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ULTRA-COM 300
Portable Powder Coating Unit

INSTRUCTION MANUAL

DOCUMENT:	**ULTRA-COM 300 - Manual**
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CAUTION

This equipment can be dangerous unless it is used in accordance with the rules laid down in this manual.

Read this manual completely before installing and operating the equipment.

Ensure all safety instructions and procedures are correctly followed and that all operators are fully trained.

IMPORTANT: ***All other manuals relevant to components and equipment of the installation must be followed.***

CONTENTS

1. Title

2. Caution

3. Contents

4. Declaration of Conformity

5. Ultra-Com 300 Portable Powder Coating Unit

6. Specification, Ultra-Com 300

- *General Data*
- *Weights and Dimensions*
- *Electrical Data*
- *Electrical Controls*
- *Pneumatic Data*
- *Pneumatic Controls*

7. Assembly Instructions

8. Set Up Procedure

9. Operating Notes

10. End of Use Cleaning Procedure and Changing Colour

11. Do's and Don'ts

12. Fault Finding and Defects On Finished Product

13. Total Energy Control

14. Appendix

(i) Assembly Drawings and Parts Lists
(ii) Schematic Diagrams

EC Declaration Of Conformity

We, Eurotec Finishing Systems Limited declare that the following product,

Description: Portable Powder Coating Unit

Model: ULTRA-COM 300

Use: Electrostatic Powder Coating

was manufactured by ourselves and conforms with the following standard (s) and / or other normative document (s):

EC Machinery Directive 89/392/EEC
EC Low Voltage Directive 73/23/EEC
EC Directive of Electromagnetic Compatibility 89/336/EEC
Electrostatic Painting and Finishing Equipment Using Flammable Materials
EN50 050:1986 and EN50 053:Part 2:1989

Signed on behalf of Eurotec Finishing Systems Ltd. by

Mr. D.H. Campbell
Technical Director

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ULTRA-COM 300 PORTABLE POWDER COATING UNIT

GENERAL DESCRIPTION

The ULTRA-COM 300 Portable Powder Coating Unit is a compact self contained electrostatic powder coating unit designed for laboratory use, on-site demonstrations and powder test sampling.

The unit is housed in a rugged yet attractive black ABS carrying case. The electrostatic and pneumatic control system is integrated in to the base section of the case and the hinged lid compartment contains the manual gun, hoses and cables.

The ULTRA-COM 300 spraying capability is achieved through use of the state of the art MG 300 manual powder gun. A robust well balanced powder gun with a built in high voltage multiplier charging system utilising the unique "Total Energy Control" system (TEC) developed by Eurotec. Once the maximum energy level on the control panel has been set by the operator (The maximum settings available to the user are 85kV and 50uA at the single point corona needle tip) the TEC system automatically adjusts both the current and voltage enabling the operator to achieve optimum spraying results. The TEC system minimises problems caused by back ionisation and the Faraday cage.

Powder feed to the gun is from either a conical cup fitted directly onto the gun via a special venturi nozzle section which replaces the standard nozzle, or a larger cup which is secured to the side of the gun handle by means of a retaining bracket. Powder flow for the larger cup is created using a venturi body section and controlled by a built in air flow regulator. To give even more accurate control the air pressure can be adjusted by the air pressure regulator mounted in the control panel of the unit.

The flexibility of the unit is further increased by the inclusion of 3 different powder deflectors and a slotted cap which, combined with a variable forward air supply to the nozzle enables the operator to control the spray pattern to suit the components being sprayed. A blow down gun is also included to allow clean down of components and the unit itself.

All in all the ULTRA-COM 300 is a self contained state of the art powder coating unit which is totally portable and can be ready for use within minutes making it ideal for powder sampling and small painting applications.

SPECIFICATION

General Data

Cup Nozzle Capacity	100 cubic centimetres (approx. 60 grams).
Cup Nozzle Mounting	Replaces standard nozzle.
Standard Cup apacity	325 cubic centimetres (approx. 170 grams).
Standard Cup Mounting	Retaining clamp and direct hose connection to powder spigot on gun.
Powder Delivery Rate	Variable to 400 gms. / min.
Operating Temperature	5 degrees C (41 deg. F.) to 40 degrees C (104 deg. F).
Length of Hoses & Cables supplied	2 metres, airline supply, blowdown gun and gun supply. 2 metres, mains cable and trigger lead.
Powder Charging	Single Point Corona Discharge Needle.

Weights and Dimensions

MG 300 hand gun weight:-	0.58kg
Cup nozzle weight (exc. deflector):-	90.2g
Cup and adapter weight (inc. hose, airline and clamp):-	258.2g
Unit weight (unpacked):-	6.5kg
Unit dimensions (closed and unpacked):-	L265, W356, H154
Unit weight (packed):-	7.0kg
Unit dimensions (packed):-	L290, W380, H180
Unit volume (packed):-	0.019 cubic metres

Electrical Data

Input Voltage	100-130/200-260 Volts, 50/60 Hz single phase
Power Consumption	35VA
Input Current (Max.)	400mA at 115V, 200mA at 230V
Electrostatic Output Voltage (Max.)	10-85KV negative
Electrostatic Output Current	0-50uA

Electrical Controls

Mains Switch - Control Panel	Rotary 2 position, ON/OFF (Green LED indicates ON).
Electrostatic Switch - Control Panel	Rotary 2 position, monitor uA or monitor KV.
Maximum Charge Control - Control Panel	Rotary potentiometer, sets Max. level of charge (Yellow LED indicates ON)
Electrostatic Meter - Control Panel	Dual scale, 0-50uA or 0-100KV.
Mains Input - Control Panel	Via connector (to IP65), on panel.
Trigger Output - Control Panel	Via connector (to IP65), on panel.
Circuit Protection - Control Panel	Miniature circuit breakers:- *0.6A* Mains, Live. *0.6A* Mains, Neutral.

Pneumatic Data

Input air pressure- Max.	7.0 bar (100 p.s.i.)
Input air conditioning	Oil free to 0.1 p.p.m. and dry to 1.3 g/cubic Nm.
Air consumption (Nominal)	10.0 m^3/hr. (6.0 c.f.m)
Input Connection	Quick release stem fitting.

Pneumatic Controls

Air Input - Control Panel	Mains air inlet connection.
Solenoid Switched Output - Regulated	Regulated air supply to the gun.
Pressure Regulator & Gauge	Provides a regulated output (2bar, 30 psi) to the gun for repeatable powder control.
Solenoid switched output - Non regulated	Provides a non regulated air supply to the gun, for powder control using flow regulators built in to the gun/cup attachments.
Non Switched Auxiliary Output	Maintained unregulated air output for connection of an air clean down gun (supplied).

WARNING THIS EQUIPMENT MUST BE EARTHED

NOTE:- Electrical/pneumatic circuit diagrams are given at the rear of this manual.

(1) Carefully remove units and components from packaging, and check contents against packing list.

(2) Unclip fasteners on front of unit and open lid, this should reveal the coiled airlines (which prevent the contents from displacing during transit). Remove the airlines and release the inner lid container by removing the upper Velcro fastener and carefully lowering. Inside the lid container one should find the MG300 manual powder spray gun, the trigger lead assembly and the mains lead assembly.

(3) Select either the cup nozzle or the cup adapter as the required apparatus and follow the assembly instructions detailed in appendix (i).

(4) Once the gun is assembled fit the required deflector or slotted cap.

(5) Connect the airline(s) and trigger lead to the connectors on the handle/cup adapter body of the gun as shown in appendix (i).

(6) Connect the free ends of the trigger lead and airline(s) to the control panel as shown in appendix (i).

(7) Connect the main airline assembly to the incoming quick release air fitting.

(8) The cleandown airgun (supplied) is connected using a 6mm airline with a quick release fitting (supplied).

(9) Connect the mains electrical socket on the mains lead onto the quick release connector on the control panel of the unit. Before connecting the unit to the mains supply firstly ensure the voltage selector is set correctly, either 230V or 115V

WARNING

Under no circumstances should the voltage selector be set to a value lower than the mains supply as damage may result.

NOTE:- The units are supplied set to 230V.

IMPORTANT

When fitting a plug to the mains lead (unit comes with plug fitted) it is essential that it contains an earthing/grounding contact and that this is connected.

Under no circumstances should this equipment be connected to a mains supply which does not include an earthing/grounding wire and contacts. e.g.. 2 -Wire extension leads as used for some domestic equipment ***MUST NOT BE USED***.

NOTE:- The cable colour coding used for the Control Unit and its supplied mains cable is as follows:-

Pole		**US/JAPAN**	**U.K.**
Live	***L***	Black	Brown
Neutral	***N***	White	Blue
Earth / Ground	***E***	Green	Green/Yellow

NOTE:- For U.K. Equipment

The wire which is coloured *GREEN and YELLOW* must be connected to the terminal in the plug which is marked with the letter *E* or by the earth symbol, or coloured green or green and yellow. The wire which is coloured *BLUE* must be connected to the terminal which is marked with the letter *N* or coloured black. The wire which is coloured *BROWN* must be connected to the terminal which is marked with the letter *L* or coloured red.

NOTE:-

The terminals used in the mains connector on the control panel of the unit are:-

POLE	**PIN No.**
Live	Pin 1
Neutral	Pin 3
Earth / Ground	Pin E

NOTE:-

The method of disconnection from the mains electrical supply is by removal of the mains lead plug from its respective supply socket.

The unit is now ready for use.

SET UP PROCEDURE

NOTE:- Ensure the unit has been assembled correctly. If in doubt refer to the assembly instructions detailed in this manual.

(1) Ensure that all switches are in the OFF position, and there is no powder in the cup being used.

NOTE:- If the pressure regulator on the control panel is being used (see airline connection illustration in appendix (i)) ensure it is properly closed (the knob should be turned fully anti-clockwise). The knob of the pressure regulator is released by pulling outwards and locked by pressing inwards.

(2) Turn on the 'MAINS ELECTRICAL' switch of the control unit. The green LED above the switch will illuminate. (Diagrams in the appendices of this manual indicate the function and location of the various switches, regulators, connectors etc. on the control panel).

(3) With the spray gun pointing into an extracted spray booth, operate the trigger of the gun and open the appropriate flow regulator(s) until a hissing is heard from the nozzle of the gun.

(4) Fill the powder receptacle being used with the desired amount of powder.

(5) With the gun pointing into an extracted booth press the trigger, open the flow regulator(s) until the desired powder flow is obtained. This air supply should be kept to a minimum consistent with smooth powder flow to prevent powder from being ejected into the surrounding air.

NOTE:- The flow regulator on the control panel has a locking facility, operated by pushing the adjusting knob inwards, which may be used to lock the flow setting.

(6) Check that the regulator, the solenoid valve and the electrostatic generator (see (9)) are operating when the trigger is pulled.

NOTE:- The set maximum KV level will be displayed on the KV meter without the need to operate the trigger of the gun. The uA level will only be displayed on the uA meter when the gun is in use.

(7) Adjust pressures (using regulator screw on cup adapter body or regulator on control panel) as necessary to ensure an even flow of the desired quantity of powder from the gun.

(8) The small flow regulator on the left hand side of the spray gun is used to control the air flow which passes forward through the nozzle. This air flow must be adjusted to ensure that the electrode and spreader faces are maintained clean. Further adjustment of the air flow allows the operator to alter the size and shape the powder cloud or the velocity of powder from the slotted nozzle.

(9) With the charge control potentiometer turned anti-clockwise, turn the electrostatic switch to the position marked kV. The yellow LED above the charge control potentiometer will illuminate dimly, and the electrostatic meter will indicate approximately 22 kV. Slowly turn the charge potentiometer clockwise and the brightness of the yellow LED will increase and the pointer of the electrostatic meter will rise to approximately 85 kV when the potentiometer is fully clockwise.

