



INSTRUCTION MANUAL

**Electrostatic Food Spray Unit
Model SAS DV Mk.III**



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Dear Customer.

Thank you for buying a new ELECTROSTATIC FOOD SPRAY UNIT model SAS/ DRY/VIBRATOR 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.,
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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/DRY/VIBRATOR Mk III spray unit uses the principal of atomising the spice as it falls off the vibrator by spraying air and electrical charge onto the powder, it is 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

Cable:	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

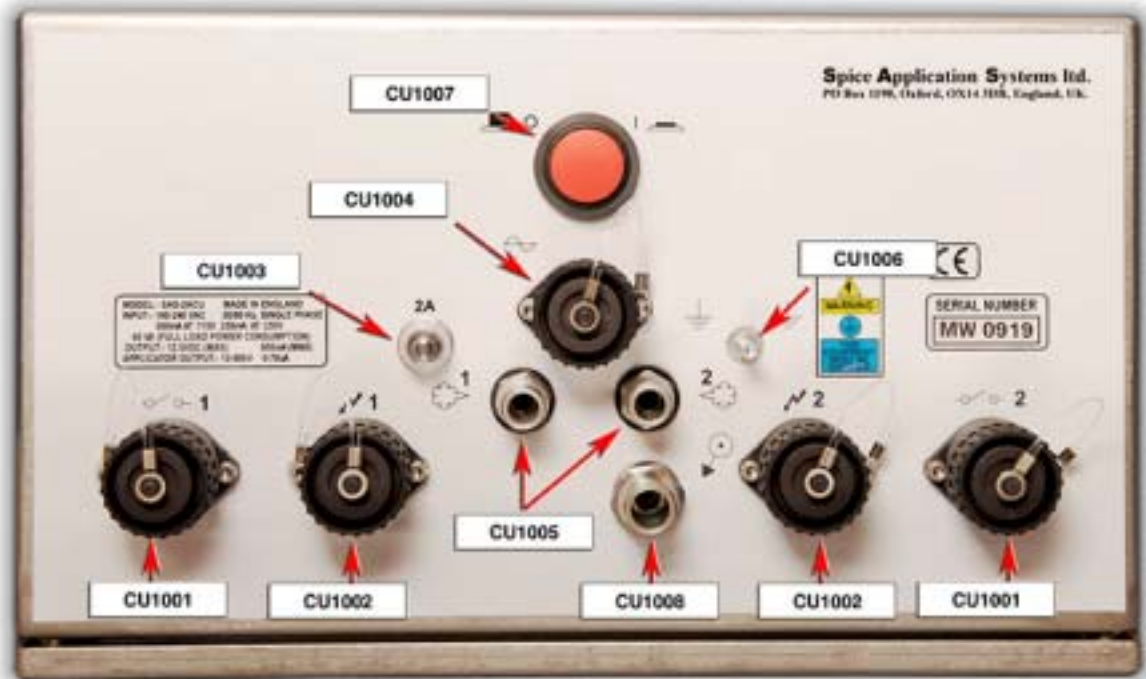
ELECTROSTATIC GENERATING HEAD

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 ³ /hr (6 c.f.m) per Applicator
Max Water Vapour Content	- 1.3g/m ³
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)

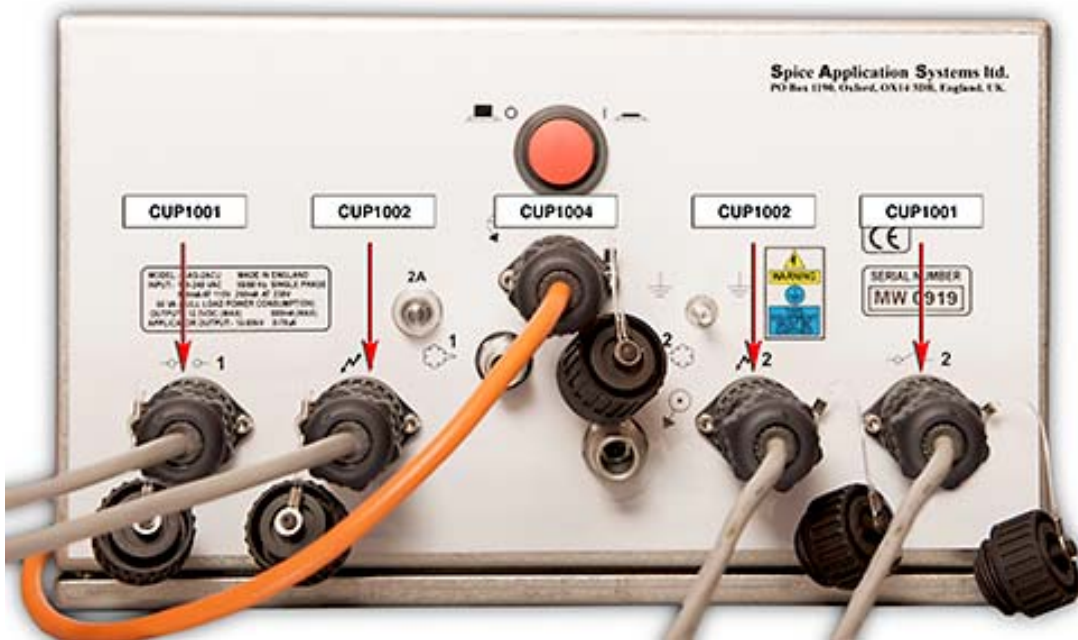
CU1005 Pneumatic Air output quick release 8mm (IP65)

