



INSTRUCTION MANUAL

# Electrostatic Food Spray Unit Model SAS O Mk.III

Incorporating SAS Oil Spray Head Manual  
October 2011

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**Dear Customer.**

**Thank you for buying a new ELECTROSTATIC FOOD SPRAY UNIT model SAS/ Oil Mk. III every care has been taken, from design to manufacture, to ensure that this product gives you complete satisfaction.**

Electrostatics is an environmentally responsible way to atomize powder/oil, because it significantly increases quality and production, equally decreases powder/oil costs.

### **How does it work?**

The aim is to eliminate wasteful over spray and put as much coating material on the target as possible. This is achieved by negatively charging atomized powder/oil particles so that they are attracted to the grounded work piece, opposites attract.

A charging electrode is located at the tip of the electrostatic spray head or atomizer. The powder/oil is atomized as it moves past the electrode, its particles become ionized - negatively charged. An electrostatic field is created between the charging electrode and the grounded work piece, the spray is concentrated within it.

Further atomization is achieved as charged particles form a fine cloud. Due to the electrostatic attraction, spray that would normally be lost, ends up on the back and sides of the work piece to produce a "wrap-around " effect.

### **When to use electrostatics!**

When you want to achieve maximum transfer efficiency and minimize coating waste and dusting/misting emissions, while achieving maximum application wrap around effect, high production and high flow rates.

### **The advantages!**

Increased transfer efficiency and reduced over spray, which results in significant cost savings and reduced dusting/misting emissions. We build our system with safety in mind. With flexible, lightweight low voltage cable going to the generating spray head.

### **State-of-the-art technology!**

With our new modular design, Spice Application Systems has been the leader in the electrostatics food industry for many years. With proven components and circuitry built to IP 65, it is a combination that will be hard to beat.

The new Control Unit has the added benefit of putting total control at your fingertips. With its unique design, it provides the ability to monitor current flow and control the pneumatics, in addition to providing the controls to operate your electrostatic spray heads.

**To obtain the best performance and reliability from this equipment it is strongly recommended to read the instruction manual thoroughly before**

**attempting to use the equipment.**

## EC DECLARATION OF CONFORMITY FOR MACHINERY

The manufacturer : Spice Application Systems Ltd.,  
PO Box 1190, Oxford,  
OX4 4GH, England, UK.  
Tel: 00 44 1865 747634  
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Herewith declares that “the Electrostatic Food Spray Unit”, is in conformity with the provisions of :

- RL94/9/EC The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres
- EN 292-1 Machine safety
- EN 292-2 Machine safety
- EN 50 014 to EN 50 020, identical: DIN VDE 0170/0171 Electrical equipment for locations where there is danger of explosion
- EN 50 177 Stationary electrostatic spraying equipment for flammable coating powder
- EN 60 204 IP-Type protection: contact, foreign bodies and water protection for electrical equipment
- EC Machinery Directive 89/392/EEC Annex II, sub A
- EC Low Voltage Directive 73/23/EEC
- EC Directive of Electromagnetic Compatibility 89/336/E
- EN 50081-1
- EN 50082-1
- EC Equipment Using Flammable Materials 89/336/EEC
- EN50 050:1986 Electrical apparatus for potentially explosive atmospheres
  - Electrostatic hand-held spraying equipment
  - EN50 053:Part 2:1989 EN 50 053, part 2 Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials- Hand-held electrostatic powder spray guns

All as amended, and with national implementing legislation.

Established in Oxford, on October 1st 1999

Peter King  
Managing Director

**Warning**

All controls within the Control Box have been adjusted for optimum performance and safety during manufacturing.

The Electrostatic Generating heads and control box is sealed for IP 65.

Re-adjustments, alterations or substitutions of any component may result in a hazardous operating condition a failure and possible damage to the equipment as well as over-riding the built in safety features.

Any unauthorised modification will invalidate the warranty and could endanger the work force.

Under no circumstances are any alterations allowed to the electrostatic equipment without specific written instructions and consent from Spice Application Systems Ltd.,

## SAFETY GUIDELINES

- ➔ The person in charge of the Manufacturing work area should ensure that personnel are properly trained in the use of this equipment. The safety rules which follow should be fully understood and applied at all times.
- ➔ Never point the spray unit at any person or animal.
- ➔ Spraying certain products can be dangerous, depending on what is being sprayed so full protection for operators in the form of instructions supplied with that product must be adhered to at all times.
- ➔ The normal safety rules and precautions for powder atomisation must be observed.
- ➔ For more information, consult the local safety rules. In addition, the following precautions must be observed.
- ➔ **WARNING !** Failure to observe one of the following rules may affect the operation of the equipment and create unsafe conditions.

**ALL personnel who are associated with the coating operation should read and fully understand this manual. It is especially important that the operators of the electrostatic equipment and their supervisory personnel understand the requirements for safe and proper usage of the electrostatic process.**

## TECHNICAL FEATURES

The SAS/OIL MK III spray unit uses the principle of atomising the spice as it is pumped through the spray nozzle. The oil becomes atomised and passes through an electrostatic field, it is then able to obtain the ultimate wrap-around effect, onto a grounded product

An electronic safety device, incorporated into the SAS power supply unit, automatically detects the presence of a grounded object in the vicinity of the spray head. Once this ground approaches within 10 cm / 4" this device reduces the voltage.

