Model PC-100
Power Supply Control Module
Operator’s Manual
Manual Part Number: 5001777
Safety First

Read This Before Using Thermal Spray Equipment

WARNING
Read and understand operator’s manual before using this machine. Failure to follow operating instructions could result in injury or damage to equipment.

Thermal spraying is powerful technology. Do not use equipment carelessly or without observing safe practices. Be safe!
Learn the recommended procedures and standards.

Failure to follow recommended procedures and standards can result in severe injury to people and damage to equipment.

Who should use Thermal Spray Equipment?
Use the equipment only if you have been trained fully in safely using it. Do not allow untrained persons to install, operate, or maintain the equipment.

Understand what to do before you do it!
Make sure that you have read and understand the contents of this manual - especially the safety guidelines and operating procedures - before installing, operating, or maintaining this equipment. Contact a Factory Representative if you do not fully understand any guidelines or instructions.
Sources of Information

To work safely with thermal spray equipment, become familiar with these items:

- This manual and related documentation, especially:
  - Safe practices and safety guidelines described in section 1 and in highlighted paragraphs throughout this guide
  - Operating instructions (see section 4)
- Technical bulletins included with or referred to in this manual. This includes industry publications that contain standards that may apply to your work. (See page vi of this guide for a list of industry publications.)
- Labels, tags, other instructions, and warnings that come with or are attached to the equipment
- Guidelines and practices your specific site has established as standard
# About This Manual

This manual presents information about setting up, operating, maintaining, and troubleshooting your equipment.

## Conventions

Throughout this manual, certain words and symbols are used to draw your attention to important information. These symbols and words have the following meaning:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
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<tr>
<td>Praxair Surface Technologies <strong>RECOMMENDS</strong></td>
<td>A procedure or setting that will produce optimum results</td>
</tr>
<tr>
<td>!</td>
<td>Information that can help to operate the equipment more effectively.</td>
</tr>
<tr>
<td>📚</td>
<td>Refer to the manual before doing any maintenance.</td>
</tr>
<tr>
<td>🕶️</td>
<td>Wear respirator.</td>
</tr>
<tr>
<td>🕶️</td>
<td>Risk of eye injury. Eye protection required.</td>
</tr>
<tr>
<td>⌘</td>
<td>Pressure Relief</td>
</tr>
</tbody>
</table>
WARNING
This device is designed for use with Argon and/or Nitrogen gas.
The gases used with this device pose an asphyxiation hazard.
USE THIS DEVICE ONLY IN A WELL VENTILATED AREA.

WARNING
PERSONAL INJURY HAZARD:
Use caution when handling the powder feeder, feed lines and fittings. There is a possibility of static electricity discharge from the powder feed system which could result in significant discomfort or injury.

HAZARD
Hazards that can result in minor or major damage to equipment, bodily injury to people, and how to prevent such hazards.

EXPLOSION HAZARD

ELECTRIC SHOCK HAZARD

FIRE HAZARD

HIGH TEMPERATURE HAZARD
Related Publications

Information that can help

OSHA (Occupational Safety and Health Administration) establishes mandatory federal safety regulations. For information about the regulations, refer to OSHA Standards, Code of Federal Regulations, Title 29, Part 1910.

Handling compressed gas is among the safety hazards associated with thermal spraying. ANSI/AWS Z49.1, Safety in Welding and Cutting and the Williams-Steiger Occupational Safety and Health Act of 1970 (84 Stat. 1943) cover safe handling of compressed gases. More recently, the Resource Conservation and Recovery Act (RCRA), dealing with the disposal of toxic wastes, potentially affects the thermal spray industry.


**Standard for Gaseous Hydrogen at Consumer Sites, CGA Pamphlet G5.1**, available from the Compressed Gas Association.


**Acetylene, CGA Pamphlet G-1**, available from the Compressed Gas Association.


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Section 1

Safety Guidelines

This section covers potential hazards and safety issues associated with thermal spraying, preparing for its use, and its finishing processes. Subjects include:

- Fire prevention and protection
- Safe operating conditions
- Flame spray and HVOF equipment
- Plasma and arc equipment
- Abrasive blast machines
- Safe operation of the equipment
- Worker’s protection
- Ventilation
- Toxic material handling
- Relevant safety standards

1.1 Reminder: Safety First!

Thermal spraying equipment is very powerful. Do not use equipment carelessly or without observing safe practices. Be safe! Learn the recommended procedures and standards. Failure to follow recommended procedures and standards can result in severe damage to equipment and injury to people.

Use the equipment only if you have been trained fully in its safe operation. Do not allow untrained persons to install, operate, maintain, or troubleshoot the equipment.

Make sure that you have read and understand the contents of this manual - especially the safety guidelines and operating procedures - before installing, operating, or maintaining this equipment. Contact a Factory Representative if you do not fully understand any guidelines or instructions.
1.2 General Guidelines

All persons concerned with thermal spraying must know and understand these safe practices and the safety regulations contained in established standards. Pertinent established standards are listed in "Related Publications" on page vi.

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting that should be read, understood, and followed for the safe and effective use of this equipment.

The installation, operation, maintenance, and troubleshooting of thermal spray equipment requires practices and procedures that ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained by qualified persons as specified in this manual and in accordance with all applicable codes such as, but not limited to, those listed in section 1, and the corresponding sections of the manual. You should thoroughly understand and comply with local, state, and federal (OSHA) health standards, especially when handling toxic materials.

1.3 Fire Protection and Prevention

1.3.1 Work Areas

Keep the work area clean! Avoid accumulating metal dusts. Inspect rafters, tops of booths, and floor cracks for dust accumulation.

**NEVER** store paper, wood, oily rags, or cleaning solvents within the spray room or enclosure.

1.3.2 High Temperatures

Thermal spraying operations generate extremely high temperatures. **NEVER** point thermal spray equipment at any person or flammable material.
1.3.3 Hazardous Materials

**Toxic Wastes**
Preparations for thermal spraying, the process itself, or subsequent finishing operations may generate toxic materials. Dispose of them according to the [EPA Resource Conservation and Recovery Act (RCRA)](https://www.epa.gov/).

**Flammable Solvents and Sealer Bases**
Certain de-greasing solvents and sealer bases are flammable and require special use, handling, and storage precautions in and around the thermal spray area.

