal.



- [10] Re-assemble with a new Heater Element.
 - [10.1] Make sure the leads are correctly replaced.
 - [10.2] Make sure that the slots cut in the lower edges of the inner and outer perforated drums fit properly over the Heater Element cables.
 - [10.3] Make sure that cables are not trapped when fitting the case onto the Base Plate.
 - [10.4] Do not overtighten screws into the Ceramic Ring.
- [11] Carefully 'run in' by slowly raising the temperature in small stages to the normal operating temperature.
- [12] Verify the performance of the instrument.

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>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.</p> <p>Important document. Retain with product records.</p>
<p>GERMAN</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>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.</p> <p>Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.</p>	
<p>FRENCH</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>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.</p> <p>Ce document est important. Conservez-le dans le dossier du produit.</p>	
<p>ITALIAN</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>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.</p> <p>Documento importante. Conservare con la documentazione del prodotto.</p>	
<p>DANISH</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>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.</p> <p>Vigtigt dokument. Opbevares sammen med produktdokumenterne.</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.