CUTMASTER™
PLASMA CUTTING SYSTEM

Operating Manual

Rev. AB Date: March 3, 2008 Manual # 0-2964
Operating Features:

30 AMP DC 1 PHASE 208-230 V

A-03286
WE APPRECIATE YOUR BUSINESS!

Congratulations on your new Thermal Dynamics product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency call 1-800-426-1888, or visit us on the web at www.thermal-dynamics.com.

This Operating Manual has been designed to instruct you on the correct use and operation of your Thermal Dynamics product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

YOU ARE IN GOOD COMPANY!

The Brand of Choice for Contractors and Fabricators Worldwide.

Thermal Dynamics is a Global Brand of manual and automation Plasma Cutting Products for Thermadyne Industries Inc.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to developing technologically advanced products to achieve a safer working environment within the welding industry.
WARNINGS

Read and understand this entire Manual and your employer’s safety practices before installing, operating, or servicing the equipment.

While the information contained in this Manual represents the Manufacturer’s best judgement, the Manufacturer assumes no liability for its use.

Plasma Cutting System

CE CutMaster™ 38 Power Supply
Model SL60 Air Plasma Cutting Torch

Operating Manual Number 0-2964
Published by:
Thermal Dynamics Corporation
82 Benning Street
West Lebanon, New Hampshire, USA 03784
(603) 298-5711

www.thermal-dynamics.com

Thermal Dynamics Corporation

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Printed in the United States of America

Publication Date: March 3, 2008

Record the following information for Warranty purposes:

Where Purchased:____________________________________

Purchase Date:_______________________________________

Power Supply Serial #:________________________________

Torch Serial #:_______________________________________
**TABLE OF CONTENTS**

APPENDIX 1: SEQUENCE OF OPERATION  
(BLOCK DIAGRAM) ........................................................................................................... A-1

APPENDIX 2: DATA TAG INFORMATION ........................................................................... A-2

APPENDIX 3: SYSTEM SCHEMATIC ............................................................................... A-4

APPENDIX 4: Publication History ................................................................................... A-6

   Global Customer Service Contact Information ........................................... Inside Rear Cover
SECTION 1:
GENERAL INFORMATION

1.01 Notes, Cautions and Warnings
Throughout this manual, notes, cautions, and warnings are used to highlight important information. These highlights are categorized as follows:

NOTE
An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION
A procedure which, if not properly followed, may cause damage to the equipment.

WARNING
A procedure which, if not properly followed, may cause injury to the operator or others in the operating area.

1.02 Important Safety Precautions

WARNINGS

OPERATION AND MAINTENANCE OF PLASMA ARC EQUIPMENT CAN BE DANGEROUS AND HAZARDOUS TO YOUR HEALTH.

Plasma arc cutting produces intense electric and magnetic emissions that may interfere with the proper function of cardiac pacemakers, hearing aids, or other electronic health equipment. Persons who work near plasma arc cutting applications should consult their medical health professional and the manufacturer of the health equipment to determine whether a hazard exists.

To prevent possible injury, read, understand and follow all warnings, safety precautions and instructions before using the equipment. Call 1-603-298-5711 or your local distributor if you have any questions.

GASES AND FUMES

Gases and fumes produced during the plasma cutting process can be dangerous and hazardous to your health.

- Keep all fumes and gases from the breathing area. Keep your head out of the welding fume plume.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from the plasma arc depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when cutting or welding any metals which may contain one or more of the following:
  Antimony  Chromium  Mercury
  Arsenic  Cobalt  Nickel
  Barium  Copper  Selenium
  Beryllium  Lead  Silver
  Cadmium  Manganese  Vanadium
- Always read the Material Safety Data Sheets (MSDS) that should be supplied with the material you are using. These MSDSs will give you the information regarding the kind and amount of fumes and gases that may be dangerous to your health.
- For information on how to test for fumes and gases in your workplace, refer to item 1 in Subsection 1.03, Publications in this manual.
- Use special equipment, such as water or down draft cutting tables, to capture fumes and gases.
- Do not use the plasma torch in an area where combustible or explosive gases or materials are located.
- Phosgene, a toxic gas, is generated from the vapors of chlorinated solvents and cleansers. Remove all sources of these vapors.
- This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Sec. 25249.5 et seq.)

ELECTRIC SHOCK

Electric Shock can injure or kill. The plasma arc process uses and produces high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the workplace.

- Never touch any parts that are electrically “live” or “hot.”
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.
• Repair or replace all worn or damaged parts.
• Extra care must be taken when the workplace is moist or damp.
• Install and maintain equipment according to NEC code, refer to item 9 in Subsection 1.03, Publications.
• Disconnect power source before performing any service or repairs.
• Read and follow all the instructions in the Operating Manual.

FIRE AND EXPLOSION

Fire and explosion can be caused by hot slag, sparks, or the plasma arc.

• Be sure there is no combustible or flammable material in the workplace. Any material that cannot be removed must be protected.
• Ventilate all flammable or explosive vapors from the workplace.
• Do not cut or weld on containers that may have held combustibles.
• Provide a fire watch when working in an area where fire hazards may exist.
• Hydrogen gas may be formed and trapped under aluminum workpieces when they are cut underwater or while using a water table. DO NOT cut aluminum alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.

NOISE

Noise can cause permanent hearing loss. Plasma arc processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

• To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs. Protect others in the workplace.
• Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.
• For information on how to test for noise, see item 1 in Subsection 1.03, Publications, in this manual.

PLASMA ARC RAYS

Plasma Arc Rays can injure your eyes and burn your skin. The plasma arc process produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

• To protect your eyes, always wear a welding helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear.
• Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.
• Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
• Protect others in the work area from the arc rays. Use protective booths, screens or shields.
• Use the shade of lens as suggested in the following per ANSI/ASC Z49.1:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Than 300*</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>300 - 400*</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>400 - 800*</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

* These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.

1.03 Publications

Refer to the following standards or their latest revisions for more information:


2. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126


4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

5. ANSI Standard Z41.1, STANDARD FOR MEN’S SAFETY-TOE FOOTWEAR, obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018

6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
9. NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202
12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3
13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103
15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

1.04 Note, Attention et Avertissement

Dans ce manuel, les mots “note,” “attention,” et “avertissement” sont utilisés pour mettre en relief des informations à caractère important. Celles mises en relief sont classifiées comme suit :

**NOTE**

Toute opération, procédure ou renseignement général sur lequel il importe d’insister davantage ou qui contribue à l’efficacité de fonctionnement du système.

**ATTENTION**

Toute procédure pouvant résulter l’endommagement du matériel en cas de non-respect de la procédure en question.

**AVERTISSEMENT**

Toute procédure pouvant provoquer des blessures de l’opérateur ou des autres personnes se trouvant dans la zone de travail en cas de non-respect de la procédure en question.