With the gun pointing into an extracted spray booth, trigger the unit and slowly move the nozzle of the gun close to an earth point or the product. As the nozzle moves closer than approximately 280 mm it will be seen that the kV level indicated on the meter will reduce progressively as the nozzle is moved closer to earth. Repeat this procedure with the electrostatic switch set

to the uA position and it will be seen that as the nozzle moves to within approximately 280 mm from earth, the current will rise progressively to approximately 50 uA. As the nozzle continues to be moved closer, the current then falls progressively. Refer to the graph showing the typical electrostatic discharge characteristics with respect to the distance from earth.

NOTE:- The discharge current and voltage will be dependent on the proximity of the spray gun discharge needle to earth. When setting the maximum discharge voltage, the spray gun discharge needle should be placed at least 300 mm. from earth.

GENERAL NOTE:-

An approved mask should always be worn when spraying.

GENERAL OBSERVATIONS:-

It is essential that all substrates and jigs are clean and that there is a good earth / ground to the workpiece to ensure maximum powder attraction.
Powder spraying is best performed by slow motions of the spray gun as opposed to the faster gun movements often associated with liquid paint spraying. Higher powder emissions do not necessarily mean faster coating or better penetration into corners and recesses. In practice it can often cause the opposite effect and produces products with a poor finish.
Similarly, high electrostatic discharge currents or voltages do not necessarily mean faster or more efficient coating. Again, in practice, they can cause the opposite effect and produce products with a poor finish.

OPERATING NOTES

(1) This equipment can be dangerous unless it is used in accordance with the rules laid down in this manual.

(2) Ensure that the equipment is properly earthed/grounded. Refer to assembly instructions item (9).

(3) The electrical supply to the electrostatic gun and control unit should be interlocked with the spray booth extraction system such that spraying cannot be carried out unless the exhaust ventilation system is in operation. The efficiency of the exhaust ventilation system should be checked regularly.

(4) All conductive structures within the vicinity of the spray area shall be bonded together with the earth terminal of the gun control unit to the protective earth of the system.

(5) The equipment operates by electrostatically charging the powder by means of a high voltage corona discharge at the nozzle of the gun. This electrostatic discharge can seriously damage other electronic equipment if it is sited in close proximity and not suitably protected.

(6) It is essential that all jigs and workpieces are adequately earthed. The workpiece shall have a resistance to earth of no greater than 1 Mohm. This should be checked regularly. If the earthing is not adequate, it can result in:-

a) Poor coating.

b) Sparks between the product and jigs, which can constitute an ignition or explosion hazard.

c) Radio and TV interference from sparks between the product and jigs. This interference may also affect computer systems and process controllers.

(7) Ensure that the air supply is clean and dry. Using a wet and dirty or poorly maintained air supply may invalidate warranty. Refer to the pneumatic specifications.

END OF USE CLEANING PROCEDURE

IMPORTANT WHENEVER COMPRESSED AIR IS USED FOR CLEANING EQUIPMENT THIS OPERATION MUST BE CARRIED OUT IN AN EXTRACTED SPRAY BOOTH. AN APPROVED MASK AND EYE PROTECTION SHOULD ALWAYS BE WORN WHEN USING A COMPRESSED AIR CLEAN DOWN GUN.

(1) Turn the mains switch to the OFF position.

(2) Empty remaining powder from the cup being used, and remove from the spray gun (see assembly instructions and diagrams in the appendices).
Clean the cup and other associated components with compressed air and wipe clean.

(3) Remove the nozzle from the front of the gun and clean internally with compressed air and externally with a clean cloth.

(4) Re-fit the nozzle nut securely in place.

(5) Clean case internally and externally with compressed air and wipe down with a clean cloth if necessary.

(6) Ensure that electrical and pneumatic supplies to the unit are switched off and disconnect from the unit.

(7) Replace the standard nozzle, cup nozzle/cup and adapter and the deflectors to the appropriate spaces in the lower moulding.

(8) Coil the airlines and electrical leads.

(9) Replace the gun and coiled mains and trigger leads into the lid section of the case.

(10) Place the coiled airlines over the components section of the case so that they will be held in place when the lid is closed, for security during transit.

CHANGING COLOUR

NOTE:- Follow the cleaning procedure excluding sections regarding packing the equipment.

In short clean all of the gun and cup components internally and externally with compressed air and if necessary wipe down with a clean cloth. Once cleaned to a satisfactory level a different colour may then be introduced into the system.

DO's And DON'Ts

DO's

(1) Ensure that the equipment is operated by trained personnel only.

(2) Ensure that the equipment is serviced regularly by qualified personnel. All repairs and maintenance shall be carried out by qualified personnel only, in accordance with the manufacturers instructions. Repairs must be carried out at the instigation of the operator when faults or defects are detected. Repairs must not be performed in hazardous areas and must not compromise safety standards.

(3) Ensure that the operator is correctly earthed. If overalls are worn, they should be anti-static or non-insulating. If gloves are worn, they should be anti-static or non-insulating. If this is not possible, gloves with the palms removed may be used. Footwear intended for use by operators shall be anti-static or non-insulating and shall comply with the requirements of ISO 2251 / BS 5451 or equivalent. Shoes with leather soles are usually adequate.

(4) Ensure that the operator wears suitable respiratory equipment and or protective clothing. All personnel working in a powder-laden atmosphere should wear similar equipment.

(5) Ensure that the operator wears suitable eye protection e.g. goggles or a visor (in addition to a respiratory mask) when using a compressed air clean down gun as particles in the airstream can damage eyes.

(6) Avoid skin contact with powders where possible as some powders may cause skin irritation.

(7) Wash hands and face after work and prior to eating or drinking.

(8) Keep floors and equipment within 5 metres of the spray area clean using a suitable industrial vacuum cleaner.

(9) Keep light fittings and all other electrical equipment clean.

(10) Regularly check the effectiveness of dust/powder collectors and extraction filters and that recycled air is clean.

(11) Regularly check the earthing of electrical equipment and manually operated spray guns.

(12) Regularly check the earth bonding of all conductive electrical enclosures and all conductive structures such as floors, walls, ceilings, fences, conveyors, powder containers etc. within the vicinity of the spray area. These shall be bonded together with the earth terminal of the high voltage generator to the protective earth system of the electrical supply. Electrostatic grounding should comply with EN 50053.

(13) Ensure that all jigs and work pieces are adequately earthed. Each workpiece shall have a resistance to earth of not greater than 1 Mohm. This resistance shall be checked regularly.

(14) Ensure that correct cleaning procedures are followed. See " Cleaning Procedures".

(15) Ensure that powders are processed in compliance with the powder manufacturers instructions. Special care should be taken with powders containing metallic pigments.

(16) Regularly check the compressed air supply to ensure that it is clean and dry.

DON'TS

(1) The operator must not wear insulating gloves, clothing or footwear.

(2) Do not smoke in areas where powder coating is being carried out or in areas where powder is stored.

(3) Do not eat or drink in areas where powder coating is being carried out or in dust-laden atmospheres.

(4) Do not spray into areas which are not properly extracted. The direction of airflow should always be from behind the operator. It is recommended that airflow velocities over the face area of a booth opening should be in excess of 0.5 metres/sec.

(5) Do not use compressed air for cleaning skin and clothing as it can penetrate the skin causing embolisms. Use a suitable industrial vacuum cleaner for clothing and wash skin with water.

(6) Do not point compressed air clean down guns towards body orifices (mouth, ears etc.).

(7) Do not enter spray booths when in operation.

(8) Do not attempt to make any internal repairs as there is a risk of injury. Any repairs made to the equipment other than those made by qualified personnel will invalidate any warranty on the equipment.

(9) Do not operate the equipment in environments which exceed the operating parameters of the unit, as this may result in damage to the equipment and subsequently invalidate any warranty.

NOTE:-
The workplace must be kept tidy and well organised to reduce the risk of accidents. Good illumination, protection from any damp environment and correct storage of materials will assist the operator to maintain concentration and an awareness of potential hazards.

NOTE:-
Before starting to clean the spray gun or carrying out any other work in the spraying area, the high voltage supply shall be switched off in such a manner that it cannot be re-energised by operating the trigger of the spray gun.

FAULT FINDING

UNIT WILL NOT OPERATE (No LED's will illuminate)

(1) Check that mains connector is fitted to the control panel of unit.

(2) Check that unit is connected to a suitable mains electrical supply and is switched on.

(3) Check that miniature circuit breaker (automatic fuses) on the control panel of the unit have not been tripped. If one or more has, then press to reset. If it trips again, switch off unit and refer to an authorised distributor or service agent.

UNIT WILL NOT OPERATE (LED's will illuminate)

(1) Check the trigger connections at the gun and on the control panel of the unit.

(2) Check that the trigger switch in the gun is operating. Depress the trigger and an audible click should be heard if the trigger switch is operating.

(3) Check that the voltage selector switch is set to the required voltage. The unit is supplied pre-set to 230 volts. If the local supply is between 100V and 130V, reset the selector switch on the control panel to 115 volts.

WARNING **DO NOT** set the voltage selector switch to 115V if a higher supply voltage is being applied as damage may result.

NO POWDER DELIVERY

(1) Check air supply to unit.

(2) Check that powder container is not empty.

(3) Check that the internal solenoid valve is operating by depressing gun trigger when an audible click should be heard. If it is not, check the trigger connections at the gun and on the control panel of the unit.

(4) Check for blocked powder hose section (cup adapter).

(5) Check for blockage in venturi body section and gun.

POWDER DELIVERY INTERMITTENT OR SURGING

(1) Check that there is sufficient powder in the container.

(2) Check air pressure and adjust if necessary.

(3) Check for any partial blockages in the powder hose section, venturi body section, or gun. Blockages in powder paths may be caused by damp powder if the air supply contains more than the permitted level of moisture.

(4) Check that the venturi body is sealing properly with its associated components.

(5) Check that the powder is not damp. If it is, it may not move down to the suction point and lumps may form in the powder causing partial blockages and 'spitting' from the nozzle of the gun. Powder may become damp if left for long periods in an open container.

POWDER DOES NOT ADHERE TO WORKPIECE

(1) Check that electrostatic switch is set to either the uA or kV positions. The yellow LED should be illuminated.

(2) Check the setting of the charge control potentiometer and that an electrostatic charge is present at the discharge electrode needle of the gun.

(3) Check that the workpiece is properly earthed / grounded.

(4) Check that the compressed air supply is clean and dry. Dirt and moisture trapped inside the gun may cause a loss of electrostatic charge to earth, if this is occurring the units warranty may be invalidated

DEFECTS ON FINISHED PRODUCT

CONTAMINATION OF SURFACE WITH SPECKS OF OTHER COLOURS

(1) Application equipment inadequately cleaned after using previous powder.

(2) Airborne powder of different type within a contaminated spraybooth, or sucked in from dirty surroundings.

(3) Reclaimed powder contaminated with other powders from within the reclaim system e.g. ductwork, cyclone, booth etc.

(4) Airborne contamination within the oven.

(5) Dust or dirt dislodged from jigs or conveyor.

(6) Dusty environment before or after coating.

LUMPS OR PROTRUSIONS ON SURFACE

(1) Dirty or contaminated powder.

(2) Dirty or contaminated substrate (workpiece)

(3) Rusty substrate

(4) Dusty environment before or after coating.

(5) Dust or dirt in oven.

(6) Dust or dirt dislodged from jigs or conveyor.

HEAVY 'ORANGE PEEL'

(1) Applied coating is too thick.

(2) Incorrect cure cycle and/or temperature.

(3) Inferior quality or powder.

FISH EYES

(1) Contamination of substrate.

(2) Contamination of powder.

(3) Contamination of compressed air supply.

NOTE:- Contamination may be caused by airborne vapour such as wet paint, airline or conveyor oil or stripping facilities.

Silicones and acrylic paints are the worst offenders and can contaminate the powder and / or substrate.

CRATERS AND VOIDS

(1) Poor cleaning of substrate e.g.. trapped oils or solvents.

