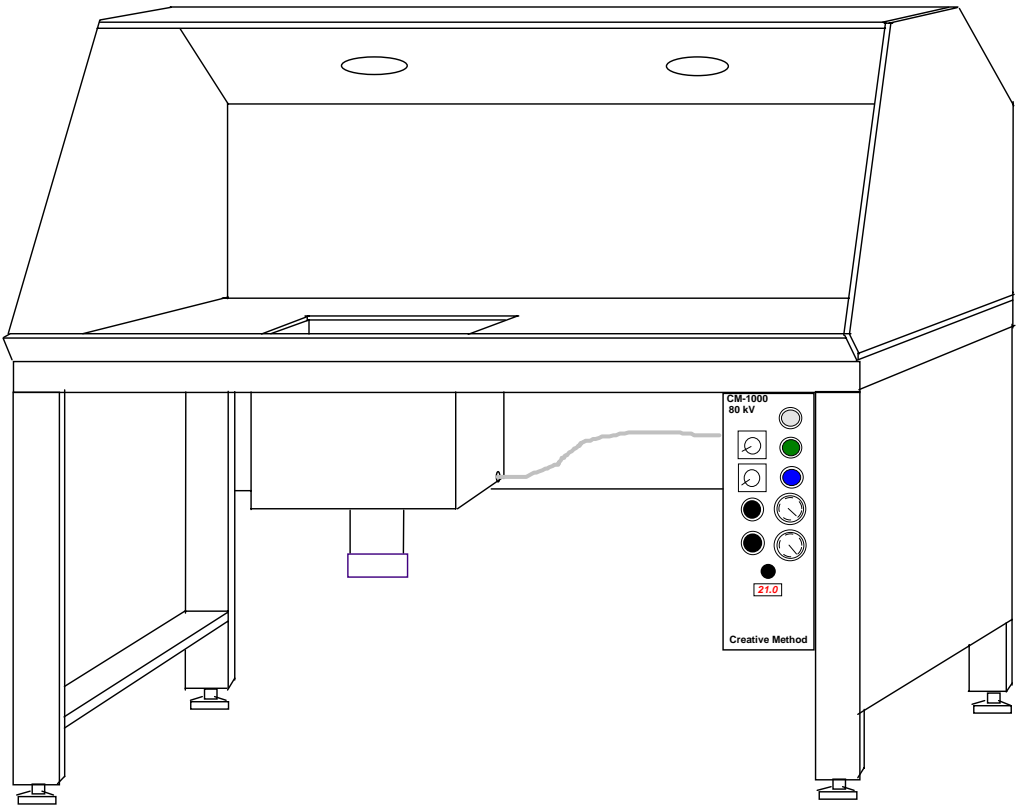


**Electrostatic Powder Coating System 80kV
Model CM-1000
Instruction Manual**



CM Creative Method
www.CMethod.com

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1 INTRODUCTION

This Instruction Manual must be studied and followed for the safe and efficient operation of the "CM-1000 Powder Application System". Study this manual before locating and installing the equipment.

CREATIVE METHOD
13561 FUSANO AVENUE
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TELEPHONE: 818-621-9103

In future correspondence, please refer to the MODEL (CM-1000 Powder Coating System) the "POWDER COATING MACHINE".

2 SHIPPING

Sometimes equipment can be damaged in transit. An inspection of the shipping crate should be made upon delivery, and when equipment is removed, it should be carefully inspected to make sure the unit is in good condition. If the equipment is damaged, the carrier's claim agent should be requested to prepare a report, a copy of which should be sent to:

CREATIVE METHOD
13561 FUSANO AVENUE
SYLMAR, CALIFORNIA 91342

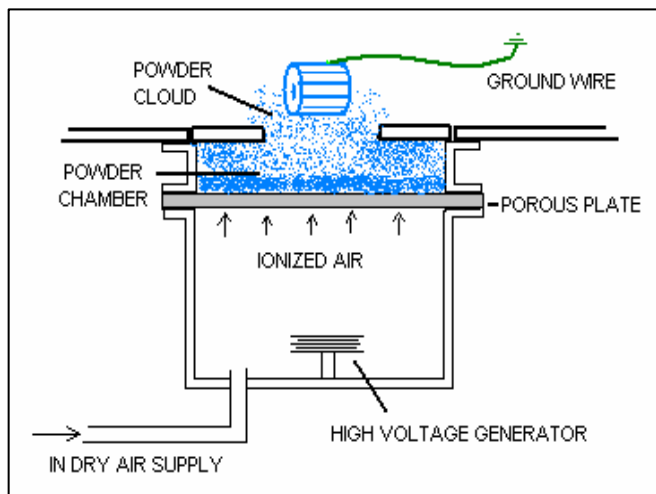
Creative Method will then advise concerning repairs and replacements.