1.05 Précautions De Sécurité Important

**AVERTISSEMENTS**

L’OPÉRATION ET LA MAINTENANCE DU MATÉRIEL DE SOUDAGE À L’ARC AU JET DE PLASMA PEUVENT PRÉSENTER DES RISQUES ET DES DANGERS DE SANTÉ.

Coupant à l’arc au jet de plasma produit de l’énergie électrique haute tension et des émissions magnétique qui peuvent interférer la fonction propre d’un “pacemaker” cardiaque, les appareils auditif, ou autre matériel de santé électronique. Ceux qui travail près d’une application à l’arc au jet de plasma devrait consulter leur membre professionnel de médication et le manufacturier de matériel de santé pour déterminer s’il existe des risques de santé.

Il faut communiquer aux opérateurs et au personnel TOUS les dangers possibles. Afin d’éviter les blessures possibles, lisez, comprenez et suivez tous les avertissements, toutes les précautions de sécurité et toutes les consignes avant d’utiliser le matériel.Composez le + 603-298-5711 ou votre distributeur local si vous avez des questions.

**Avertissement**

La fumée et les gaz produits par le procédé de jet de plasma peuvent présenter des risques et des dangers de santé.
• Eloignez toute fumée et gaz de votre zone de respiration. Gardez votre tête hors de la plume de fumée provenant du chalumeau.
• Utilisez un appareil respiratoire à alimentation en air si l’aération fournie ne permet pas d’éliminer la fumée et les gaz.
• Les sortes de gaz et de fumée provenant de l’arc de plasma dépendent du genre de métal utilisé, des revêtements se trouvant sur le métal et des différents procédés. Vous devez prendre soin lorsque vous coupez ou soudez tout métal pouvant contenir un ou plusieurs des éléments suivants:
  antimoine    cadmium    mercure
  argent       chrome      nickel
  arsenic      cobalt      plomb
  baryum       cuivre      sélénium
  béryllium    manganèse  vanadium
• Lisez toujours les fiches de données sur la sécurité des matières (sigle américain “MSDS”); celles-ci devraient être fournies avec le matériel que vous utilisez. Les MSDS contiennent des renseignements quant à la quantité et la nature de la fumée et des gaz pouvant poser des dangers de santé.
• Pour des informations sur la manière de tester la fumée et les gaz de votre lieu de travail, consultez l’article 1 et les documents cités à la page 5.
• Utilisez un équipement spécial tel que des tables de coupe à débit d’eau ou à courant descendant pour capter la fumée et les gaz.
• N’utilisez pas le chalumeau au jet de plasma dans une zone où se trouvent des matières ou des gaz combustibles ou explosifs.
• Le phosgène, un gaz toxique, est généré par la fumée provenant des solvants et des produits de nettoyage chlorés. Eliminez toute source de telle fumée.
• Ce produit, dans le procédé de soudage et de coupe, produit de la fumée ou des gaz pouvant contenir des éléments reconnu dans L’état de la Californie, qui peuvent causer des défauts de naissance et le cancer. (La sécurité de santé en Californie et la code sécurité Sec. 25249.5 et seq.)

⚠️ CHOC ELECTRIQUE


• Ne touchez jamais une pièce “sous tension” ou “vive”; portez des gants et des vêtements secs. Isolez-vous de la pièce de travail ou des autres parties du circuit de soudage.
• Réparez ou remplacez toute pièce usée ou endommagée.
• Prenez des soins particuliers lorsque la zone de travail est humide ou moite.
• Montez et maintenez le matériel conformément au Code électrique national des États-Unis. (Voir la page 5, article 9.)
• Débranchez l’alimentation électrique avant tout travail d’entretien ou de réparation.
• Lisez et respectez toutes les consignes du Manuel de consignes.

⚠️ INCENDIE ET EXPLOSION

Les incendies et les explosions peuvent résulter des scories chaudes, des étincelles ou de l’arc de plasma. Le procédé à l’arc de plasma produit du métal, des étincelles, des scories chaudes pouvant mettre le feu aux matières combustibles ou provoquer l’explosion de fumées inflammables.
• Soyez certain qu’aucune matière combustible ou inflammable ne se trouve sur le lieu de travail. Protégez toute telle matière qu’il est impossible de retirer de la zone de travail.
• Procurez une bonne aération de toutes les fumées inflammables ou explosives.
• Ne coupez pas et ne soudez pas les conteneurs ayant pu renfermer des matières combustibles.
• Prévoyez une veille d’incendie lors de tout travail dans une zone présentant des dangers d’incendie.
• Le gaz hydrogène peut se former ou s’accumuler sous les pièces de travail en aluminium lorsqu’elles sont coupées sous l’eau ou sur une table d’eau. NE PAS couper les alliages en aluminium sous l’eau ou sur une table d’eau à moins que le gaz hydrogène peut s’échapper ou se dissiper. Le gaz hydrogène accumulé explosera si enfumé.

⚠️ RAYONS D’ARC DE PLASMA

Les rayons provenant de l’arc de plasma peuvent blesser vos yeux et brûler votre peau. Le procédé à l’arc de plasma produit une lumière infra-rouge et des rayons
ultra-violets très forts. Ces rayons d’arc nuiront à vos yeux et brûleront votre peau si vous ne vous protégez pas correctement.

- Pour protéger vos yeux, portez toujours un casque ou un écran de soudeur. Portez toujours des lunettes de sécurité munies de parois latérales ou des lunettes de protection ou une autre sorte de protection oculaire.
- Portez des gants de soudeur et un vêtement protecteur approprié pour protéger votre peau contre les étincelles et les rayons de l’arc.
- Maintenez votre casque et vos lunettes de protection en bon état. Remplacez toute lentille sale ou comportant fissure ou rognure.
- Protégez les autres personnes se trouvant sur la zone de travail contre les rayons de l’arc en fournissant des cabines ou des écrans de protection.
- Utilisez la nuance de lentille qui est suggérée dans le recommandation qui suivent ANSI/ASC Z49.1:

<table>
<thead>
<tr>
<th>Courant Arc</th>
<th>Nuance Minimum Protective Numéro</th>
<th>Nuance Suggérée Numéro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moins de 300*</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>300 - 400*</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>400 - 800*</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

* Ces valeurs s’appliquent ou l’arc actuel est observé clairement. L’expérience a démontré que les filtres moins foncés peuvent être utilisés quand l’arc est caché par moisseau de travail.

- BRUIT


- Pour protéger votre ouïe contre les bruits forts, portez des tampons protecteurs et/ou des protections auriculaires. Protégez également les autres personnes se trouvant sur le lieu de travail.
- Il faut mesurer les niveaux sonores afin d’assurer que les décibels (le bruit) ne dépassent pas les niveaux sûrs.
- Pour des renseignements sur la manière de tester le bruit, consultez l’article 1, page 5.