**Pressure/Connections:**

Control air out ..... polyamide hose Ø 6 x 8mm

Control air in ..... polyamide hose Ø 8 x 10mm

**The pneumatic system to provide clean, dry, oil free food quality compressed air a maximum pressure of 2 bar / 29 psi**

**Electrical features:** Ionization.....Negative charge on the electrode.

**Weight:** Total weight of electrostatic generating head: 0.9kg / 1.98lb

**Stainless Steel Control Box:** Food Quality 316/304 Total weight : 6.8kg / 14.96lb

**Plastics:** Polypropylene Co Polymer-Nat

Acetal Co Polymer-White

<b>Cable:</b>	PVC	Black	110/240v.
	PVC	Gray	3-13.5v

**ELECTRICAL - CONTROL UNIT**

Mains Electrical Supply	- Single Phase 3 Wire (Live-Neutral-Earth)
Supply Voltage	- 90 – 264V a.c.
Supply Frequency	- 47 – 64 Hz
Connected Load	- 40 VA
Circuit Protection	- 0.6 A Miniature Circuit Breakers – Live & Neutral
No. of Outputs to Applicators	- 1 or 2 Applicators
Output Voltage to Applicators	- 3.5 – 13V d.c.
Output Current to Applicators	- 400mA Max
Protection Category	- IP 65
Operating Temperature	- -10°C/+60°C

### **ELECTROSTATIC GENERATING HEAD**

Supply Voltage	- 3.5 – 13V dc
Supply Current	- 400mA Max
Output Voltage	- 20-85kV
Output Current	- 50uA Max
Protection Category	- 1P 65
Operating Temperatures	- -10°C/+80°C

### **PNEUMATIC – CONTROL UNIT**

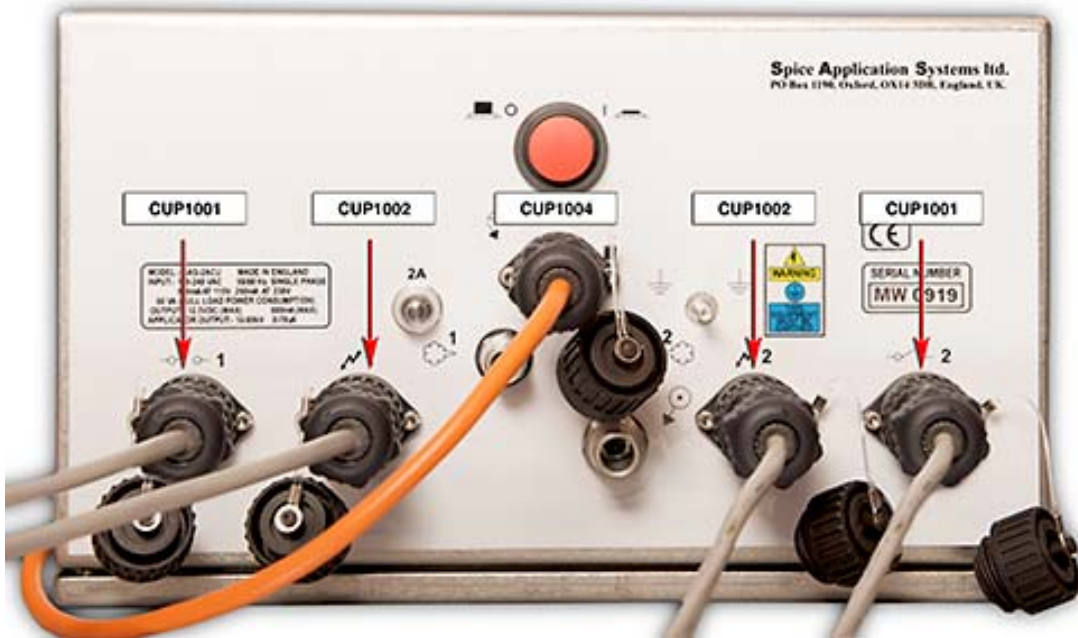
Compressed Air Supply	- 8 Bar (114psi) Max / 5 Bar (75 psi) Min
Compressed Air Consumption	- 10m <sup>3</sup> /hr (6 c.f.m) per Applicator
Max Water Vapour Content	- 1.3g/m <sup>3</sup>
Max Oil Vapour Content	- 0.1 p.p.m.
Regulated Air Output	- 0-4 Bar

## **Control Unit Fittings**



- CU1001 Remote trigger cabinet plug 6 pin Female (IP65)**
- CU1002 Electrostatic generating head cabinet plug 4 pin Female (IP65)**
- CU1003 Circuit Breaker (IP65)**
- CU1004 Mains electric input cabinet plug 4 pin Male (IP65)**
- CU1005 Pneumatic Air output quick release 8mm (IP65)**
- CU1006 Terminal, Earth Post (IP65)**
- CU1007 Mains electric master on/off switch (IP65)**
- CU1008 Pneumatic Air input quick release 10mm (IP65)**