3 OPERATING PRINCIPLES

3.1 SCHEMATIC DIAGRAM OF AN ELECTROSTATIC COATER

3.2 PROCESS DESCRIPTION

Powder particles are aerated in a fluidizing bed and are electrostatically charged by ionized air forced through porous plate at the base of the chamber. As the powder particles become charged, they repel each other to such a degree that they rise above the chamber forming a cloud or veil of charged particles. When a grounded object is placed in this cloud, or conveyed through this cloud, the charged powder particles, because of their opposite potential, are attracted to it. As the particles become attached to the object, they form a uniform coating, being more attracted to exposed areas than to those already insulated. The longer the object is exposed to the cloud, the thicker the coating becomes, until saturation eventually takes place. Coating thickness is controlled by applied voltage to the charging media and exposure time to the cloud. Because of the high voltage capability of the charging media, a sufficiently great potential exists between it and most substrates to permit



even natural insulators to be coated. Unlike equipment with exposed electrodes, Creative Methods air ionization process charges the powder without permitting the powder, the object, or the operator to come in contact with the charging media.

4 GENERAL SAFETY

4.1 INTRODUCTION

This section contains general study instructions for using your Creative Method (CM) equipment. Task-and-equipment-specific warnings are included in other sections of this manual where appropriate.



NOTE ALL WARNINGS AND FOLLOW ALL INSTRUCTIONS CAREFULLY. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

To use this equipment safely:

- Read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- Read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- Store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- Follow all applicable procedures required by your company, industry standards, and government or regulatory agencies. Refer to the National Fire Protection Association (NFPA) standard 33 and to federal, state, regulatory agency, and local codes for rules and regulations covering installation and operation of powder coating systems.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used.

4.2 SAFETY SYMBOLS

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.



WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Risk of explosion of fire. Fire, open flames and smoking prohibited.



WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.



WARNING: System or material pressurized. Release pressure. Failure to observe this warning may result in serious injury of death.



CAUTION: Failure to observe may result in equipment damage.

4.3 QUALIFIED PERSONAL

"Qualified Personnel" is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating the equipment to see that its personnel meet these requirements.

4.4 INTENDED USE



WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

CM cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine CM replacement parts.
- Failure to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your CM equipment.
- Allowing unqualified personnel to perform any task.

4.5 INSTALLATION

Read the installation section of all system components manuals before installing your equipment. A thorough understanding of the system components and their requirements will help you install the system safely and efficiently.

- Allow only qualified personnel to install CM and auxiliary equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install locking, manual, shutoff valves in the air supply lines to the system.
- This allows you to relieve air pressure and lock out the pneumatic system before undertaking maintenance and repairs.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Ground all electrically conductive equipment within 10 feet (3 meters) of the coating area. Ungrounded conductive equipment can store a static charge which could ignite a fire or cause an explosion if a hot spark is discharged.
- Install safety interlocks which shut down the coating system if the exhaust fan fails, a fire is detected, or other emergency situation develops.
- Make sure the coating area floor is conductive to ground and that the operator's platform is grounded.
- Use only designated lifting points or lugs to lift and move heavy equipment. Always balance and block loads when lifting to prevent shifting. Lifting devices must be inspected, certified, and rated for a greater weight than the equipment being lifted.
- Protect components from damage, wear, and harsh environmental condition.
- Allow ample room for maintenance, material supply container drop-off and loading, panel accessibility, and cover removal.
- If safety devices must be removed for installation, reinstall them immediately after the work is completed and check them for proper functioning.

4.6 OPERATION

Only qualified personnel, physically capable of operating the equipment and with no impairments to their judgment or reaction times, should operate this equipment. Read all component manuals before operating a powder coating system. A thorough understanding of all components and their operations will help you operate the system safely and efficiently.

- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Before starting this equipment, check all safety interlocks, fire detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.

- Know where OFF buttons, shutoff valves, and fire extinguishers are located. Make sure they work. If a component malfunctions, shut down and lock out the equipment immediately.
- Before operating, make sure all conductive equipment in the coating area is connected to a true earth ground.
- Never operate equipment with a known malfunction or leak.
- Do not attempt to operate electrical equipment if standing water is present.
- Never touch exposed electrical connections on equipment while the power is ON.
- Do not operate the equipment at pressures higher than the rated maximum working pressure of any component in the system.
- Know the pinch points, temperatures, and pressures for all equipment that you are working with. Recognize potential hazards associated with these and exercise appropriate caution.
- Wear shoes with conductive soles, such as leather, or use grounding straps to maintain a connection to ground when working with or around electrostatic equipment.
- Do not wear or carry metallic objects (jewelry or tools) while working with or around electrostatic equipment. Ungrounded metal can store a static charge and cause harmful shocks.
- Keep parts of the body or loose clothing away from moving equipment or parts.
- Remove personal jewelry and cover or tie back long hair.
- Wear National Institute of Occupational Safety and Health (NIOSH) approved respirators, safety glasses or goggles, and gloves while handling powder containers, operating coating equipment, and performing maintenance or cleaning tasks. Avoid getting powder coatings on your skin.
- Do not smoke in the coating area. A lit cigarette could ignite a fire or cause an explosion.
- If you notice electrical arcing in the coating equipment, shut down the system immediately. An arc can cause a fire or explosion.
- Shut off electrostatic power supplies before making adjustments to powder coating fluidized bed.
- Shut off moving equipment before taking measurements or inspecting work pieces.
- Wash exposed skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove coating materials from your skin.
- Do not use high-pressure compressed air to blow powder off your skin or clothes. High-pressure compressed air can be injected under the skin and cause serious illness or death. Treat all high-pressure fittings and hoses as if they could lead and cause injury.