1.06 Documents De Reference

Consultez les normes suivantes ou les révisions les plus récentes ayant été faites à celles-ci pour de plus amples renseignements :

5. Norme ANSI Z41.1, NORMES POUR LES CHAUSSURES PROTECTRICES, disponible auprès de l’American National Standards Institute, 1430 Broadway, New York, NY 10018
8. Norme 51 de l’Association Américaine pour la Protection contre les Incendies (NFPA), LES SYSTEMES À GAZ AVEC ALIMENTATION EN OXYGENE POUR LE SOUDAGE, LA COUPE ET LES PROCÉDÉS ASSOCIÉS, disponible auprès de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
9. Norme 70 de la NFPA, CODE ELECTRIQUE NATIONAL, disponible auprès de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

10. Norme 51B de la NFPA, LES PROCÉDÉS DE COUPE ET DE SOUDAGE, disponible auprès de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269


13. Livret NWSA, BIBLIOGRAPHIE SUR LA SÉCURITÉ DU SOUDAGE, disponible auprès de l’Association Nationale de Fournitures de Soudage (National Welding Supply Association), 1900 Arch Street, Philadelphia, PA 19103


1.07 Declaration of Conformity

Manufacturer: Thermal Dynamics Corporation
Address: 82 Benning Street
West Lebanon, New Hampshire 03784
USA


The equipment described in this manual conforms to all applicable aspects and regulations of the “EMC Directive” (European Council Directive 89/336/EEC) and to the National legislation for the enforcement of this Directive.

Serial numbers are unique with each individual piece of equipment and details description, parts used to manufacture a unit and date of manufacture.

National Standard and Technical Specifications

The product is designed and manufactured to a number of standards and technical requirements. Among them are:

* CSA (Canadian Standards Association) standard C22.2 number 60 for Arc welding equipment.
* UL (Underwriters Laboratory) rating 94VO flammability testing for all printed-circuit boards used.
* CENELEC EN50199 EMC Product Standard for Arc Welding Equipment.
* ISO/IEC 60974-1 (BS 638-PT10) (EN 60 974-1) (EN50192) (EN50078) applicable to plasma cutting equipment and associated accessories.

* For environments with increased hazard of electrical shock, Power Supplies bearing the S mark conform to EN50192 when used in conjunction with hand torches with exposed cutting tips, if equipped with properly installed standoff guides.

* Extensive product design verification is conducted at the manufacturing facility as part of the routine design and manufacturing process. This is to ensure the product is safe, when used according to instructions in this manual and related industry standards, and performs as specified. Rigorous testing is incorporated into the manufacturing process to ensure the manufactured product meets or exceeds all design specifications.

Thermal Dynamics has been manufacturing products for more than 30 years, and will continue to achieve excellence in our area of manufacture.

Manufacturers responsible representative: Giorgio Bassi
Managing Director
Thermal Dynamics Europe
Via rio Fabbiani 8A
40067 Rastignano (BO)
Italy
1.08 Statement of Warranty

LIMITED WARRANTY: Thermal Dynamics® Corporation (hereinafter “Thermal”) warrants that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the Thermal products as stated below, Thermal shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with Thermal’s specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at Thermal’s sole option, of any components or parts of the product determined by Thermal to be defective.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: Thermal shall not under any circumstances be liable for special or consequential damages, such as, but not limited to, damage or loss of purchased or replacement goods, or claims of customers of distributor (hereinafter “Purchaser”) for service interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of Thermal with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by Thermal whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.

THIS WARRANTY BECOMES INVALID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY THERMAL PRODUCT.

THIS WARRANTY IS INVALID IF THE PRODUCT IS SOLD BY NON-AUTHORIZED PERSONS.

The limited warranty periods for Thermal products shall be as follows (with the exception of XL Plus Series, CutMaster Series, Cougar and DRAG-GUN): A maximum of three (3) years from date of sale to an authorized distributor and a maximum of two (2) years from date of sale by such distributor to the Purchaser, and with the further limitations on such two (2) year period (see chart below).

The limited warranty period for XL Plus Series and CutMaster Series shall be as follows: A maximum of four (4) years from date of sale to an authorized distributor and a maximum of three (3) years from date of sale by such distributor to the Purchaser, and with the further limitations on such three (3) year period (see chart below).

The limited warranty period for Cougar and DRAG-GUN shall be as follows: A maximum of two (2) years from date of sale to an authorized distributor and a maximum of one (1) year from date of sale by such distributor to the Purchaser, and with the further limitations on such two (2) year period (see chart below).

<table>
<thead>
<tr>
<th>Parts</th>
<th>XL Plus &amp; CutMaster Series</th>
<th>Parts</th>
<th>Cougar/Drag-Gun</th>
<th>Parts</th>
<th>All Others</th>
<th>Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Power Magnetics</td>
<td>3 Years</td>
<td>1 Year</td>
<td>2 Years</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original Main Power Rectifier</td>
<td>3 Years</td>
<td>1 Year</td>
<td>2 Years</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control PC Board</td>
<td>3 Years</td>
<td>1 Year</td>
<td>2 Years</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Other Circuits And Components Including, But Not Limited To, Starting Circuit, Contactors, Relays, Solenoids, Pumps, Power Switching Semi-Conductors</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consoles, Control Equipment, Heat Exchanges, And Accessory Equipment</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torch And Leads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximizer 300 Torch</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SureLok Torches</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td>1 Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Other Torches</td>
<td>180 Days</td>
<td>180 Days</td>
<td>180 Days</td>
<td>180 Days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair/Replacement Parts</td>
<td>90 Days</td>
<td>90 Days</td>
<td>90 Days</td>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Warranty repairs or replacement claims under this limited warranty must be submitted by an authorized Thermal Dynamics® repair facility within thirty (30) days of the repair. No transportation costs of any kind will be paid under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the customer. All returned goods shall be at the customer’s risk and expense. This warranty supersedes all previous Thermal warranties.

Effective: November 15, 2001
SECTION 2: SPECIFICATIONS

**CE CutMaster 38 Power Supply Specifications**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input Power</strong></td>
<td>208-230 VAC (± 10%), Single-Phase, 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td><strong>Input Power Cable</strong></td>
<td>Suitable for 208-230VAC, 20-Amp Single-Phase input power.</td>
<td></td>
</tr>
<tr>
<td><strong>Output Current</strong></td>
<td>20-30 Amps, continuously variable</td>
<td></td>
</tr>
<tr>
<td><strong>Power Supply Gas Filtering Ability</strong></td>
<td>Particulates to 20 Microns</td>
<td></td>
</tr>
</tbody>
</table>

**CE CutMaster 38 Power Supply Duty Cycle (Note 1)**

<table>
<thead>
<tr>
<th></th>
<th>104°F (40°C)</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duty Cycle</strong></td>
<td>35%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>DC Voltage</strong></td>
<td>78</td>
<td>89</td>
</tr>
<tr>
<td><strong>Current</strong></td>
<td>30A</td>
<td>22</td>
</tr>
</tbody>
</table>

**SL 60 Torch Gas Requirements**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas Type</strong></td>
<td>Compressed Air</td>
</tr>
<tr>
<td><strong>Gas specifications</strong></td>
<td>Clean, dry, oil-free (Note 2)</td>
</tr>
<tr>
<td><strong>Maximum Input Gas Pressure</strong></td>
<td>125 psi / 8.6 bar</td>
</tr>
<tr>
<td><strong>Operating Gas Pressure</strong></td>
<td>65 psi / 4.5 bar</td>
</tr>
<tr>
<td><strong>Gas Flow Requirements</strong></td>
<td>300 scfh / 141.5 lpm</td>
</tr>
</tbody>
</table>

**Notes**

1. Duty Cycle is the percentage of time the system can be operated without overheating. Duty cycle is reduced if primary input voltage (AC) is low or the DC voltage is higher than shown in this chart.

