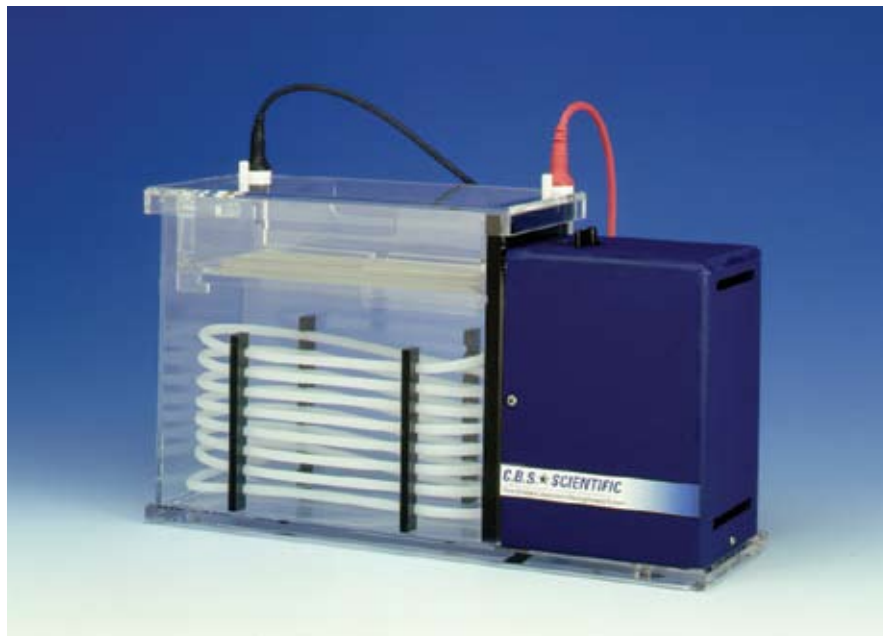


# INSTRUCTION MANUAL

## **Pore Gradient Lipoprotein Electrophoresis System (LPE) LPE-4003**



# TABLE OF CONTENTS

	Page
<b>Important User Information</b>	3-4
<b>Section 1    General Information</b>	
1.1    Introduction and Features	5
1.2    Specifications	5
1.3    Safety	5
<b>Section 2    Description of parts</b>	
2.1    Unpacking	6
2.2    Components/Assembly	6
<b>Section 3    Instructions for Use</b>	
3.1    PGGE Unit Preparation	7
3.2    Buffer Preparation	7
3.3    Gel Preparation when using pre-cast gels	7
3.4    Running Standard PAGE gels	7
3.5    Sample Loading and Electrophoresis	7
3.6    Gel Removal	7
<b>Section 4    Running Conditions</b>	
4.1    Recommended Power	7
4.2    References	7
<b>Section 5    Maintenance of Equipment</b>	
5.1    Care and Handling	8
5.2    Maintenance	8
<b>Section 6    LPE Replacement parts list</b>	9

## IMPORTANT USER INFORMATION

This Instruction Manual will explain how to use this product safely and effectively. Please read and carefully follow the instruction manual in its entirety.



The triangle/exclamation mark symbol alerts the user of the product to important operational, maintenance, and/or warranty requirements.



The triangle/lighting bolt symbol alerts the user of the product to potentially hazardous electrical exposure.



Failure to adhere to the instructions could result in personal and/or laboratory hazards, as well as invalidate any warranty. Always turn off the DC power source prior to disconnecting power cords from the product. Disconnect power cords from the power source first and then from the product. For maximum safety, always operate this system in an isolated, low traffic area, not accessible to unauthorized personnel. Never operate damaged or leaking equipment.

## WARRANTY AND LIABILITY

This product was produced utilizing the highest practical standards of materials, workmanship, and design. C.B.S. SCIENTIFIC warrants that the product has been tested and will meet or exceed published specifications. This warranty is valid only if the product has been operated and maintained according to the instructions provided.