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)

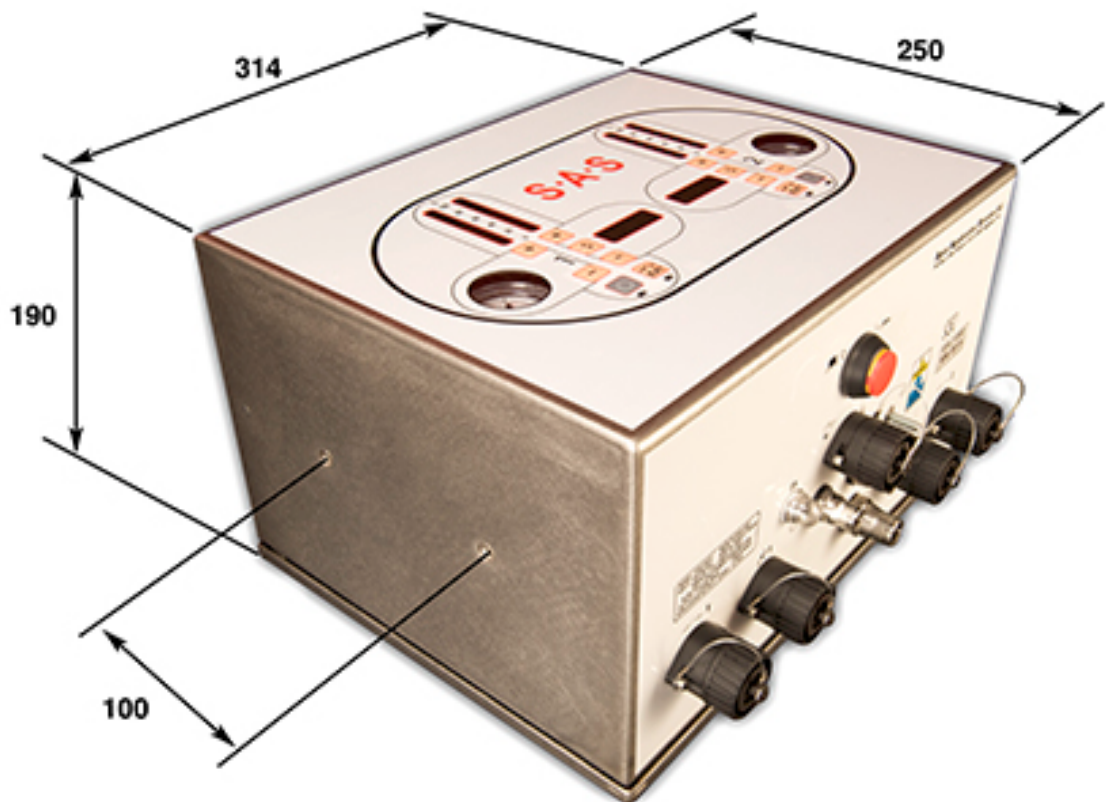
CUP1004 Mains electric input plug 4 pin Female (IP65)

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)

Powder 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 powders.