2. Air supply must be free of oil, moisture, and other contaminants. Excessive oil and moisture may cause double-arcing, rapid tip wear, or even complete torch failure. Contaminants may cause poor cutting performance and rapid electrode wear. Optional filters provide increased filtering capabilities.

**CAUTION**

Provide clearance for proper air flow through the power supply. Operation without proper air flow will inhibit proper cooling and reduce duty cycle.
## Electrical Requirements

### CE CutMaster 38 Input Power Requirements

<table>
<thead>
<tr>
<th>Voltage (Volts)</th>
<th>Freq. (Hz)</th>
<th>Power Input (kVA)</th>
<th>Current Input (Amps)</th>
<th>Fuse (Amps)</th>
<th>Wire (AWG)</th>
<th>Wire (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>208</td>
<td>50 / 60</td>
<td>3.4</td>
<td>16</td>
<td>20</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>230</td>
<td>50 / 60</td>
<td>3.4</td>
<td>14</td>
<td>20</td>
<td>12</td>
<td>4</td>
</tr>
</tbody>
</table>

Line Voltages with Suggested Circuit Protection and Wire Sizes
Based on National Electric Code and Canadian Electric Code

### NOTES

Refer to Local and National Codes or local authority having jurisdiction for proper wiring requirements.

Cable size is de-rated based on the Duty Cycle of the equipment.

The suggested sizes are based on flexible power cable with power plug installations.

Cable conductor temperature used is 167°F (75°C).

An energy limiting fuse UL Class RK-1 (examples: BUSS LPS/LPN-RK or Gould-Shawmut AZK-A6K) should be used to minimize damage to Plasma Cutting, Welding or power distribution equipment.

NEVER use replaceable element fuses like UL Class H, or “one-time” fuses like UL Class K5.

### Extension Cords

Extension cords must meet National Electric Code Guidelines (and OSHA Guidelines, where applicable). Extension cords must have the same rating as the service and must have a three-pronged plug.

### Options and Accessories

The following options and accessories are available for this Power Supply. Section 6 provides catalog numbers and ordering information.

**A. Single-Stage Air Filter Kit**

A single-stage air filter for use on compressed air shop systems. Highly effective at removing moisture and particulate matter from the air stream to at least 0.85 microns.

**B. Multi-Purpose Cart**

Rugged steel cart on easy-rolling rear wheels and front-mounted swivel casters. Provides maximum mobility for the power supply and can also serve as a display cart. Top shelf is 12" (305 mm) x 20 (508 mm). Steel handle is 30" (762 mm) high.

**C. Cutting Guide Kit**

Easy add-on attachments for straight line, circle, or bevel cutting.

**D. Nylon Dust Cover**

Nylon canvas power supply dust cover with water resistant finish, large outer pocket for storing manuals or spare consumables, and adjustable draw cord for tight fit.
**Torch Specifications**

The Torch provides cutting capacity of up to 3/8 inch / 9.5 mm at 30 amperes.

**A. Torch Configuration and Dimensions**

The torch head is at 75° to the torch handle. The torch includes a torch handle and torch trigger assembly.

B. Torch Leads Lengths

Leads are available in 20 ft (6.1 m) lengths.

C. Parts-In-Place (PIP)

Torch has built-in switch.

12 vdc circuit rating

D. Type of Cooling

Combination of ambient air and gas stream through torch

E. SL60 Torch Ratings *(Refer to Note)*

<table>
<thead>
<tr>
<th>SL60 Torch Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temperature</td>
</tr>
<tr>
<td>Duty Cycle</td>
</tr>
<tr>
<td>Maximum Current</td>
</tr>
<tr>
<td>Voltage <em>(V&lt;sub&gt;peak&lt;/sub&gt;)</em></td>
</tr>
<tr>
<td>Arc Striking Voltage</td>
</tr>
</tbody>
</table>

**NOTE**

*Ratings shown apply to the SL60 Torch only. Refer to the Specifications chart on page 2-1 for CutMaster 38 data.*

F. Plasma Power Supply Used With

- Thermal Dynamics CutMaster 38 series

G. Direct Contact Hazard

For exposed tip the recommended standoff is 0 - 1/16 inch (0 - 2 mm).
SECTION 3: INSTALLATION

3.1 Unpacking

1. Use the packing lists to identify and account for each item.
2. Inspect each item for possible shipping damage. If damage is evident, contact your distributor and / or shipping company before proceeding with the installation.
3. Record Power Supply and Torch model and serial numbers, purchase date and vendor name, in the information block at the front of this manual.

3.2 Lifting Options

The Power Supply includes a handle for hand lifting only. Be sure unit is lifted and transported safely and securely.

⚠️ WARNINGS

Do not touch live electrical parts.

Disconnect input power cord before moving unit.

FALLING EQUIPMENT can cause serious personal injury and can damage equipment.

HANDLE is not for mechanical lifting.

- Only persons of adequate physical strength should lift the unit.
- Lift unit by the handle, using two hands. Do not use straps for lifting.
- Use optional cart or similar device of adequate capacity to move unit.
- Place unit on a proper skid and secure in place before transporting with a fork lift or other vehicle.
3.3 Primary Input Power Connections

CAUTION

Check your power source for correct voltage before plugging in or connecting the unit. The primary power source, fuse, and any extension cords used must conform to local electrical code and the recommended circuit protection and wiring requirements as specified in Section 2.

The Power Supply operates on single phase, 208-230VAC, 50/60 Hz input power.

CAUTION

The primary power source and power cable must conform to local electrical code and the recommended circuit protection and wiring requirements (refer to table in Appendix 1).

The Power Supply is equipped with an input power cable attached. Connect the cable to the customer’s power source as follows:

1. The outer covering of the cable is stripped back at the factory to expose the individual wires at the free end of the cable.
2. Cut back the insulation on the individual wires approximately 1/8 - 3/16 inch (3-5 mm).
3. Connect the ends of the individual wires to a customer supplied plug or main disconnect. All three wires must be connected.
4. Connect a customer-supplied grounding cable to the grounding stud on the rear panel as required by applicable Local and National Codes or local authority having jurisdiction. Grounding stud is identified with this symbol: ⚡
5. Connect the input power cable (or close the main disconnect switch) to supply power to the system.
3.4 Gas Connections

A. Connecting Gas Supply to Unit

The connection is the same for compressed air or high pressure gas cylinders. Refer to subsection 3.4-B if an optional air line filter is to be installed.