C.B.S. SCIENTIFIC warrants this product to be free from defects in materials and workmanship under normal service for one year from date of shipment. If the product proves defective during this period, SCIENTIFIC will repair or replace it at our option, free of charge, if returned to us postage prepaid. This warranty does not cover: damage in transit, damage caused by carelessness, misuse or neglect, normal wear through frequent use, damage caused by solvent corrosion, damage caused by improper handling or user alteration, nor unsatisfactory performance as a result of conditions beyond our control. C.B.S. SCIENTIFIC shall in no event be liable for incidental nor consequential damages, including without limitation, lost profits, loss of income, loss of business opportunities, loss of use and other related damages, however caused, nor any damage arising from the incorrect use of the product.

<p><b>FRANÇAIS INFORMATION IMPORTANTE À L'USAGE DES UTILISATEURS</b></p> <p>Le présent manuel d'utilisation explique la manière de se servir efficacement du produit en conditions de sécurité. Il est recommandé de soigneusement lire la totalité du manuel, avec ses consignes et ses instructions.</p> <p> Le triangle avec point d'exclamation est un symbole destiné à avertir l'utilisateur du produit de l'importance de certaines exigences relatives au fonctionnement, à l'entretien et/ou à la garantie.</p> <p> Le triangle avec flèche en zigzag est un symbole destiné à avertir l'utilisateur du produit de la possibilité d'exposition à des décharges avec danger de secousses électriques.</p> <p> Tout manquement à l'observation des consignes et des instructions peut exposer les personnes et les biens à des dommages corporels et/ou matériels et peut annuler toute garantie. Il faut toujours interrompre l'alimentation de courant continu avant de déconnecter les cordons d'alimentation du produit. Déconnecter d'abord les cordons d'alimentation branchés sur la source de tension (alimentation de secteur) puis ceux branchés sur le produit. Pour une sécurité maximum, il faut toujours faire fonctionner ce système dans un lieu isolé, peu fréquenté, où le personnel non autorisé n'a pas accès. Ne jamais faire fonctionner un matériel endommagé ou affecté par des fuites.</p> <p><b>GARANTIE ET RESPONSABILITÉ</b></p> <p>Le produit a été fabriqué conformément aux normes applicables les plus exigeantes en matière de matériaux, de main d'œuvre, de conception et d'ingénierie. C.B.S. SCIENTIFIC garantit que le produit a subi des essais et que ses performances rempliront les conditions des spécifications publiées ou leur seront même supérieures. La présente garantie n'est valide que si le produit a fonctionné et a été entretenu conformément aux consignes et instructions fournies.</p> <p>C.B.S. SCIENTIFIC garantit que le produit sera dépourvu de vices de matériaux et de main d'œuvre, en conditions de service normales, pendant un an à compter de la date d'expédition. Au cas où le produit s'avérerait défectueux pendant cette période de garantie, C.B.S. SCIENTIFIC réparera ou remplacera le produit, à sa discrétion et gratuitement, si le produit lui est retourné port payé d'avance. La garantie ne couvre pas les dommages de transport; les dommages causés par l'imprudence, le manque de soins, l'abus ou la négligence; l'usure normale résultant d'une utilisation fréquente; les dommages causés par la corrosion des solvants; et les dommages causés par la manipulation inadéquate ou des changements apportés par l'utilisateur. La garantie ne couvre pas non plus les performances non satisfaisantes résultant de conditions hors du contrôle de C.B.S. SCIENTIFIC. C.B.S. SCIENTIFIC ne pourra en aucun cas être tenue responsable de dommages indirects, y compris, de manière non limitative, la perte de bénéfices, le manque à gagner, la perte d'occasions d'affaires, l'impossibilité d'usage ou tous autres dommages associés, quelle qu'en soit la cause, ni de dommages résultant de l'usage incorrect du produit.