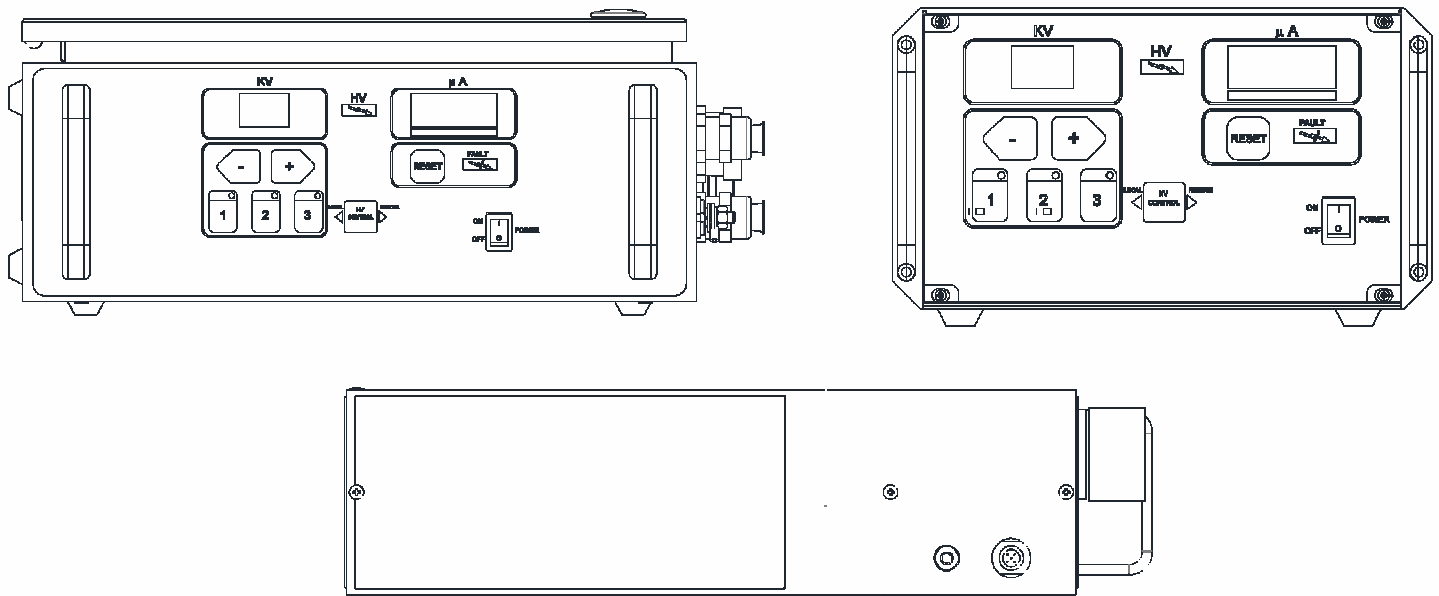


9060 Power Supply Kit for 80104 External Cascade



**MODEL: 80143-XXX for use with
Esta-Quick Applicator AEMD600
(Atex Approved)**

**MODEL: 80146-XXX for use with
Evolver SE (Non-Approved)**

IMPORTANT: Before using this equipment, carefully read
SAFETY PRECAUTIONS, starting on page 1, and all instructions
in this manual. Keep this Service Manual for future reference.

Service Manual Price: \$50.00 (U.S.)

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SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any Ransburg electrostatic coating system, read and understand all of the technical and safety literature for your Ransburg products. This manual contains information that is important for you to know and understand. This information relates to USER SAFETY and PREVENTING EQUIPMENT PROBLEMS. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

A WARNING! states information to alert you to a situation that might cause serious injury if instructions are not followed.

A CAUTION! states information that tells how to prevent damage to equipment or how to avoid a situation that might cause minor injury.

A NOTE is information relevant to the procedure in progress.

While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment. Differences in local codes and plant requirements, material delivery requirements, etc., make such variations inevitable. Compare this manual with your system installation drawings and appropriate Ransburg equipment manuals to reconcile such differences.

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. If you do not have the manuals and safety literature for your Ransburg system, contact your local Ransburg representative or Ransburg.



WARNING

► The user **MUST** read and be familiar with the Safety Section in this manual and the Ransburg safety literature therein identified.

► This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the **WARNINGS** and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to ALL local building and fire codes and ordinances as well as **NFPA-33 SAFETY STANDARD, LATEST EDITION**, prior to installing, operating, and/or servicing this equipment.



WARNING

► The hazards shown on the following pages may occur during the normal use of this equipment. Please read the hazard chart beginning on page 2.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
Spray Area 	Fire Hazard Improper or inadequate operation and maintenance procedures will cause a fire hazard. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation. Frequent Power Supply or Controller shut-down indicates a problem in the system requiring correction.	Fire extinguishing equipment must be present in the spray area and tested periodically. Spray areas must be kept clean to prevent the accumulation of combustible residues. Smoking must never be allowed in the spray area. The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance. When using solvents for cleaning: - Those used for equipment flushing should have flash points equal to or higher than those of the coating material. - Those solvents used for cleaning must have a flash point at minimum of 5°C (9°F) greater than the ambient temperature. It is the end users responsibility to insure this condition is met.). Spray booth ventilation must be kept at the rates required by NFPA-33, OSHA, country, and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents. Electrostatic arcing must be prevented. Safe sparking distance must be maintained between the parts being coated and the applicator. A distance of 1 inch for every 10KV of output voltage is required at all times. Test only in areas free of combustible material. Testing may require high voltage to be on, but only as instructed. Non-factory replacement parts or unauthorized equipment modifications may cause fire or injury. If used, the key switch bypass is intended for use only during setup operations. Production should never be done with safety interlocks disabled. Never use equipment intended for use in water-borne installations to spray solvent based materials. The paint process and equipment should be set up and operated in accordance with NFPA-33, NEC, OSHA, local, country, and European Health and Safety Norms.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
Spray Area 	Explosion Hazard Improper or inadequate operation and maintenance procedures will cause a fire hazard. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation. Frequent Power Supply or Controller shutdown indicates a problem in the system requiring correction.	Electrostatic arcing must be prevented. Safe sparking distance must be maintained between the parts being coated and the applicator. A distance of 1 inch for every 10KV of output voltage is required at all times. Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33. Test only in areas free of flammable or combustible materials. The current overload sensitivity (if equipped) MUST be set as described in the corresponding section of the equipment manual. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if the current overload sensitivity is not properly set. Frequent power supply shutdown indicates a problem in the system which requires correction. Always turn the control panel power off prior to flushing, cleaning, or working on spray system equipment. Before turning high voltage on, make sure no objects are within the safe sparking distance. Ensure that the control panel is interlocked with the ventilation system and conveyor in accordance with NFPA-33, EN 50176. Have fire extinguishing equipment readily available and tested periodically.
General Use and Maintenance 	Improper operation or maintenance may create a hazard. Personnel must be properly trained in the use of this equipment.	Personnel must be given training in accordance with the requirements of NFPA-33, EN 60079-0. Instructions and safety precautions must be read and understood prior to using this equipment. Comply with appropriate local, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, EN Norms and your insurance company requirements.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
Spray Area / High Voltage Equipment 	Electrical Discharge There is a high voltage device that can induce an electrical charge on ungrounded objects which is capable of igniting coating materials. Inadequate grounding will cause a spark hazard. A spark can ignite many coating materials and cause a fire or explosion.	Parts being sprayed and operators in the spray area must be properly grounded. Parts being sprayed must be supported on conveyors or hangers that are properly grounded. The resistance between the part and earth ground must not exceed 1 meg ohm. (Refer to NFPA-33.) Operators must be grounded. Rubber soled insulating shoes should not be worn. Grounding straps on wrists or legs may be used to assure adequate ground contact. Operators must not be wearing or carrying any ungrounded metal objects. When using an electrostatic handgun, operators must assure contact with the handle of the applicator via conductive gloves or gloves with the palm section cut out. NOTE: REFER TO NFPA-33 OR SPECIFIC COUNTRY SAFETY CODES REGARDING PROPER OPERATOR GROUNDING. All electrically conductive objects in the spray area, with the exception of those objects required by the process to be at high voltage, must be grounded. Grounded conductive flooring must be provided in the spray area. Always turn off the power supply prior to flushing, cleaning, or working on spray system equipment. Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
Electrical Equipment 	Electrical Discharge High voltage equipment is utilized in the process. Arcing in the vicinity of flammable or combustible materials may occur. Personnel are exposed to high voltage during operation and maintenance. Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation. Frequent power supply shutdown indicates a problem in the system which requires correction. An electrical arc can ignite coating materials and cause a fire or explosion.	Unless specifically approved for use in hazardous locations, the power supply, control cabinet, and all other electrical equipment must be located outside Class I or II, Division 1 and 2 hazardous areas in accordance with NFPA-33 and EN 50176. Turn the power supply OFF before working on the equipment. Test only in areas free of flammable or combustible material. Testing may require high voltage to be on, but only as instructed. Production should never be done with the safety circuits disabled. Before turning the high voltage on, make sure no objects are within the sparking distance.
Toxic Substances 	Chemical Hazard Certain materials may be harmful if inhaled, or if there is contact with the skin.	Follow the requirements of the Material Safety Data Sheet supplied by coating material manufacturer. Adequate exhaust must be provided to keep the air free of accumulations of toxic materials. Use a mask or respirator whenever there is a chance of inhaling sprayed materials. The mask must be compatible with the material being sprayed and its concentration. Equipment must be as prescribed by an industrial hygienist or safety expert, and be NIOSH approved.

AREA	HAZARD	SAFEGUARDS
Tells where hazards may occur.	Tells what the hazard is.	Tells how to avoid the hazard.
Spray Area 	Explosion Hazard— Incompatible Materials Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1,-Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment explosion.	Aluminum is widely used in other spray application equipment - such as material pumps, regulators, triggering valves, etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing, or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your coating supplier. Any other type of solvent may be used with aluminum equipment.

N O T E S

INTRODUCTION

GENERAL DESCRIPTION

The Ransburg Spray Process

The *Ransburg Spray Process* is an air atomized method for applying coatings to objects electrostatically. This system applies a high voltage DC charge to the applicator nozzle electrode, creating an electrostatic field between the atomizer and the target object. The target is electrically grounded through its support that may be either stationary or moving.

A regulated pressure fluid system delivers coating material to the atomizer. At the atomizer, air is applied that atomizes the coating material forming a spray mist that, under the influence of the electrostatic field, becomes electrically charged. The charged particles are attracted to, and deposited on, the target object. The forces between the charged particles and the grounded target are sufficient to turn most normal overspray around and deposit it on the side and back surfaces of the target. Therefore, a high percentage of the spray is deposited on the target.

9060 Power Supply

The *9060 Cascade Control Unit* converts standard AC line voltage to a high frequency, low voltage signal ranging from 0 to 10 Vrms. This signal is supplied to an external cascade through a low voltage cable. The external cascade converts the low voltage signal into a high voltage. This high voltage is transmitted through the cable to the applicator. At the applicator an electrode in the applicator creates a DC high voltage field the spray goes through and picks up the electrostatic charge. When the material is directed to a grounded target, more material is attracted to the target yielding higher painting efficiency.

The voltage/current characteristic is designed to optimize the charging process under varying load conditions, and to limit the

operating current to a safe maximum value.

In addition to supplying low voltage output to the applicator, the 9060 Cascade control unit also provides controls for AC power ON/OFF, infinite high voltage adjustment, a high voltage meter, a current meter, an AC power ON indicator, a high voltage ON indicator, a cable fault indicator, and a current overload indicator and reset switch. Additionally, output terminals are provided for remote overload reset, analog current output, and high voltage control. Interlock connections for a conveyor and exhaust fan are also provided. A combination triple setpoint/analog input control board is also supplied with 9060 Cascade control units powering automatic spray applicators.

9060 Power Supply Kit 80143 and 80146

The 9060 Power Supply Kit 80143-XXX and 80146-XXX are designed to be used with either the Esta-Quick Applicator (AEMD 600) or the Evolver SE product (A12455-XXXX). Both use an oil filled cascade.

NOTE

- The only combination of units that carry any approval is the AEMD600 used with the 80143-XXX units as described in this manual. Any other combination of applicator and 9060 unit does not have any agency approval associated with it. When using equipment that is not approved, the user needs to be aware of the code requirements needed to operate safely. If there is any question regarding safe installation requirements when using this product, refer to European Norms (EN 50 176) or NFPA-33.

The 9060 Power Supply Kit is available for automatic applicators as follows:

****Note: CE/Atex approval with this power source is only for the AEMD-600**

****9060 Power Supply Kit Part Structure**

80143-ABC (Atex approved when used with AEMD600)-Esta-Quick

A-Unit Power Type

- 1 For 110/120 V Input Power (Domestic) 10" Rack
- 2 For 220/240 V Input Power (European) 10" Rack
- 3 For 220/240 V Input Power (Chinese) 10" Rack
- 4 For 110/120 V Input Power (Domestic) Box Style
- 5 For 220/240 V Input Power (European) Box Style
- 6 For 220/240 V Input Power (Chinese) Box Style

B- High Voltage Cable Length

- 1 For 4.5 m (15 ft.)
- 2 For 7.5 m (25 ft.)
- 3 For 15 m (50 ft.)
- 4 For 22.5m (75 ft.)

C-Low Voltage Cable Length

- 1 10 m LV Cable
- 2 15 m LV Cable

80146-ABC (non- approved when used with A12455-XX) Evolver SE

A-Unit Power Type

- 1 For 110/120 V Input Power (Domestic) 10" Rack
- 2 For 220/240 V Input Power (European) 10" Rack
- 3 For 220/240 V Input Power (Chinese) 10" Rack
- 4 For 110/120 V Input Power (Domestic) Box Style
- 5 For 220/240 V Input Power (European) Box Style
- 6 For 220/240 V Input Power (Chinese) Box Style

B- High Voltage Cable Length

- 1 For 4.5 m (15 ft.)
- 2 For 7.5 m (25 ft.)
- 3 For 15 m (50 ft.)
- 4 For 22.5m (75 ft.)

C-Low Voltage Cable Length

- 1 10 m LV Cable
- 2 15 m LV Cable

SPECIFICATIONS

Physical - #80143 Kit - 10" Rack 9060 P/N 80120-31X

Height:	132mm (5.2 inches)
Width:	429mm (16.9 inches) (483mm ear to ear) (19 inches)
Depth:	308mm (12.1 inches)
Weight:	6.8 kg (15.1 lbs.)

Physical - #80143 Kit - 19" Box 9060 P/N 80100-31X

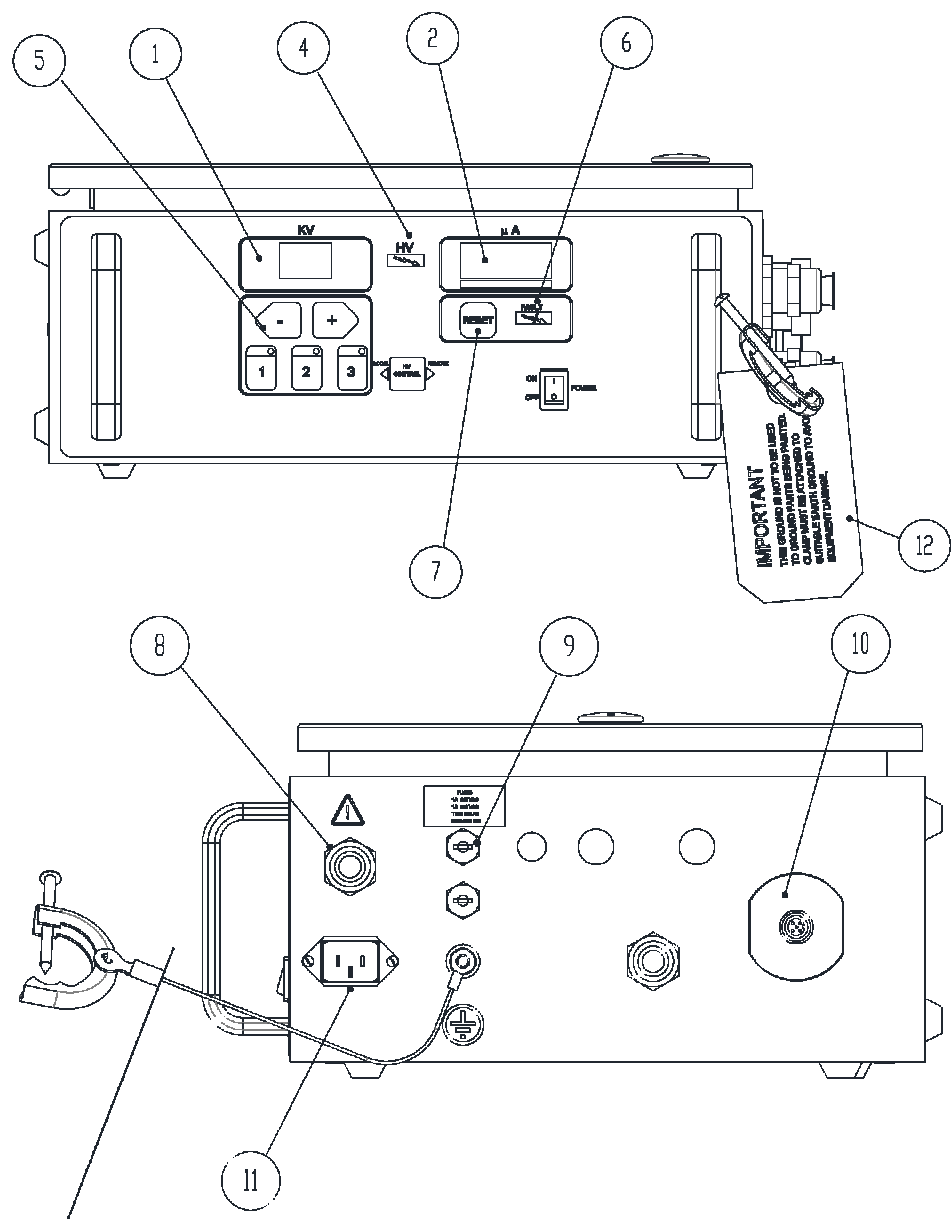
Height:	16.5 cm (6.5 inches)
Width:	37.8 cm (14.9 inches)
Depth:	30.7 cm (12.1 inches)
Weight:	10.2 kg (22.5 lbs.)

Physical - Cascade—#80104

Height:	400mm (15.7 inches)
Width:	102mm Square (4.0 inches)
Weight:	4.1 kg (9.1 lbs.)

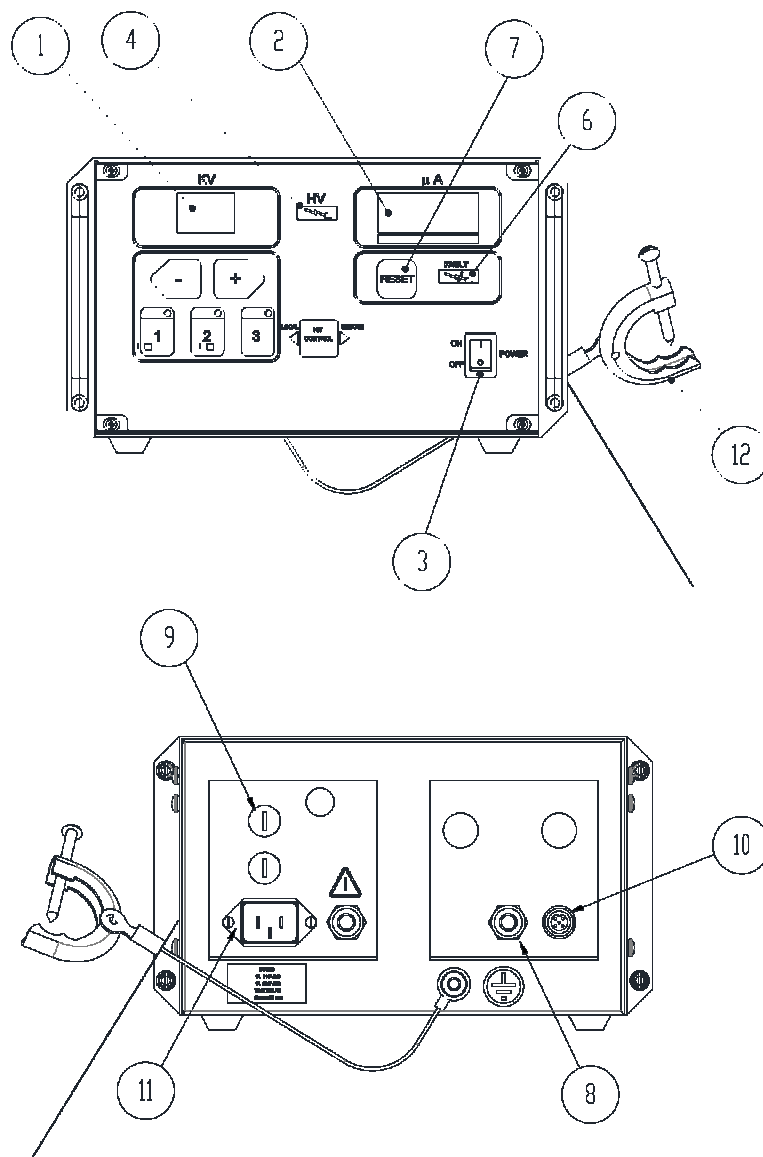
Electrical Requirements

Input:	
Voltage:	90-264 VAC
Current:	0.4/0.2 Amps AC
Frequency:	50/60 Hertz
Wattage:	40 watts (Max.)
Output:	
Voltage:	0-10 VRMS
Current:	1.5 Amps RMS (max.)
Pneumatic:	
Supply Air:	6.9 Bar (Max.) (100 PSI)
Cascade:	
Umax:	90kv (Maxi.)
Max. Current:	120 mA (Max.)



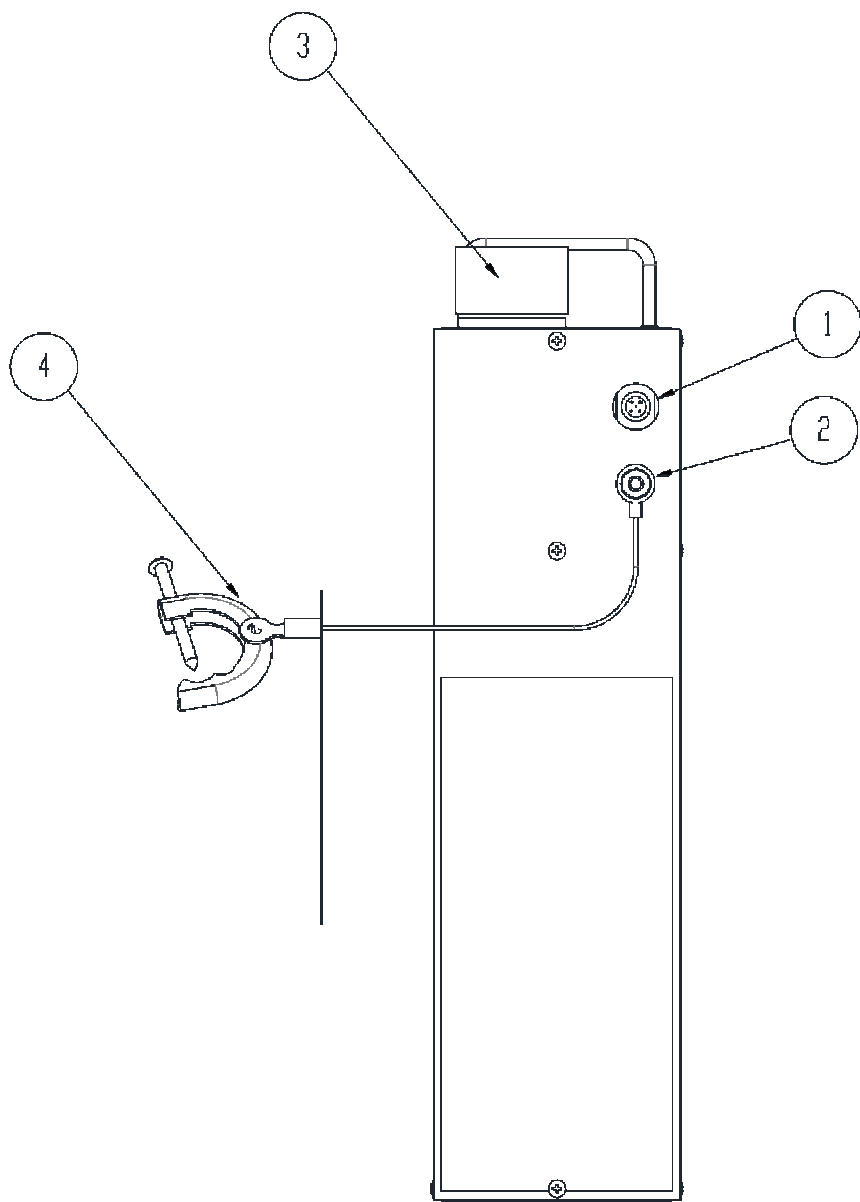
Number	Description
1	Kilovolt Display
2	Micro Amp Display
3	High Voltage On Indicator
4	Unit—OFF—OFF Switch
5	Set Point Adjust Buttons
6	Fault Indicator
7	Manual Reset Pad
8	External Wiring Grommet
9	Fuse
10	Low Voltage Cable Connector
11	AC Inlet Receptacle
12	Ground Wire Assembly

Figure 1: 80100 Cascade Control Unit Features



Number	Description
1	Kilovolt Display
2	Micro Amp Display
3	High Voltage On Indicator
4	Unit—OFF—OFF Switch
5	Set Point Adjust Buttons
6	Fault Indicator
7	Manual Reset Pad
8	External Wiring Grommet
9	Fuse
10	Low Voltage Cable Connector
11	AC Inlet Receptacle
12	Ground Wire Assembly

Figure 2: 80120 Cascade Control Unit Features



Number	Description
1	Low Voltage Cable Connector
2	Ground Lug Connector
3	Cascade High Voltage Connection
4	Ground Wire Assembly

Figure 3: 80104 Cascade Control Unit Features

EUROPEAN ATEX DIRECTIVE 94/9/EC, ANNEX II, 1.0.6

The following instructions apply to equipment covered by certificate number Sira 11ATEX5240X:

1. The equipment may be used with flammable gases and vapors with apparatus groups II and with temperature class T6.
2. The equipment is only certified for use in ambient temperatures in the range +12.8°C to +40°C and should not be used outside this range.
3. Installation shall be carried out by suitably trained personnel in accordance with the applicable code of practice e.g. EN 60079-14:1997.
4. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice e.g. EN 60079-17.
5. Repair of this equipment shall be carried out by suitable trained personnel in accordance with the applicable code of practice e.g. EN 60079-19.
6. Putting into service, use, assembling, and adjustment of the equipment shall be fitted by suitably trained personnel in accordance with the manufacturer's documentation.

Refer to the "Table of Contents" of this service manual:

- a. Installation
 - b. Operation
 - c. Maintenance
 - d. Parts Identification
7. Components to be incorporated into or used as replacement parts of the equipment shall be fitted by suitably trained personnel in accordance with the manufacturer's documentation.

8. The certification of this equipment relies upon the following materials used in its construction:

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection provided by the equipment is not compromised.

Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions: e.g. regular checks as part of routine inspections or establishing from the material's data sheets that it is resistant to specific chemicals.

Refer to "Specifications" in the "Introduction" section:

- a. All fluid passages contain stainless steel or nylon fittings.
 - b. High voltage cascade is encapsulated with a solvent resistant epoxy.
9. A recapitulation of the certification marking is detailed in the "Atex" section, on the next page, drawing numbers: 80108 and 80075.
 10. The characteristics of the equipment shall be detailed e.g. electrical, pressure, and voltage parameters.

The manufacturer should note that, on being put into service, the equipment must be accompanied by a translation of the instructions in the language or languages of the country in which the equipment is to be used and by the instructions in the original language.

9060 Cascade Low Voltage Control Unit Kit ATEX Product 80143-XXX

Marking Definitions

Ex Certificate Number: Sira 11ATEX5240X

Sira = Notified Body performing EC-type examination

11 = Year of certification

ATEX = Reference to ATEX Directive

5 = Protection Concept Code (code 5 is titled Encapsulation)

240 = Document serial number

X = Special conditions for safe use apply

Product Marking



II 2 G

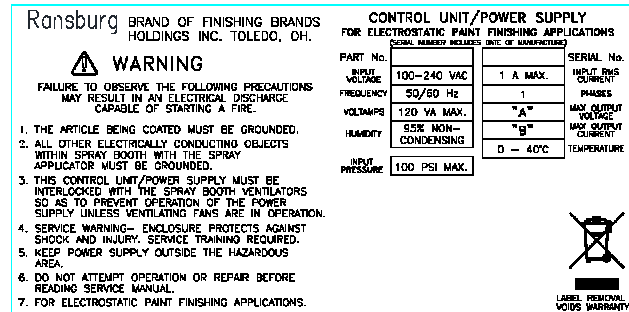
Ex = Specific marking of explosive protection

II = Equipment Group hazardous area characteristics

2 = Equipment Category

G = Type of explosive atmosphere (gases, vapors, or mists)

EEx 0.24mJ. The 80143-XXX 9060 Cascade Control Unit Kit is suitable for use in electrostatic spraying installations complying with EN 50 176 as they are a Type A class with a discharge energy limit of 0.24mJ.



Label 80108



Label 80075



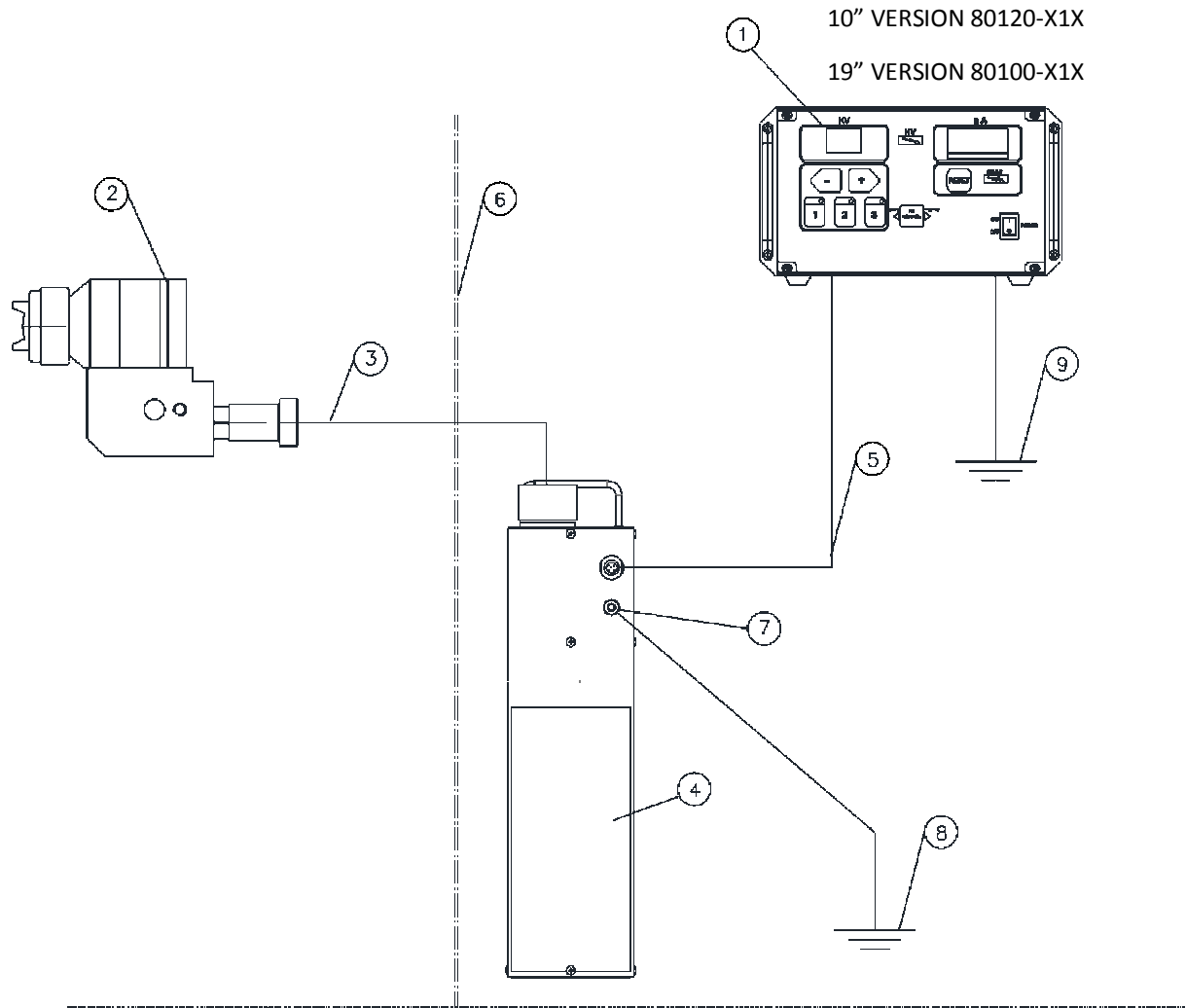
Label 80081

INSTALLATION

**WARNING**

- The 9060 Controller **MUST** be located outside of the hazardous area.
- The User **MUST** read and be familiar with the “Safety” section of this manual.
- This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean, or maintain this equipment! Special care should be taken to ensure that the warnings and requirements of operating and servicing safely are followed. The user should be aware of and adhere to ALL local building and fire codes and ordinances as well as NFPA-33, OSHA, and all related country safety codes prior to installing, operating, and/or servicing this equipment.

Refer to CP-13-05 or CP-13-02 (Included with Your Kit) for Control Unit Installation Instructions.



Number	Description
1	9060 Low Voltage Unit
2	AEMD-600 Unit (Atex Approved) WITH MACHINE ADAPTER AEMD-4500-6
3	A10560-XXD High Voltage Cable
4	80104-01 External Cascade
5	79338-XX Low Voltage Cable
6	Booth Wall
7	Cascade Ground Connection
8	Cascade Separate True Earth Ground
9	Control Unit Separate True Earth Ground

Figure 4: Typical Installation 80143-XXX

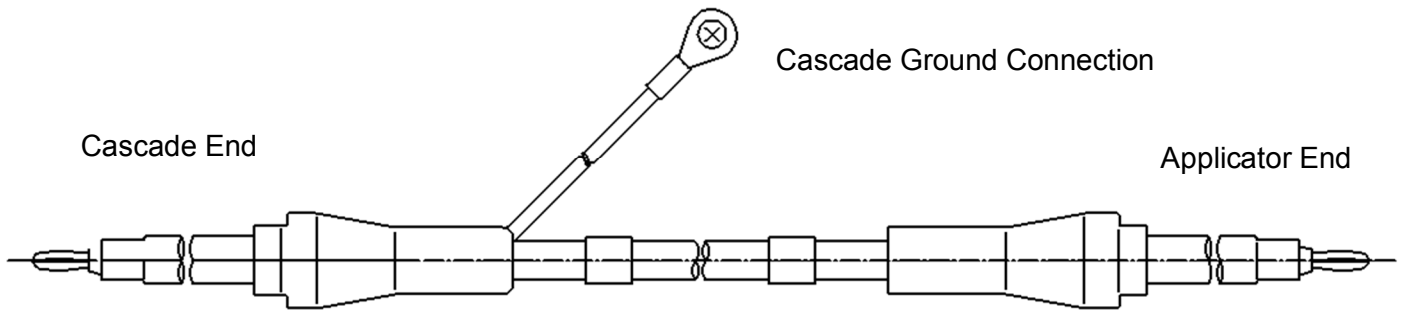


Figure 5: High Voltage Cable A10560-XXD

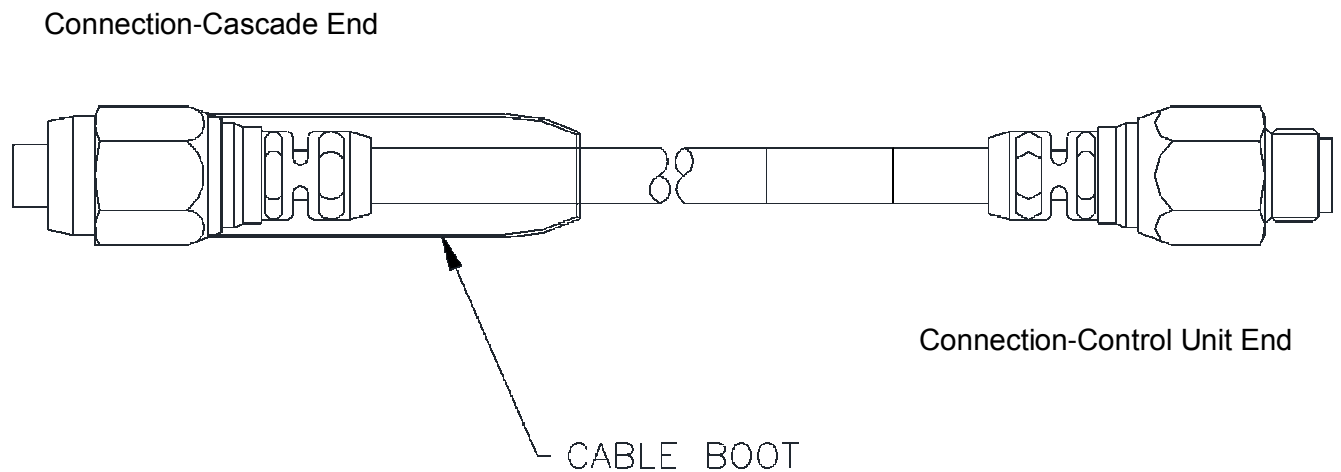
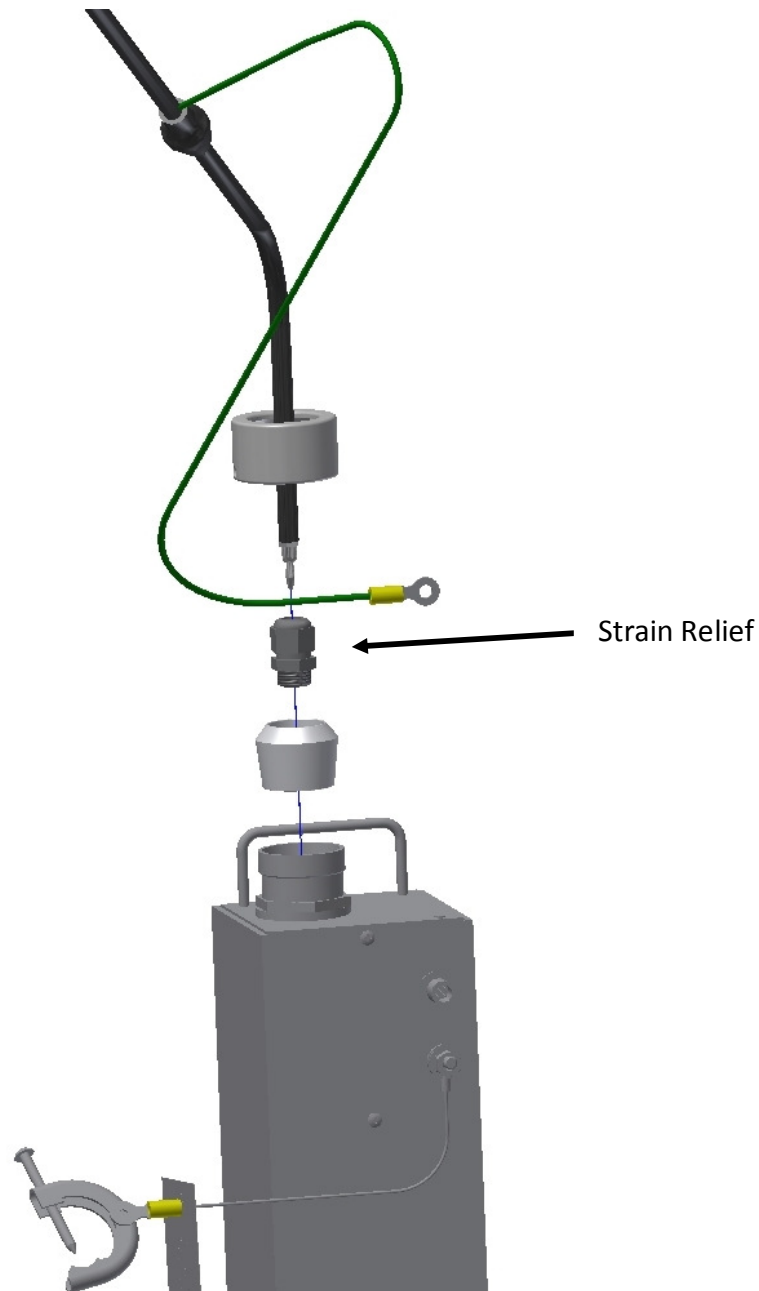


Figure 6: Low Voltage Cable 79338-XX

HIGH VOLTAGE CABLE TO CASCADE CONNECTION



Insert the grounded cable end of the high voltage cable and the associated connector parts into the external cascade in the order shown.

Before tightening the cable strain relief, assure the cable is fully inserted and seated into the bottom of the high voltage tube.

OPERATION

**WARNING**

➤ The user **MUST** read and be familiar with the **SAFETY PRECAUTIONS** and **SAFETY SECTIONS** of this manual and the Ransburg safety literature therein identified **BEFORE OPERATING** the 9060 Cascade control unit.

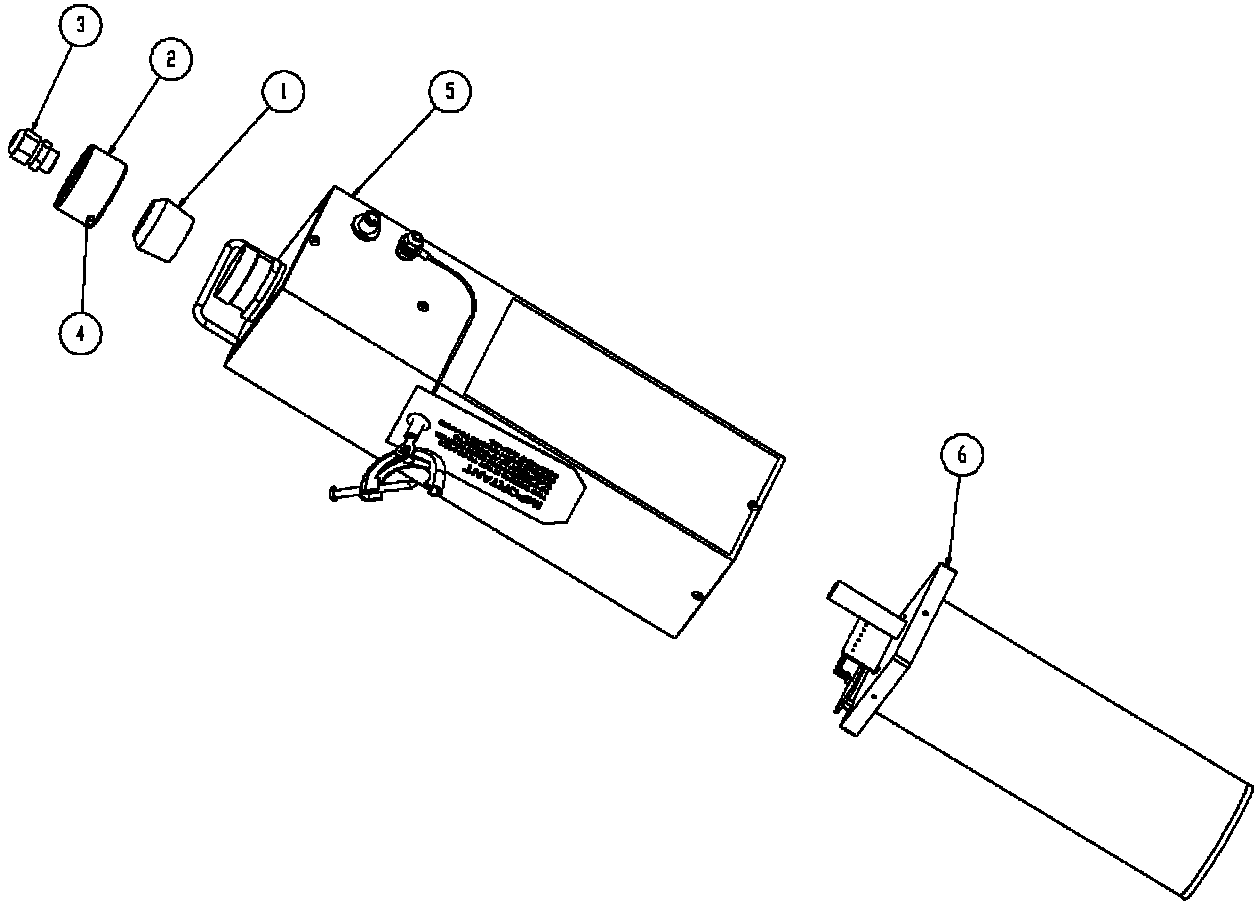
Refer to CP-13-02 or CP-13-05 (Included in Your kit) for Operation Instructions and Procedures.

MAINTENANCE

Consult CP-13-02 or CP-13-05 (Included in Your kit) for Maintenance and Trouble Shooting Information.

Spare Parts

Refer to CP-13-02 or CP-13-05 (Included in Your kit) for Spare parts available.



80104-01 EXTERNAL CASCADE COMPONENTS		
Item #	Part Number	Description
1*	80074-00	COUPLER, CABLE
2*	7296-00	NUT, CABLE PLUG
3*	80073-00	RELIEF, STRAIN
4*	8521-06F	SET SCREW
5	80104-01	ASSEMBLY, EXTERNAL (includes item 6)
6	79350-01	SUB-ASSEMBLY, CASCADE

*Not included with the 80104-01 Assembly (must be ordered separately)

WARRANTY POLICIES

LIMITED WARRANTY

Ransburg will replace or repair without charge any part and/or equipment that falls within the specified time (see below) because of faulty workmanship or material, provided that the equipment has been used and maintained in accordance with Ransburg's written safety and operating instructions, and has been used under normal operating conditions. Normal wear items are excluded.

THE USE OF OTHER THAN RANSBURG APPROVED PARTS, VOID ALL WARRANTIES.

SPARE PARTS: One hundred and eighty (180) days from date of purchase, except for rebuilt parts (any part number ending in "R") for which the warranty period is ninety (90) days.

EQUIPMENT: When purchased as a complete unit, (i.e., guns, power supplies, control units, etc.), is one (1) year from date of purchase.

WRAPPING THE APPLICATOR, ASSOCIATED VALVES AND TUBING, AND SUPPORTING HARDWARE IN PLASTIC, SHRINK-WRAP, OR ANY OTHER NON-APPROVED COVERING, WILL VOID THIS WARRANTY.

RANSBURG'S ONLY OBLIGATION UNDER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATERIALS. THERE ARE NO IMPLIED WARRANTIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. RANSBURG ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CONSEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR INCOME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PURCHASER OR OTHERS.

EXCLUSIONS:

If, in Ransburg's opinion the warranty item in question, or other items damaged by this part was improperly installed, operated or maintained, Ransburg will assume no responsibility for repair or replacement of the item or items. The purchaser, therefore will assume all responsibility for any cost of repair or replacement and service related costs if applicable.

Ransburg

Manufacturing

1910 North Wayne Street

Angola, Indiana 46703-9100

Telephone: 260-665-8800

Fax: 260-665-8516

Technical Service — Assistance

320 Philips Ave.

Toledo, Ohio 43612-1493

Telephone (toll free): 800-233-3366

Fax: 419-470-2233

Technical Support Representative will direct you to the appropriate telephone number for ordering Spare Parts.