## Control Unit Plug in Fittings



**CUP1001 Remote Trigger plug 6 pin Male (IP65)**

**CUP1002 Electrostatic generating head plug 4 pin Male (IP65)**

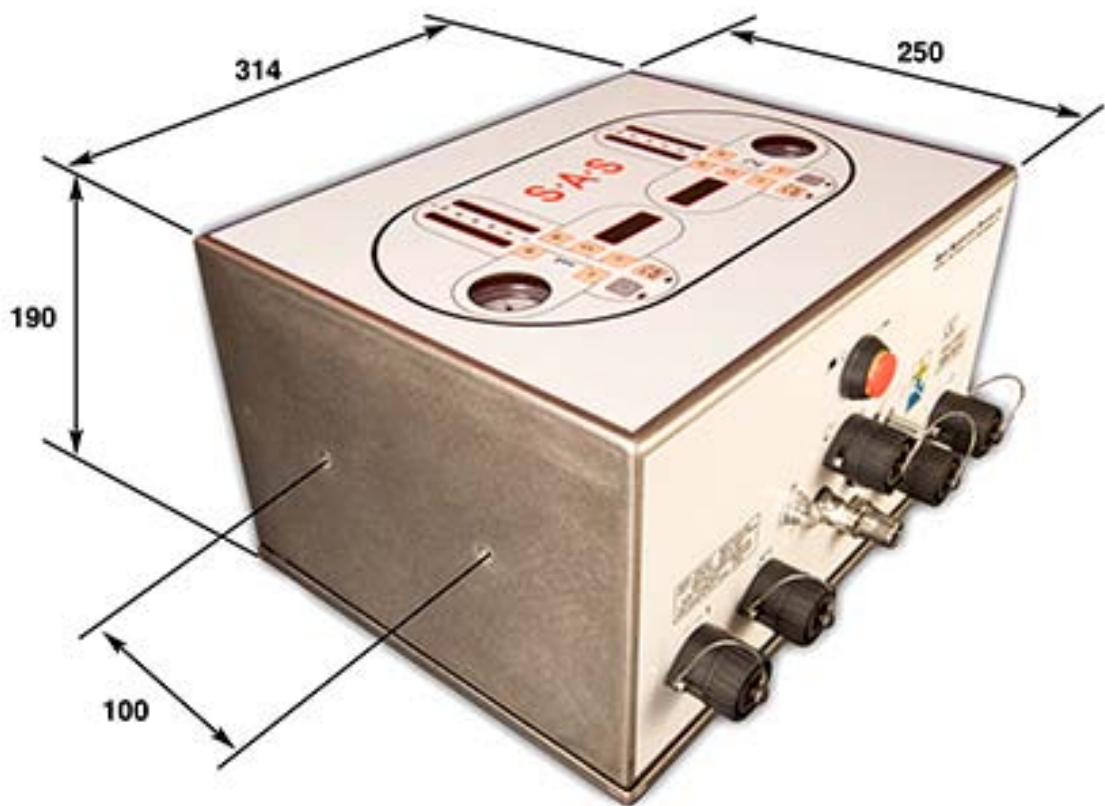
**CUP1004 Mains electric input plug 4 pin Female (IP65)**

## Control Unit Front Panel



- 1= 0-2bar Pressure gauge
- 2= Pressure regulator adjustment + (rise in air pressure)
- 3= Pressure regulator adjustment - (fall in air pressure)
- 4= Pre Selection program numbers up +
- S= Lock selection button
- 5= Pre Selection program numbers -
- 6= Local on/off switch
- 7= Remote trigger on/off switch
- 8= Program information numbers
- 9= Ampage dial (orange)
- 10= Voltage dial (green)

## Cabinet Fixing Sizes



## Electrostatic Generating Head



- 1= GH3001 Generating head MK3 complete**
- 2= GH3002 Cascade MK3**
- 3= GH3003 Oscillator board MK3**
- 4= GH3004 Cable MK3**
- 5= CUP1002 Electrostatic generating head plug 4 pin Male (IP65)**
- 6= GH3006 Cable Gland**
- 7= GH3007 Extension electrode (State length required 1-5mtrs)**

## **Oil air pressure control**

The unit can hold in memory 100 different air pressure settings, this is so you can easily change the pressure for different oils.

The oil pressure needs to be stored in the memory by a competent person who will be working with the unit.

The operator will only need to press one button when changing to another type of oil

### **Automatic Changing of Air Pressure**

**Turn on unit using local on/off switch Button No. 6**

**Adjust air pressure press button 2 to give more air & 3 for less air**

**To set the required pressure press button S once**

**Choose the program number Button 4 to go up & 5 to come down**

**To set the program press button S**

**To now use the programmed system use button 4 & 5 to go up and down the scale**

### **IMPORTANT**

When fitting a plug to the mains lead 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:-

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

***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:-

<u>POLE</u>	<u>PIN No.</u>
Live	Pin 1
Neutral	Pin 3
Earth / Ground	Pin E

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

## **OPERATING PRINCIPLE**

The SAS control power supply transforms the 110/220 Vac into an adjustable voltage which can be set from 3.5 to 13 Vdc.

The generator at the spray head converts the 3.5 to 13 Vdc into 85 kV negative charge, the material being applied is drawn to the positively grounded product.

## INSTALLATION

For full and perfect performance the drum will require at least 6 horizontal flights and diameter of at least 0.750 mtr.

1. The product to be coated must be able to fully tumble and roll in front of the spray pattern. If it does not do so the electrostatic effect will not activate properly and will give poor quality finish to the product.
2. The appropriate distance between the spray head and the product to be coated to be about 20 - 45 cm / 8" - 18" (minimum distance is 15 cm / 6"). The electrostatic generating head is delivered with the support bars.
3. The product to be coated must be able to fully tumble and roll in front of the spray pattern. If it does not do so the electrostatic effect will not activate properly and will give a poor quality finish to the product.
4. Attach the oil feed hose from the oil pump to the inset on the spray head, make sure it is pushed in firmly
5. The control unit must be located outside the flavouring drum.
- 6. All metal parts, pumps, containers, conveyors (feeding in and out of the drum) and any other conductive article within 2mtrs/ 6ft - must be grounded.**
- 7. The pump must be attached to earth**
8. Keep the spraying area clean. Remove all unnecessary metal components.
9. After fixing the the electrostatic generating head in place inside the drum. Fix the cable (CUP1002) with plug attached to the back of the control attachment, to electrical plug maked "1" and lock into place. (Locking mechanism already attached to control) If using a twin head system attach both cables, first to "1" and the second to "2" . (see page 9)

10. After fixing the electrostatic generating head in place inside the drum. Fix the 8mm air line to the bottom air fittings on the back of the control to fitting “1” Push in firmly. If using a twin head system attach both 8mm air lines, first to bottom air fitting “1” and the second to bottom air fitting “2” (see page 8)The other end of the air lines attached to the air fittings on the air knife under the vibratory tray.
11. Plug into rear of control (CU1008) a10mm air line from the main air supply.(The air always has to be clean and dry. Fit a filter if necessary)
12. Plug mains electric supply into back of control (CU1004) and lock into position.  
**When wiring up the mains supply the earth must be wired to the factory mains earthing system.**
13. Item CU1001 is for a remote trigger for tuning the unit to switch on and off with an existing production line. If not using, make sure the dust cap is fitted and locked into place.
14. Wire the earthing cables from the drum to the earthing point at the rear of the control. (CU1006).
15. The drum must be earthed in 2 places. With the earthing contacts rubbing against the wall of the drum. The out going and incoming vibratory conveyors to and from the drum must always be earthed and all metal within 2mtrs of the drum

## **ATOMIZATION**

1. The part to be coated must be connected to the ground continuously.

2. Keep the spray nozzle perfectly clean.
3. Do not use the equipment if there is an air leak in the hoses.
4. Be sure that the product does not come closer than 15 cm / 6" and no further than 45cm/18" from the spray head.
5. Before plugging in the power supply unit, be certain the electrostatic generating unit's spray nozzle is installed correctly.