</p>	<p><b>ESPAÑOL INFORMACIÓN IMPORTANTE PARA EL USUARIO</b></p> <p>El presente instructivo explica la manera de usar este producto en forma segura y efectiva. Sírvase leerlo en su totalidad y seguir detenidamente las indicaciones que contiene.</p> <p> El símbolo del triángulo con exclamación llama la atención del usuario a requisitos importantes para el uso y mantenimiento del producto, así como para la validez de la garantía.</p> <p> El símbolo del triángulo con rayo llama la atención del usuario a la posibilidad de riesgos eléctricos.</p> <p> El incumplimiento de las instrucciones aquí señaladas podría dar lugar a riesgos a la persona, al laboratorio o a ambos y podría anular toda garantía. Siempre apague la fuente de corriente continua antes de desenchufar los cables eléctricos del producto. Primero desconecte los cables de la fuente de energía y después del producto. Para mayor seguridad, siempre use este sistema en un área aislada, de poco movimiento de personas e inaccesible a personal no autorizado. Jamás use equipo que presenta algún daño o fuga.</p> <p><b>GARANTÍA Y RESPONSABILIDAD</b></p> <p>Este producto fue fabricado de acuerdo con las normas más estrictas que sean factibles en cuanto a materiales, mano de obra y diseño. C.B.S. SCIENTIFIC garantiza que se sometió el producto a pruebas y que cumplirá o excederá las especificaciones publicadas. Esta garantía será válida únicamente si se usa y se da servicio de mantenimiento al producto de acuerdo con las instrucciones señaladas.</p> <p>C.B.S. SCIENTIFIC garantiza que este producto se encontrará libre de defectos de materiales y mano de obra por un período de servicio normal de un año a partir de la fecha de embarque. Si el producto resulta defectuoso durante este período, C.B.S. SCIENTIFIC lo reparará o lo repondrá, a criterio de C.B.S. SCIENTIFIC, libre de cargos, si se devuelve el producto a C.B.S. SCIENTIFIC porte pagado. Esta garantía no cubre daños sufridos en tránsito, daños provocados por descuido, mal uso o negligencia, desgaste normal como consecuencia del uso excesivo, daños atribuibles a corrosión provocada por solventes, daños causados por el uso indebido o alteraciones realizadas por el usuario ni rendimiento insatisfactorio atribuible a circunstancias fuera del control de C.B.S. SCIENTIFIC. C.B.S. SCIENTIFIC en ningún caso asumirá responsabilidad por daños incidentales o subsecuentes, incluyendo, en forma no limitativa, la pérdida de utilidades, de ingresos, de oportunidades comerciales o del uso del producto y otros daños afines, fuere cual fuere su origen, ni por daños derivados del uso incorrecto del producto.</p>
<p><b>DEUTSCH WICHTIGE INFORMATION FÜR DEN BENUTZER</b></p> <p>Diese Bedienungsanleitung beschreibt wie man dieses Produkt sicher und wirksam benutzt. Bitte lesen und befolgen Sie alle Anweisungen in dieser Anleitung.</p> <p> Das Dreieck mit Ausrufezeichen weist den Benutzer des Produktes darauf hin, daß wichtige Bedienungs-, Wartungs- und/oder Garantievorschriften zu beachten sind.</p> <p> Das Dreieck mit Zickzackblitz warnt den Benutzer des Produktes vor möglichen Gefahren durch elektrische Spannungen.</p> <p> Nichtbeachtung dieser Anweisungen kann zu persönlichen und/oder labortechnischen Schäden führen und gleichzeitig alle Garantien als nichtig erklären. Die DC Stromzufuhr muß immer, vor dem Entfernen der Steckdose und erst dann vom Produkt entfernt werden. Um höchste Sicherheit zu gewährleisten sollte dieses System in einem abgesonderten und besonders ruhigen Bereich eingesetzt werden und vor Unbefugten sicher sein.