(2) Wet components e.g.. water trapped in corners or joints.

(3) Contamination of powder.

(4) Contamination of substrate.

PIN-HOLING AND BUBBLES

(1) Porous substrate e.g. expansion or air or solvents from porosity or cavities in castings during curing cycle.

Pre-heating of the workpiece may help to overcome this.

(2) Excessive electrostatic charge applied to the powder. To overcome, reduce the discharge current.

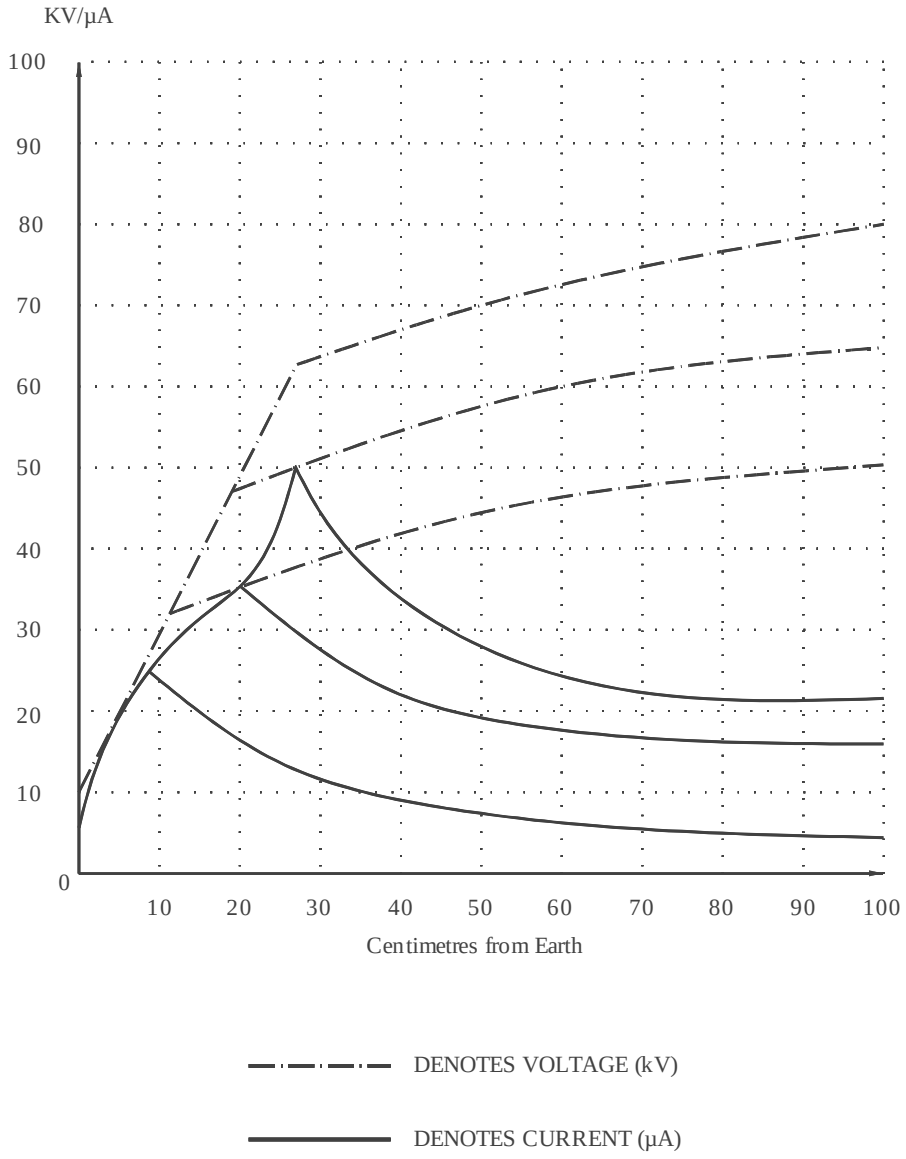
(3) Rusty substrate.

(4) Contamination of substrate, powder, air supply or from dirty surroundings.

(5) Excessive moisture in compressed air supply. Refer to pneumatic data in specifications.

TOTAL ENERGY CONTROL

The "Total Energy Control" system developed by Eurotec is used to set the discharge energy of the spray guns corona needle up to a maximum of 85kV and 50 µA.
The maximum current generated is limited to 50 µA (as with existing current control equipment) but now both the current and voltage are reduced as the gun approaches the product. Rather than controlling just the current or the voltage the operator is now able to control the total energy output from the gun.

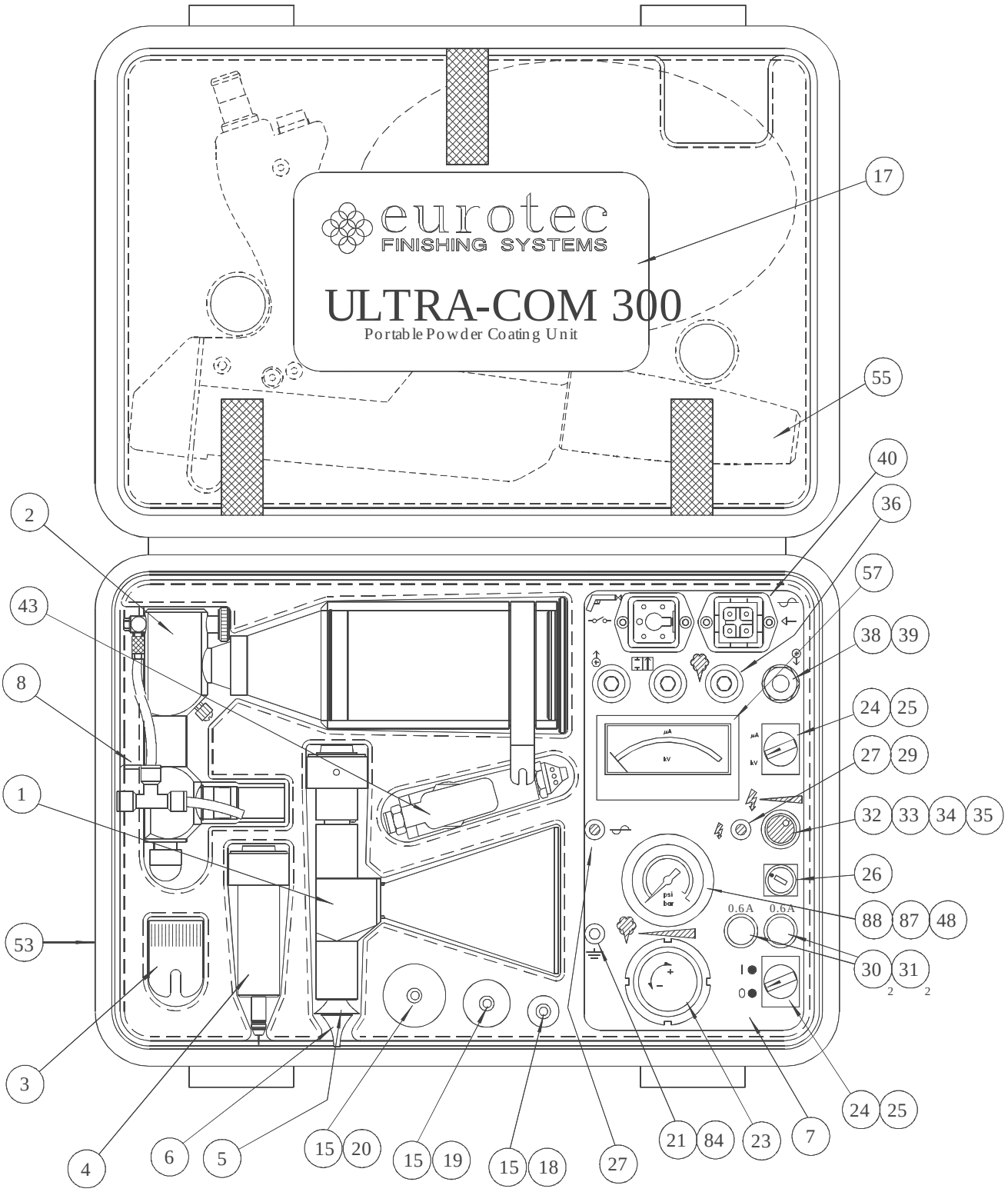


In free air, away from the influence of any earthed objects the maximum discharge current will be 20 µA when the Discharge potential is set to maximum 85 kV. As the gun is moved within one meter of the product the current starts to rise and, in tandem, the control circuit reduces the voltage. This process continues as the gun is moved closer to the product until a point is reached at which the energy is limited by the setting of the control potentiometer. At this point the Total Energy Control system rapidly reduces the energy output from the gun as it further approaches the product.
The ability to control the output energy of the gun allows the operator to take the gun right in to corners and recesses and still effectively charge powder at very low electrostatic outputs. High film builds are achieved with superior finishes and no surface disruption, whilst very significant improvements are noted in the ability to re-coat previously coated products.

APPENDIX (i)

ASSEMBLY DRAWINGS & PARTS LISTS

ULTRA-COM 300 Portable Unit General Assy
Part.No. 5020001
Illustration No. 6000059



ULTRA-COM 300 Portable Unit General Assy
PARTS LIST

Item	Part No.	Description	Qty.
1	3016090	Cup Nozzle Assy	1
2	3016100	Cup Adaptor Assy	1
3	3015045	Slotted Cap Assy	1
4	3016005	Nozzle Assy	1
5	3000040	Spreader	1
6	3000039	Spreader	1
7	5020004	Lab Unit Overlay, 300 series	1
8	5020010	Top Panel, Lab Unit, 300 series	2
9	5020011	Lid Panel, Lab Unit 300 Series	1
10	5020012	Gauge Coupling, Lab Unit 300 Series	1
11	5020013	Chassis, Lab Unit 300 Series	1
12	5020014	Solenoid Fixing Bracket, Lab Unit 300	1
13	5020016	Nut Plate Long, Lab Unit 300 Series	2
14	5020017	Nut Plate Short, Lab Unit 300 Series	2
15	5020018	Pillar, Deflector Mounting, Lab Unit 300	3
16	5020019	Label Outer, Lab Unit 300 Series	1
17	5020020	Label Inner, Lab Unit 300 Series	1
18	3015047	Deflector Assy Small	1
19	3015048	Deflector Assy Medium	1
20	3015049	Deflector Assy Large	1
21	9000113	Earth Terminal	1
22	2001010	Transformer	1
23	2000026	Regulator Assembly	1
24	9001528	Switch Contact Block	2
25	9001527	Switch Actuator	2
26	9001053	Voltage Selector	1
27	9000005	Led Housing 3mm 3105	2
28	9000095	Led Green	1
29	9000096	Led Yellow	1
30	9000016	Circuit Breaker	2
31	9000019	Boot For Circuit Breaker	2
32	9000051	Potentiometer	1
33	9000002	Collet Knob, Black Type K151-250	1
34	9000004	Nut Cover, Black Type N151	1
35	9000003	Potentiometer Cap, Yellow	1
36	9001595	Q.D Air Connector, Female 6/4 Bulkhead	3
37	9000038	Solenoid Valve	1
38	9001083	Q.D Air Connector, Male 1/8 BSPMP	1