The powder 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 spice

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

1. The vibratory powder transfer unit needs to be positioned just below the screw feeder and the spray head needs to be positioned inside the drum facing the tumbling product at a 45° angle.
2. The vibratory system is delivered with a support bar and fixings to allow adjustment for the correct positioning of the vibratory tray
3. The electrode needle on the electrostatic generating head must always be pointing away from the vibratory tray
4. The vibrator control needs to be fitted close to the vibrator to allow operators to adjust the vibration speed. If the vibrator control has to be moved to a fixing further away than the standard distance of 1.5mtrs (6') a junction box has to be fitted to a rating of IP 65. Contact Spice Application Systems Ltd. for this fitting
5. The electrostatic generating head is delivered with the support bars.
6. 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.
7. The appropriate distance between the spray head air knife and the product to be coated to be of about 20 - 45 cm / 8" - 18" (minimum distance is 15 cm / 6").
8. The control unit must be located outside the flavouring drum.

- 9. All metal parts, pumps, containers, conveyors (feeding in and out of the drum) and any other conductive article within 2mtrs/ 6ft - must be grounded.**
10. Keep the spraying area clean. Remove all unnecessary metal components.
11. 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)
12. 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.
13. 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)
14. 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.
15. 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.
16. Wire the earthing cables from the drum to the earthing point at the rear of the control. (CU1006).
17. 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 air knife 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 air knife nozzle is installed correctly. The flat jet has to be horizontal facing upwards to hit under the vibratory tray.

POWDER FLOW SYSTEM

- 1 Position the vibratory tray under the screw feeder , it must be aligned correctly to allow the powder to fall into the vibratory tray
- 2 Position the vibratory unit at about a 45 angle to the rotating product within a drum
- 3 The system must be set-up to freely transport the powder throughput from the screw feeder at the maximum line rate, i.e. Set the air pressure at the electrode air knife to suit the type of powder being sprayed and lock into control memory. (See page 13)

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
- 5 - Turn the vibrator control to ON position

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%)
- **ON THE FRONT OF THE VIBRATOR CONTROL** Adjust the vibrator speed to when the powder is coating the bed of the vibratory tray. This will give an even curtain drop onto the air knife
- 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 air knife into the electrostatic generating head making sure it is set in the horizontal position
- Connect the flexible air tube to the air knife
- Check that the air knife and vibrator are completely dry

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 IMMERSED 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. Air knife and vibrator 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

Unit will not operate :

1. *Mains connector not fitted to control panel :*
 - Connect to the rear of control panel (page 7 Item 15)
2. *Not connected to a suitable mains electrical supply :*
 - Engineer to check supply
3. *Not switched on :*
 - Turn the switch on at the front of the control panel (page 7 Items 3 & 5)
4. *Circuit breakers tripped at the rear of the control panel :*
 - Press circuit breakers inwards. If they trip out again after turning on the unit call for an engineer

Spitting Spray:

1. *Insufficient air pressure:*
 - Turn up the air pressure
 - Check hoses for leaks and tighten fittings
2. *Empty powder hopper in the screw feeder:*
 - Fill the hopper

No powder delivery:

1. *Screw feeder Blocked:*
 - Empty screw feeder, remove screws and clean thoroughly
 - Re-assemble and re-fill hopper
2. *Insufficient air pressure to the air spray head:*
 - Increase air pressure at the control
1. *Pinched or restricted air lines:*
 - Check and replace if necessary
2. *No powder in the screw feeder:*
 - Fill the screw feeder hopper
3. *Vibratory tray not working:*
 - Turn on vibrator at the vibrator control

Poor atomisation of powder:

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

Powder spraying, poor adhesion to product:

1. *Voltage output too low:*
 - Adjust the vibratory tray further away from the product
2. *Earthing not correct:*
 - Re-set the earth wiring and contacts
3. *Spice not suitable for electrostatic application:*
 - Contact spice supplier
4. *Spice particles too large:*

- Contact spice supplier

Partial or missed coating of product:

1. *Vibratory tray incorrectly positioned in the drum:*
 - Set to correct position about 45° angle facing the tumbling product
2. *Insufficient powder output:*
 - Increase screw feeder output
 - Re-fill powder hopper
3. *Flavouring drum speed/angle:*
 - Increase or decrease drum speed
 - Raise or lower drum angle

Dust in the air (Dusting):

1. *Electrostatics are not turned on:*
 - Turn on the 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. *Powder very fine (Under 60 microns)*
 - Powder supplier to re-formulate the powder.
4. *Air pressure too high:*
 - Turn down the pressure at the control

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

AIR KNIFE PARTS LIST

PART NO. 8259058 FLAT AIR SPRAY NOZZLE 110° WHITE (AIR JET)
 PART NO. 8474 AIR SPRAY BODY BLACK
 PART NO. 8475 AIR SPRAY CAP BLACK
 PART NO. PM450812E FEMALE ADAPTOR BLACK (JG)



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.

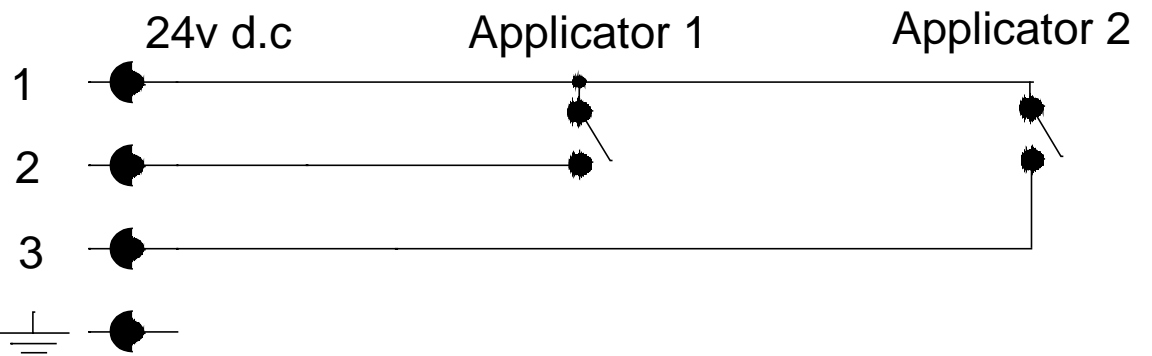
Hold the S.E.T. with the screwdriver tip between the fingers. With the handle end pointing towards the generating head, about 1mtr. Away, move towards the electrode at the end of the electrostatic generator and you should see a strong red light illuminate, being at it strongest when you are within 400-500mm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

Electromagnetic Feeder LE type

manual ref SAS Vibrator
October 2011

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INTRODUCTION

The SAS electromagnetic vibrating feeders consist in two parts, defined equipments, and coupled by means of leaf springs.

Feeders operation is due to an electromagnet interdependent with the static equipment, which energized by half wave current, attracts or loosens the electromagnet which is interdependent with the trough producing the right vibratory movement of it.

The trough is equipped with tightening shoes with holes, which are pre-determined by fixing of the trough or different kind of hoppers following the different applications.

INSPECTION

Upon receipt, carefully unpack the feeder, remove all packing bands and thoroughly inspect the feeder for any damage that may have occurred during shipment. If damage is found, contact SAS

THEORY OF OPERATION

When operating the feeder produces an alternated vibrating stroke on the surface of the feeder trough. This stroke results from the action of the electromagnet as it pulls the trough backward and forward.

This one is closely connected with the network frequency (50 or 60 Hz) and produces the feed of what is on the trough thanks to the angle of leaf springs.

The feeders require the use of control containing a rectifier, which converts alternating current into rectified current and regulates also the speed of the system.

INSTALLATION

CAUTION: never lift the unit by the trough, as the feeder has been factory tuned for your specific application, it might be not working properly.

NOTE: When installing the feeder, the rigidity of the support area must be carefully considered.

The unit must not be installed where the trough could come in contact with any rigid object or adjacent surface. A 305 mm clearance must be maintained between the vibrating part and adjacent static parts.

The separate control assembly should be installed as close to the feeder as possible, where it is easily seen by and accessible to the operator. Installation on a wall, in a clean, dry vibration-free location is recommended. Install the control in an open location where it will receive adequate ventilation, this will ensure prolonged component life.

NOTE: The voltage and frequency of the power supply must match that designated on the nameplate. The line conductor and the conductor between the feeder and separate control must be of sufficient size and flexible to carry the required current and voltage (as stamped on the nameplate). The wiring connections between the feeder, control and power supply must be secure and in accordance with the wiring diagram supplied with the control.

WARNING: The equipment must be properly earthed.

With the feeder and controller properly installed and all wiring completed, the equipment is ready for operation.

OPERATION

WARNING: Unauthorized modification of the feeder or use of unauthorized parts may damage the feeder.

SAS will not assume responsibility for feeder performance as a result of any unauthorized alterations to the equipment. Consult SAS before modifying your equipment.

WARNING: The control door must be kept closed and secured while the equipment is in operation.

Before starting the equipment, rotate the potentiometer to “0”, that is counter clockwise position, turn the switch to its ON position and the feeder will begin operating at a low rate of feed. While the feeder is running at this low rate, check all external bolts of the feeder assembly for tightness. Check the feeder support, making sure it is rigid and the feeder is not touching any rigid objects or an adjacent structure.

CAUTION: During normal operation, the feeder should perform with a smooth, even stroke. If a loud “striking” noise occurs, immediately turn off unit.

Striking is the result of the faces of the armature and core making contact. Striking can result in serious damage to the unit. Refer to the **table 1** Air Gap on page 5 for instructions on adjusting the air gap or refer to Troubleshooting for instructions on avoiding a striking condition.

If the feeder operating satisfactorily, load the trough with the material to be conveyed and adjust the potentiometer to the desired output. Clockwise rotation will increase the feed rate; the material will flow along the trough surface in a smooth, controlled rate of feed toward the discharge end of the trough.

AIR GAP

The air gap is the spacing that exists between the armature and magnet assembly, proper adjustment of the air gap is extremely important for good feeder operation. If the air gap is adjusted so the armature and magnet assembly are too close, the faces of these items will make contact during feeder operation, the "striking". On the other hand, if the air gap is adjusted so the armature and magnet assembly are too far apart, the feeder current may climb to a dangerous level and result in coil burn-out, failure of control components.

CAUTION: Do not operate the feeder when either of the above conditions exists.

The air gap is properly set at the factory. So adjustment is rarely required. However, if high voltage is applied to the feeder, or if the air gap has been altered due to improper handling, an adjustment may be in order.

ADJUSTING THE AIR GAP

To adjust the air gap, perform the following steps referring to the illustrations 2 and 3 on page 8.

1. Loosen the nut (2).
2. Screw the screws (1), clockwise, until it comes to the end of the stroke and so right in time with the drive.
3. Loosen the screw (1), counter clockwise, with reference to table 1, determine the adequate air gap for your feeder. So turn the screw so many times as necessary to obtain the required air gap.
4. Tighten the nut to maintain the set screw tightly (1).

NOTE: The air gap adjustment is a very delicate procedure and it may require some time to properly obtain the desired setting.

FEEDER STROKE

Feeder stroke is the distance the trough travels in one complete cycle of vibration and is measured from the upward limit of the vibrating stroke to the downward limit of the vibrating stroke.

The stroke can be measured by applying a stroke gauge sticker to the feeder trough. Be certain that the graduated lines on the gauge are parallel with the centerline of drive. The gauge can be applied at any point on the side of the trough, as close to the centerline of the drive as possible.

Under vibrations, a black "V" will appear on the gauge. The stroke of the unit can be read at the apex of the "V". The lines should appear solid black. If the lines are fuzzy and gray, it means that the graduated lines of the gauge are not parallel to the center line of the drive.

SETTING

The dimension of spring assembly (number and thickness) is necessary to modify the bearing of the feeder.

WARNING: Disconnect the feeder from the power supply before replacing springs. Work

on one spring assembly at a time, beginning with the rear spring stack.

Make a note of the location and arrangement of each spring, spacer and clamp and remove the bolts, which secure the leaf springs to the base, then the bolts, which hold the springs to the trough-mounting bracket.

Reassemble the spring arrangement in the reverse order of which it was removed; replace the cap screws by using torque values from **Table 2**.

MAINTENANCE

WARNING: Before performing any maintenance work, disconnect the electrical power supply at the safety disconnect switch.

Due to their nature, some materials adhere to the trough surfaces. Trough build-up increases the dead weight to the feeder pan, and if permitted to build-up excessively, will alter the natural frequency of the feeder.

Material build-up on the trough should be daily removed. Look for material build-up at the rear of the feeder trough, particularly around and under hopper openings.

Humidity or glue build-up can be prevented by factory installation of electrically warmed covering leafs.

Clean, dry, compressed air is recommended for general cleaning. Water is not recommended.

NOTE: Never oil the spring assembly; this might destroy the clamping effect of the spring pads against one another.

Under normal operating conditions, feeder coils run warm, but never too hot to touch. **WARNING:**

Any sign of excessive heat or burned components is an indication of trouble. At first notice of an

overheating condition, immediately investigate and correct the cause.

This could eliminate a potentially major component failure.

TROUBLE SHOOTING

In case of necessary repairs, take immediate action to avoid possible injury to personnel and damage to feeder parts from faulty operation. When ordering replacements parts, include all information given on the nameplate.

PROBLEM	CAUSE	RESOLUTION
Feeder operates too slow	<p>Line voltage is below designated rating.</p> <p>Unit comes in contact with rigid object or surface.</p> <p>Spring action may be hampered.</p> <p>Leaf springs are defective.</p> <p>The trough is worn or Cracked.</p>	<p>Increase line voltage to reach this designated on the nameplate.</p> <p>Isolate unit.</p> <p>Remove and clean spring assemblies.</p> <p>Replace them.</p> <p>Replace it.</p>
Feeder operates too fast	<p>Line voltage above designated rating. High voltage will cause a "striking" condition.</p>	<p>Reduce line voltage as designated.</p>
Unit hums, does not vibrate	<p>The SCR within controller is defective.</p>	<p>Replace it.</p>
Unit fails to operate	<p>No power to controller.</p> <p>Switch or fuse are defective.</p> <p>The SCR within controller is Defective.</p> <p>Feeder coil is burned out or grounded.</p> <p>Short circuit in wiring. Winding on rheostat is open.</p>	<p>Check for broken or grounded lines.</p> <p>Replace them.</p> <p>Replace it.</p> <p>Replace it.</p> <p>Repair it.</p> <p>Replace it.</p>

MODEL	Coil dimension	Quantity	Air gap	Rotation of the screw
LE 1	Ø 21	1	1.5 mm	360° 1 full turn
LE 2	Ø 28	1	3 mm.	720° 2 full turns
LE 3	32 x 30	1	3 mm.	720° 2 full turns
LE 4	32 x 40	1	3 mm.	720° 2 full turns

Table 1

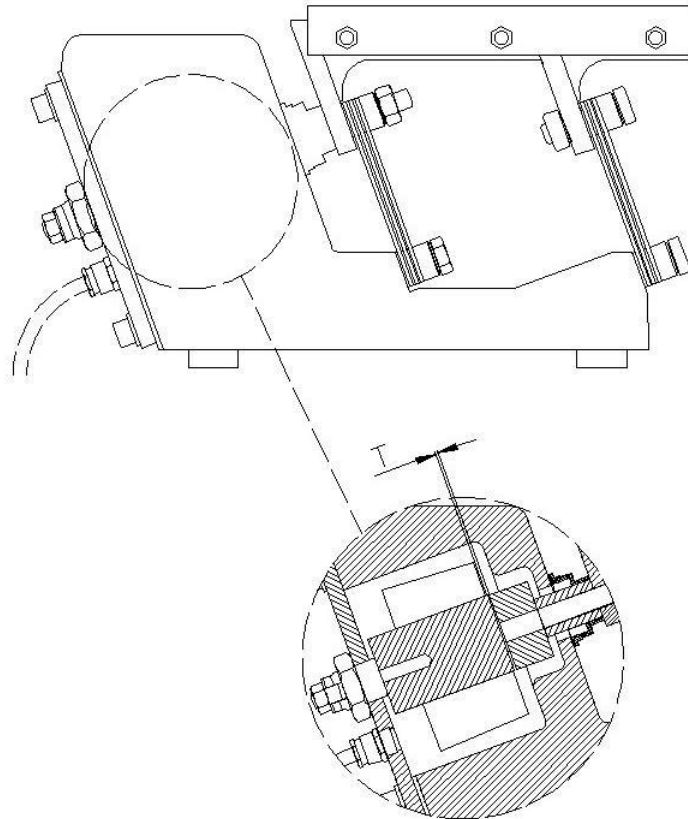


Fig. 1

MODEL	ABSORPTION	POWER (W)	LEAF DIMENSION	LEAF THICKNESS	SCREWING STROKE
LE 1	0.1	13	40 x 48	1 - 1.5 - 2	7.5 N/m – M5
LE 2	0.25	37	70 x 82	1.5 - 2	30 N/m – M8
LE 3	0.45	40	80 x 91	1.5 - 2 - 2.5	70 N/m – M10
LE 4	0.65	68	90 x 98	2 - 2.5	70 N/m – M10

Table 2

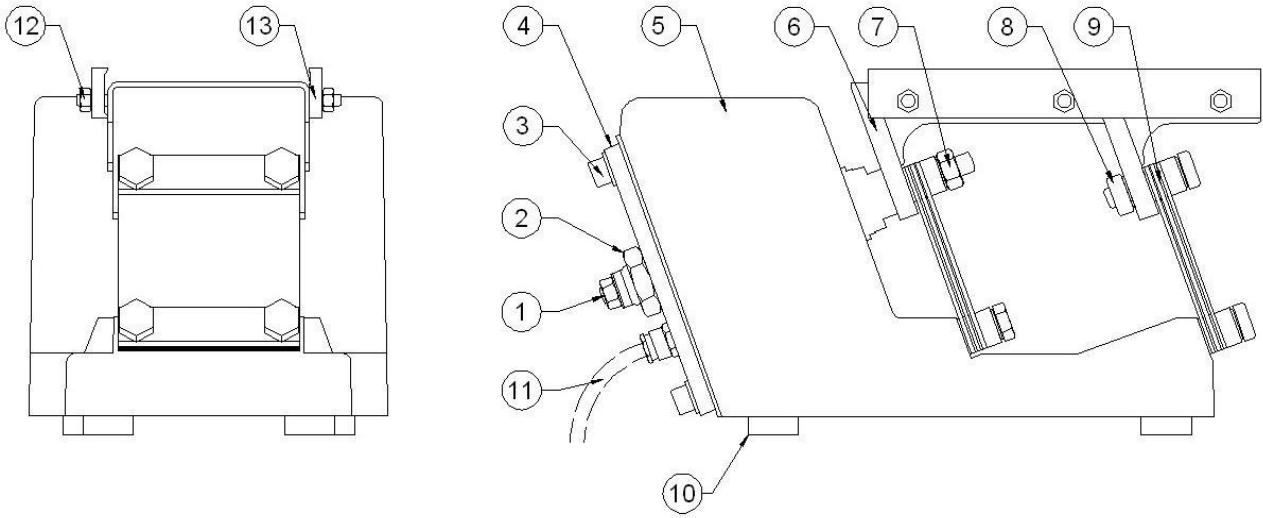


Fig. 2

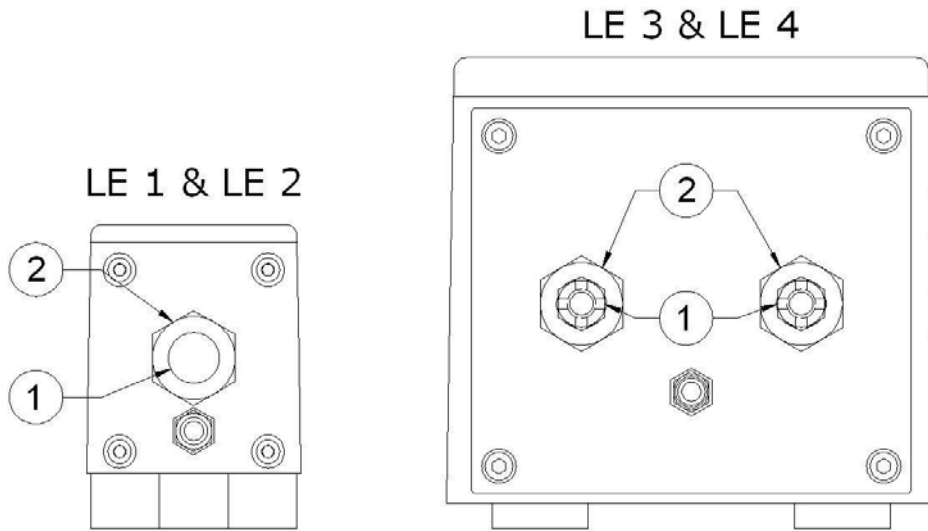


Fig. 3

PART N°	COMPONE
1	SCREW FOR AIR GAP SETTING
2	SCREW LOCKING NUT
3	COVER SCREW
4	SEATING COIL COVER
5	STATIC EQUIPMENT – VIBRATING BODY
6	TROUGH
7	LEAF LOCKING SCREW
8	LEAF SCREW LOCKING NUT
9	LEAF ASSEMBLY
10	ANTIVIBRATING LEG
11	POWER SUPPLY CABLE
12	SCREW FOR FIXING TRAYS FRAME
13	FIXING TRAYS FRAME

MODEL	WEIGH	A	B	C	D	E	F	G	H
LE 1	4.6 kg	245	111	78	115	25	76	Fig. 4	Fig. 4
LE 2	13.1 kg	260	145	128	152	45	95	80	142
LE 3	19.1 kg	326	164	148	171	45	120	90	193
LE 4	26.2 kg	335	175	178	182	60	120	120	195

Table 3

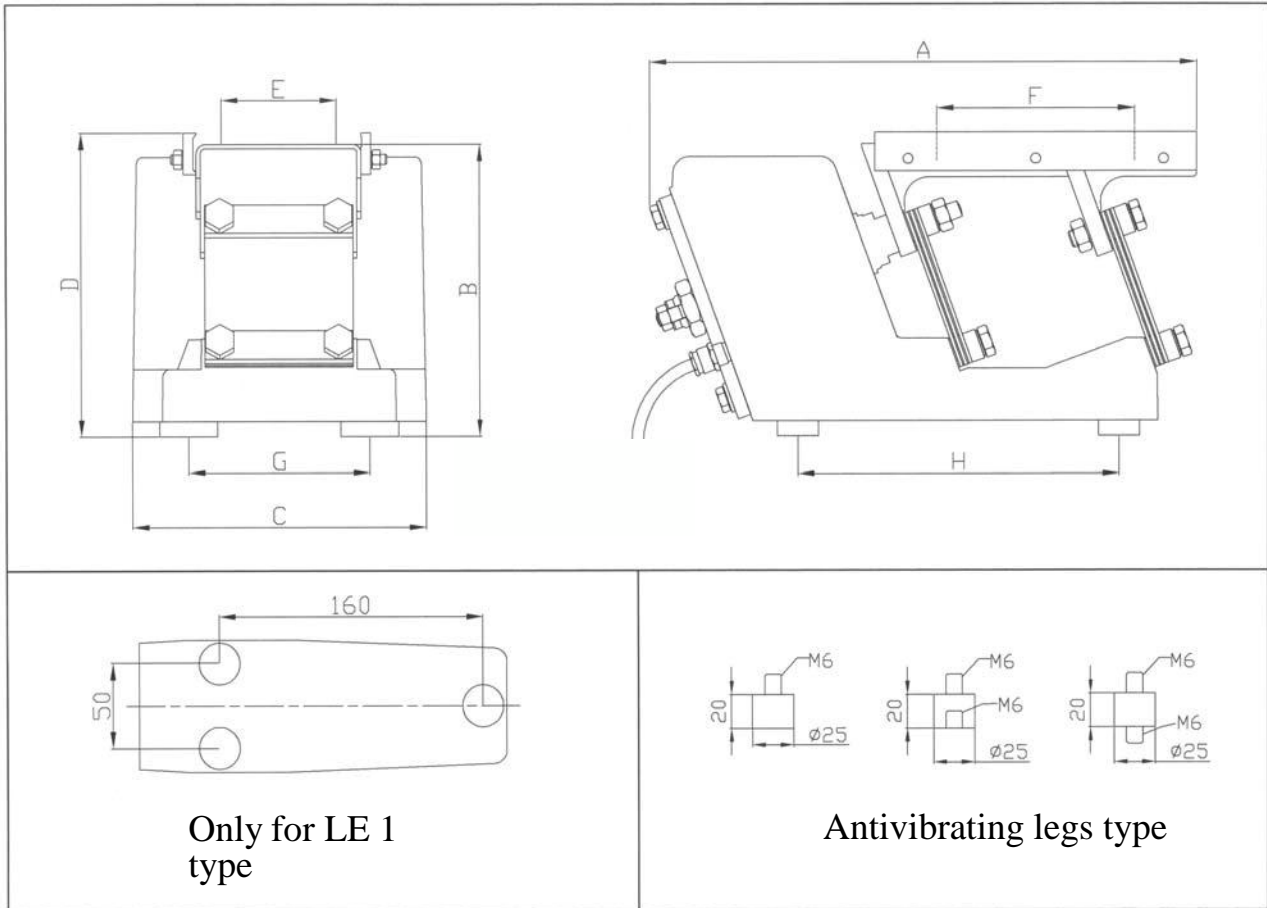


Fig. 4

MODEL	TRAYS ALLOWED MAX. WEIGHT	DELIVERY (T/h)
LE 1	2	0,6
LE 2	3	2
LE 3	7,5	5
LE 4	10	7

Table 4

* = Calculated with sand density 1,6 t/m³.

REPLACEMENTS PARTS LIST				
MODEL	LEAF THICKNESS	SPRING CODE	COIL CODE	ANTIVIBRATING CODE
L E 1	1	95011011	95012100	95000002
	1,5	95011511		
	2	95012011		
L E	1,5	95021511	95012800	95000002
	2	95022011		
L E 3	1,5	95031511	95013230	95000002
	2	95032011		
	2,5	95032511		
L E	2	95042011	95013240	95000002
	2,5	95042511		