</p> <p><b>GARANTIE UND HAFTUNG</b></p> <p>Dieses Produkt wurde unter Anwendung von Produkten mit höchster Qualität und aus Materialien mit bester Verarbeitung und modernstem Design hergestellt. C.B.S. SCIENTIFIC garantiert, daß das Produkt getestet wurde und alle publizierten Spezifikationen übertrifft. Diese Garantie ist jedoch nur gültig, wenn das Produkt nach der beigefügten Bedienungsanleitung bedient und gewartet wurde.</p> <p>C.B.S. SCIENTIFIC garantiert, daß dieses Produkt bei normaler Bedienung aus fehlerfreiem Material besteht und fehlerfrei in der Ausführung ist. Diese Garantie gilt für ein Jahr ab Lieferdatum. Sollte das Produkt in diesem Zeitraum fehlerhaft werden, bietet SIGMA eine kostenlose Reparatur bzw. kostenlosen Ersatz, einschließlich freiem Rückporto. Diese Garantie schließt folgendes aus: Transportschaden, Schaden durch Nachlässigkeit, Mißbrauch oder Vernachlässigung, normale Abnutzung durch regelmäßigen Gebrauch, Schaden durch Säureangriff, Schaden durch falsche Handhabung, Veränderung des Produktes durch den Benutzer, oder unzureichende Leistungen die sich nicht im Verantwortungsbereich von C.B.S. SCIENTIFIC befinden. C.B.S. SCIENTIFIC kommt unter keinen Umständen für folgende Schäden auf: Sachschadensverlust, Einkommensverlust, Verlust von Geschäftsmöglichkeiten, Verlust der Anwendung und andere damit verbundene Schäden die auf irgend eine Art und Weise entstanden sind, oder Schäden die aus falscher Anwendung des Produktes entstanden sind.</p>	<p><b>ITALIANO INFORMAZIONI IMPORTANTI PER L'UTENTE</b></p> <p>Questo manuale spiega come utilizzare questo prodotto in maniera sicura ed efficiente. Si preghi di leggere e seguire con cautela le istruzioni di ogni parte di questo manuale.</p> <p> Il triangolo contenente il simbolo di un punto esclamativo avverte l'utente di importanti requisiti relativi al funzionamento, manutenzione e/o garanzia del prodotto.</p> <p> Il triangolo contenente il simbolo di un lampo avverte l'utente del prodotto della possibilità di pericoli dovuti a corrente elettrica.</p> <p> La mancata osservanza delle istruzioni può essere causa di pericolo alla propria persona ed al laboratorio, oltre a poter annullare la garanzia. Prima di distaccare il cordone d'alimentazione dal prodotto, spegnere sempre la sorgente di corrente continua. Distaccare i cordoni d'alimentazione prima dal lato della sorgente di tensione e poi dal lato del prodotto. Per maggior sicurezza, mettere sempre in funzione il prodotto in un'area isolata con poco traffico che non sia accessibile al personale non autorizzato. Non mettere mai in funzione un'apparecchiatura che sia danneggiata o abbia perdite.</p> <p><b>GARANZIA E RESPONSABILITÀ</b></p> <p>Questo prodotto è stato fabbricato seguendo gli standard più elevati per i materiali, la manodopera e la progettazione. La C.B.S. SCIENTIFIC garantisce il prodotto è stato sottoposto a prova e raggiunge o supera i valori pubblicati per i dati tecnici. Questa garanzia è valida solo se il prodotto è messo in esercizio e soggetto a manutenzione secondo le istruzioni fornite.</p> <p>La C.B.S. SCIENTIFIC garantisce che questo prodotto è libero di difetti di materiali e manodopera, in normali condizioni d'esercizio, per la durata di un anno dalla data di spedizione. Se, in questo periodo, il prodotto si dimostrerà difettoso, la C.B.S. SCIENTIFIC, a suo giudizio, lo riparerà o sostituirà. Questa garanzia non copre danni in transit, danni causati da negligenza, uso improprio, trascuratezza, normale consumo derivante da uso frequente, o danni causati da solventi corrosivi, danni causati da maltrattamento o da modifiche apportate dall'utente e non copre prestazioni insoddisfacenti che siano il risultato di condizioni al di fuori del controllo del fabbricante. La C.B.S. SCIENTIFIC A non sarà in ogni caso responsabile per danni incidentali o consequenziali, incluso, senza limitazioni, perdite di profitto, perdita di entrate, perdita di opportunità d'affari e altri danni relativi, comunque causati, e per danni risultati da uso incorretto del prodotto.</p>