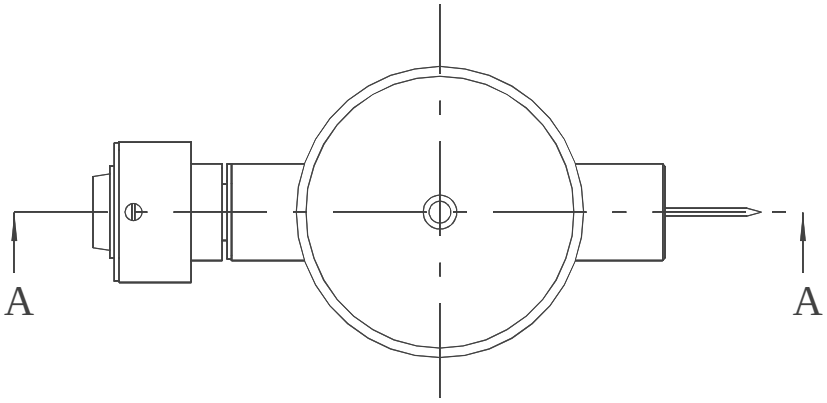
Continued:-

Item	Part No.	Description	Qty.
39	9001596	Elbow, 1/8BSPFP - 6mm PI	3
40	9000120	Panel Mounting Base	2
41	9000013	Socket Connector 4 Pin +E	1
42	9000011	Plug Connector 3 Pin + E	1
43	9001526	Blow Down Gun	1
44	9000105	Stud	1
45	9000036	Twin Banjo Body	2
46	9001531	Banjo Bolt 3/8 BSP Single	2
47	2020054	PCB,Generator Board, Lab Unit 300 Series	1
48	2020024	Pressure Gauge, DIA 40mm, 30 PSI	1
49	9001156	Pillar	4
50	9000077	Connector CN-M5-PK-4	1
51	5020021	Connector Earthing Plate	1
52	5020006	Earth Lead Assembly, Lab Unit 300 Series	1
53	9001521	Case, ABS, Sealed, 613, Black	1
54	9000070	Foam Sealing Tape	1.3m
55	3016002	MG300 MK11 Manual Powder Gun Assy	1
56	5020007	Air Line Assembly, Lab Unit 300 Series	2
57	2020015	Meter	1
58	9001536	Connector, Disc Drive, Plug Free	1
59	9001537	Connector, Disc Drive, Socket Free	1
60	9000569	Screw, M4 x 20, CSK, SKT, HD, Black	8
61	9000804	Nut, M4 Nyloc	4
62	5020009	Powder Gun, Cable Assy, Lab Unit 300	1
63	5020022	Mains Lead Assy, Lab Unit 300 Series	1
64	9000168	Tubing, 6mm O.D. x 4mm I.D. Black	1.5m
65	9001534	Feet, Self Adhesive	4
66	9000560	Screw, M4 x 12, CSK, SKT, HD. Black	7
67	9000452	Cable, 6 Core, 16/0.2, Unscreened	0.7m
68	9000462	Cable, 4 Core, 16/0.2, Unscreened	1.38m
69	9000424	Wire, Brown, 0.5mm SQ, 16/02, Trirated	1.05m
70	9000425	Wire, Blue, 0.5mm SQ, 16/0.2, Trirated	1.05m
71	9000429	Wire, Grn/Yell, 0.5mm SQ, 16/0.2, Trirated	1.88m
72	9000427	Wire, Orange, 0.5mm SQ, 16/0.2, Trirated	0.38m
73	9000437	Wire, White, 0.5mm SQ, 16/0.2, Trirated	0.38m
74	9000468	Wire, Red, 7/0.2	0.15m
75	9000469	Wire, White, 7/0.2	0.15m
76	9001547	Mounting Blade, 45 Deg, 0.25IN PCB	3

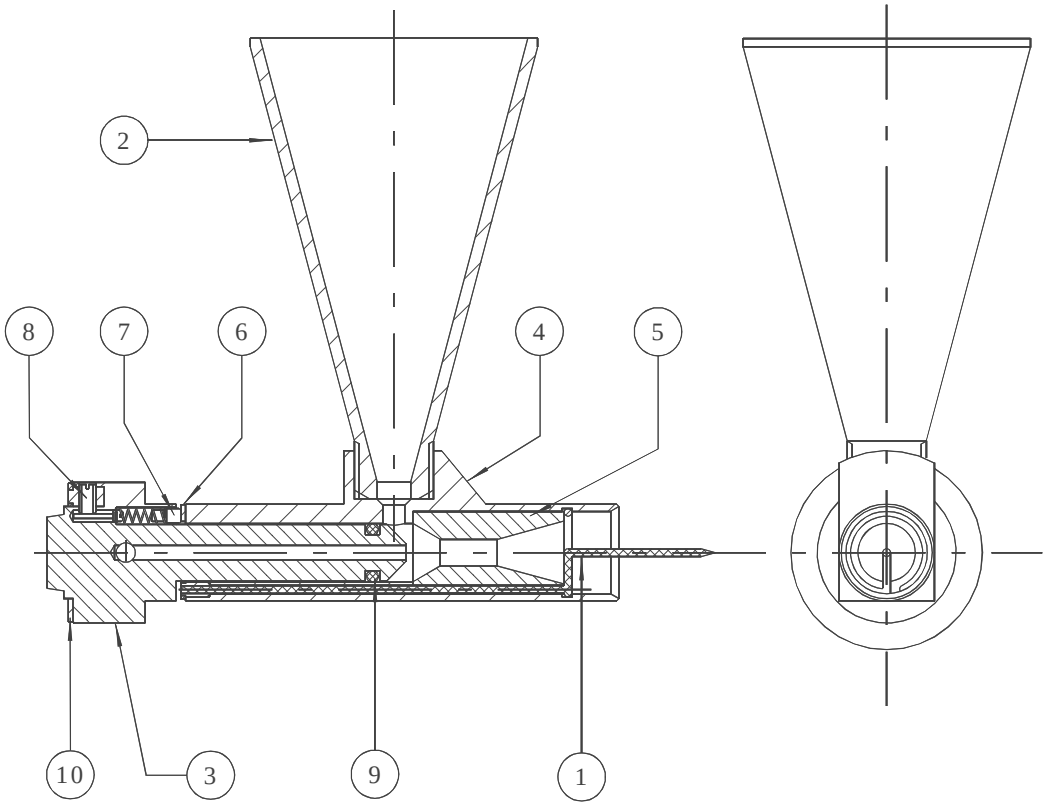
Continued:-

Item	Part No.	Description	Qty.
77	9000022	Cable Tie	15
78	9000550	Screw, M4 x 8, Cap, HD, Black	1
79	9000049	Terminal, Spaded, Large	8
80	9000050	Terminal, Spaded, Small	7
81	9000142	Terminal, Cover, Small	7
82	9000141	Terminal, Cover, Large	8
83	9000047	Sleeve, Rubber, H15	12
84	9000046	Solder Tag, 2BA	1
85	9000048	Sleeve, Rubber, H12	7
86	9001541	Nipple, M5 Hose - 4mm Tube	1
87	9000008	Base, Cable Tie	2
88	9000203	Tubing, 4mm O.D x 2.5mm I.D. PU, Black	0.15m
89	9001551	Velcro, Loop, 20mm x 5m	0.16m
90	9001552	Velcro, Hook, 20mm x 5m	0.28m
91	9001553	Tape, Insulating, Black Cloth	0.18m
92	9001561	Bulkhead, 1/8BSPFP -6 mm PI	1
93	9001597	Elbow, 6mm Plug In - 6mm PI	1

Cup Nozzle General Assembly
Part No. 3016090
Illustration No. 6000061



SECTION A - A

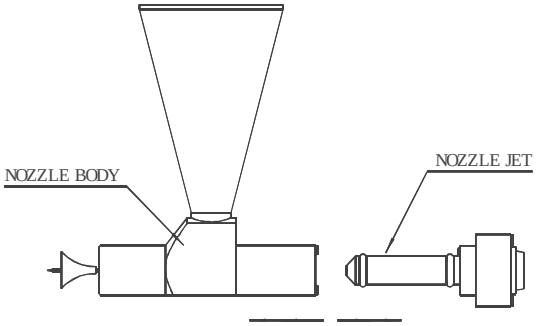


Item	Part No.	Description	Qty.
1	3016096	Electrode, Cup Nozzle	1
2	3002031	Cup Small	1
3	3016091	Jet, Cup Nozzle	1
4	3016093	Body, CupNozzle	1
5	3016092	Venturi Insert, Cup Nozzle	1
6	3016098	Washer, HT Contact Assy, Cup Nozzle	1
7	3016097	HT Contact Spring Assy, Cup Nozzle	1
8	9000518	Screw, M3 x 5, HT Contact	1
9	9001058	O-Ring, BS No. 109	2
10	3015023	Washer, HT Contact	1

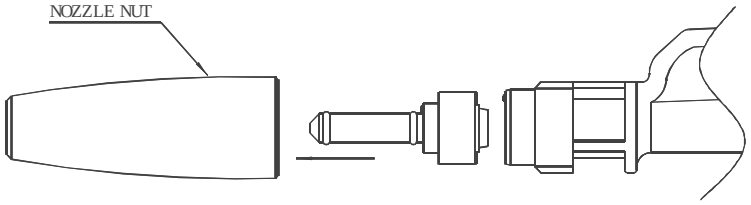
Cup Nozzle Assembly Instructions

Illustration No. 6000064

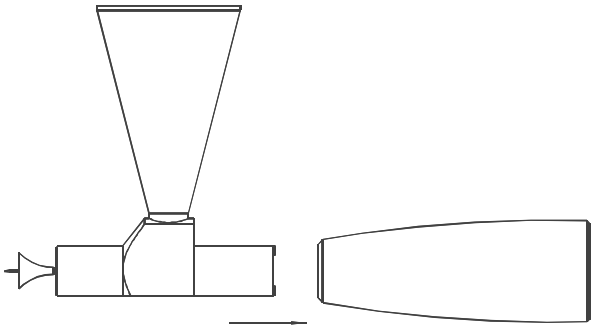
Step 1)
Separate the nozzle jet from the nozzle bodysimply by easing the two components apart.

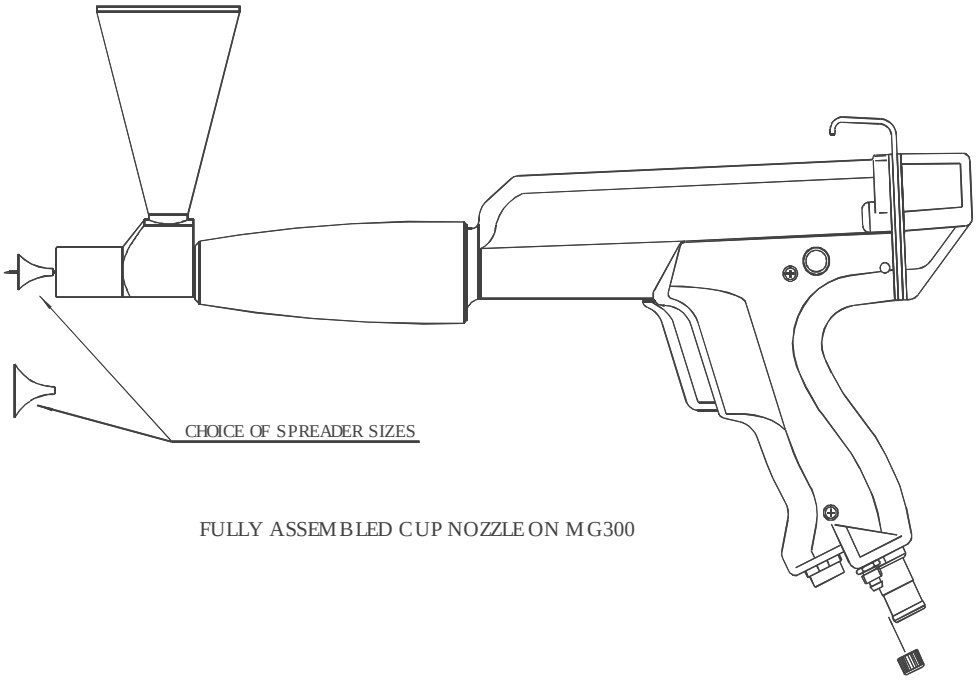


Step 2)
Once separated insert the nozzle jet section into the nozzle nut, then secure the nozzle nut onto the barrel.