**Metal Dusts and Powders**
Treat airborne metal dusts, finely divided solids, or accumulations as explosives. Minimize the danger from dust explosions by providing adequate ventilation in spray booths. Install a cartridge-type dry dust collection system to collect spray dust.

1.4 Safe Operating Conditions

1.4.1 Compressed Gas Cylinders
NEVER use oil or grease on oxygen equipment. Use ONLY special oxidation-resistant lubricants. Consult the equipment manufacturers or a qualified dealer for more information.

Be sure the work area is adequately ventilated before opening any gas valves. Drain the regulator of gas and release the regulator adjusting screw before SLOWLY opening the cylinder valves. ALWAYS stand away from the direction of force when opening cylinder valves.

Install pressure reducing regulators in accordance with ANSI/AWS Z49.1. Use only the appropriate regulator for each gas cylinder: USE ONLY ACETYLENE REGULATORS ON ACETYLENE TANKS OR MANIFOLD SYSTEMS. Always use the correct size wrench to connect the regulator to the cylinder valve outlet; NEVER force or overtighten a connection.

NEVER use oil or grease on a regulator.

1.4.2 Flow Meters

Install and use flow meters in accordance with ANSI/AWS Z49.1. Avoid unsafe operating conditions and ensure proper flame balance by installing backflow prevention devices in conjunction with the flow meters. Place a protective shield on flow meters with glass tubes.

Install and use hose and hose connections according to ANSI/AWS Z49.1 and the Specification for Rubber Welding Hose published by the Rubber Manufacturer’s Association and the CGA. Handle hoses carefully to avoid damage. Use hoses only in the applications for which they are designed. Blow out hoses to remove any dust. Avoid any ignition sources.

Turn regulator adjusting screws slowly to prevent surges that may crack or burst flow meter tubes. Overtightening can collapse the nipple nose, so NEVER OVERTIGHTEN the connecting nuts on pressure reducing regulators and flow meters. If a fitting does not seal without undue force, replace it.

NEVER use a flame to check for gas leaks. Use soapy water to check all hose connections for leaks. Soapy water provides a safer, more sensitive test.
If any connections leak, depressurize, open the connection, clean the sealing surfaces and threads, re-assemble, pressurize, and test for leaks. If a leak persists, depressurize the system.

**EXPLOSION HAZARD:**

NEVER USE LEAKING THERMAL SPRAY EQUIPMENT.

Place a “Danger Do Not Operate” tag on the defective equipment to alert others to the unsafe condition.

Obstructed gas lines caused by defective hoses, collapsed hose stems, or dirt in the gun head gas passages or nozzle jets require excessive gas pressure to obtain proper gas flow.

If required oxygen and fuel gas pressure are more than 3 psi (0.2 bar) over the recommended pressure, check for a fouled nozzle or incorrect air cap. Low pressures often indicate a serious leak. Shut down the equipment and correct the condition before restarting the system.

**EXPLOSION HAZARD:**

Acetylene pressures exceeding 15 psig (1.03 bar) may cause the gas to detonate. If this pressure of 15 psig (1.03 bar) is insufficient, use another fuel gas.

### 1.4.3 Compressed Air

Always refer to gases by their proper names to avoid confusion. Never use compressed air, oxygen, or fuel gas to clean clothing.

For thermal spraying or blasting operations, use compressed air only at recommended pressures. Keep the air line free of oil and moisture. Consult an equipment dealer for filter and after-cooler recommendations.

### 1.4.4 Flame Spray and HVOF Equipment

- Thoroughly read and understand this manual and familiarize all operators with gun operation before lighting the gun. Maintain guns according to recommendations.
PERSONAL INJURY (BURN) HAZARD:
Using a match to light a flame spraying gun can result in serious injury. Use a friction lighter, pilot light, or arc ignition instead.

- Properly seating and lubricating the gun's oxygen, fuel gas and compressed air valves helps the gun operate freely and shut off completely.

Extinguish gun backfires as quickly as possible.

Determine the cause of gun backfires or blowouts BEFORE relighting.

- When you have completed spray operations, when you are shutting down the equipment, or when you leave the equipment unattended, release all gas pressure from the regulators and hoses.

EXPLOSION OR FIRE HAZARD:
NEVER hang a flame spraying gun or its hoses on regulators or cylinder valves.

1.4.5 Plasma and Arc Spray Equipment

Plasma and arc spray equipment differ from flame and HVOF equipment. They use high voltages and amperages that represent an electrical hazard. Train operators how to use the equipment safely before they actually use it. Specifically, ensure that operators know and understand all the operating and safety recommendations in the operator manuals. Always observe standard safety precautions for electrical equipment and operate in accordance with ANSI/AWS Z49.1

Frequently clean arc guns and power supplies to prevent metal dust accumulation that causes electrical short circuits. Properly insulate or ground the wire feed units used with the arc spray equipment. If the gun is suspended, insulate or ground the suspension hook. Ground or insulate all exposed plasma gun electrodes and cable connections. Interconnect all ground cables.
Periodically inspect cables, insulation, hoses, and gas lines. All pushbuttons, pilot lights, plugs, and cables should be intact and meet ANSI/NFPA 70-1979, National Electrical Code standards. Repair or replace faulty equipment at once. Never adjust, clean, or repair any part of the power supply, console, or gun without first disengaging the entire system, including the power supply.

Avoid contact between any ungrounded portion of the plasma or arc gun and the spray booth or chamber. Electrically isolate plasma guns and nozzles from support brackets to prevent stray high frequency current from damaging other electrical equipment and controls.

1.4.6 Abrasive Blast Machine

- Maintain and inspect abrasive blast machines according to manufacturer's instructions. Remove and repair or replace worn parts as needed. Do not exceed recommended air pressure in the blast tank.

- Keep blast hoses as straight as possible between the blast machine and blasting area. Sharp hose bends cause excessive friction and wear that can lead to a blowout at those points. If hoses must be curved around an object, use long radius curves. Store blast hoses in cool, dry areas.

- Be sure blast hose controls function properly. They should require continuous pressure on the activating lever for operation. Releasing the lever should cause the system to shut off (dead man control).

PERSONAL INJURY:

NEVER point a blast nozzle at a person.

- Most blasting operations require respiratory protection for the operator. Select, operate, and maintain the protective device according to ANSI Z88.2, Standard Practices for Respiratory Protection, described in section 1.5.2.
1.4.7 **Handling and Manipulating Equipment**

Most thermal spray and blasting applications require rotation or other manipulation of the part being worked on. Some handling equipment can impart high rotational speeds to parts being coated. Affix and balance parts when necessary. Provide protection for the operator in case a rotating part becomes airborne. Never leave operating equipment unattended.

1.5 **Protecting Workers**


1.5.1 **Eye Protection**

Spraying and blasting operations require eye protection in the form of helmets, hand shields, face shields, or goggles. See ANSI Z87.1 and Z89.2 for recommendations. Operators **MUST** use protection against infrared and ultraviolet radiation and flying particles. Provide all helpers and adjacent operators with suitable eye protection as well. Equip the eye protection with a suitable filter plate to protect against ultraviolet, infrared, and intense visible light radiation (see Table 1-1).

<table>
<thead>
<tr>
<th>Table 1-1</th>
<th>Eye Protection</th>
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<tr>
<td>Operation</td>
<td>Required Type of Eye Protection</td>
</tr>
<tr>
<td>Wire Flame Spraying (except Molybdenum)</td>
<td>Shades 2-4</td>
</tr>
<tr>
<td>Molybdenum Wire Spraying</td>
<td>Shades 3-6</td>
</tr>
<tr>
<td>Flame Spraying of Metal Powder</td>
<td>Shades 3-6</td>
</tr>
<tr>
<td>Flame Spraying of Exothermic Ceramic Powder or Rod</td>
<td>Shades 4-8</td>
</tr>
<tr>
<td>Plasma and Arc Spraying</td>
<td>Shades 9-12</td>
</tr>
<tr>
<td>Arc Bonding</td>
<td>Shades 5-6</td>
</tr>
<tr>
<td>Fusing Operations</td>
<td>Shades 4-6</td>
</tr>
</tbody>
</table>
In thermal spray operations where additional respiratory protection is not required, operators may wear eye protecting goggles alone. The goggles should have indirect ventilating fins to reduce fogging and eliminate danger from flying particles. In plasma spray operations, replace the goggles with helmets or hand shields that provide face, chin, and neck protection from infrared and ultraviolet radiation.

When blasting, use face shields or helmets equipped with dust hoods to protect eyes, face, chin and neck. Provide respiratory protection, as well as other protection discussed in the following paragraphs.

1.5.2 Respiratory Protection

Respiratory protection is necessary for most spray and blast operations. Selection of device is determined, in accordance with ANSI Z88.2, by the nature, type, and magnitude of the fume and gas involved. Select only devices approved by the U.S. Bureau of Mines, National Institute of Occupational Safety and Health (NIOSH), or an other approved authority. Suggested devices for typical thermal spraying and blasting operations include:

- **Blasting in the open**: use a mechanical filter respirator with a face shield and dust hood or a self-contained breathing apparatus.

- **Thermal spraying in confined or semi-confined spaces**: use an air line respirator. Use a device similar to the one described below for abrasive blasting.

- **Abrasive blasting in confined or enclosed spaces**: use a continuous flow air line respirator consisting of a continuous flow air line respirator, a full face piece or helmet, and dust hood sufficient to protect the head and neck from rebounding abrasive material. Minimum air flow to the respirator should be 4 cfm (11.2 L/minute) at the face piece and 6 cfm (19.6 L/minute) entering the helmet or hood. Fresh air blowers are preferred to compressed air as an air source of respirator air. If adequate ventilation is not provided, use an in-line vortex cooler when possible for operator comfort. Filter the air supply line to remove objectionable odors, oil or water mist (or both), and rust particles from the air. Locate the air intake to ensure the respirator receives clean, dry air (CDA). If gaseous air contaminants such as carbon monoxide are possible, use a separate air purifier. Grad D. or better compressed air is considered breathable.
• Thermal spraying in an open or a well-ventilated work area:
additional respiratory protection may not be necessary. In borderline cases, use approved mechanical filter respirators for protection against dust and metal fumes. Borderline cases are those that consist of light work or short duration with nontoxic materials, but with some dust exposure.

Continuous flow air line respirators are adequate for thermal spraying operations involving most commonly used materials. If the respirator air supply fails and the contaminant in the space is not immediately harmful to health, the operator may stop operations, remove the supply line, and return to breathable air.

When highly toxic materials are being applied, the contaminated air is considered immediately harmful and the operator MUST NOT remove the respirator. In these applications, the respirator must be equipped with an emergency auxiliary source of breathable air that the operator can breathe while working in the confined space.

1.5.3 Noise Protection

The Occupational Safety and Health Administration (OSHA) requires employers to provide safe working conditions. OSHA also requires employees to comply with all rules, regulations and orders that apply to their actions and conduct. OSHA does not provide thermal spraying-specific rules but establishes general rules for the control of unsafe and unhealthy elements.

1.5.3.1 Noise and Noise Level

Noise is an unneeded and objectionable sound. Excess noise reduces productivity, slows reaction times, and causes tension, hearing impairment, and nervousness.

Noise level is a measurement of sound wave energy (pressure). The standard unit of sound measurement is decibels (dB). Humans can sense approximately 130 dB.

Thermal Spray Noise Levels
Thermal spray processes generate high noise levels. Table 1-2 shows typical noise levels of various environments. To verify whether a problem exists, measure the noise and noise levels at your site.
### Table 1-2

**Typical Noise Levels of Various Environments**

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<thead>
<tr>
<th>Equipment</th>
<th>Setup</th>
<th>dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arc Guns</td>
<td>Steel</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>24 V/200</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>32 V/500 A</td>
<td></td>
</tr>
<tr>
<td>Powder Guns (Normal)</td>
<td>Acetylene</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>w/o spray booth</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>w/spray booth</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>w/spray booth &amp; air jet cooling Hydrogen</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>w/o spray booth</td>
<td>101</td>
</tr>
<tr>
<td>Powder Guns (High Capacity)</td>
<td>Acetylene</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>w/spray booth</td>
<td>111</td>
</tr>
<tr>
<td>Wire Combustion Guns</td>
<td>Acetylene</td>
<td>114</td>
</tr>
<tr>
<td>1/8 &amp; 3/16 inch</td>
<td>Propane</td>
<td>118</td>
</tr>
<tr>
<td>(3.2 &amp; 4.8 mm)</td>
<td>Propane &amp; nonload hardware</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Methylacetylene-propadiene gas</td>
<td>118</td>
</tr>
<tr>
<td>Plasma gun</td>
<td>Nitrogen - 600 A</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>Nitrogen/Hydrogen - 600 A</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>Argon - 1000 A</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Argon/Hydrogen - 600 A</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>Argon/Helium - 600 A</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>Argon/Nitrogen - 1000 A</td>
<td>131</td>
</tr>
<tr>
<td>HVOF</td>
<td>Oxygen plus kerosene</td>
<td>~126</td>
</tr>
<tr>
<td>Grit-blasting Equipment</td>
<td>Compressed air</td>
<td>80-85</td>
</tr>
<tr>
<td>Exhaust Equipment</td>
<td>Air</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>

### 1.5.3.2 Noise Duration

Noise of sufficient intensity and duration can create physiological effects. The louder the noise, the shorter the permissible exposure. Table 1-3 shows tolerable noise limits for various exposure times.
Table 1-3
Tolerable Noise Limits of Various Exposure Times

<table>
<thead>
<tr>
<th>Exposure Duration (Per Day)</th>
<th>Sound Level (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hours</strong></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>80</td>
</tr>
<tr>
<td>16</td>
<td>82</td>
</tr>
<tr>
<td>8</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>88</td>
</tr>
<tr>
<td>2</td>
<td>91</td>
</tr>
<tr>
<td>1</td>
<td>94</td>
</tr>
<tr>
<td><strong>Minutes</strong></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>97</td>
</tr>
<tr>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>7.5</td>
<td>103</td>
</tr>
<tr>
<td>3.75</td>
<td>106</td>
</tr>
<tr>
<td>1.88</td>
<td>109</td>
</tr>
<tr>
<td>0.94</td>
<td>112</td>
</tr>
<tr>
<td><strong>Seconds</strong></td>
<td></td>
</tr>
<tr>
<td>28.12</td>
<td>115</td>
</tr>
<tr>
<td>14.06</td>
<td>118</td>
</tr>
<tr>
<td>7.03</td>
<td>121</td>
</tr>
<tr>
<td>3.52</td>
<td>124</td>
</tr>
<tr>
<td>1.76</td>
<td>127</td>
</tr>
<tr>
<td>0.88</td>
<td>130</td>
</tr>
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<td>0.44</td>
<td>133</td>
</tr>
<tr>
<td>0.22</td>
<td>136</td>
</tr>
<tr>
<td>0.11</td>
<td>139</td>
</tr>
</tbody>
</table>

1.5.3.3 Hearing Protection

If noise at your site exceeds the limits established by OSHA in paragraph 1910.95, entitled "Occupational Noise Exposure" of the Occupational Safety and Health Standards, you should provide ear and/or other protection to everyone near thermal spray operations to bring the exposure within OSHA permissible, tolerable noise levels. Limit workers' exposure to noise according to federal standards prescribed under the Occupational Safety and Health Act.

Protect operators, nearby workers, and transient passers-by from thermal spray noise: at the source, during its transmission, or at the receiver. Managing any of these can solve the noise problem. Each situation
contains many variables, so each case must be treated individually. This manual can provide only general suggestions for noise control.

Use engineering or administrative controls to reduce noise or noise exposure. Engineering controls include: redesign equipment, relocate equipment, change operating conditions, isolate equipment acoustically, insulate work area, and provide operator hearing protection. Administrative controls include planning and scheduling to reduce exposure.

If engineering and administrative controls do not achieve acceptable noise control, OSHA regulations allow use of suitable personal protective equipment. This also applies while engineering and administrative controls are being established.

Mufflers on thermal spray equipment are impractical and ineffective. Simple baffles between the gun and nearby personnel are not effective because noise scatters around the baffle. Specially designed sound absorbing materials provide a 5 dB reduction to adjacent areas. Sound absorbing materials on walls and hanging baffles can reduce nearby levels but do not solve the problem for the operator.

**Relocate Equipment**
Increasing the distance between the noise source and the receiver lowers the sound pressure level. Table 1-4 lists how increasing distance can reduce decibels in a free field.

<table>
<thead>
<tr>
<th>Distance from Source</th>
<th>Theoretical dBA Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 feet (1 m)</td>
<td>0</td>
</tr>
<tr>
<td>10 feet (3 m)</td>
<td>10</td>
</tr>
<tr>
<td>30 feet (9 m)</td>
<td>20</td>
</tr>
<tr>
<td>90 feet (27 m)</td>
<td>28</td>
</tr>
</tbody>
</table>

**Isolate Equipment**
Isolate noise by moving it away from affected personnel or placing the equipment in an acoustically insulated enclosure. Praxair Surface Technologies offers spray rooms that enclose spray operations and confine noise. These rooms are designed to limit the noise level to specified limits.
outside the room. Contact Praxair Surface Technologies for additional information.

**Insulate Work Area**
Blocking the path of sound transmission by lining the work area with sound absorbing materials provides significant noise reduction. Consult noise control experts for material recommendations.

**Plan and Schedule to Reduce Exposure Time**
Engineering controls focus on eliminating, reducing, or containing the noise hazard. Administrative controls attempt to reduce exposure time.

Planning and scheduling are best used where spraying is intermittent. Usually, spraying time is a small percentage of the total job compared with setup, surface preparation, and finishing.

If spraying time exceeds the permissible levels for noise exposure, schedule jobs over more than one shift or day to keep exposure within maximum limits. More than one operator can spray jobs to keep the exposure of any one person within limits. Spraying outside of regular plant hours can control exposure of persons near the operation. Also, rotate personnel assignments in the vicinity of the thermal spraying operation to control exposure.

1.5.4 **Protective Clothing**
When working in confined spaces, wear flame resistant clothing and leather or rubber gauntlet gloves. Clothing should fit snugly around the wrists and ankles to keep sprayed materials and dust away from the skin.

For work in the open, ordinary clothing may be sufficient. However, open shirt collars and unbuttoned pocket flaps are potential hazards. Always wear high-top shoes and cuffless trousers that cover the tops of the shoes.

If workers will be spraying toxic materials, consult a material supplier for information on protective clothing. Plasma spraying generates intense ultraviolet radiation that can cause a "sunburn" through normal clothing. When plasma spraying, wear clothing such as thick, tightly woven wool clothing that provides protection against radiation. Also wear appropriate eye protection. For more intense exposure, leather capes or aluminized clothing is necessary. Take care to attach aluminized clothing to the outside of the face shield so radiation is
not reflected onto the face shield. Wear aluminized gloves and dark, fire-retardant clothing.

Arc spraying radiation protection is similar to that for electric arc welding and is outlined in ANSI/AWS Z49.1. Some arc spraying guns are equipped with an arc shield that protects the operator from direct exposure to the arc. Also use a helmet if any parts of the body are exposed to direct arc radiation or if exceptionally reflective substrates are being sprayed.

1.5.5 Confined Spaces

Spaces such as a closed tank, boiler, pressure vessel or ship compartment are considered confined spaces. Review AWS F3.1, Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances, if the confined space previously held combustible materials.

Work in confined spaces requires ventilation. See the standards referred to in "Compressed Gas Cylinders" in section 1.4.1 of this manual for ventilation requirements. When you are thermal spraying in any confined space, keep the gas cylinders out of the work space.

1.5.5.1 Rapid Emergency Exit

If operators must enter a confined space through a small opening, provide the means for rapid emergency exit. If operators are using safety belts and life lines for this purpose, attach them to the operator's body so they will not jam in a small exit space. Station at least one attendant trained in rescue work outside the confined space at all times and verify this person's ability to remove the operator from the confined space if an emergency should occur.

1.5.5.2 Factors to Consider

To eliminate the chance of gas escaping through leaks or improperly closed valves, prior to entering the confined space, close the gun valve and shut off the gas supply at a point outside the confined space. If possible, remove the gun and hose from the confined space. Evaluate oxygen level inside the confined space with oxygen monitoring equipment. The amount of contamination to which an operator is exposed during spray operations depends on many factors. Consider the following factors when selecting ventilation systems for operator safety:
- Volume of space in which the operation is performed
- Number of spray/abrasive blast units operating in that space
- Sources of hazardous fumes, gases, or dusts (varies depending on material sprayed)
- Heat generated by the spraying process
- Presence of volatile solvents

Where thermal spraying operations are incidental to general operations, apply local exhaust ventilation to the spray areas to prevent contamination of the general work area.

Carefully maintain individual respiratory protective devices. Clean and disinfect devices before transferring them between employees (see ANSI Z88.2).

Provide mechanical ventilation for operations not performed in the open or in a properly designed and ventilated room. Ventilation equipment usually consists of motor driven portable exhaustors with flexible piping or ducts that remove dust rapidly and allows operators suitable visibility. A ventilation system does not preclude the need for respiratory protection devices. See "Respiratory Protection," section 1.5.2, for recommendations on protective devices and filtration systems.

When thermal spraying on a machine tool such as a lathe, mount an exhaust hood at the end of the carriage so that it travels with the gun, exhausting dust and fumes into the dust collector. Aim the gun so the sprayed material enters the face of the hood. An average lathe hood is about 2 ft² (0.2m²) and the velocity of air entering the opening should be at least 200 feet/minute (1 m/s). The hood opening design should eliminate turbulence along the sides that could force spray dust into the operator's breathing zone. In permanent installations, the entire tool is enclosed except the front; air enters the enclosure at approximately 300 feet/minute (1.5 m/s). The hood top can be hinged to facilitate loading and unloading with a crane. In automatic and production spraying, the entire mechanism is often totally enclosed. Refer to "Industrial Ventilation" published by the American Conference of Governmental Industrial Hygienists (ACGIH).

Provide exhaust equipment for dry grinding or lapping operations performed on sprayed coatings. Consult ANSI Z43.1, Ventilation Control of Grinding, Polishing and Buffing Metals.
Equip spray cabinets used for spraying small and medium size parts with exhaust ventilation with an air velocity of 200 to 400 feet/minute (1 to 2 m/s) entering the hood opening. This is often referred to as the "face velocity." Operate the spray equipment within the face area of the hood and direct the spray into it. Design the cabinet to eliminate turbulent currents. Refer to "Industrial Ventilation" published by ACGIH.

**Blasting Rooms**

Design and maintain separate rooms for grit-blasting and thermal spraying. Design of a blasting room should include adequate lighting and a dry cartridge-type ventilation system having ventilation down draft and longitudinal air flow at a velocity of at least 80 to 100 feet/minute (0.2 to 0.5 m/s). Thoroughly investigate local, state, and federal regulations before exhausting directly into the atmosphere. A blasting room should include a dust collection system that satisfies all laws and local ordinances for the type of work being done in the room.

Grit-blasting and thermal spraying will require their own independent dust collectors. Although dry cartridge-type dust collectors are suitable for use in both the grit blast and thermal spray environments, it is suggested to refer to "Industrial Ventilation", a manual of recommended practice with a compilation of research data and information on design, maintenance and evaluation of industrial exhaust ventilation systems. This manual is not intended to be used as law, but rather as a guide. In addition, the NFPA guidelines should be used for the handling of metallic and other materials.

Avoid using the grit-blasting room for thermal spraying because the dust collectors can quickly become clogged with a combination of thermal spray and grit dust. Also, an accumulation of metallic dust may create a fire or an explosion hazard.

Replace ventilation-removed air with clean, breathable air. Choose fans that provide at least 10 air changes per minute. If your site uses portable gasoline or diesel engines to drive ventilators, position them so that engine exhaust cannot be drawn into the ventilating system or the intake of the respirator air compressor.

Provide operators with respiratory protection as detailed in "Respiratory Protection" in section 1.5.2.

Ground all fans, pipes, dust arrestors and motors. DO NOT ground to piping that carries fuel gas, oxygen, or other flammables or combustibles.
Run ventilation fans when operators are cleaning out booths, pipes, etc. to prevent accumulation of dust or fumes in the system. NEVER weld or cut while repairing any ventilation or dust collecting equipment unless the equipment has been thoroughly cleaned.

### 1.6 Toxic Material

**PERSONAL INJURY HAZARD:**

Almost any material, in finely divided form, can damage the respiratory system. Damage is often not sensed immediately. Take care to keep floors, work benches, and booths free of dusty residues. Carefully clean protective clothing to remove dust, or discard clothing after use. Specific precautions for protecting the health of spray equipment operators vary according to the type of material being sprayed.

#### 1.6.1 Beryllium and Lead

Praxair Surface Technologies does not recommend spraying beryllium, lead, or their compounds because they are highly toxic and hazardous.

#### 1.6.2 Cadmium

Cadmium is highly toxic and hazardous. Use respiratory protective equipment such as fume respirators approved by the U.S. Bureau of Mines, National Institute of Occupational Safety and Health (NIOSH), or other approving authority.

#### 1.6.3 Cobalt, Chromium, and Tellurium

The principal hazard when spraying or blasting these materials comes from ingestion, inhalation, and the subsequent absorption of fumes, dust, or vapors.

The fumes and dust from chromium alloys (such as stainless steels, nickel chromium, and chromium oxide) and tellurium are toxic and hazardous. Provide respiratory protection and adequate ventilation wherever the fume and dust concentration is above the threshold limit (see "Threshold Limit Valves" in section 1.6.6).
1.6.4 Tin and Zinc

Usually encountered in the forms of their oxides and not considered toxic, tin and zinc may cause violent illness, including coughing, headache and, particularly in the case of zinc oxide fumes, nausea, vomiting, chills, fever, muscle and joint pain, and marked thirst. (In the case of zinc oxide, the effect has been known as "brass founder's ague," "brass chills," "zinc fever," or "metal fume fever.") Temporary short term immunity can be developed.

Prevention consists of adequate ventilation and proper respirators (see "Respiratory Protection" in section 1.5.2 and "Confined Spaces" in section 1.5.5). Preclude from the work any operators with pulmonary disease or those who continue to suffer discomfort even with proper ventilation and respirator measures.

1.6.5 Solvents

The radiation generated by plasma or arc spraying causes rapid decomposition of some solvent vapors into noxious and toxic gases, even at considerable distance from the arc. Slow extraction of the part from the solvent cleaning tank can reduce this problem. When spraying vapor-degreased parts, take extra care to see that all solvent (vapors or liquid films or drops of solvent caught by pockets and crevices) is removed prior to thermal spraying.

The ultraviolet radiation from plasma and arc spraying generates airborne ozone. The amount of ozone produced may exceed the maximum allowable concentration in confined spaces. Excess ozone production should be avoided.

1.6.6 Threshold Limit Values

Threshold Limit Values (TLV) are air concentration levels of hazardous materials for exposures not exceeding a total of eight hours daily. TLVs are published annually by the ACGIH. Consult a current TLV list concerning the maximum allowable concentration of toxic material allowed.

Conduct air sampling to determine the ventilation requirements for operations involving the previously listed materials. When less toxic metals are sprayed, the concentration of dust or fumes in the work area must not exceed the TLV for eight-hour exposure. Provide respiratory protection devices and exhaust ventilation when the dust or fume
concentration is sufficiently high to cause operator discomfort even when the appropriate TLV is not exceeded.

1.7 Safety Standards

In addition to the contents of this chapter, a variety of industry publications contain safety standards. See the related publications list on page vi.
Section 2

Equipment Description

2.1 Description

A Equipment

The PC-100 is installed on the Model 3710 Plasma Control Console. The PC-100R is a remote control version. Both the PC-100 and the PC-100R Control Modules are designed to be used with the Model PS-100, PS-1000, and the HPS-100 three-phase constant current (CC) DC plasma power supplies with solid state control. The PC-100 allows the arc spray parameters to be preset before the plasma spraying operation begins. Plasma spray parameters include amperage and voltage settings, auxiliary gas start, and maximum amperage limit settings. The unit also has a Unit Ready, Fan ON, and transformer and rectifier Overheating indicator lights.

Figure 2-1
Model 3710 Control Console with PC-100
Figure 2-2
Model PC-100
Section 3

Installation of PC-100 and PC-100R

ELECTRIC SHOCK HAZARD: Do not touch live electrical parts.

Shut down unit, disconnect input power and employ “lockout/tagging procedures” on power source before making any gun connections. Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

3.1 Removal of Old PC-100

Open the front panel of plasma control console to gain access to both the front and back of the PC-100.

1. If not already marked, label all wires from external devices connecting to the back of the PC-100. See Figure 3-1.

   ![Internal wire bundle](image)
   ![12-pin connection](image)
   ![Grey 3-wire line filter wire](image)
   ![External wire connections](image)

   **Figure 3-1**
   Back of PC-100

2. Disconnect all these wires and move wire bundle off to side.
3. Disconnect internal white wire bundle at the 12-pin connector. See Figure 3-1.

4. Disconnect the internal grey 3-wire line filter cable. Using a screw driver, disconnect the silver ground wire from the back of the PC-100. Then, using long needle nose pliers, reach down between the PC-100 front panel and the back of the unit and carefully pull the white and black spade connectors off of the line filter. Note which wire goes to which spade terminal. See Figure 3-2.

5. From the front of the plasma control panel, locate the PC-100’s four mounting screws and loosen using a 3/32” hex key. See Figure 3-3.

HAZARD
Carefully hold both front and back parts of the PC-100 as the last of the mounting screws are removed. When the four front mounting screws are removed the PC-100 front panel and back assembly will come apart and the back assembly could fall and be damaged.
6. Holding both front and back parts of the PC-100, slowly pull the front panel away from the plasma control panel. Carefully maneuver the 12 wire bundle and the 3-wire cable that are connected to the PC-100 front panel through the gap in the PC-100 rear assembly and the hole in the plasma control panel.

7. Place both halves aside or discard if necessary.

3.2 Installation of New PC-100

1. Disconnect internal white wire bundle at the 12-pin connector. See Figure 3-1.

2. Disconnect the internal grey 3-wire line filter cable. Using a screwdriver, disconnect the silver ground wire from the back of the PC-100. Then, using long needle nose pliers, reach down in between the PC-100 front panel and the back of the unit and carefully pull the white and black spade connectors off of the line filter. Note which wire goes to which spade terminal. See Figure 3-2.

3. Using a 3/32 hex key, remove the four front panel mounting screws. See Figure 3-3. Set aside for use in step 6.

4. Carefully separate the new PC-100 by maneuvering the 12 wire bundle and the 3-wire cable that are connected to the PC-100 front panel through the gap in the PC-100 rear assembly and the whole in the plasma control panel.
5. Locate the back assembly on the back of the plasma control panel and bring the PC-100 front panel up to the front of plasma control panel. Carefully maneuver the 12 wire bundle and the 3-wire cable that are connected to the PC-100 front panel through the gap in the PC-100 rear assembly and the hole in the plasma control panel. Pull them both through the top of the PC-100 rear assembly.

6. Using a 3/32 hex key, replace the four front panel mounting screws and tighten.

7. Connect the internal grey 3-wire line filter cable. Using a screw driver, connect the silver ground wire to the ground connection on the back of the PC-100 back assembly. Then, using long needle nose pliers, reach down in between the PC-100 front panel and the back of the unit and carefully attach the white and black spade connectors to their appropriate spade connector on the line filter.

8. Connect internal white wire bundle’s 12-pin connector. Make sure connection is tight.

9. Connect all the external source wires to their appropriate terminals on the back of the PC-100. See Figure 3-1.

10. Check all mounting and connections.

11. Power up unit.

### 3.3 PC-100R Location

This unit is designed to be installed to a sturdy vertical or horizontal surface. Mounting brackets are provided, or the unit can be directly mounted to the surface.

1. If the mounting bracket is required, install the brackets to the underside of the unit with the screws provided.

2. Attach the bracket (or unit directly) to the mounting surface with the screws provided.

### 3.4 Installing PC-100R Interconnection Cables

This unit is shipped with 5 interconnecting cords that should be connected to the receptacles on the unit as indicated in the steps below. To make connections to the unit: align keyways, insert the cord plug into the
matching receptacle on the unit, and rotate the threaded collar fully clockwise. (reference Figure 3-4)

1. Connect the cord with a 6 pin plug to RC2 on the unit. The remaining end with #10 screw rings should be connected to the bus bar connections. These connections are located behind the front door on the high frequency unit. Connect terminal 66 to the positive connection, and terminal 67 to the negative.

2. Connect the cord with a 3 pin plug to RC3 on the unit. The remaining end with hubbles should be connected to the 2 pole twistlock receptacle on the front of the high frequency unit.

3. Connect the cord with a 4-pin plug to RC4 on the unit. The remaining end with a standard female wall plug should be connected to the power supply on the high frequency unit.

4. Connect the cord with a 17 pin plug to RC5 on the unit. The remaining end with a 17 pin should be connected to the matching receptacle n the PS-100 power supply.

5. Connect the cord with a 4 socket receptacle to RC1 n the unit. The remaining end, with the standard wall plug, should be inserted into a standard 115 volt outlet.

Figure 3-4
Operator Controls for PC-100R
3.5 PC-100R Remote Control Receptacle RC6 Connections

Receptacle RC6 has the capability to provide remote control operation of PC-100R high frequency power, arc start power, and a contact closure in conjunction with relay CR1 to operate such devices as a warning light, buzzer, etc.

The following information is provided to make the necessary pin and jumper link connections to operate a remote control device from RC6. This information is to be used in conjunction with the circuit diagram for the PC-100R found in Section 7.

Socket A: 115 vac is supplied when switch S1 is closed.

Socket B: When the jumper link between K and L on terminal strip 1T is removed, socket B of receptacle RC6 allows remote control 115 vac from socket A of receptacle RC6 to socket B of receptacle RC4, from socket A of receptacle RC6 to socket K of receptacle RC5, and from socket A of receptacle RC6 to push buttons PB2 and PB4. When jumper links between K and L, and K and M on 1T are removed, socket B of receptacle RC6 allows remote control of 115 vac from socket A of receptacle RC6 to socket B of receptacle RC4.

Socket C: When the jumper link between K and L on terminal strip 1T is removed, socket B of receptacle RC6 allows remote control 115 vac from socket A of receptacle RC6 to socket B of receptacle RC4, from socket A of receptacle RC6 to socket K of receptacle RC5, and from socket A of receptacle RC6 to push buttons PB2 and PB4. When jumper links between K and L, L and M on 1T are removed, socket C allows remote control of 115 vac from socket A of receptacle RC6 to socket K of receptacle RC5, and from socket A of receptacle RC6 to push buttons PB2 and PB4.

Socket D: Normally open contact closure with respect to socket E which is energized when the AUXILIARY GAS amperage setting of the PC-100R is reached and relay CR1 is energized.

Socket E: Normally open contact closure with respect to socket D which is energized when the AUXILIARY Gas amperage setting of the PC-100R is reached and relay CR1 is energized.

Socket F: Machine chassis (circuit common).
The remaining sockets in the receptacle are not used.

To make remote control connections to RC6, proceed as follows:

1. Obtain a proper cord and a customer supplied 8-pin Amphenol plug (MS 3106-20-20-7P or equivalent).

2. Connect conductors at end of core to the appropriate pins in plug.

3. Remove front panel of the PC-100R, and locate terminal strip 1T.

4. Remove appropriate jumper links.

5. Reinstall front panel.

6. Align keyway, insert 8-pin plug into receptacle RC6, and rotate threaded collar fully clockwise.

7. Connect remaining end of cord to remote control unit.
Section 4

Operation

4.1 PC-100 and PC-100R Operation

4.1.1 VOLTMETER
The digital VOLTMETER displays arc voltage while plasma spraying. Voltage is displayed to the nearest tenth of a volt.

4.1.2 AMMETER
The digital AMMETER displays preset amperage while idling, and plasma spray amperage while spraying. Amperage is displayed to the nearest ampere.

4.1.3 UNIT READY INDICATOR LIGHT
The UNIT READY indicator light will turn on when power is applied to the PC-100 and open-circuit voltage is available.

4.1.4 FAN ON INDICATOR LIGHT
The FAN ON indicator light will turn on when the fan motor is running. If this goes out while the unit is operating, automatic shut down of the unit will occur. Allow a cooling period before restarting the unit.

4.1.5 XFMR INDICATOR LIGHT
The OFMR indicator light will turn on when either thermostat opens. If this light turns on when the unit is in operation, automatic shut down of the secondary output will occur. Allow a cooling period before attempting to resume operation. The unit will automatically reset when cooled to the proper temperature, and the UNIT READY light will turn back on.
4.1.6 MAIN CONTROL
Depress the actuator button and rotate knob to preset desired amperage.

4.1.7 AUXILIARY GAS START
Depress the actuator button and rotate the knob to preset the amperage at which auxiliary gas will start. The amperage setting is displayed on the AMMETER as long as the actuator button is depressed for a maximum of 15 seconds. When the preset amperage is reached, the auxiliary gas valve is energized. To preset the auxiliary gas pressure, turn the AUXILIARY GAS START control knob fully counterclockwise. Set the PRESSURE and START values before starting the arc.

4.1.8 MAXIMUM LIMIT
Depress the actuator button and rotate the knob to preset a maximum amperage limit for the desired application. The maximum amperage limit is displayed on the AMP meter as long as the actuator button is depressed for a maximum of 15 seconds. If the maximum amperage limit is exceeded, the unit will automatically shut down.
4.1.9 MASTER POWER SWITCH and IDICATING LIGHT
(Model PC-100R only)
The MASTER POWER switch controls the power to both the control unit and high frequency unit. When the switch is in the ON position, the green indication light above the switch will be energized. The indication light will go out when the switch is in the OFF position.

4.1.10 PRESS FOR ARC START PUSH BUTTON
(Model PC-100R only)
When the PRESS FOR ARC START push button is depressed, it momentarily closes and starts the high frequency unit and initiates the arc.

4.1.11 ARC POWER ON PUSH BUTTON
(Model PC-100R only)
The ARC POWER ON push button switch is used to turn on the power to the rectifier. The rectifier must be on before the arc can be started.

4.1.12 ARC POWER OFF PUSH BUTTON
(Model PC-100R only)
The ARC POWER OFF push button switch is used to turn off the power to the rectifier. The arc cannot be started when the rectifier is off.

Figure 4-2
Operator Controls for PC-100R
Section 5  Maintenance & Troubleshooting

5.1  Maintenance

Regular maintenance is critical to ensure safe and accurate operation of the Model PC-100(R). Praxair Surface Technologies recommends developing a maintenance schedule to ensure tasks are performed at the proper times. A suggested schedule is shown in Table 5-1:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>When Due</th>
<th>Performed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect all cables for cuts, cracks, or abrasion* (Replace as required)</td>
<td>Weekly</td>
<td>Operator</td>
</tr>
<tr>
<td>Clean excess dirt and dust from equipment</td>
<td>Weekly</td>
<td>Operator</td>
</tr>
</tbody>
</table>

5.2  Equipment Troubleshooting

ELECTRIC SHOCK HAZARD: Do not touch live electrical parts. Shut down the controller and disconnect the input power, using proper lockout / tagout procedures before inspecting, maintaining, or servicing the equipment. Lockout / tagout procedures consist of locking the line disconnect switch in the open position, removing fuses from the fuse box, or employing another disconnecting device.

Troubleshooting is to be performed by qualified personnel only.

This equipment is designed to operate safely and efficiently. However, as with all equipment, a malfunction can occur. Table 5-2 is an aid to diagnose and fix some common problems that may develop with this control unit. Use Table 5-2 while performing troubleshooting procedures. If you cannot correct the problem, contact a Praxair Surface Technologies Factory Representative. Please provide the following information when reporting a malfunction to your Factory Representative:

- Product model and serial numbers
- Date of delivery and date put into service
- Praxair TAFA Invoice number
- Nature of the problem (fault) and details of any attempt made to correct the fault
<table>
<thead>
<tr>
<th>FAULT/ALARM</th>
<th>CAUSE</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red light on PC100R does not come on.</td>
<td>(a) No supply power.</td>
<td>(a) Verify the cables are all plugged in to the side tightly and/or verify 110 VAC at wall outlet.</td>
</tr>
<tr>
<td></td>
<td>(b) F1 fuse blown.</td>
<td>(b) Replace 5 amp fuse, if it blows again find short.</td>
</tr>
<tr>
<td>Volt or amp meters remain blank after power up.</td>
<td>(a) Circuit board supply voltages missing.</td>
<td>(a) Power supply not powered up.</td>
</tr>
<tr>
<td>A digit in the volt or amp meters missing segments.</td>
<td>(a) Faulty meter.</td>
<td>(a) Replace faulty meter on circuit board with pn 05007305.</td>
</tr>
<tr>
<td>Amp meter setpoint does not display when microswitch is depressed.</td>
<td>(a) Microswitch not making contact with circuit board button.</td>
<td>(a) Remove excessive varnish around standoffs on circuit board or tighten loose circuit board mounting screws.</td>
</tr>
<tr>
<td>Amp meter displays a value before process is started.</td>
<td>(a) One or more microswitches are stuck in the depressed position.</td>
<td>(a) Use electronic contact cleaner to clean dirt out of the microswitch or replace.</td>
</tr>
<tr>
<td>XFRM or rectifier indicator lights on.</td>
<td>(a) Power supply over heated.</td>
<td>(a) Verify power supply ambient temperature, power supply fan operation, power supply is the correct distance from walls for adequate air flow, power supply sheet metal attached properly, or clean dirt from inside of power supply.</td>
</tr>
</tbody>
</table>
Figure 5-1  PC-100 Circuit Diagram

Figure 5-2  PC-100R Circuit Diagram
Figure 5-3  Wiring Diagram for PC-100
Figure 5-4  Wiring Diagram for PC-100R
Notes
Section 6

Parts List
<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART #</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>017605A</td>
<td>PC-100 CONTROL</td>
<td>EA</td>
</tr>
<tr>
<td>2</td>
<td>5008466</td>
<td>HARNESS, WIRING, PC-100</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>5008100</td>
<td>PANEL, PC-100 CABINET</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>5008102</td>
<td>PANEL, PC-100, FRONT</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>5008101</td>
<td>PANEL, PC-100 MOUNTING</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>5008113</td>
<td>PANEL, PC-100 FRONT LEXAN</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>5007297</td>
<td>KNOB, POINTER</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>5007296</td>
<td>LENS, YELLOW, LED</td>
<td>2</td>
</tr>
<tr>
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