## SECTION 1 General Information

### 1.1 Introduction

The PGGE, Pore Gradient Lipoprotein Electrophoresis System, Cat. # LPE-4003, is designed to run 1-4 nondenaturing gradient gels with dimensions of 82 x 82 x 5mm (Alamo Gels). The primary application is for the resolution of Lipoprotein sub-classes (LDL, HDL) based on particle size using non-denaturing pore gradient gel electrophoresis (GGE). Other applications include Standard PAGE and Short DNA Sequencing runs. The PGGE system features; 4-gel capacity, temperature control, buffer recycling and inter-locking safety cover.

**Table 1  
Features of PGGE System**

Model #		Glass Plate Dimensions (mm) (w x h)	Precast Gels available	Internal cooling chamber	Manual Gel Casting	Buffer Cycling
LPE-4003	4 gel capacity	82 x 82 x 5	Yes	Yes	Yes	Yes

### 1.2 Specifications

**Constructions:**

**Buffer chamber, safety cover**

**Electrodes**

**Power cords**

**Safety Certification**

Acrylic, Kydex

Platinum wire .012" diameter

FR Urethane rated 7500VDC, 200mA, 65°C

EN61010-1-1993 (IEC1010-1)

**Table 2  
Specifications**

	LPE-4003
Shipping weight	12 lbs.
Overall Size (l)x(w)x(h) cm	39 x 12 x 28
Recommended buffer volume	3.5 L
Distance between electrodes -cm	16
Voltage limit	250VDC
Mains	115V/60Hz

### 1.3 Safety



Power to the PGGE unit is to be supplied by an external DC voltage power supply that must be ground isolated so that the DC voltage output floats with respect to ground. For any power supply used, the maximum specified operating parameters for the units are:

**Maximum Limits**

250VDC

30watts power

125mA current

55°C ambient temperature



Current to the unit, provided from the external power supply, must enter the unit through the lid assembly, providing a safety interlock to the user. Current to the unit is broken when the lid is removed. **Do not attempt to use the unit without the safety lid, and always turn the power supply off before removing the lid, or when working with the unit in any way. Follow safety precautions specified by the power supply manufacturer.**

## SECTION 2

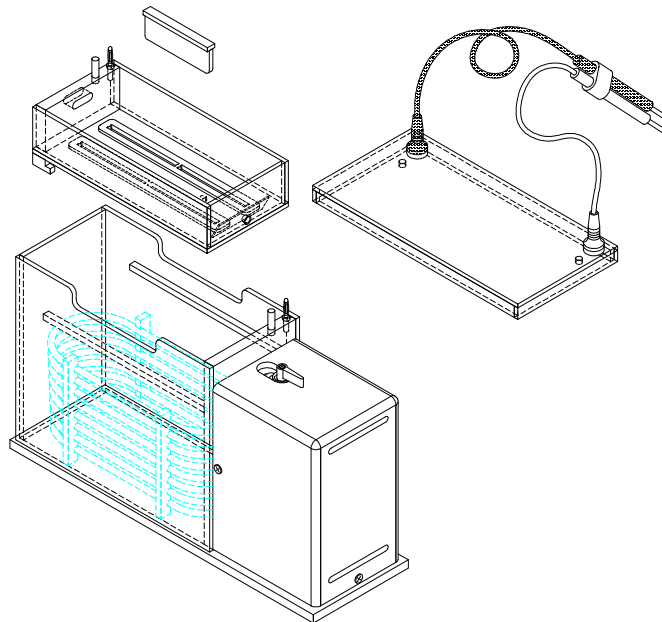
### Description of Parts

#### 2.1 Unpacking

Please verify that your unit comes complete with the following components:

- Base unit with lower buffer chamber, cooling coil with external connections and recycling pump
- Upper reservoir with 2 grey silicone gaskets
- Safety Cover & power leads
- 3 gel slot plugs
- Mains-power cord (not shown)

#### 2.2 Components/Assembly



## SECTION 3

### Instructions for Use



#### 3.1 PGGE Unit Preparation

Place the unit on a level work surface in an authorized work area. Attach the black (Mains) power cord to the unit and a mains outlet. Check to be sure the toggle switch is in the "0" position.