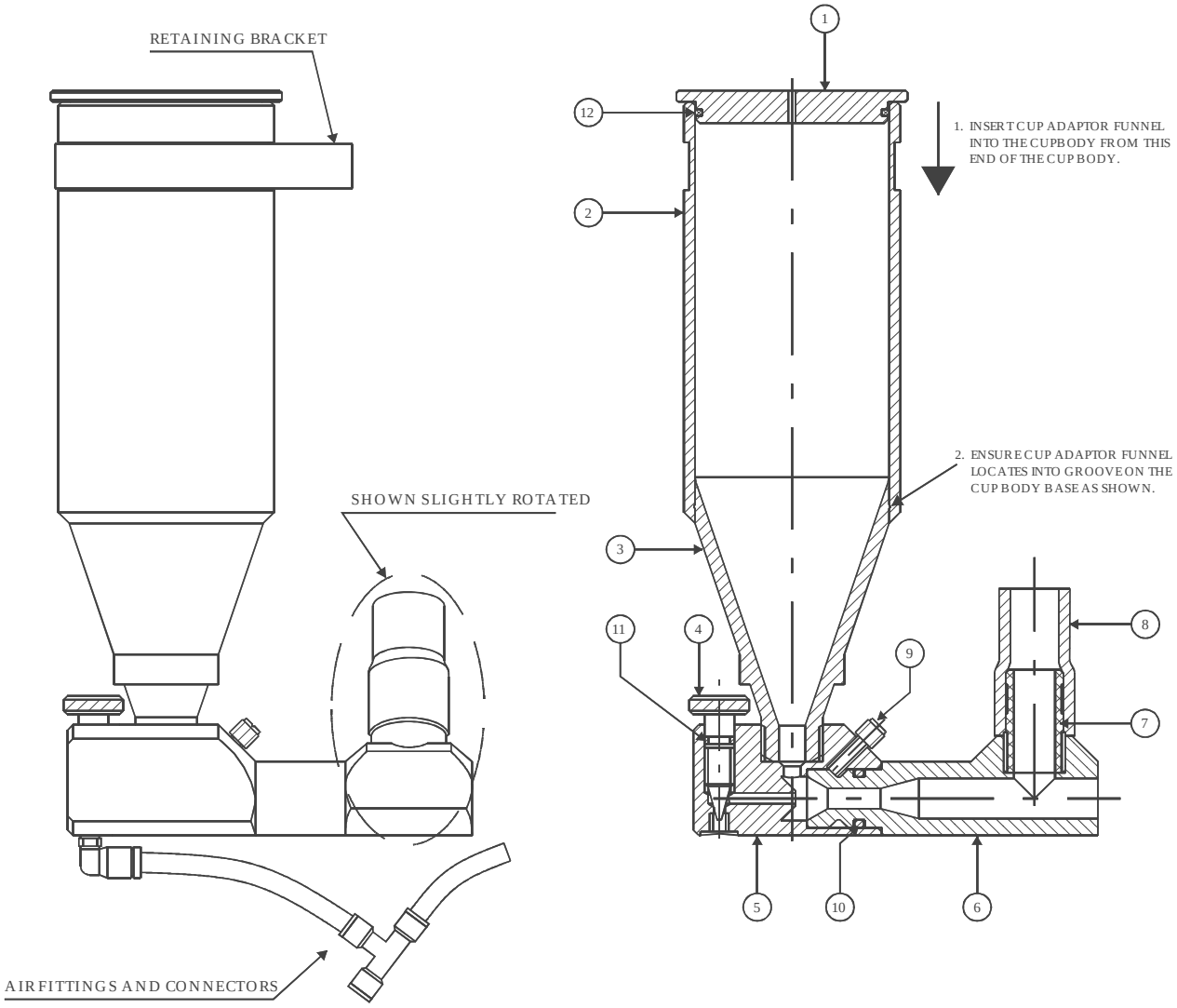
Step 3)
Once the nozzle nut is secured push the cup section onto the end of the jet and into the the nozzle nut as far as it will go to ensure good electrical continuity.





FULLY ASSEMBLED CUP NOZZLE ON MG300

Cup Adaptor Assembly
Part No. 3016100
Illustration No. 6000062

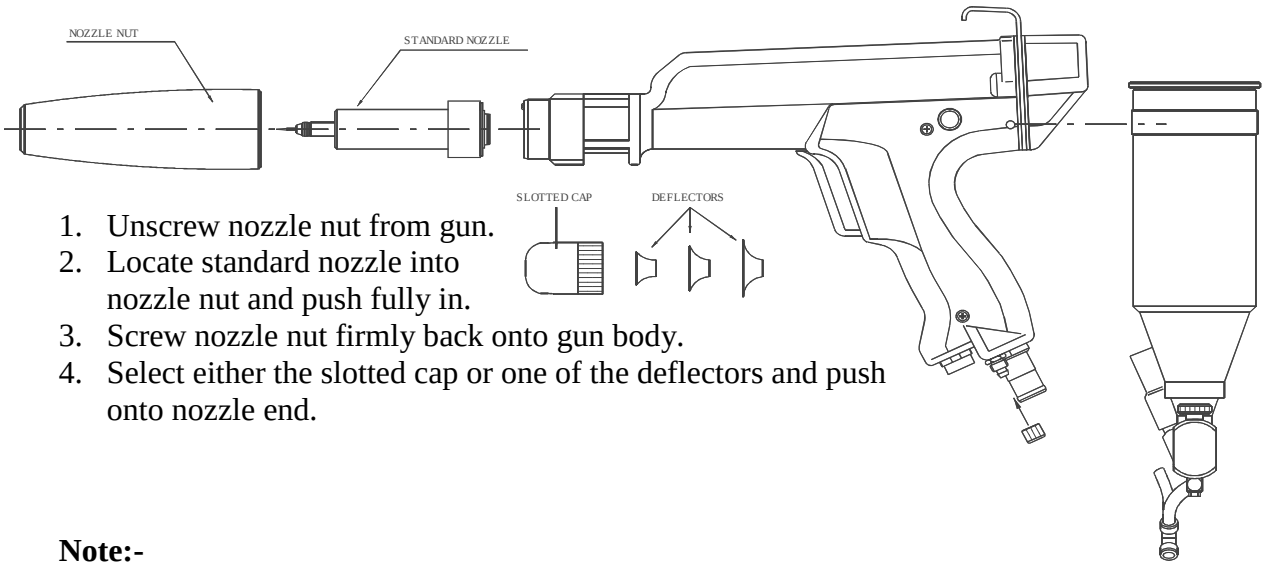


Item	Part No.	Description	Qty.
1	3016107	Lid, Cup Adaptor	1
2	3016104	Cup Body, Cup Adaptor	1
3	3016103	Funnel, Cup Adaptor	1
4	3016105	Screw, Regulator, Cup Adaptor	1
5	3016101	Body, Cup Adaptor	1
6	3016102	Venturi, Cup Adaptor	1
7	3016106	Powder Stub, Cup Adaptor	1
8	3016109	Sleeve Assy, Cup Adaptor	1
9	9000575	Screw, M4 x 12, Slt. Thumb Hd, Nylon	1
10	9001533	O-Ring, 11.6 x 2.4	1
11	9000071	O-Ring, 5.28 x 1.78	1
12	9001532	O-Ring, BS No. 032	1
13	3016108	Cup Body Clamp (Retaining Bracket)	1
14	9000366	Equal Tee, Push In Fitting	1
15	9001672	M6 Hose Elbow, 6mm Tube, Miniature	1
16	9000168	Tubing, 6mm OD x 4mm ID, Black	0.13m

Cup Assembly Instructions

Illustration No. 6000076

To fit standard nozzle:



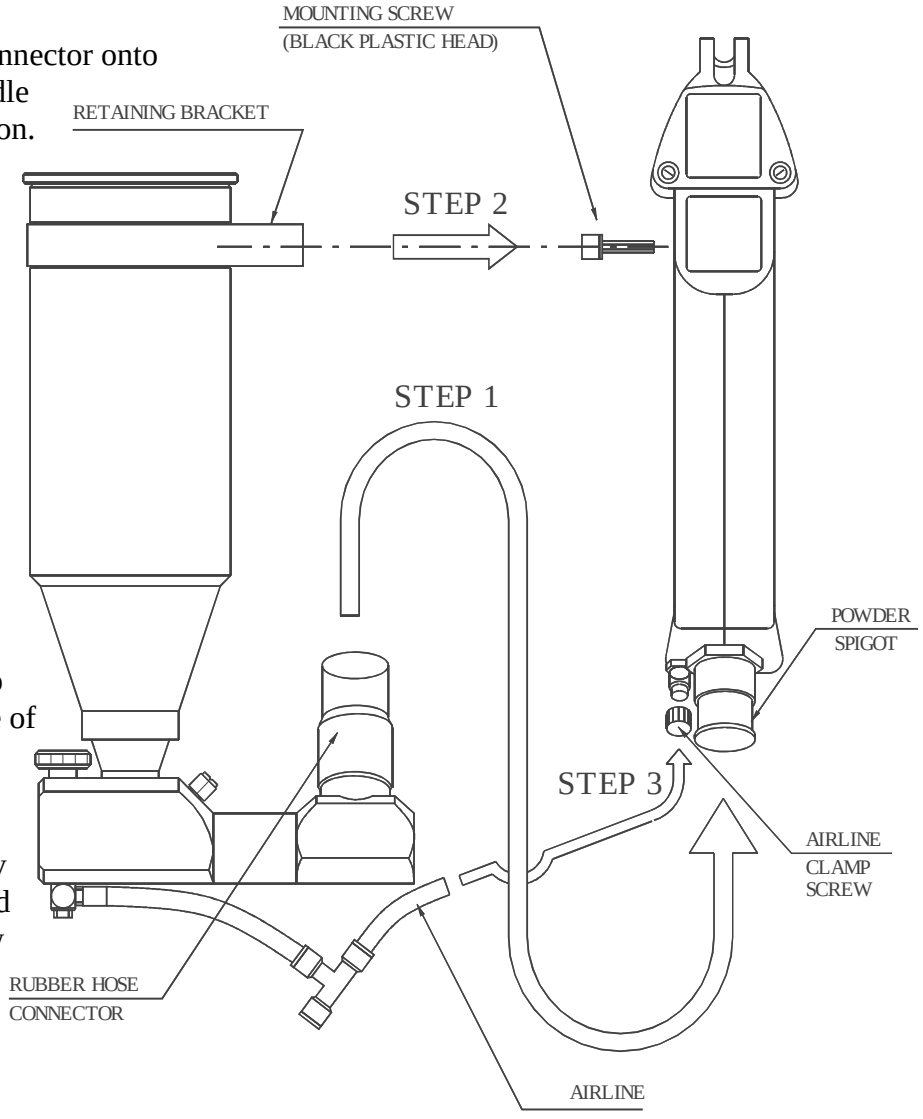
1. Unscrew nozzle nut from gun.
2. Locate standard nozzle into nozzle nut and push fully in.
3. Screw nozzle nut firmly back onto gun body.
4. Select either the slotted cap or one of the deflectors and push onto nozzle end.