4.7 LESS OBVIOUS DANGERS

Operators should also be aware of less obvious dangers in the workplace that often cannot be completely eliminated:

- Exposed surfaces on the equipment which may be hot or have sharp edges and cannot be practically safeguarded.
- Electrical equipment which may remain energized for a period of time after the equipment has been shut off.
- Vapors and materials which may cause allergic reactions or other health problems.
- Automatic pneumatic or mechanical equipment or parts that may move without warning.

- Unguarded, moving mechanical assemblies.

4.8 ACTION IN THE EVENT OF A SYSTEM OR COMPONENT MALFUNCTION

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power. Close and lock out hydraulic and pneumatic shutoff valves and relieve pressures.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component.

4.9 MAINTENANCE & REPAIR

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Always wear appropriate protective devices and use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Use only genuine CM replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.
- Do not attempt to service electrical equipment if there is standing water present. Do not service electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Do not attempt to service a moving piece of equipment. Shut off the equipment and lock out power. Secure equipment to prevent uncontrolled movement.
- Relieve air pressures before servicing equipment. Follow the specific instructions in this manual.
- Make sure that the area or room where you are working is sufficiently ventilated.
- If a "power on" test is required, perform the test carefully and then shut off and lock out power as soon as the test is over.
- Connect all disconnected equipment ground cables and wires after servicing the equipment. Ground all conductive equipment.

✗ WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make visual wiring condition checks as part of your periodic maintenance program.

- Do not store flammable materials in the coating area or room. Keep containers or flammable materials far enough away from the Coater to prevent their inclusion in a fire. If a fire or explosion occurs, flammable materials in the area will increase the chances and the extent of personal injuries and property damage.

- Practice good housekeeping procedures. Do not allow dust or powder coatings to accumulate in the coating area or on electrical equipment. Read this information carefully and follow instruction.

4.10 DISPOSAL

Dispose of equipment and materials used in operation and cleaning according to your local regulations.



IMPORTANT: Provide a proper ground connection for the plug equipment ground wire. Polarity of the receptacle must be according to code.

5 AIR AND ELECTRICAL REQUIREMENTS

5.1 CM-1000

5.1.1 Air

15 scfm @ 60 psi minimum/90 psi maximum. A 3/8 in. minimum air line should be connected between the Coalescent Filter (outlet side of the Refrigerant Air Dryer) and the CF-1000 Coating Machine.

5.1.2 Electrical

115 Volts, 60/50 Hertz, 20 Amp circuit is required (an eight foot cord with a three wire duplex plug is provided).



IMPORTANT: Provide a proper ground connection for the plug equipment ground wire. Polarity of the receptacle must be according to code.

6 DESCRIPTION OF COMPONENTS

6.1 CM-1000 COATING STATION

The coating machine is complete with Coating Bed, Powder Feed Box, High Voltage Multiplier, Air Flow Regulator(s), Cycle Timer(s), and cloud containing Hood.

6.1.1 Part Holding Spindles

The Holding Spindles are located in the Coater Bed area. This Spindles are used to hold and rotate parts during the coating process to produce an evenly coated armature. The stacks are placed on the spindles for the coating cycle.

6.2 CM-1000 Air Knife Tooling for Stator Stacks

6.2.1 O.D. Cleaner for inter-slot Stacks

The O.D. Cleaner utilizes air knives to remove powder from the stacks outside diameter after the stacks have complete the coating cycle on the rotating spindles. The spindles continue to rotate, the air knife comes ON, and the stack O.D. is cleaned.

6.2.2 I.D. Cleaner for outer-slot Stacks

The I.D. Cleaner utilizes air knives to remove powder from the stator inside diameter. After a stator has completed the coating cycle, it removed from the spindle and place onto the I.D. cleaner. The proximity switch activates the air knife to remove powder over spay for a second and the stack I.D. is cleaned.

6.3 REFRIGERANT AIR DRYER

A Refrigerant Air Dryer (with Particle and Coalescing Filter) is installed with the CM-1000 Powder Application System to ensure clean, dry (moisture free), oil free air is supplied to the system.

6.4 DUST COLLECTOR

The Dust Collector consists of the following:

6.4.1 800 CFM Collector Module

The 800 CFM Collector Module uses a 1 HP motor to drive the Exhaust Fan. The Exhaust Fan pulls air from Powder Application Hood (Canopy) and into the Bag Filters chamber. The air passes through the Bag Filters and the clean powder free air is returned to the surroundings. Powder accumulating on the Bag Filters is knocked off using the Collector's Shaker Handle while the Collector is OFF. The powder falls to the bottom of the Collector's Tray where it can be recovered and recycled or discarded.

7 INSTALLATION

These instructions for installing, operating and maintaining the CM-1000 Powder Application System must be followed for its safe and efficient operation. In particular, precautions should be observed whenever the unit is operated. Study this manual before installing or operating equipment. Some voltages employed in this equipment are high. Remember that any source of voltage can be hazardous.

7.1 LOCATION

- 1) Avoid placing the Coating System near heating and air-condition vents or fans that cause powder cloud disturbance.
- 2) Avoid rooms with swap coolers as the moisture in the air effects the powder quality.
- 3) Place "CM-1000" and Dust Collector on a level surface at the desired location. Refer to Floor Plan Drawing in the Appendix of this manual.
- 4) Although your machine may be shipped preassembled, please read through this manual before installing.

7.2 AIR CONNECTIONS

CM supplies the Poly-Flo tubing for all air connections. Refer to the Pneumatic Schematic in the Appendix of this manual.

- 1) Check that all pneumatic hoses are connected securely throughout the machine.
- 2) Connect the hose from the Coalescing Filter (on the Refrigerant Air Dryer) to the main air inlet of the CM-1000.
- 3) Connect the ¼" air supply hose to the inlet of the Particle Filter (on the Refrigerant Air Dryer).

7.3 ELECTRICAL CONNECTION

- 1) Connect the Booth and Electrical Panel to a true earth ground.
- 2) Connect the electrical cord from the Refrigerant Air Dryer to a receptacle outlet rated: 115 Volts, 60/50 Hz, 1 Phase.
- 3) Connect the CM-1000 Application System electrical cord to a receptacle rated: 115 Volts, 60/50 Hz, 20 Amp.



CAUTION: ALL RECEPTACLES MUST HAVE A PROPER GROUND CONNECTION.

7.4 VACUUM HOSES

CM supplies the flexible vacuum hose required. Refer to the Floor Plan Drawing in the Appendix of this manual.



NOTE: The vacuum hose(s) can build up a static charge when the Powder Collector is "ON" and running. To prevent this static charge build-up, ground wires **must** be installed with the vacuum hose(s). **All** vacuum hose connections must be grounded to equipment frame, metal surface to metal surface and must be checked for continuity. To do this: Connect a ground wire from the internal wire of the vacuum hose and the opposite end to a metal surface. **Note:** If the internal wire is not exposed, strip away the hose material to expose a 1" section of bare wire.

7.5 CONTROLS

7.5.1 Settings

- 1) Turn "ON" the system electrical power and open the air supply shutoff valve.
- 2) Turn "ON" the Auto/Manual Button if the cycle timer is used.
- 3) Turn "ON" the Air Knife Follow Timer button if the Air Knife cycle is to be used.
- 4) Adjust the System Main air pressure to 80 psi.
- 5) Adjust the Coater Bed air pressure to 30 psi.
- 6) Adjust the Air Knife Cleaning option air pressure to 10 psi.
- 7) Adjust Coating Bed Cycle Timer to 10 seconds.
- 8) Adjust Air Knife Cleaning Cycle Timer to 10 seconds.
- 9) Adjust the Input Voltage to 21 Volts (Maximum setting)
- 10) Press the Dust Collector "START" push button.

7.5.2 Footswitch

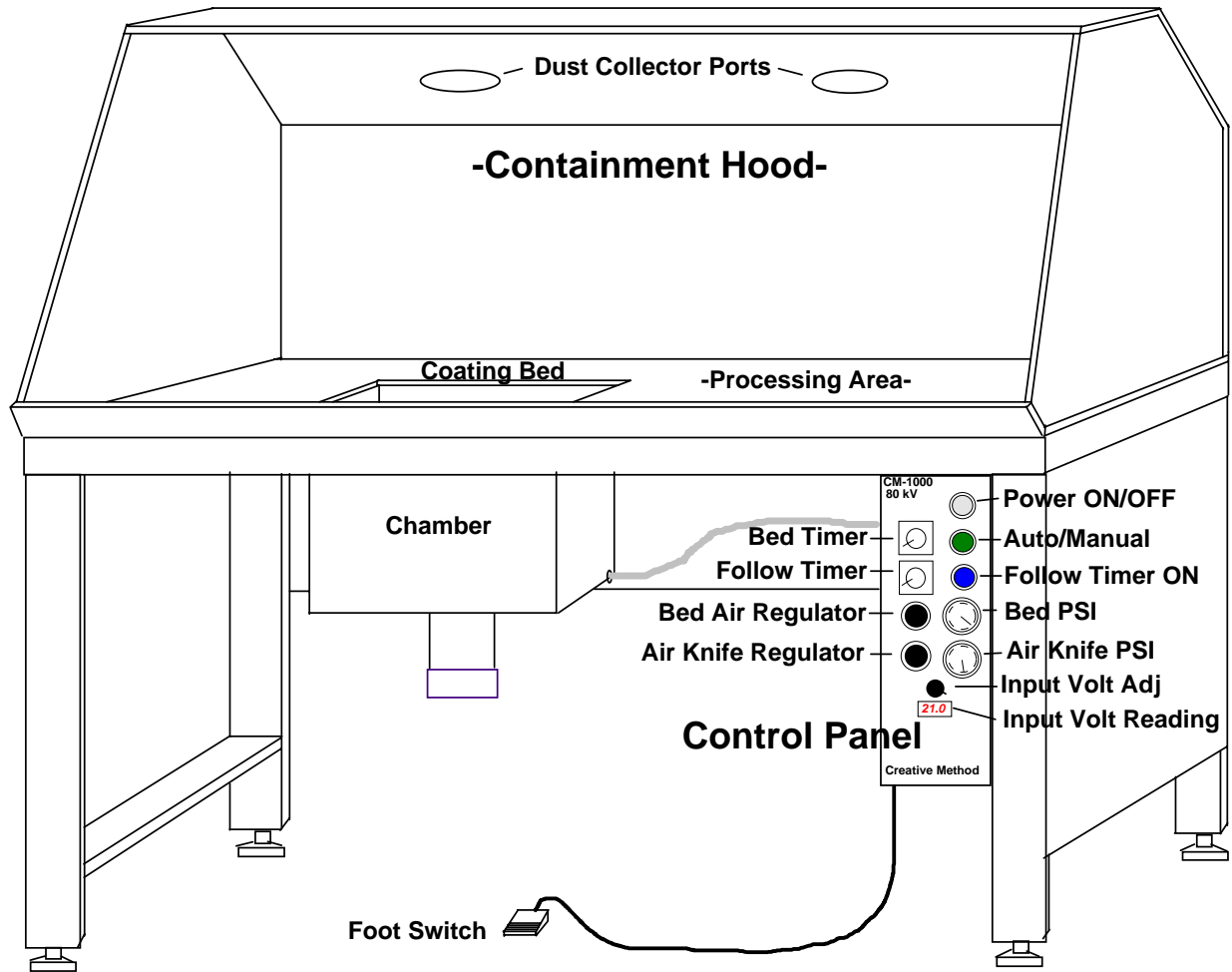
- 1) Locate the Coater Footswitch and position in front of the Coater Station. The Footswitch is already pre-wired to the electrical controls.

7.6 POWDER MAINTENANCE

Most powders are hygroscopic. An attempt should be made to finish the day's run with a minimum amount of powder left in the Collector Fluidizing Hopper. All powder containers (bags, barrels, hoppers, etc.) should be kept tightly closed. **NOTE:** Do not mix different types of powder.

7.7 REFRIGERANT AIR DRYER

Plug the Refrigerant Air Dryer into proper electrical receptacle. Make sure the ON/OFF switch is in the "ON" position. When Main Power is "ON", Refrigerant Air Dryer will operate.



8 DESCRIPTION OF CONTROLS

8.1 COATER CONTROL PANEL

8.2 ELECTRICAL CONTROLS

<p>MAIN POWER BUTTON ON/OFF</p>	<p>-Push "ON" (Button will light white) Turns the System electrical ON. -Push "OFF" (Button light will go OFF) Turns the System electrical OFF and will Stop and Reset any Timers running.</p>
<p>AUTO/MANUAL BUTTON</p>	<p>-Push "ON" (Button will light green) enables the Bed Timer. When the Foot Switch is depressed, the Bed Timer will run the Coating Bed for the time it was set for. -Push "OFF" (Button light will go OFF) disables the Timer. The Coating Bed will run only while the Foot Switch is depressed.</p>

8.3 COATER CONTROLS

BED TIMER Time Adjustment	Increase/Decrease Bed Timer to achieve the desired coating thickness. Factory default range 0-60 Seconds.
FOLLOW TIMER Time Adjustment	Increase/Decrease Bed Timer to achieve the desired cleaning effects. Factory default range 0-60 Seconds.
COATER BED AIR REGULATOR ADJUST Air Pressure Regulator & Gauge	Adjusts and indicates the amount of air pressure supplied to the coating bed. Adjust to optimize the coating cloud.
<u>AIR KNIFE REGULATOR</u> <u>Air Pressure Regulator & Gauge</u>	<u>Adjusts and Indicates the amount of air pressure supplied to the air knife system. Adjust to achieve the best clean results.</u>
INPUT VOLTAGE ADJUST AND METER 9 – 21 Volt Range	Adjustable Potentiometer adjusts the input voltage 9 – 21 VDC (30 – 80 kV) being supplied to the High Voltage Multiplier. Use lower than 21 Volts when small parts require thinner coating thickness.
FOOTSWITCH	Activates the Coater when pressed. When the Auto Timer is ON and has a time set on it, the timed cycle will be started by pressing the Footswitch, otherwise, the Coating unit will only operate while the Footswitch is pressed and cease to operate when the Footswitch is released.

8.4 CLEANING CONTROLS

9 START-UP AND OPERATION PROCEDURE

9.1 COATING STATION SET-UP

- Step 1 - Make sure the Refrigerant Air Dryer is plugged into the electrical supply and is “ON” and wait 15 minutes before beginning to coat parts.

- Step 2 - Turn "ON" the Dust Collector.
- Step 3 - Add powder to the Coating Bed about 1/3 full.
- Step 4 - Place the Coating Tools over the Coating Bed and attach the Ground Wire.
- Step 5 - Initially adjust the Coater Bed air pressure to 25 psi. The normal operation range is 10-40 psi.
- Step 6 - Initially turn the Input Voltage Control full clockwise, 21 volts (80 kV) on the display.
- Step 7 - Initially set the Coater Cycle Timer to 10 seconds.
- Step 8 - Place the part(s) to be coated with any masking required over the Coating Bed, or onto fixtures or tooling used.

9.2 AIR KNIFE CLEANING SET-UP

- Step 1 - The Air Knife Tools and Controls needs to be set up and ready for cleaning operations.
- Step 2 - Set-up the Air Knife Tools as required. Adjust nozzles for optimum cleaning.
- Step 3 - Initially adjust the Air Knife regulator to 10 psi.
- Step 4 - Turn Follow Timer "ON" (lights blue).
- Step 5 - Initially set Follow Timer for 10 seconds.

9.3 COATING OPERATION

Note: The Control Panel adjustments can be during and after the Coating Cycle.

- Step 1 - Adjust the Coater Bed Fluidizing Adjust if necessary. There should be adequate fluidization of the powder in the Bed so a cloud forms.
- Step 2 - Load a part(s) into the tooling or fixtures.
- Step 3 - Press the Coater Footswitch and activate the Coating Bed allowing the part to be coated for the duration of the coating cycle.
- Step 4 - Remove the part(s) to inspect after coating. Adjust the Coater Bed Air Regulator, Voltage setting and/or length of coating cycle in order to obtain the optimum coating coverage and thickness.
- Step 5 - Repeat these steps as required to obtain a satisfactorily coated substrate.

Note: Powder falling outside the Coating Bed, may be periodically swept back into the Bed using 3 to 4 inch wide clean Paint Brush.

9.4 AIR KNIFE CLEANING OPERATION

- Step 1 - Once a part has been satisfactorily coated, inspect the parts for the cleaning operation.
- Step 2 - Adjust the Air Knife Regulator and Air Knife Timer length of cleaning cycle in order to obtain the desired cleaning results.
- Step 3 - Remove any Masking Aids.
- Step 4 - Once parts are satisfactorily coated and cleaned, place them onto a rack or hanger for oven cure.

10 SHUT-DOWN PROCEDURE

10.1 COATING & CLEANING OPERATION

- Step 1 - Press the Power ON/OFF button on the control panel.
- Step 2 - Turn Dust Collector "OFF".
- Step 3 - Turn the Refrigerant Air Dryer "OFF".

10.2 EXTENDED SHUT-DOWN PROCEDURE

When shutting the machine down for more than an overnight period, the following should be noted:

When not in use, the coating material in the unit should be removed from the Coater Bed and Collector to prevent clogging of the Porous Plate. As most coating materials are hygroscopic, storage of the powder in the Powder Feeder for extended periods of time is not recommended. It is advisable that the powder be removed and stored in an air tight container. Observe the following procedure:

10.2.1 Coating & Cleaning

- Step 1 - Carefully remove the Powder from the Coating Bed without scratching the porous plate, into a sealable jar or bag.
- Step 2 - Clean the inside of the canopy with a rubber squeegee or other grounded, nonmetallic device.

- Step 3 - Carefully vacuum the remaining powder from the Bed. Use a vacuum hose attached to the dust collect with a soft plastic nozzle on the end of its hose to vacuum the powder.

10.2.2 Dust Collector

- Step 1 - Turn the Dust Collector to the “OFF” position.
- Step 2 - Use the Shaker Handle to knock the Powder to the lower tray. Wait a few minutes for the dust to settle.
- Step 3 - Open the Dust Collector Door to access the tray of powder. Remove tray and empty into a sealed container for proper disposal.

10.3 POWDER/TYPE CHANGE

When changing powder from one type to another, it is very important that the Coating Bed be thoroughly cleaned to prevent contamination. The same bed cleaning procedure as above should be used.

11 TROUBLE SHOOTING COATER-SYMPATOM POSSIBLE CAUSE(S) REMEDY(S)

Powder does not clean to part. (No or low coating)

- Increase (turn knob) Voltage control.
- Verify part(s) are grounded. Faulty ground to substrate. Verify Ground wire to ground.
- DC Power Supply in control box has failed. Replace Power Supply. Contact your CM representative for further instructions.
- High Voltage Multiplier is bad. Replace Multiplier. Contact your CM representative for further instructions.

Coating Bed is 1/3 full but Powder Cloud doesn't develop.

- Insufficient air to fluidize powder. Coating Bed Regulator set too low.
- Air conditioning vents or fans in area air cloud disturbance.
- Air leaking by gasket at porous plate. Check gasket, replace if necessary. Tighten screws around porous plate.
- Porous Plate is clogged. Install new porous plate.
- Air solenoid is not operating. Replace the defective solenoid.
- Moisture in Coater fluidizing air. Check and analysis Air Dryer.
- Particle Air Filter is dirty. Replace filter element. Refer to the Spare Parts List of this manual for part number.
- Coating powder is wet or damp. Powder is hygroscopic and has absorbed moisture from the humid air around it when sitting for extended periods. Replace with new Powder.

12 MAINTENANCE

12.1 GENERAL

A systemic maintenance schedule should be set up and adhered to in order to insure optimum machine operation. Daily, weekly, and monthly schedules should be established as applicable for each part of the coating system.



WARNING: ELECTRICAL VOLTAGE USED IN THIS EQUIPMENT CAN BE HAZARDOUS. MAINTENANCE SHOULD BE HANDLED BY QUALIFIED PERSONNEL

12.2 AIR SYSTEM

The importance of keeping the compressed air clean, dry and oil free cannot be overemphasized. More coating problems can be traced to failure to maintain the air filters and air dryers than any other cause.

Particle Air Filter – Clean and check for proper functioning. Change filter element if it's dirty.

Refrigerant Air Dryer – Once the Refrigerant Air Dryer is "ON" and operating, after 15 minutes and periodically thereafter the following procedures should be implemented:

- Step 1 - Make sure that the "Power On" light is lit.
- Step 2 - Make sure that condensate drains are draining; drains can very easily become clogged by oil or dirt. This will allow wet compressed air to enter the machine, resulting in a clogged porous plate in the Coater and poor fluidization.

12.3 COATING BED

If the fluidization is not uniform, the Porous Plate has become clogged and will have to be replaced. The Porous Plate will require periodic replacement depending upon hours of use, contaminants in the compressed air, and conditions of operation and cleaning.



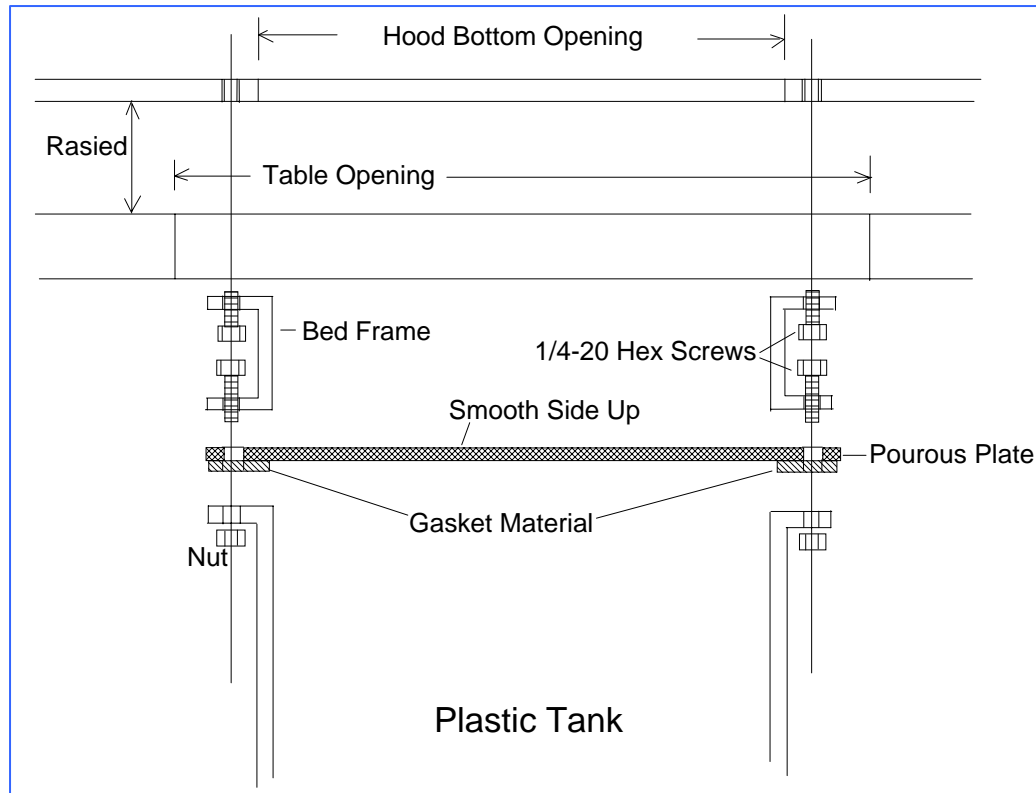
CAUTION: THE UNIFORM POROSITY OF THE POROUS PLATE IS VERY IMPORTANT TO PROPER COATING. DO NOT SCRAPE OR EVEN TOUCH IT WITH A HARD OR SHARP OBJECT. NEVER POINT AN AIR GUN DIRECTLY AT THE PLATE.