#### 3.2 Buffer Preparation

Prepare the PGGE buffer as in Ref. 1 (90mM Tris, 9mM borate, 2.5mM EDTA, pH 8.3). The buffer should be pre-chilled to 5°C (cold room). Add 3.5L of chilled buffer to the lower reservoir. Connect the inlet and outlet tubes to the refrigerated water bath (chiller). For optimal running conditions, set the waterbath temperature control to 7°C and begin circulation.

#### 3.3 Gel Preparation when using pre-cast gels

Remove the pre-cast gel cassettes from protective wrapping (always wear gloves!). Rinse in d.d.H<sub>2</sub>O. Insert gel cassettes into upper reservoir such that 1cm remains above the grey gasket. Turn toggle switch to "I" position to begin buffer cycling and filling upper reservoir to correct level.

#### 3.4 Running Standard PAGE gels.

The LPE-4003 can be used for other types of gels other than pre-cast non-denaturing acrylamide gradients. Accessories for manually casting PAGE gels are available for the LPE-4003. Please contact our customer service department for ordering information.



#### 3.5 Sample Loading and Electrophoresis

Prepare samples as per ref. 1,2,3. Turn buffer cycling off, insert well former into gel cassettes and load samples with controls. Resume buffer cycling, attach safety cover, connect power cords to DC power supply and begin electrophoresis.



#### 3.6 Gel Removal

After completion of electrophoresis, turn off power supply and disconnect power cords. Remove the upper reservoir. Remove gel cassettes from grey gasket by pushing from top until cassette ejects from gasket.

## SECTION 4

### Running Conditions

#### 4.1 Recommended Power

Precise electrophoresis conditions will vary according to the number and type of gels used, buffer conditions employed, power input, and the general goal of the experiment. Refer to the reference section for in depth discussions on practical; and theoretical approaches to Lipoprotein electrophoresis.



#### 4.2 References

Rainwater, David L., et.al. Production of polyacrylamide gradient gels for the electrophoretic resolution of lipoproteins. *Journal of Lipid Research*, **Volume 33**, 1992.

Rainwater, David L., Electrophoretic Separation of LDL and HDL Subclasses, *Methods in Molecular Biology*, **Volume 110**: Lipoprotein Protocols.

Rainwater, David L., et.al. Characterization of a composite gradient gel for the electrophoretic separation of lipoproteins, *Journal of Lipid Research*, **Volume 38**, 199.

## SECTION 5

### Maintenance of Equipment



#### 5.1 Care and Handling

The components of the PGGE units are fabricated from acrylic, Kydex, silicone rubber and polyethylene. Electrodes and connectors are made from pure platinum, stainless steel, and chrome plated brass. As with any laboratory instrument, adequate care ensures consistent and reliable performance.

After each use, rinse buffer chamber and accessories with de-ionized water. Wipe dry with a soft cloth or paper towel, or allow to air dry. Whenever necessary, all components may be washed gently with water and a non-abrasive detergent, and rinsed and dried as above. *Never* use abrasive cleaners, glass cleaning sprays or scouring pads to clean the components, as these will damage the unit and components.

Additional precautions:

- Do not autoclave or dry-heat sterilize the apparatus or components.
- Do not expose the apparatus or components to phenol, acetone, benzene, halogenated hydrocarbon solvents or alcohols.
- Avoid prolonged exposure of the apparatus or components to UV light.
- Do NOT treat with diethylpyrocarbonate (DEPC)-treated water for extended periods at 37°C. A brief rinse with DEPC-water is sufficient after a thorough wash.

#### 5.2 Maintenance



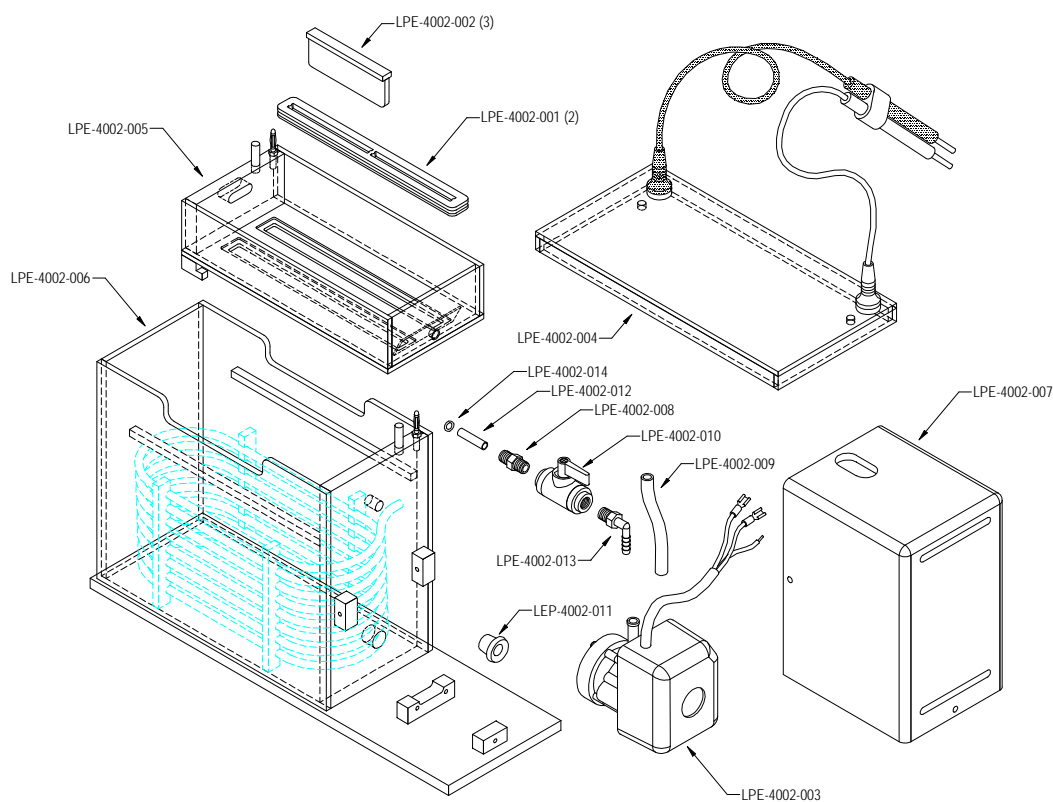
The following inspection and maintenance procedures will help maintain the safety and reliable performance of the PGGE systems. Replacement parts can be ordered by calling 1-800-243-4959 or by contacting your local distributor.

- Banana plugs and power cords should be inspected regularly. If the banana plugs become loose or do not feel friction tight replace the plugs or power cords.
- Should power cord assemblies (connectors, wire or shrouds) show any signs of wear or damage (e.g. cracks, nicks, abrasions, or melted insulation), replace them immediately.
- The platinum wire is secured to the banana jack by compression between a stainless washer and the jack nut. The nut/washer interface should be tight and free of corrosion.

## SECTION 6

### LPE-4002 REPLACEMENT PARTS LIST

Part Number	Qty/unit	Description
LPE-4002-001	2	Grommet 2x80
LPE-4002-002	3	Plug for 2X80 grommet
LPE-4002-003	1	Pump
LPE-4002-004	1	Safety Cover W/Power Leads
LPE-4002-005	1	Tank, upper
LPE-4002-006	1	Tank, lower
LPE-4002-007	1	Pump cover w/AC switch/outlet
LPE-4002-008	1	1/8" NPT Nipple
LPE-4002-009	1	Hose, 5"
LPE-4002-010	1	Plastic ball valve
LPE-4002-011	1	Grommet, pump intake
LPE-4002-012	1	polytube
LPE-4002-013	1	RA fitting
LPE-4002-014	1	O-Ring



#### POWER SUPPLY

Cat. #	Item
EPS-250	Mini Power Supply, 20-250 Volts, 300mA @ 150-250V or 500mA below 150V
EPS-250V	Mini Power Supply, 20-250 Volts, 300mA @ 150-250V or 500mA below 150V, 220V
EPS-250-II	Mini Power Supply, 10-250 Volts, 10-500mA with timer
EPS-250-IIV	Mini Power Supply, 10-250 Volts, 10-500mA with timer, 220V

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## NOTES

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## NOTES

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# CONTACT INFORMATION



**Telephone:**  
Local or International  
858-755-4959  
Toll Free: 800-243-4959



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