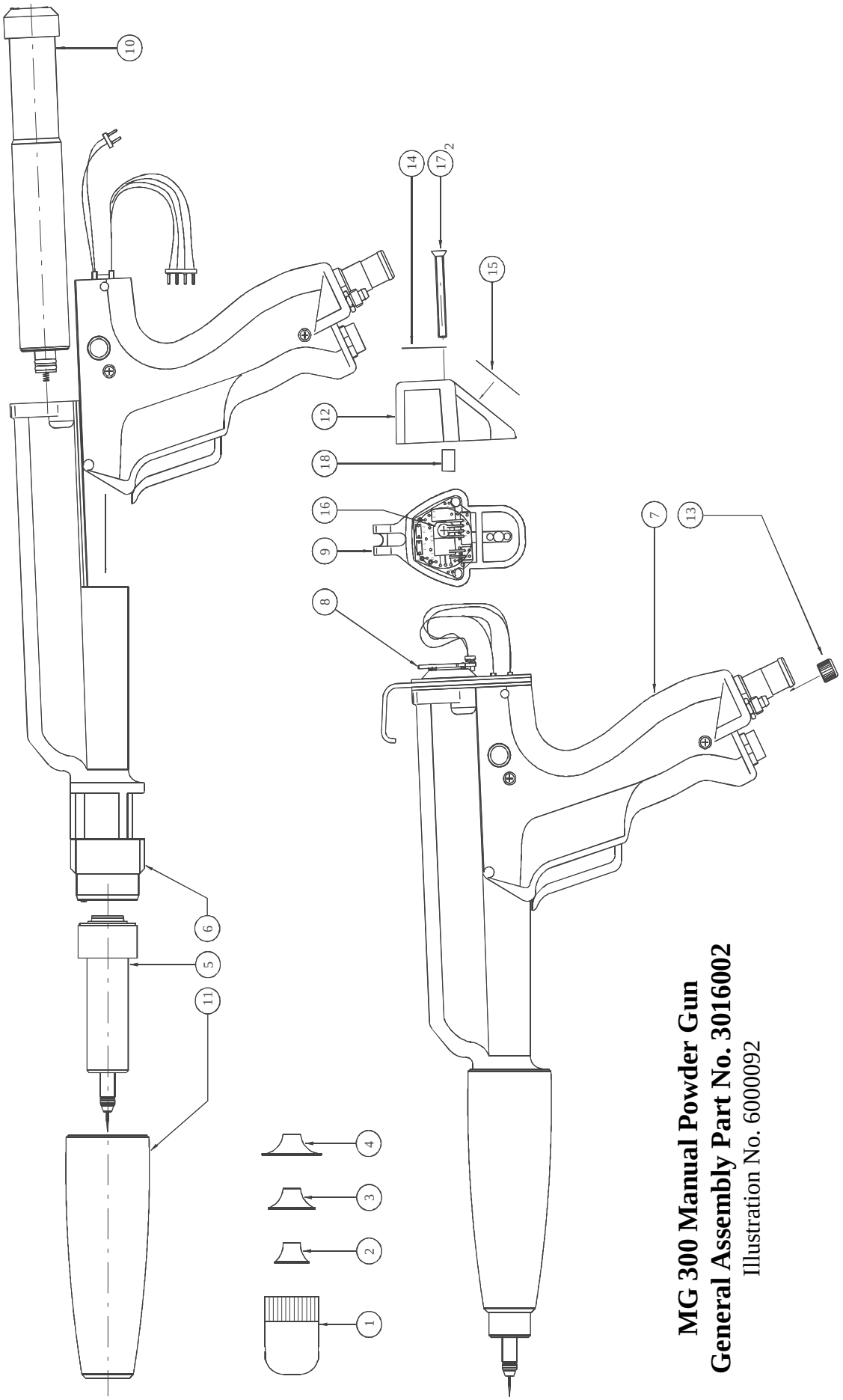
Note:-
The assembly intructions are for right handed operators however the cup may be mounted on either side of the gun allowing for left handed users.

Step 1)
Locate rubber hose connector onto powder spigot on handle of gun and push fully on.

Step 2)
Loosen mounting screw located on side of gun (black plastic head) and slide retaining bracket mount between gun and screw, then tighten screw to secure cup assembly to the gun.

Step 3)
Unscrew airline clamp screw, located on base of handle, and slide over the airline from the cup adapter body. Then push airline fully onto the airline tail and screw the clamp screw back onto the air fitting to secure the airline in place.



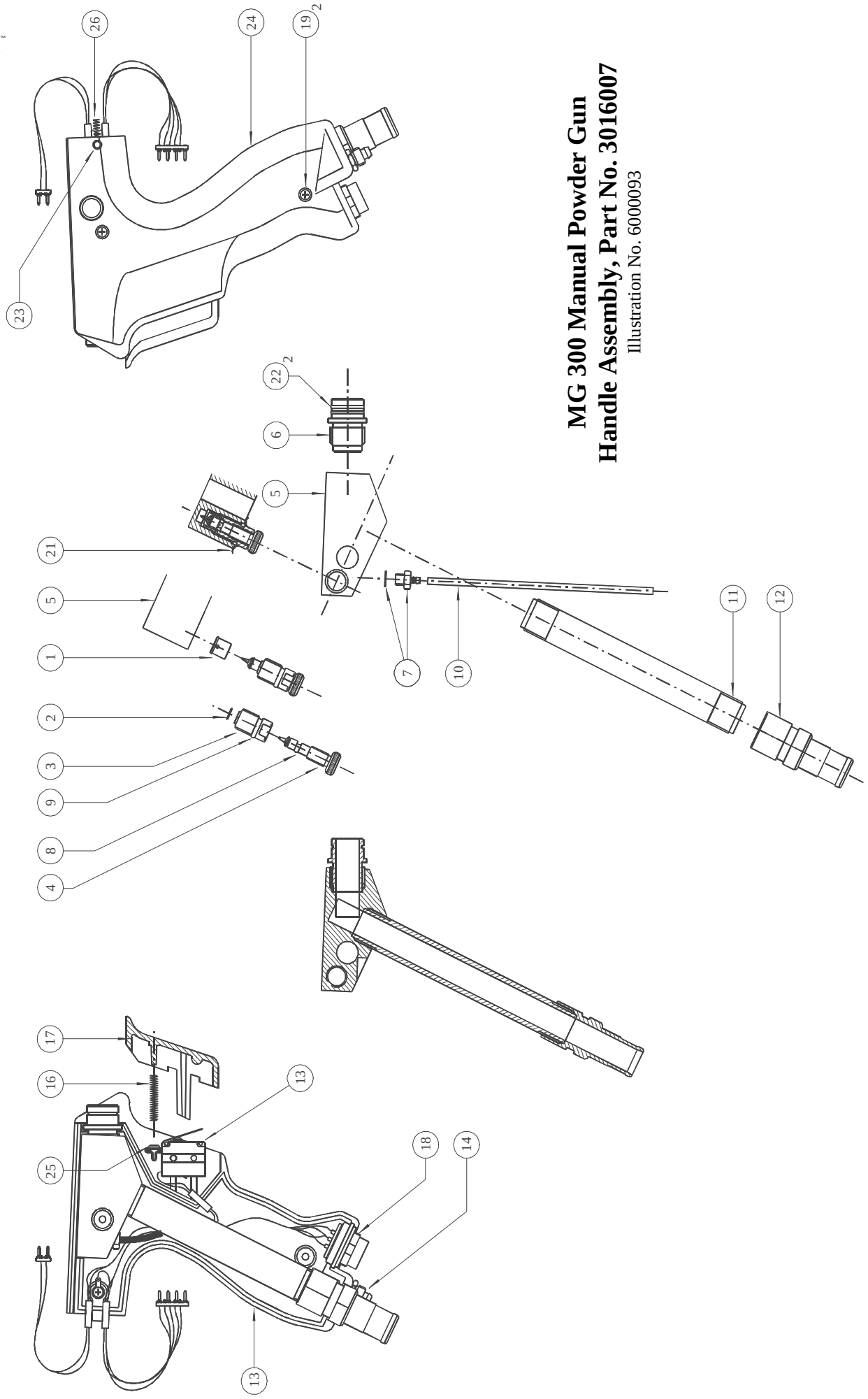


MG 300 Manual Powder Gun
General Assembly Part No. 3016002
Illustration No. 6000092

MG 300 Manual Powder Gun General Assembly
PARTS LIST

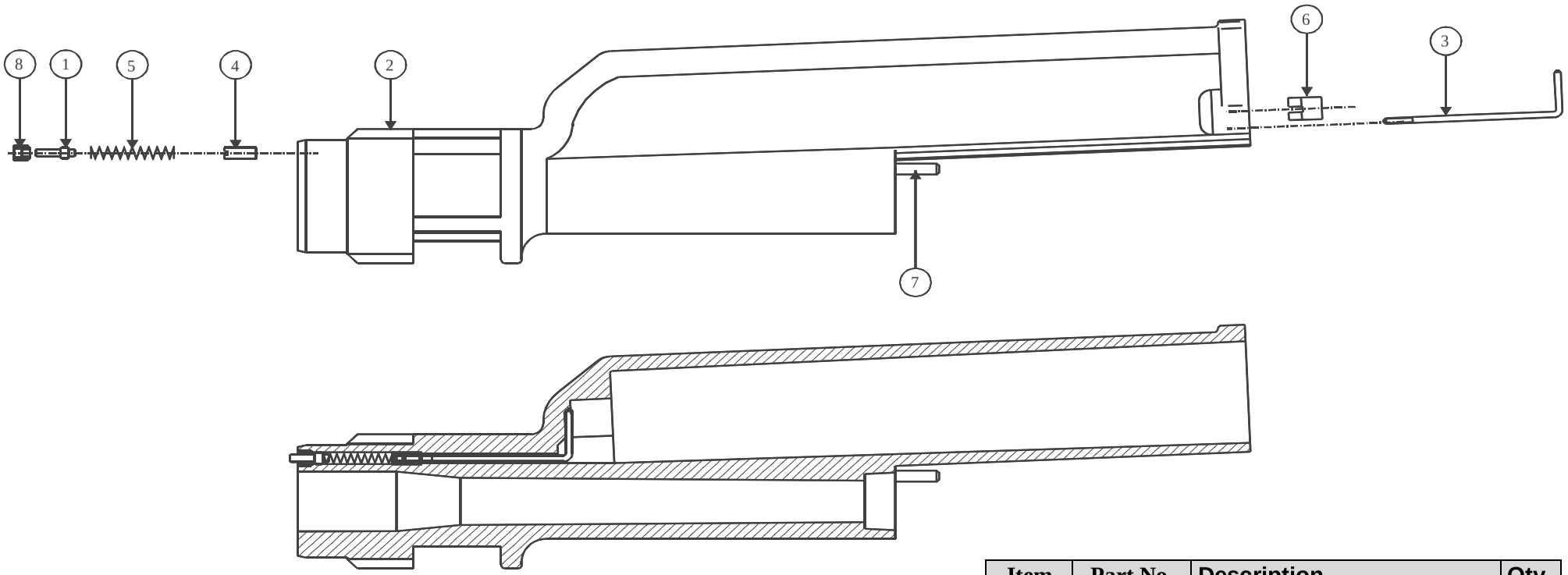
Item	Part No.	Description	Qty.
1	3015045	Slotted Cap Assy.	1
2	3015047	Deflector Assy. Small	1
3	3015048	Deflector Assy. Medium	1
4	3015049	Deflector Assy. Large	1
5	3016005	Nozzle Assembly	1
6	3016006	Barrel Assembly	1
7	3016007	Handle Assembly	1
8	3016008	Oscillator PCB Assy.	1
9	3016010	Gun Hook Assembly	1
10	3016011	HV Multiplier Assembly	1
11	3016012	Nozzle Nut Assembly	1
12	3016027	Rear Cap	1
13	3016034	Air Connector Nut	1
14	3016042	Label, Type	1
15	3016083	Label, Rating	1
16	9000512	Screw, M3 x 8, Pozi Pan Head	1
17	9000571	Screw, M4 x 40, Ctsk skt head Blk	2
18	3016063	Locating Bush PCB	2

MG 300 Manual Powder Gun
Handle Assembly, Part No. 3016007
Illustration No. 6000093