## **OIL FLOW SYSTEM**

1. Attach the oil feed hose into the spray nozzle. Make sure the hose is pressed fully home in to the nozzle.
2. Position the spray head at about a 45 angle to the product
3. The electrostatic generating head need not be moved for cleaning. The system is IP65
4. The system must be set-up to freely transport the oil at the maximum line rate, i.e. set the air pressure at the electrode spray nozzle (0.25 - 2.0.bar) as if the plant is at maximum production

## **START UP**

### **ELECTROSTATIC CIRCUIT**

- 1 - Connect the SAS control to its power source

- 2 - Supply the SAS control with clean dry compressed air minimum 4 bar / 58 psi)
- 3 - Turn the power-supply ON/OFF switch to the ON position (CU1007)
- 4 - The power supply emits a constant voltage at any given setting from 3,5 to 13 Vdc. This regulated voltage is transformed into high voltage within the generator barrel before being delivered to the spray head

## **QUALITY ADJUSTMENT**

Adjust the spraying parameters ON THE FRONT OF THE CONTROL:

- Material flow rate Adjust by pressing + for more air and - for less air. Press set to lock into memory
- Electrostatic effect (High voltage is on green maximum Yellow light between 75-100%)
- The air hoses and the generating head must remain dry.

**The electrostatic efficiency decreases quickly when spray head and hoses are dirty or damp, this will lead to poor quality finished product.**

## **CLEANING METHOD**

**The ON/OFF switches on the power supply and to the spray head must be OFF before starting cleaning operation.**

**Wait for 10 seconds before entering the spray area**

**All metallic parts located within and around the spray head must be correctly connected to the ground. The floor must be electrically conductive and grounded.**

**Only apply a moderate amount of cleaning solution onto a clean soft cloth or bristle brush to clean the spray head and hoses.**

**Synthetic resins used in the fabrication of the electrostatic spray head can react with certain cleaning agents. Check with SAS .**

**CAUTION : avoid using the most toxic cleaning agents. Do not use chlorinates.**

**Dry the spray head carefully and thoroughly with air.**

## **PROCEDURE**

- 1 - Turn the power supply ON/OFF switch to OFF position.
- 2 - Hose down the complete vibratory system in place (CIP). There is no need to remove the system for cleaning
- 3 - Wash thoroughly and dry completely with compressed air before commencing production. **(THIS IS VERY IMPORTANT IF THE UNIT IS NOT DRY IT CAN LEAD TO POWDER BUILD UP ON THE VIBRATOR)**

**Warning : Never switch ON the Electric power supply unit during the washing and cleaning operation.**

Before switching ON the electrostatic effect :

- Install the spray nozzle onto the spray head.
- Connect the flexible oil tube to the spray nozzle
- Connect the 8mm air line to the spray nozzle
- Check the spray nozzle is locked in

## **SERVICING**

- 1 - The electric power supply must be interrupted before any cleaning operation **(power supply unit switched OFF).**

- 2 - When shutting off the voltage, **wait for some 10 seconds** so that the electric charge has time to reach the ground.
- 3 - Do not soak or immerse the spray unit or any plastic parts in a solvent. This could result in damage and impair the safety circuits. If necessary, clean the plastic parts with a soft brush soaked in a soapy water solution after hosing down and then dry immediately.
- 4 - **Before disconnecting hoses, ensure that the circuit is no longer pressurized, the air is turned off, and that the electric current is also switched off.**
- 5 - After any repair - prior to turning on the power supply –
  - The air knife is correctly installed into the spray unit.
  - Re-connect the three pin plug and cable assembly to the power source.
  - Re-connect the ground wire to an earth connection.
  - Re-connect low voltage cable between SAS control and electrostatic generator head

## **EXTENDED SHUT DOWN PERIOD**

1. Turn the on/off switch on the power supply to the off position
2. Carry out a complete flushing of the system. Carefully clean the spray head with a solution soaked rag or bristle brush.
3. Dry the clean parts with compressed air. Be sure the air spray nozzle is clean.

**NEVER LEAVE ASSEMBLY AND SPRAY HEAD IMMERSSED IN CLEANING SOLUTION. ALWAYS STORE IN A DRY PLACE.**

**NEVER USE METAL TOOLS TO CLEAN THE SPRAY HEAD.**

## **DAILY CARE EXTENDED SHUT-DOWN PERIOD**

1. Spray heads are kept clean,
2. All hoses are not worn or crimped, all air and coating material connections are tight,
3. All electrical cables are not broken or knotted
4. All earthing wires on the in/outgoing vibratory trays and the drum are connected correctly.

## **TROUBLE SHOOTING**

### **Spitting Spray:**

#### **1. Insufficient air pressure:**

- Turn up the air pressure
- Check hoses for leaks and tighten fittings

2. **Oil vat empty:**
  - Fill the vat
3. **Pump not working correctly**
  - Engineers to check pump

**No Oil delivery:**

1. **Hose from pump to spray head blocked:**
  - Re-place the hose
2. **Pump not working:**
  - Turn on the pump
  - Engineers to check pump
3. **Pinched or restricted oil hose lines:**
  - Check and replace if necessary
4. **No oil in the vat**
  - Fill the vat with slurry mix

**Poor atomisation of Oil:**

1. **Air nozzle obstructed or worn down:**
  - Clean nozzle or replace with new
2. **Low air pressure:**
  - Increase air pressure

**Oil spraying, poor adhesion to product:**

1. **Voltage output too low:**
  - Adjust the spray head further away from the product
2. **Earthing not correct:**
  - Re-set the earth wiring and contacts
3. **Oil mix not suitable for electrostatic application:**
  - Contact spice supplier
4. **Electrostatics turned off:**
  - Turn on electrostatics at the control
5. **The low voltage cable not connected or is damaged**
  - Replace cable if needed. (This cable must be supplied by SAS)

**Partial or missed coating of product:**

1. **Oil spray head incorrectly positioned in the drum:**
  - Set to correct position about 45° angle facing the tumbling product
2. **Insufficient Oil output:**
  - Increase slurry pump output
  - Re-fill oil Vat
3. **Flavouring drum speed:**
  - Increase or decrease drum speed
  - Raise or lower drum angle

**Misting in the air:**

1. **Electrostatics are not turned on:**
  - Turn on at the control
2. **The low voltage cable not connected or is damaged:**
  - Replace cable if needed. (This cable must be supplied by SAS)
3. **Earthing not correct:**

- Re-set the earth wiring and contacts
- 4. *Air pressure to high:***
- Turn down the pressure at the control

**Oil leaking from the back of the spray head**

**1. *Oil tube not fitted correctly:***

- Re-insert oil tube into spray head, making sure the tubes are pushed in all the way

**Operators are getting electric shocks:**

**1. *Earthing not connected:***

- Re-set the earth wiring and contacts.

**2. *Operator not wearing conductive clothing;***

- Purchase conductive foot gear, or conductive operator earthing straps

**Electric shocks from the intake and exit vibratory conveyors:**

**1. *No earthing on the vibratory trays:***

- Fit earthing straps to both conveyors



## **STATIC ELECTRICITY TESTER. (S.E.T.)**

Instructions:

Always “self test” the tester (S.E.T) before you start. Do this by touching both ends simultaneously. The red light should illuminate indicating that the S.E.T. is functioning correctly.

Electrostatic test.

Turn on the electrostatic generating head.

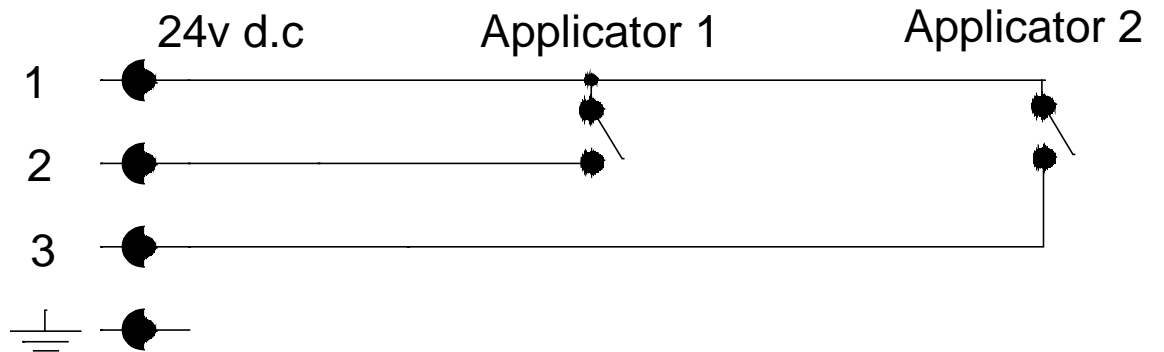
Hold the S.E.T. with the screwdriver tip between the fingers. With the handle end pointing towards the generating head, about 1mtr. Away, move towards the electrode at the end of the electrostatic generator and you should see a strong red light illuminate, being at it strongest when you are within 400-500mm from the electrode.

**Always make sure you are holding onto an earthing point when doing this test, or you are wearing conductive shoes.**

If no red light appears refer to the main manual under Fault Finding:

## Remote Trigger Wiring Diagram

Remote  
Volt Free  
Contact



**Remote Trigger plug CUP 1001 6 pin,**

**Solder wire to pin 1 & 6**



INSTRUCTION MANUAL

# Electrostatic Oil Spray

manual ref SAS Oil Spray  
October 2011

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## SUMMARY

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## 1. TECHNICAL FEATURES

The SAS oil spray uses the principal of a conventional spraying which enables to obtain an excellent coating quality spraying with a flat/cone fan of adjustable width.

An electronic safety device, incorporated into the SAS MK III power supply unit, automatically detects the presence of a grounded object in the vicinity of the OIL spray head. Once this ground approaches within less than 10 cm / 4" this device reduces the high voltage.

<b>Pressure</b>	Spraying .....flat fan pattern
<b>Flow rate</b>	Fluid pressure ..... 6 bar / 87 psi (maximum)
	Atomizing air pressure ..6 bar / 87 psi (maximum)
	Control air pressure .....4 bar / 58 psi (minimum)
	Fluid flow rate .....240 cm <sup>3</sup> /mn/15 cu.in/mn (nozzle size 15)
	Air consumption .....20 m <sup>3</sup> /h / 12 c.f.m (maximum)
	Fan width .....30 cm / 12" (SAS pray head)
	Temperature .....60° C / 140° F (maximum)

<b>Connections</b>	Fluid inlet .....Polyamide hose Ø 6 x 8
	Atomization air :
	- Fan air (marked E) ..... Polyamide hose Ø 6 x 8
	- Centre (marked A) .....Polyamide hose Ø 6 x 8
	Control air (marked C) ..... Polyamide hose Ø 4 x 6

### Electrical features

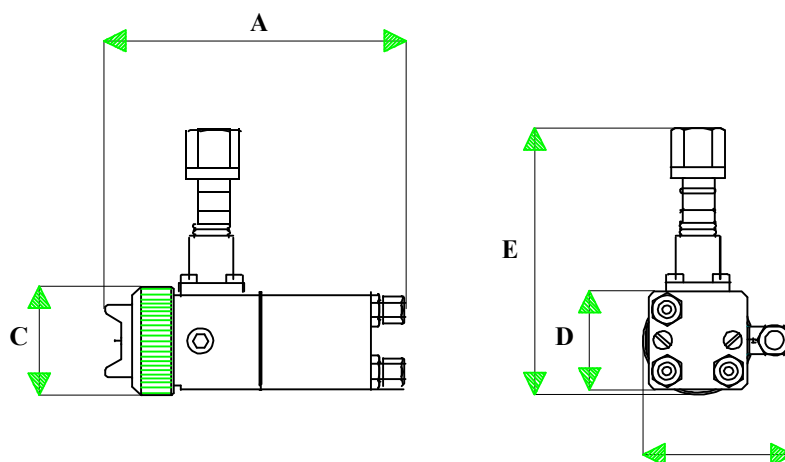
Number of electrode ...1	
Ionization.....Negative charge on the electrode.	
High voltage at the electrode maxi 85 kV	
Voltage .....12 V	} measured at the generator barrel
Current .....0.65 A (maxi)	

### Wetted parts in contact with the product :

Polyacétal, stainless steel

<b>Weight</b>	Total weight with BG (without cable or hose) : Around 1 kg 250 / 2.75 lb
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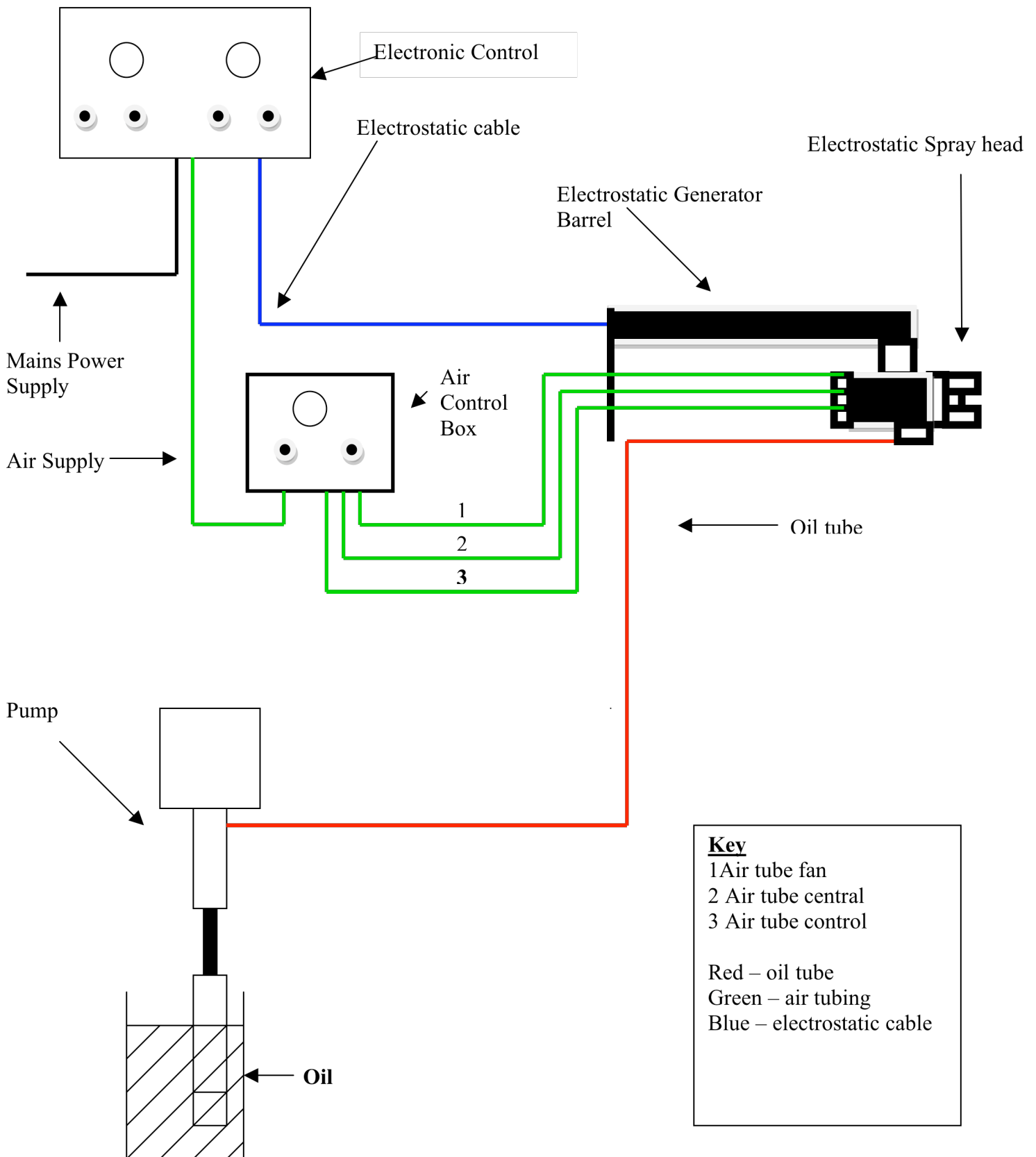
# 1. TECHNICAL FEATURES (continued)



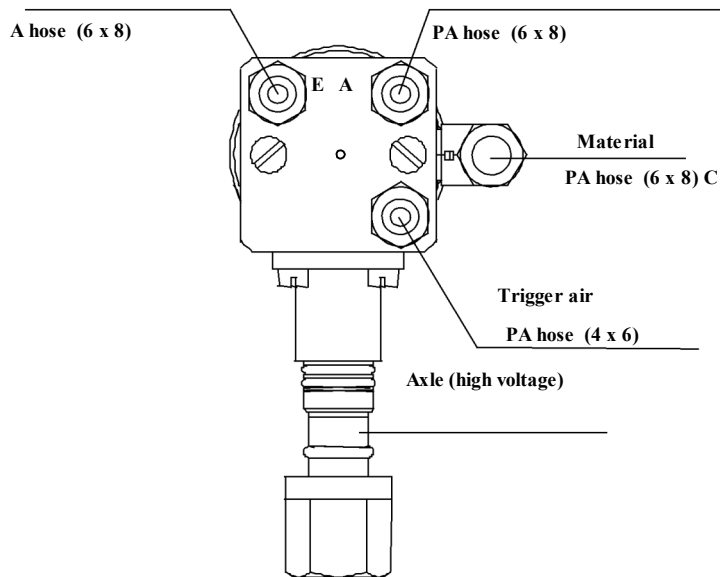
**Dimensions**

## 2: OPERATING PRINCIPLE/INSTALLATION

### FAN SPRAY



### 3: SAS OIL SPRAY: Rear View



Fittin	Air supply	Spraying	Pressure Adjustment
C	Trigger air.	Spraying triggered material dispensed from the nozzle.	P = 4 to 6 bar / 58 to 87 psi
E	Fan air.	Fan width: - round fan - Flat fan	P = 0 P = 1 to 4 bar / 14.5 to 58 psi
A	Atomizing air (Central air).	Fineness of spraying	P = 2 to 5 bar / 29 to 72.5 psi

### 4: START UP

#### FAN WIDTH ADJUSTMENT

- 1 - Screw the nozzle into the oil spray body.
- 2 - Insert the air cap into the retaining ring. Screw retaining ring and air cap firmly onto the spray head positioning the air cap to obtain the desired pattern orientation. Pattern orientation will be 90° from the orientation of the air horns on the air cap.
- 3 - Prime the pump.
- 4 - Trigger the oil spray head with a pressure of 4 bar / 58 psi).
- 5 - Adjust the material pressure (pump air regulator) for the desired flow rate.
- 6 - Adjust the atomizing air pressure (A - central air) for a very fine spraying.
- 7 - Adjust the atomizing air pressure (E - fan air) until a proper flat fan is achieved.

## 5: TROUBLESHOOTING CHART

### MECHANICAL TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	SOLUTION
Jerking or spitting spray.	Air is being sucked into material stream. Insufficient fluid pressure. Dirt in the fluid line. Not enough fluid in the container.	Check pump suction hose for leaks and tighten fittings. Increase pump air pressure and/or clean fluid filter. Clean the fluid line and filter. Fill the fluid container.
No fluid flow rate.	Nozzle blocked. Dirt in the fluid being applied. Insufficient air pressure to trigger the oil spray head. Fluid filter clogged. Low fluid pressure.	Clean air cap and nozzle. Use a finer fluid filter or replace a damaged filter. Pressure = minimum 4 bar/58 psi. Clean it. Increases pump air pressure/check the fluid filter.
Fluid continuously leaking from oil spray nozzle.	Needle worn. Nozzle-seat worn.	Replace it. Replace it.

### MECHANICAL TROUBLESHOOTING (Cont'd)

Fluid leaksthrough holes in air cap.	Nozzle badly screwed into the body.	Clean the air cap and nozzle. Check if fluid did not flow back in the air passage.
Poor atomization.	Nozzle obstructed or worn out. Low fluid pressure. Fluid viscosity too high. Atomizing air pressure too low.	Clean nozzle or replace it. Increase pumps air pressure. Reduce viscosity by adding compatible solvent or heating material where appropriate Increase atomizing air pressure.
Excessive delivery in middle of spray (spray fan is not uniform)	Excessive fluid flow rate Nozzle too large. Fluid viscosity too high. Air holes in air cap obstructed.	Reduce fluid flow rate. Increase atomizing air pressure. Install a smaller nozzle. Reduce viscosity. Clean air cap, blow air holes, clean with Compressed air.

## **6: DISASSEMBLY**

### **NEEDLE (15) removal from the back of the SAS oil spray head**

Unscrew Plugs (25)

Unscrew Plugs (24)

Unscrew Plugs (21)

Remove spring (27) pay attention to the seal

Pull piston to remove the needle-piston assembly (15)

Take the new needle-piston assembly, apply a light coating of food grade grease to the ball and the O ring

Carefully insert this new needle-piston assembly into part (26)

Replace the seals if necessary

Reinstall the spring, cylinder, screws and plugs

**Safety precaution, be certain plugs (25) are re-installed**

### **CARTRIDGE ASSEMBLY (30) removal from the back of the SAS oil spray head**

Unscrew Plugs (25)

Unscrew Plugs (24)

Unscrew Plugs (21)

Remove spring (27) pay attention to the seal

Pull piston to remove the needle-piston assembly (15) unscrew part (26)

With pliers, pull cartridge assembly (30) out of the oil spray head body

Lightly lubricate O ring (32) with food grade grease and install the new cartridge. Screw back (26)

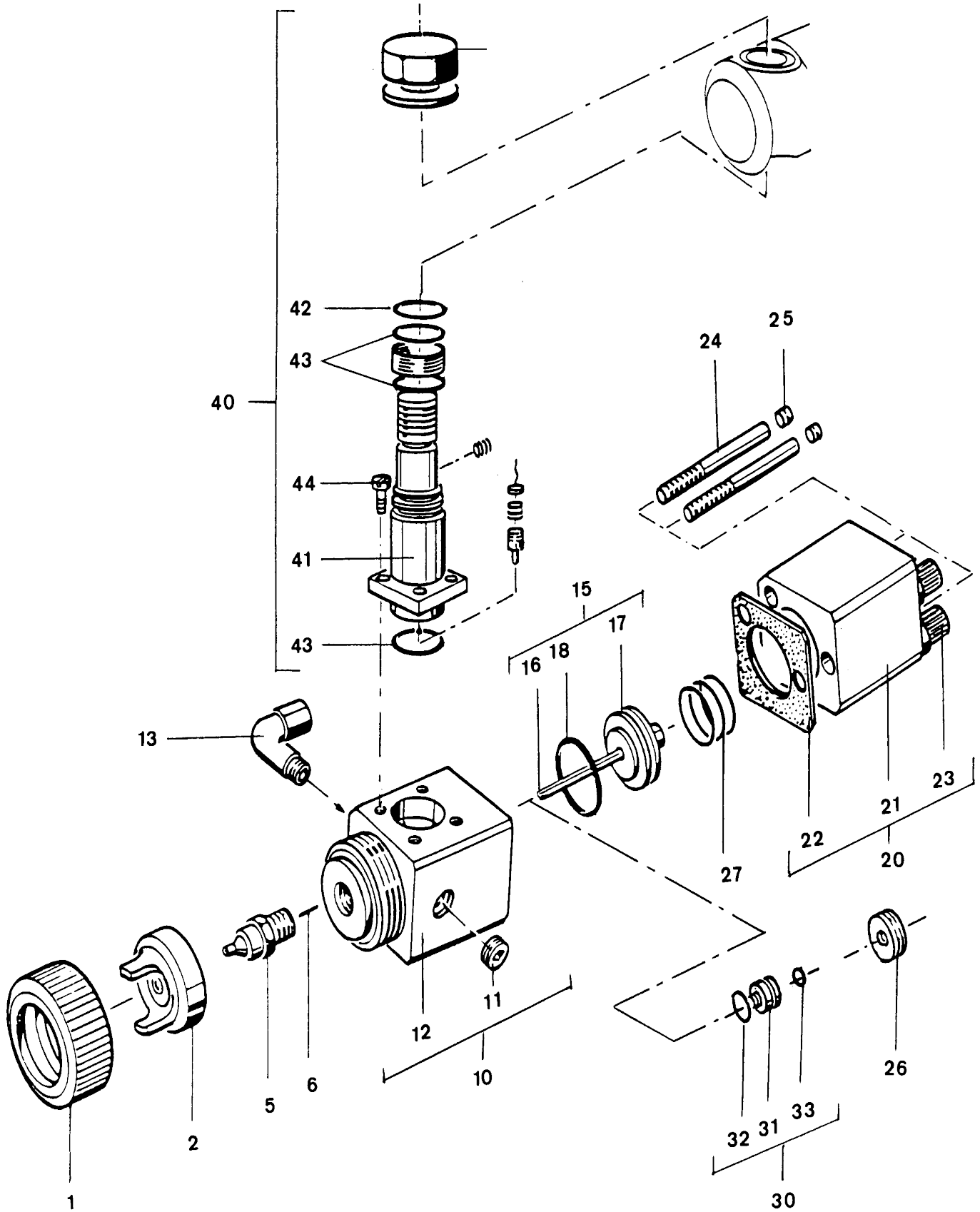
Take the new needle-piston assembly, apply a light coating of food grade grease to the end ball.

Replace the seals if necessary

Reinstall the spring, cylinder, screws and plugs

**Safety precaution, be certain plugs (25) are re-installed**

# 7: PARTS IDENTIFICATION LIST



## 7: PARTS IDENTIFICATION LIST (continued)

### SAS ELECTROSTATIC OIL SPRAY HEAD - without air cap

Ind.	Part number	Description	Qty
1	129.887.0	Retaining ring, air cap	1
*	01	<b>Air cap, type SAS 3 (optional - not part of oil spray head assembly)</b>	1
2	<b>132.286.0</b>		
*	<b>00</b>	<b>Nozzle, size 15</b>	<b>1</b>
5	<b>134.880.0</b>		
	<b>01</b>	Electrode (pack of 10)	1
6		<b>Body assembly</b>	<b>1</b>
*	129.887.0	• Plug, 1/4 NPT	1
	24	• Body	1
10		• Fitting, elbow	1
1	<b>129.392.9</b>	<b>Needle-piston assembly with O Ring</b>	
1	<b>01</b>	• Needle	<b>1</b>
1	906.335.1	• Piston with O Ring	1
2	13	• O Ring (pack of 10)	1
1	N S		1
3	S	<b>Cylinder assembly</b>	
		• Cylinder	1
*	905.190.4	• Gasket, cylinder (pack of 10)	1
	01	• Fitting, straight, G 1/8 - T 4 x 6	1
15		• Fitting, straight, G 1/8 - T 6 x 8	1
1	<b>129.392.0</b>	• Screw, CHc M 5x35	1
6	<b>30</b>	• Plug	2
*	N S	Screw, locking	2
17	S	Spring, piston	2
1	129.392.9		
8	03	<b>Cartridge assembly</b>	1
*	129.393.9	• Cartridge	1
	03	• O Ring (pack of 10)	
20		• Ring, R1 (pack of 10)	<b>1</b>
2	<b>129.392.9</b>	<b>Connector assembly (generator, high voltage)</b>	1
1	<b>02</b>	• Axle	1
*	029.392.0	• O Ring (pack of 10)	1
22	01	• O Ring (pack of 10)	<b>1</b>
-	049.030.021	Wrench	1
-	906.300.101	Brush, large	1

\* Preceding index number denotes a suggested spare part

N S S : denotes parts are not serviceable separately

### OTHER PROJECTOR

Description	Part	Description	Part
Air cap, SAS oil spray head	132.880.100	Nozzle, size 09	134.880.003
		Nozzle, size 12	134.880.002