Clogging of the pores of the plate is the most common cause of failure. Once the Porous Plate has been removed, inspect it to determine which of the following reasons caused clogging:

- Leaving powder unused in the bed for an extended period of time during humid conditions.
- Oil or water in air supply system.
- Damage from scratching, gouging or denting the plate.
- Blowing compressed air directly at the surface of the plate.
- Correct the cause of plate failure and avoid conditions in the future which may have lead to it.

Order a new Porous Plate and gasket material from CM and carefully install.

12.3.1 Porous Plate Replacement



- Step 1 - Turn the Coating System "OFF"
- Step 2 - Unplug the Coating System from all electrical power sources.
- Step 3 - Remove all the powder from the bed.
- Step 4 - Disconnect the Air Hose from Plastic Tank.
- Step 5 - Disconnect the Cable from the Multiplier.
- Step 6 - Unbolt the Containment Hood from the Table. Raise the Hood about one foot held up with blocks.

Note: The follow parts have alignment marks and are to be reassembled with the same alignment.

- Step 7 - Remove the plastic hex head screws from the Powder Bed Frame and Containment Hood bottom. Move assembly to work bench.

- Step 8 - Remove the plastic hex head screws and nuts from the Porous Plate Base with Bed Frame and Plastic Tank.
- Step 9 - Remove the old Porous Plate and gasket material.
- Step 10 - Clean electrostatic powder out of the charging media (wire bristles) if required using compressed air.
- Step 11 - Use the old Porous Plate as a template for positioning and making the mounting holes ($\emptyset .265''$) in the new Plate. Add alignment mark.
- Step 12 - Place the new Porous Plate onto the bottom flange of the Bed Frame .
- Step 13 - Place new gasket material around the outside edge of the plate and position the Porous Plate. MAKE SURE TO INSTALL THE NEW POROUS PLATE WITH THE SMOOTH SIDE FACING UP.
- Step 14 - Replace the plastic screws and tighten down evenly so that the retaining ring is snug against the Porous Plate to prevent ionized air leakage around edges of the Porous Plate.

12.4 POWDER COLLECTOR

Refer to Appendix of this manual for maintenance information on the Powder Collector.

13 SPARE PARTS LIST

PART DESCRIPTION	CM PART NO.	ASSEMBLY	QTY.	RECM,D SPARE	PRICE EACH
Porous Plate, 10 x 14" CM-1000		Pneumatic	1	1	
Gasket Material, 1 x 1/8 Coating		Pneumatic	1	1	
Nylon Screws, 1/4-20 x 1"		Hardware	80	10	
Nylon Nuts, 1/4-20		Hardware	40	5	
High Voltage Multiplier 80 kV		Electric	1	1	
Particle Filter Pneumatic		Pneumatic	1		
Particle Filter Replacement		Pneumatic	1	1	
Desiccant Filter		Pneumatic	1		
Desiccant Replacement		Pneumatic	1	2	
Solenoid Valve, 115 VAC Coil		Electric/ Pneumatic	2		
Dc Power Supply 21VDC		Electric	1		
Relay, Solid State		Electric	1		
3 1/2 Digit Meter		Electric	1		
Potentiometer		Electric	1		
Footswitch		Electric	1		
Timer, 115VAC		Electric	2		
Relay, 11 Pin 115V		Electric	2	1	
Fuse, 15A		Electric	1	1	
Air Regulator Controls		Pneumatic	2		

Air Gauge		Pneumatic	2		
DC Power Supply 5 VDC		Electric	1		
Air Regulator Main		Pneumatic	1		
Push Button "White"		Electric	1	1	
Push Button "Blue"		Electric	1		
Push Button "Green"		Electric	1		
Push Button Switch		Electric	3	1	

Please Note: Prices are valid for 90 days from the date on this document.

14 PNEUMATIC SCHEMATIC

See the Appendix for the Pneumatic Schematic Drawing.

15 ELECTRICAL DRAWING

See the Appendix for Elementary Electrical Drawing.

16 MANUFACTURER'S MANUALS

All of the Manufacturer's Manuals listed below can be found in the Appendix of this manual:

- Coalescing Filter (Major Pneumatics)
- 3 ½ Digit Meter (KYI)
- OD Cleaner Motor (Bodine)
- Particle Filter (Major Pneumatics)
- Part Rotator Motor (GearTron)
- Proximity Switch (Acer)
- Refrigerant Air Dryer (Kaeser)
- Solenoid Valve (Notel)
- Pressure Regulator (Hassle)
- Timers (Timex)