MG 300 Gun Handle Assembly
PARTS LIST

Item	Part No.	Description	Qty.
1	3016032	Air Regulator Orifice	1
2	9001379	Circlip	1
3	3016023	Air Regulator Body	1
4	3016022	Air regulator Needle	1
5	3016029	Powder Elbow	1
6	3016020	Powder Bore Insert	1
7	9001380	Air Fitting	1
8	9001376	O-Ring, 2.2x1.6	1
9	9001328	O-Ring, BS No. 011	1
10	9001378	3mm Airline	0.115
11	3016028	Powder Tube	1
12	3016031	Powder Tail	1
13	3016060	Handle Moulding, Left Hand Side	1
14	3016033	Air Fitting	1
15	3016045	Microswitch Assembly	1
16	9001375	Spring, Compression	1
17	3016018	Trigger Moulding	1
18	3016044	Connector Assembly	1
19	9000513	Screw, M3x20, Slt Csk Hd, Black	2
20	9000510	Screw, M3x6, Pan Head	1
21	3016062	Washer, Conductive, Plastic	1
22	9001377	O-Ring, 13.0x1.0	1
23	9001434	M3 Threaded Brass Insert	5
24	3016026	Handle Moulding, Right Hand Side	1
25	9000318	O-Ring, BS.007	1
26	9000375	Spring Compression	1



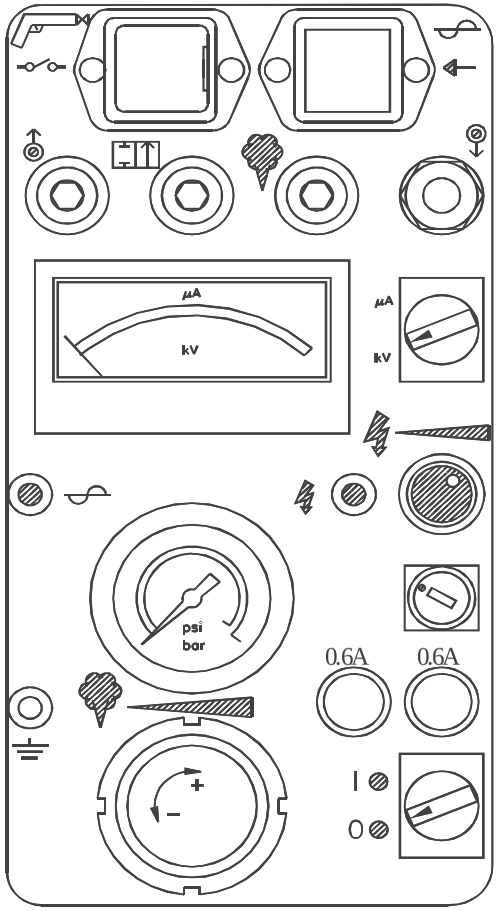
AG/MG 300 Powder Guns
Barrel Assembly, Part No. 3016006

Illustration No. 6000094

Item	Part No.	Description	Qty
1.	3015024	HT Contact Pin	1
2.	3016057	HT Barrel Type 85	1
3.	3016038	HT Contact Rod	1
4.	3016039	HT Contact Nut	1
5.	9001375	Spring, Compression	1
6.	9001435	Insert, Threaded	2
7.	3021022	Air Connection Pin	1
8.	3016013	HT Pin Retaining Screw	1

Control Panel Symbols Explanation
ULTRA-COM 300

Illustration No. 6000077



GUN TRIGGER LEAD CONNECTOR (CONTROLS SOLENOID VALVE)

MAINS SUPPLY CONNECTOR

AUXILIARY AIR OUTLET, NON REGULATED & NON SWITCHED

SWITCHED NON REGULATED AIR OUTLET

REGULATED AIR OUTLET (CONTROLLED WITH REGULATOR ON CONTROL PANEL)

AIR SUPPLY INLET CONNECTOR

µA
kV
uA/KV SELECTOR (DETERMINES THE METER DISPLAY)

CHARGE CONTROL POTENTIOMETER

MAINS "ON" LED INDICATOR

ELECTROSTATICS "ON" LED INDICATOR

0.6A 0.6A CIRCUIT BREAKERS, PUSH TO RESET

AIR REGULATOR CONTROL

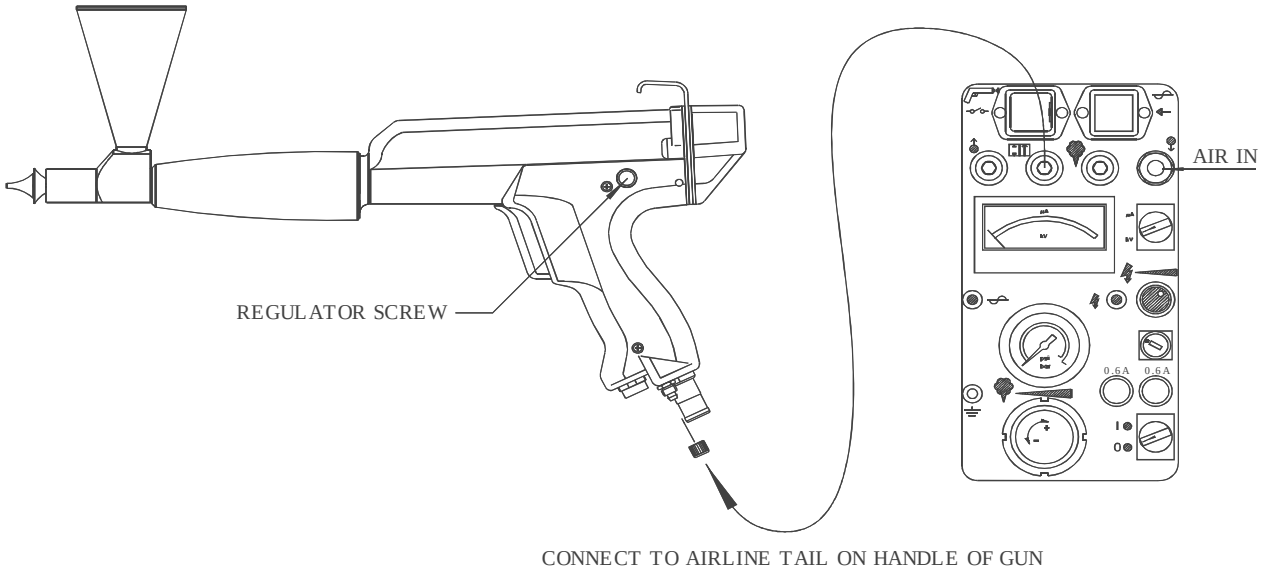
EARTHING POINT

I
O
MAINS "ON"/"OFF" SWITCH

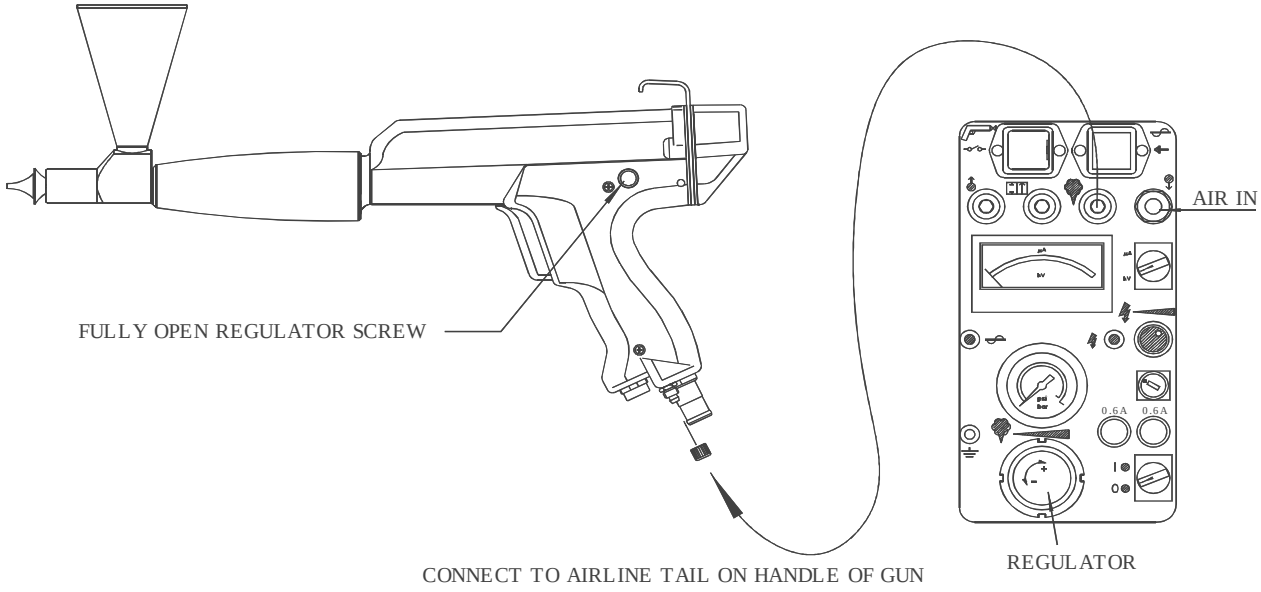
Airline Connection Variations ULTRA-COM 300
Cup Nozzle & Cup Adaptor

Illustration No. 6000067

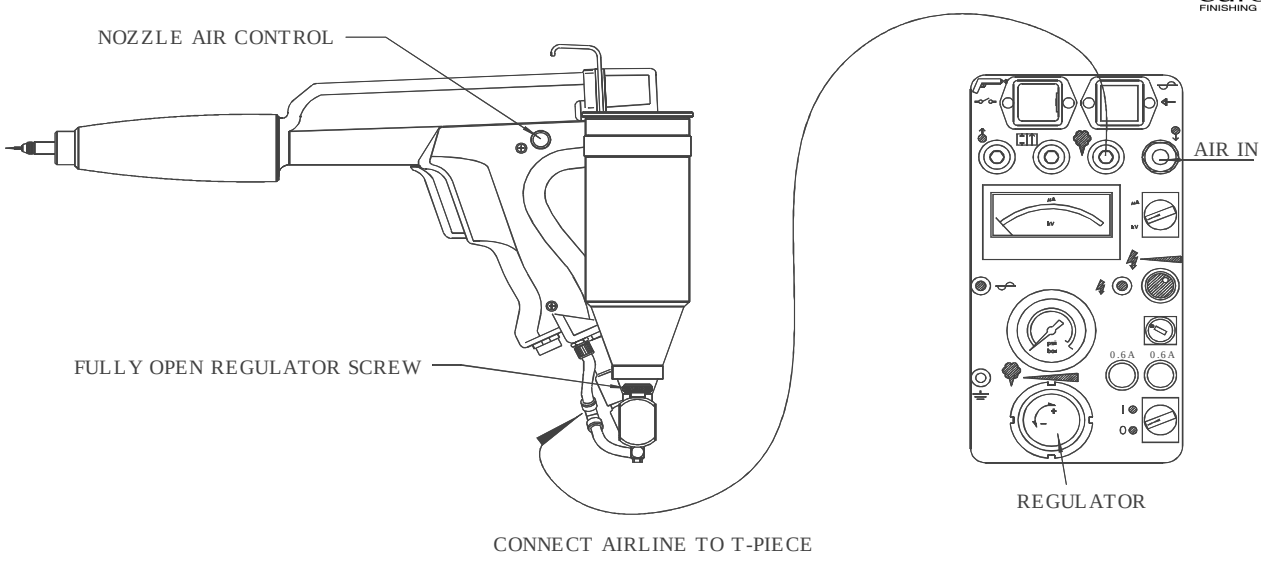
1. Powder output controlled by regulator screw on side of gun