1. Connect the gas line to the inlet port. The illustration shows typical fittings as an example. Other fittings may be used.

**NOTE**

For a secure seal, apply thread sealant to the fitting threads, according to manufacturer’s instructions. Do Not use Teflon tape as a thread sealer, as small particles of the tape may break off and block the small gas passages in the torch.
B. Installing Optional Single - Stage Air Filter

An optional filter kit is recommended for improved filtering with compressed air, to keep moisture and debris out of the torch.

1. Attach the Single - Stage Filter Hose to the Inlet Port.
2. Attach the Filter Assembly to the filter hose.
3. Connect the gas line to the Filter. The illustration shows typical fittings as an example. Other fittings may be used.

**NOTE**

For a secure seal, apply thread sealant to the fitting threads, according to the maker’s instructions. Do Not use Teflon tape as a thread sealer, as small particles of the tape may break off and block the small gas passages in the torch. Connect as follows:

**C. Using High Pressure Gas Cylinders**

When using high pressure gas cylinders as the gas supply:

1. Refer to the manufacturer’s specifications for installation and maintenance procedures for high pressure gas regulators.
2. Examine the cylinder valves to be sure they are clean and free of oil, grease or any foreign material. Briefly open each cylinder valve to blow out any dust which may be present.
3. The cylinder must be equipped with an adjustable high - pressure regulator capable of outlet pressures up to 100 psi (6.9 bar) maximum and flows of at least 300 scfh (141.5 lpm).
4. Connect gas supply hose to the cylinder.

**NOTE**

Pressure should be set at 100 psi (6.9 bar) at the high pressure gas cylinder regulator.

Supply hose must be at least 1/4 inch (6 mm) I.D.

For a secure seal, apply thread sealant to the fitting threads, according to manufacturer’s instructions. Do Not use Teflon tape as a thread sealer, as small particles of the tape may break off and block the small gas passages in the torch.
3.5 Torch Connections

If necessary, connect the torch to the Power Supply. Connect only the Thermal Dynamics model SL60 Torch to this power supply.

**WARNING**

Disconnect primary power at the source before connecting the torch.

1. Align the male connector (on the torch lead) with the female receptacle on the power supply. Press the connector into the receptacle fully.
2. Turn the locking ring on the male connector fully clockwise until it clicks.

3. The system is ready for operation.
3.6 Check Air Quality

To test the quality of air, put the RUN / SET switch in the SET (down) position, place a welding filter lens in front of the torch and turn on the gas. Any oil or moisture in the air will be visible on the lens. **Do not start an arc!**
4.01 Product Features

A. General Features

- Gas Pressure Knob
- Handle and Leads Wrap
- Torch Leads Connector
- Control Panel
- Work Cable and Clamp
B. Control Panel

1. **ON / OFF Switch**
   Controls input power to the power supply. Up is ON, down is OFF.

2. **RUN / SET Switch**
   RUN (up) position is for general torch operation. SET (down) position is for setting gas pressure and purging lines.

3. **(A) Output Current Control**
   Sets the desired output current. If the overload protection (fuse or circuit breaker) on the input power circuit opens frequently, either reduce cutting output, reduce the cutting time, or connect the unit to more adequate input power. Refer to Section 2 for input power requirements.

4. **AC Indicator**
   Steady light indicates power supply is ready for operation. Blinking light indicates unit is in protective interlock mode. Shut unit off, shut off or disconnect input power, correct the fault, and restart the unit. Refer to Section 5 for details.

5. **TEMP Indicator**
   Indicator is normally OFF. Indicator is ON when internal temperature exceeds normal limits. Shut unit OFF; let the unit cool before continuing operation.

6. **GAS Indicator**
   Indicator is ON when adequate input gas pressure is present.

7. **DC Indicator**
   Indicator is ON when DC output circuit is active.
4.02 Preparations For Operating

At the start of each operating session:

**WARNING**

Disconnect primary power at the source before assembling or disassembling power supply, torch parts, or torch and leads assemblies.

---

**A. Torch Parts Selection**

Check the torch for proper assembly and appropriate torch parts. The torch parts must correspond with the type of operation, and with the amperage output of this Power Supply (30 amps maximum). Use only genuine Thermal Dynamics parts with this torch.

**NOTE**

When operating the torch in a normal condition, a small amount of gas vents through the gap between the shield cup and torch handle. Do not attempt to over tighten the shield cup as irreparable damage to internal components may result.
B. Torch Connection

Check that the torch is properly connected.

C. Check Primary Input Power Source

1. Check the power source for proper input voltage. Make sure the input power source meets the power requirements for the unit per Section 2, Specifications.
2. Connect the input power cable (or close the main disconnect switch) to supply power to the system.

D. Gas Selection

Ensure air source meets requirements (refer to Section 2). Check connections and turn gas supply on.

E. Connect Work Cable

Clamp the work cable to the workpiece or cutting table. The area must be free from oil, paint and rust. Connect only to the main part of the workpiece; do not connect to the part to be cut off.
F. Power On

Place the Power Supply ON / OFF switch to the ON (up) position. AC indicator \( \sim \) turns on.

G. Set Operating Pressure

Place the Power Supply RUN / SET switch to the SET (down) position. Gas will flow. Adjust gas pressure to 65 psi / 4.5 bar. Gas indicator \( \checkmark \) turns on.
H. Select Current Output Level

Place RUN / SET switch to RUN (up) position. Gas flow will stop. Set the desired current output level.

I. Cutting Operation

Refer to Section 1, Important Safety Precautions. Wear heavy welding gloves and protective clothing. Protect eyes with appropriate shielding. Aim the torch head away from yourself. Slide the trigger release to the rear. Squeeze and hold the trigger. Gas flows for approximately 1 second, then shuts off briefly. The pilot arc then starts. DC indicator \( \text{DC} \) turns on. Bring the torch within transfer distance to the workpiece. The pilot arc stops and the main arc transfers to the workpiece.

**NOTE**

*When operating the torch in a normal condition, a small amount of gas vents through the gap between the shield cup and torch handle. Do not attempt to over tighten the shield cup as irreparable damage to internal components may result.*
J. Cutting Technique

Hold the torch with one or two hands, with the torch tip close to the workpiece. Do not cut or handle the workpiece without welding gloves and protective clothing. Always wear protective eye shielding when cutting or gouging. Move the torch along the cut line so the arc penetrates the workpiece and sparks emerge from the bottom of the cut. Good cutting speeds create a slight trailing arc.

K. Typical Cutting Speeds

Cutting speeds vary according to torch output, the type of material being cut, and operator skill. Speeds shown are typical for this cutting system using air plasma to cut mild steel, with output current at 30 amps and torch held at 0 - 1/16” (0 - 1.6 mm) standoff.

![Graph showing typical cutting speeds for air plasma on mild steel.](image)

Output current setting or cutting speeds may be reduced to allow slower cutting when following a line, using a template or cutting guide while still producing cuts of excellent quality.

L. Postflow

Release the trigger to stop the cutting arc. Gas continues to flow for approximately 10 seconds. During post-flow, if the user moves the trigger release to the rear and presses the trigger, the pilot arc starts. The main arc transfers to the workpiece if the torch tip is within transfer distance to the workpiece.

M. Shutdown

Turn the ON / OFF switch to OFF (down). All Power Supply indicators shut off. Unplug the input power cord or disconnect input power. Power is removed from the system.
4.03 Sequence of Operation

The following is a typical sequence of operation for this power supply. Refer to Appendix 1 for block diagram.

1. Plug the input power cord into an active circuit.
   a. AC power is available at the Power Supply.
2. Place the ON / OFF switch on the Power Supply to ON (up) position.
   a. AC indicator $\rightarrow$ turns on; fan turns on.

**NOTES**

If there is adequate gas supply pressure to the power supply, gas comes on if Torch Trigger is pressed.

If torch trigger is held while user turns on main AC power, system goes into ‘protective interlock’ mode. AC indicator flashes; torch will not pilot. Release torch trigger, turn AC switch OFF then ON.

3. Put RUN / SET switch to SET (down position).
   a. Gas flows to set pressure. Turn gas pressure adjustment knob to set pressure to 65 psi / 4.5 bar; Gas indicator $\Rightarrow$ turns ON when there is sufficient gas pressure.
5. Wear protective clothing and welding gloves. Protect eyes. Slide the trigger release to the rear; squeeze and hold the trigger. Gas flows briefly, then shuts off momentarily. Then gas flow will resume. Pilot arc is established. DC indicator $\rightarrow$ turns ON. Move Torch within transfer distance of workpiece.
   a. Main arc transfers to workpiece.
6. Complete cutting operation.

**NOTE**

If the torch is lifted from the workpiece while the torch switch is activated, the main arc will stop and the pilot arc will automatically restart.

7. Release the torch trigger.
   a. Main arc stops; gas flows for approximately 10 seconds.
8. Set the power supply ON / OFF switch to OFF (down position).
   a. AC indicator $\rightarrow$ turns OFF; fan turns OFF.
9. Set the main power disconnect to OFF, or unplug input power cord.
   a. Input power is removed from the system.
5.01 General Maintenance

A. Each Use

Check torch consumables for wear, replace if necessary.

**WARNING**

Shut off power before inspecting or removing torch parts.

**NOTE**

When operating the torch in a normal condition, a small amount of gas vents through the gap between the shield cup and torch handle. Do not attempt to overtighten the shield cup as irreparable damage to internal components may result.

Art # A-03409

Large O-Ring, Cat. No. 8-3487
Small O-Ring, Cat. No. 8-3486
Electrode, Cat. No. 9-8215
Start Cartridge, Cat. No. 9-8213
30Amp Cutting Tip, Cat. No. 9-8206
Shield Cup, Cat. No. 9-8218

Worn Electrode
Worn Tip
B. Every three months

A. Check internal air filter, replace if necessary.
   1. Shut off input power; turn off the gas supply. Bleed down the gas supply.
   2. Remove the upper cover screws.
   3. Loosen the lower screws. Pull the cover up and away from the unit.

**NOTE**

*Leave internal ground wire in place.*
4. Pull the upper end of the drain tube off the fitting on the filter bowl.
5. Unscrew the bowl. The filter element will be visible and still attached to the main body of the Regulator / Filter.
6. Unscrew the filter element from the Regulator / Filter body. The filter element will come off with a spool and some additional pieces.
7. Note the correct assembly of the filter / spool then remove the filter from the spool and either clean it or replace it.
8. Screw the filter element and spool, with the baffle ring in place (teeth facing downward) back into the Regulator body by compressing the spring on the spool. Tighten firmly by hand.

Regulator / Filter Element Replacement

9. Clean the inside of the bowl if necessary. Check that the knurled valve on the bottom of the bowl is fully open.
10. Reinstall the bowl. Reconnect the drain tube.
11. Reinstall the cover as follows:
   a. Reconnect the ground wire, if necessary.
   b. Set the cover onto the base so that it rests on the lower screws.
   c. Tighten lower screws.
   d. Reinstall and tighten the upper screws.
12. Turn on the air supply.
B. Check Optional Single - Stage Filter Element, replace if necessary.

1. Shut off input power.
2. Shut off air supply, bleed down system.
3. Disconnect gas supply hose from filter.
4. Turn the Cover counter - clockwise.
5. Remove the Filter Element from the Housing and set Element aside to dry.
6. Wipe inside of housing clean, then insert the replacement Filter Element open side first.
7. Replace Housing on Cover.
8. Reattach gas supply hose. If unit leaks between housing and cover, inspect the “O” Ring for cuts or other damage.
5.02 Common Faults

1. Insufficient Penetration
   a. Cutting speed too fast
   b. Torch tilted too much
   c. Metal too thick
   d. Worn torch parts
   e. Cutting current too low
   f. Non-Genuine Thermal Dynamics parts used

2. Main Arc Extinguishes
   a. Cutting speed too slow
   b. Torch standoff too high from workpiece
   c. Cutting current too high
   d. Work cable disconnected
   e. Worn torch parts
   f. Non-Genuine Thermal Dynamics parts used

3. Excessive Dross Formation
   a. Cutting speed too slow
   b. Torch standoff too high from workpiece
   c. Worn torch parts
   d. Improper cutting current
   e. Non-Genuine Thermal Dynamics parts used

4. Short Torch Parts Life
   a. Oil or moisture in air source
   b. Exceeding system capability (material too thick)
   c. Excessive pilot arc time
   d. Gas pressure too low
   e. Improperly assembled torch
   f. Non-Genuine Thermal Dynamics parts used

5. Difficult Starting
   a. Worn torch parts
   b. Non-Genuine Thermal Dynamics parts used
5.03 Basic Troubleshooting Guide

**WARNING**

There are extremely dangerous voltage and power levels present inside this unit. Do not attempt to diagnose or repair unless you have had training in power electronics measurement and troubleshooting techniques.

**A. Basic Troubleshooting: Overview**

This guide covers basic troubleshooting. It is helpful for solving many of the common problems that can arise with this system. If major complex subassemblies are faulty, the unit must be returned to an authorized service center for repair.

Follow all instructions as listed and complete each section in the order presented.

For major troubleshooting and parts replacement procedures refer to the Power Supply Service Manual for this product.

**B. How to Use This Guide**

The following information will help the Customer / Operator determine the most likely causes for various symptoms. Follow all instructions as listed and complete each section in the order presented.

This guide is set up in the following manner:

**X. Symptom (Bold Type)**

Any Special Instructions

1. **Cause**
   a. Check / Remedy

Locate your symptom, check the causes (easiest listed first), then remedies. Repair as needed being sure to verify that unit operates properly after any repairs.

**C. Common Symptoms**

**A. AC indicator ~ OFF**

1. **Switch at customer’s main power panel in OFF (open) position.**
   a. Close main power switch.

2. **Power Supply ON / OFF switch in OFF position.**
   a. Turn switch to ON.

3. **Customer’s main power line fuse(s) or circuit breaker(s) blown**
   a. Check main power panel fuse(s) and replace as required.

4. **Actual input voltage does not correspond to voltage of unit**
   a. Verify that the input line voltage is correct. Refer to Section 2, Input Wiring Requirements.

5. **Faulty components in unit**
   a. Return for repair or have qualified technician repair per Service Manual.
B. AC indicator  flashing; Torch cannot be activated
   1. System is in protective interlock mode. (User held torch trigger while turning on ON / OFF switch.)
      a. Release torch trigger, set ON / OFF switch to OFF (down). Return ON / OFF switch to ON (up) position.

   2. System is in protective interlock mode. (Torch parts are missing or loose.)
      a. Release torch trigger, and set ON / OFF switch to OFF (down). Open main disconnect switch. Check torch parts, including O-rings on torch head. Refer to illustration on page 5-1. Replace parts as needed. Reinstall shield cup; hand-tighten it securely against the torch head. Close main disconnect switch. Set ON / OFF switch to ON (up) position.

   3. System is in protective interlock mode. (User removed shield cup from torch while power supply ON / OFF switch was ON.)
      a. Release torch trigger, and set ON / OFF switch to OFF (down). Set ON / OFF switch to ON (up).

C. Torch will not pilot; DC indicator and GAS indicator flash alternately when torch trigger is activated
   1. Gas pressure is too low. Adjust gas pressure to 65 psi / 4.5 bar.

D. AC indicator  flashing; Temp indicator ON
   1. Fan disconnected or blocked.
      a. Clear fan if blocked; let power supply cool.

E. AC indicator ON; TEMP indicator ON
   1. Air flow blocked
      a. Check for blocked air flow around the unit and correct condition.
   2. Fan blocked
      a. Check and correct condition.
   3. Unit is overheated
      a. Let unit cool down for at least 5 minutes. Make sure the unit has not been operated beyond Duty Cycle limit. Refer to duty cycle data in Section 2.
   4. Input line voltage is below 100 Volts
      a. Check and connect to proper input power line.
   5. Faulty components in unit
      a. Return for repair or have qualified technician repair per Service Manual.

F. Torch will not pilot when torch switch is activated
   1. System is in SET mode
      a. Change to RUN mode.
   2. Faulty torch parts
      a. Inspect torch parts and replace if necessary.
3. **Gas pressure too high or too low**
   a. Adjust to proper pressure.

4. **Upper O-ring on torch head is in wrong position**
   a. Remove shield cup from torch; check position of upper O-ring. Correct if necessary.

5. **Faulty components in unit**
   a. Return for repair or have qualified technician repair per Service Manual.

G. **No cutting output; Torch activated; AC indicator ON; Gas flows; Fan operates**
   1. **Torch not properly connected to power supply**
      a. Check that torch leads are properly connected to power supply.
   2. **Work cable not connected to work piece, or connection is poor**
      a. Make sure that work cable has a proper connection to a clean, dry area of the workpiece.
   3. **Shield cup not properly installed on torch**
      a. Open main disconnect switch. Check that shield cup is fully seated against torch head. Set ON / OFF switch to OFF, check shield cup, close main disconnect switch, turn power supply ON, and try cutting.
   4. **Faulty components in unit**
      a. Return for repair or have qualified technician repair per Service Manual.
   5. **Faulty Torch**
      a. Return for repair or have qualified technician repair.

H. **Low cutting output**
   1. **Incorrect setting of CURRENT (A) control**
      a. Check and adjust to proper setting.
   2. **Faulty components in unit**
      a. Return for repair or have qualified technician repair.
I. Limited output with no control
   1. Poor input or output connections
      a. Check all input and output connections.
   2. Work cable connection to work piece is poor
      a. Make sure that work cable has a proper connection to a clean, dry area of the workpiece.
   3. Faulty components in unit
      a. Return for repair or have qualified technician repair per Service Manual.

J. Erratic or improper cutting output
   1. Poor input or output connections
      a. Check all input and output connections.
   2. Poor work cable connection
      a. Make sure that work cable has a proper connection to a clean, dry area of the workpiece.
   3. Fluctuations in input power
      a. Have electrician check input line voltage.

K. Difficult Starting
   1. Worn torch parts (consumables)
      a. Shut off input power. Remove and inspect torch shield cup, tip, starter cartridge, and electrode. Replace electrode or tip if worn; replace starter cartridge if end piece does not move freely; replace shield cup if excessive spatter adheres to it.

L. Arc shuts off during operation; arc will not restart when torch switch is activated.
   1. Power Supply is overheated (TEMP indicator ON)
      a. Let unit cool down for at least 5 minutes. Make sure the unit has not been operated beyond Duty Cycle limit. Refer to Section 2 for duty cycle specifications.
   2. Fan blades blocked (AC indicator flashing; TEMP indicator ON)
      a. Check and clear blades.
   3. Air flow obstructed (AC indicator flashing; TEMP indicator ON)
      a. Check for obstructed air flow around the unit and correct condition.
   4. Gas pressure too low (GAS indicator OFF when torch switch is activated)
      a. Check source for at least 65 psi / 4.5 bar; adjust as needed.
   5. Torch consumables worn
      a. Check torch shield cup, tip, starter element, and electrode; replace as needed.
   6. Faulty components in unit
      a. Return for repair or have qualified technician repair per Service Manual.
M. No gas flow; AC indicator \( \rightarrow \) ON; Fan operates

1. Gas not connected or pressure too low
   a. Check gas connections. Adjust gas pressure to proper setting.
2. Shield Cup not properly installed.
   a. Check to see that Shield Cup is properly installed.
3. Faulty components in unit
   a. Return for repair or have qualified technician repair.

N. Torch cuts but not adequately

1. Current (A) control set too low
   a. Increase current setting.
2. Torch is being moved too fast across workpiece
   a. Reduce cutting speed.
3. Excessive oil or moisture in torch
   a. Hold torch 1/8 inch (3 mm) from clean surface while purging and observe oil or moisture buildup (do not activate torch). If there are contaminants in the gas, additional filtering may be needed.
6.01 Introduction

A. Parts List Breakdown

The parts list provides a breakdown of all replaceable components.

B. Returns

If a product must be returned for service, contact your distributor. Materials returned without proper authorization will not be accepted.

6.02 Ordering Information

Order replacement parts by catalog number and complete description of the part or assembly, as listed in the parts list for each type item. Also include the model and serial number of the torch. Address all inquiries to your authorized distributor.

6.03 Replacement Assemblies

The following items are included with the replacement power supply: input power cord, work cable & clamp, gas pressure regulator / filter, and operating manual.

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
<th>Catalog #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CE CutMaster 38 Power Supply, European Applications, with input power cord</td>
<td>3-4620</td>
</tr>
<tr>
<td>1</td>
<td>CE CutMaster 38 Power Supply, Australian Applications, with input power cord</td>
<td>3-3820-6</td>
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<tr>
<td>1</td>
<td>Surelok Model SL60 Torch</td>
<td>7-5204</td>
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## 6.04 Power Supply Replacement Parts

<table>
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<tr>
<th>Qty</th>
<th>Description</th>
<th>Catalog #</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Regulator Assembly</td>
<td>9-8643</td>
</tr>
<tr>
<td>1</td>
<td>Regulator/Filter Replacement Filter Element</td>
<td>9-0182</td>
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</table>

## 6.05 Options and Accessories

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
<th>Catalog #</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Single - Stage Filter Kit (includes Filter &amp; Hose)</td>
<td>7-7507</td>
</tr>
<tr>
<td>1</td>
<td>Replacement Filter Body</td>
<td>9-7740</td>
</tr>
<tr>
<td>1</td>
<td>Replacement Filter Hose (not shown)</td>
<td>9-7742</td>
</tr>
<tr>
<td>2</td>
<td>Replacement Filter Element</td>
<td>9-7741</td>
</tr>
<tr>
<td>1</td>
<td>Multi - Purpose Cart</td>
<td>7-8888</td>
</tr>
</tbody>
</table>

---

![Single - Stage Air Filter Diagram](image-url)

---

Art # A-02476
**6.06 Torch Consumables**

When operating the torch in a normal condition, a small amount of gas vents through the gap between the shield cup and torch handle. Do not attempt to over-tighten the shield cup as irreparable damage to internal components may result.

---

**PATENT INFORMATION**

The following parts are licensed under U.S. Patent No(s). 5120930 and 5132512

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-8235</td>
<td>Shield Cap, Drag 50-60A</td>
</tr>
<tr>
<td>9-8236</td>
<td>Shield Cap, Drag 70-100A</td>
</tr>
<tr>
<td>9-8237</td>
<td>Shield Cap, Body</td>
</tr>
<tr>
<td>9-8238</td>
<td>Shield Cap, Machine 50-60A</td>
</tr>
<tr>
<td>9-8239</td>
<td>Shield Cap, Machine 70-100A</td>
</tr>
<tr>
<td>9-8244</td>
<td>Shield Cap, Drag 40A</td>
</tr>
<tr>
<td>9-8245</td>
<td>Shield Cap, Machine 40A</td>
</tr>
</tbody>
</table>
APPENDIX 1: SEQUENCE OF OPERATION
(BLOCK DIAGRAM)

ACTION
Close external disconnect switch.
RESULT
Power to system.

ACTION
ON / OFF switch to ON.
RESULT
AC indicator ON.
Fan on.
Power circuit ready.

ACTION
RUN / SET switch to SET.
RESULT
Gas flows to set pressure.
GAS indicator on when input pressure is adequate.

ACTION
RUN / SET switch to RUN.
RESULT
Gas flow stops.

ACTION
Connect work cable to workpiece.
RESULT
Set output amperage.
System is ready for operation.

ACTION
Protect eyes and activate torch.
RESULT
Gas flows briefly, then stops. Gas restarts.
DC indicator on. Pilot arc established.

PILOT ARC

ACTION
Torch moved away from work (while still activated).
RESULT
Main arc stops. Pilot arc automatically restarts.

ACTION
Torch moved within transfer distance of workpiece.
RESULT
Main arc transfers. Pilot arc off.

ACTION
Release torch trigger.
RESULT
Main arc stops. Gas flow stops after post - flow.

ACTION
ON / OFF switch to OFF
RESULT
All indicators off. Power supply fan shuts off.

ACTION
Unplug input power cord or open external disconnect.
RESULT
No power to system.
APPENDIX 2: DATA TAG INFORMATION

NOTES:
1. Symbol shown indicates single- or three-phase AC input, static frequency converter-transformer-rectifier, DC output.
2. Indicates input voltages for this power supply. Most power supplies carry a label at the input power cord showing input voltage requirements for the power supply as built.
3. Top row: Duty cycle values.
   IEC duty cycle value is calculated as specified by the International ElectroTechnical Commission.
   TDC duty cycle value is determined under the power supply manufacturer's test procedures.
Second row: Rated cutting current values.
Third row: Conventional load voltage values.
4. Sections of the Data Tag may be applied to separate areas of the power supply.

NOTE
Sections of the data tag may be applied in separate locations on the Power Supply.
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APPENDIX 3: SYSTEM SCHEMATIC

A

INPUT 230V ONLY
EMC FILTER CE ONLY
CHASSIS GND
L1 SW1 E1 J7 TEST
120/208/230V INPUT 50/60HZ
SW1 STUD E13
P4 J4
VT (1AM) 12VDC RED BLACK 1 2 3
120VDC
SW2
NORMAL CURRENT CONTROL
CURRENT ADJUST 20 - 30
P2 J2
SET RUN
NORMALLY CLOSED OVER-TEMP TS1 P5 J5
E14B E14A E15A
PANEL INDICATOR
AC TEMP 13 CCW DC 16 19
PS1 PRESSURE SW

B

MAIN PCB ASSEMBLY

C

TEST POINTS:
TP1 LOGIC COMMON
TP2 SHORT TO TP23 TO DISABLE BIAS SUPPLY
TP6 SHORT TO TP24 TO DISABLE POWER FACTOR CORRECTION
TP8 SHORT TO TP26 TO DISABLE SHORTED TORCH PROTECTION

CAUTION: SOME PORTIONS OF THE CONTROL/LOGIC CIRCUITRY ARE CONNECTED TO THE INPUT LINE. CONNECTION TO A GROUNDED INSTRUMENT COULD CAUSE A SHOCK HAZARD OR DESTROY THE POWER SUPPLY. ACCESS BY AN AUTHORIZED TECHNICIAN ONLY.

D

LOGIC AND CONTROL CIRCUITRY

E

BIAS CONVERTER

F

A-03405_AB

APPENDIX A-4 Manual 0-2964
## APPENDIX 4: Publication History

<table>
<thead>
<tr>
<th>Cover Date</th>
<th>Revision</th>
<th>Release Info</th>
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<tbody>
<tr>
<td>3/10/03</td>
<td>--</td>
<td>Manual released.</td>
</tr>
<tr>
<td>6/6/03</td>
<td>--</td>
<td>Added info on upper O-ring position on torch head.</td>
</tr>
<tr>
<td>3/6/06</td>
<td>--</td>
<td>Added Australian power supply version. Added dust cover to options list. Added publication history.</td>
</tr>
<tr>
<td>9/29/06</td>
<td>AA.01</td>
<td>Added patent information, new revision control and manual cover standards</td>
</tr>
<tr>
<td>3/3/08</td>
<td>AB</td>
<td>Removed ref. to 120V on front cover. Updated regulator assembly and filter element part numbers.</td>
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*NOTE:*

Thermal Dynamics uses the manual cover date to indicate release level.