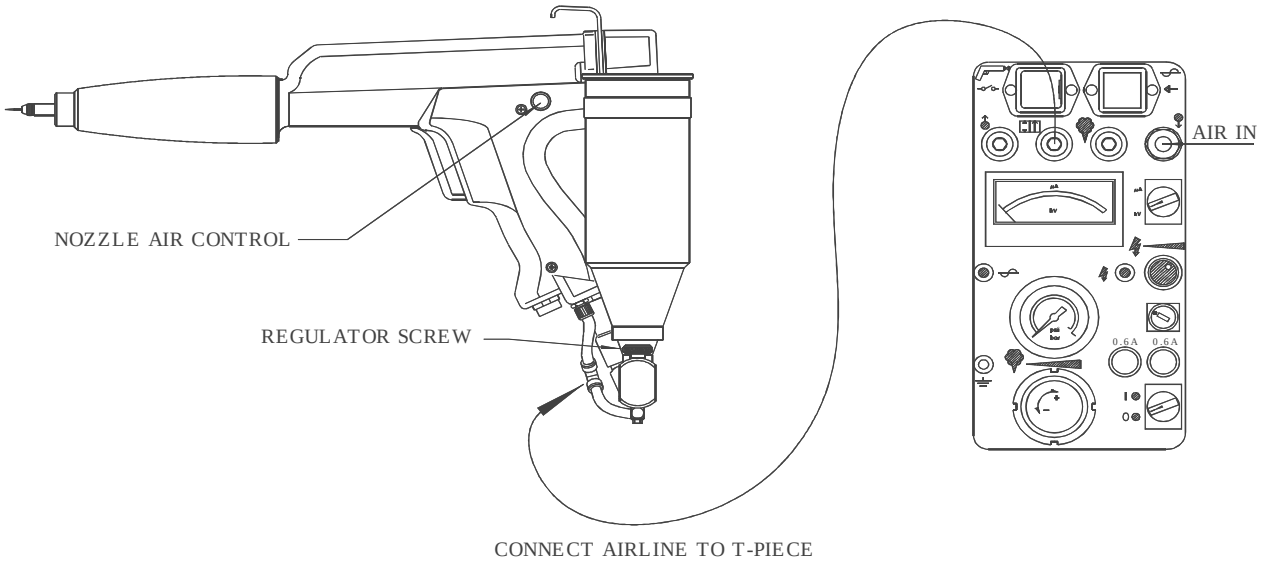
2. Powder output controlled by regulator on control panel



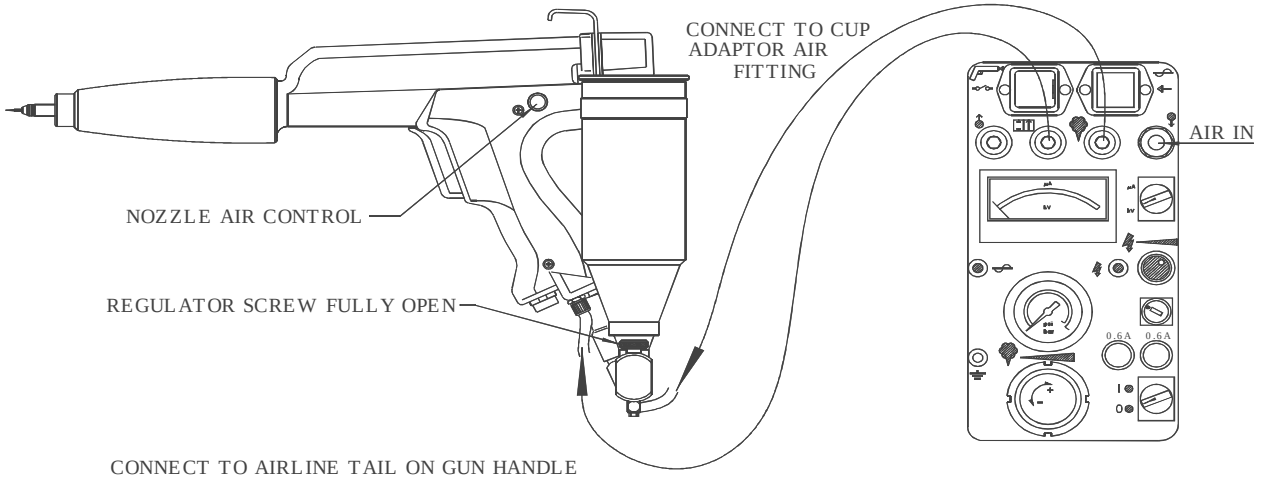
3. Powder output controlled by regulator on control panel



4. Powder output controlled by regulator screw on cup adaptor body



5. Powder output controlled by regulator on control panel with independant air supplies to nozzle & cup



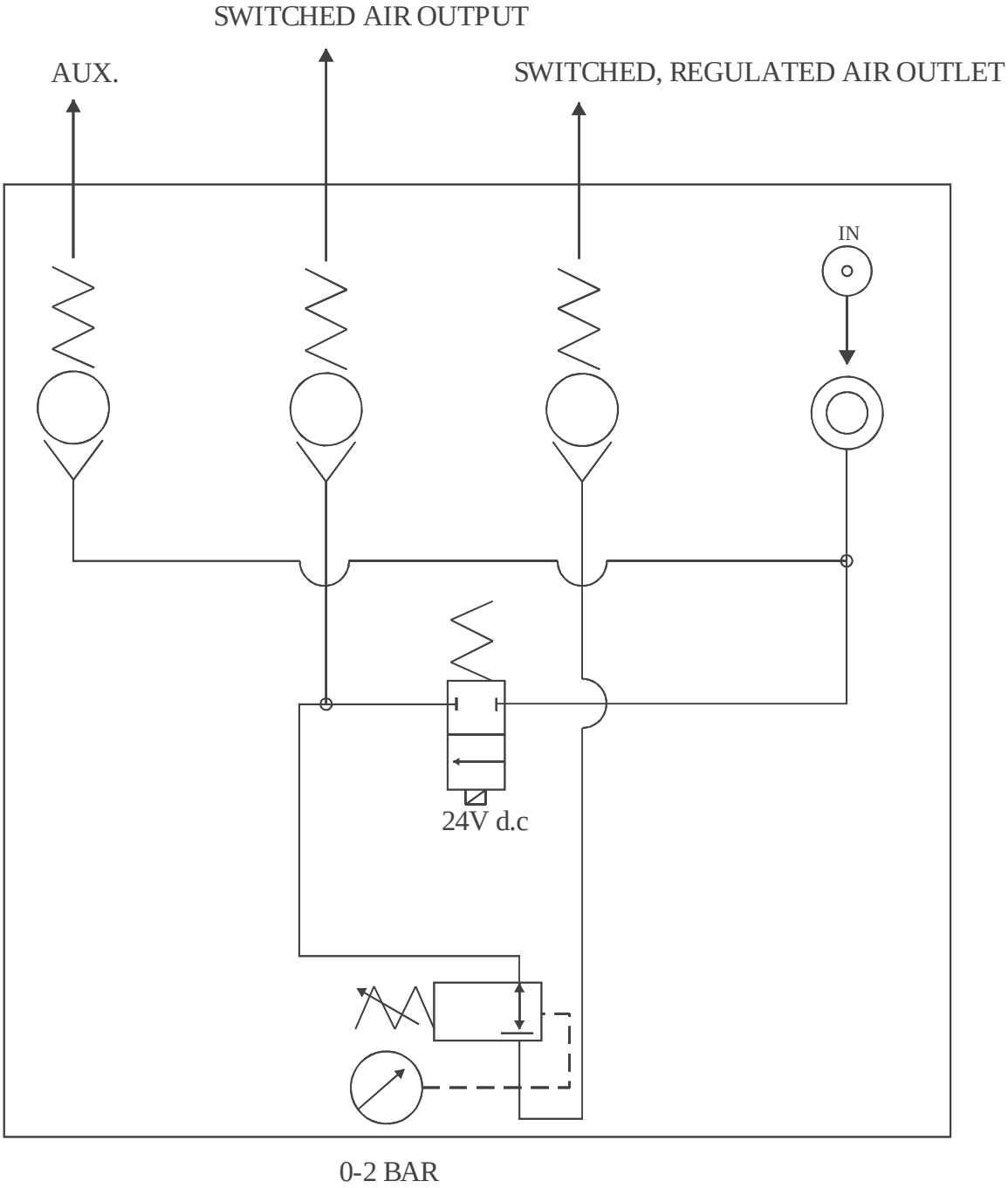
APPENDIX (ii)

SCHEMATIC DIAGRAMS

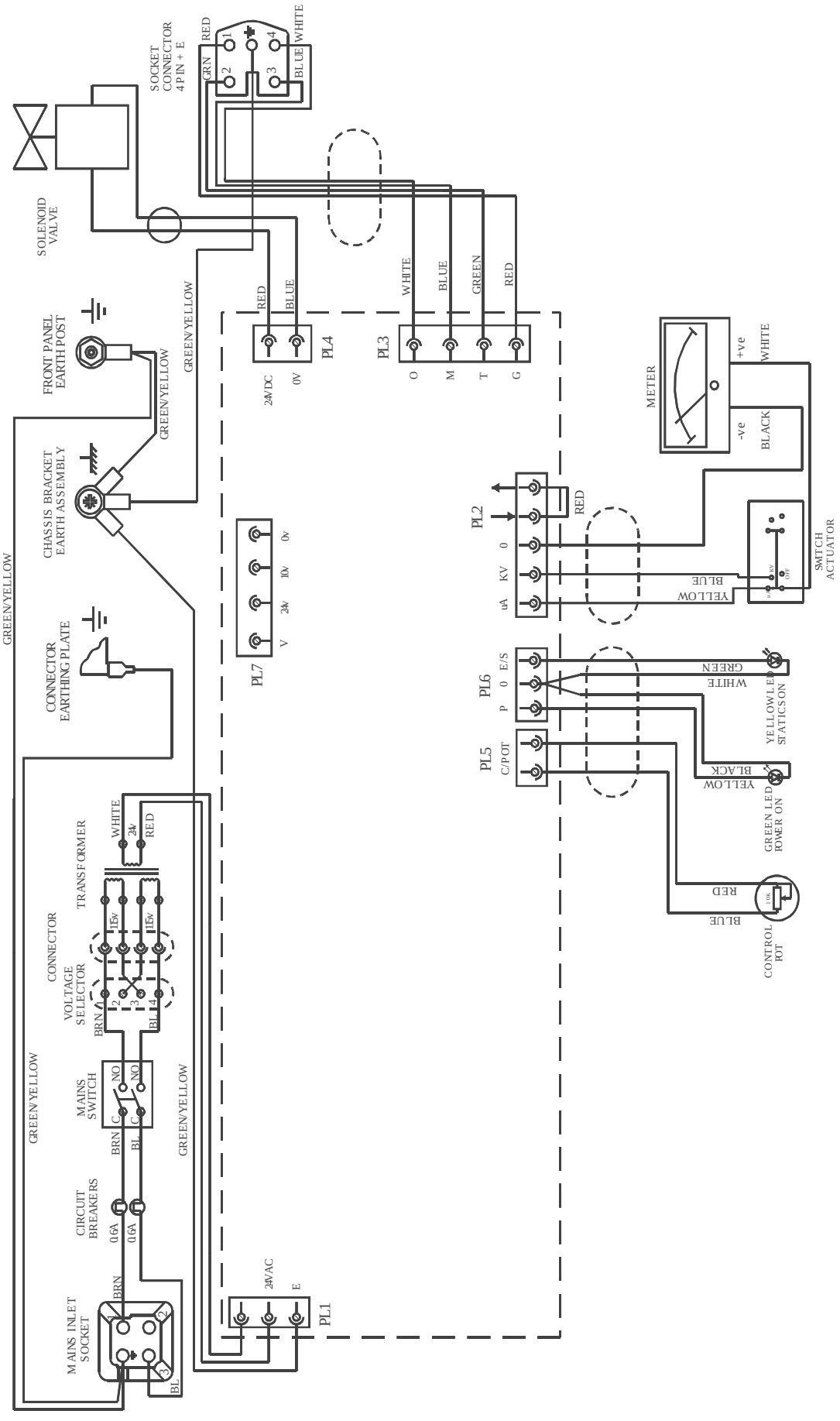
ULTRA-COM 300 PORTABLE UNIT

Pneumatic Diagram

Illustration No. 6000066



ULTRA-COM 300 Portable Unit
Wiring Diagram
Illustration No. 6000060



NOZZLE NUT

NOTES: