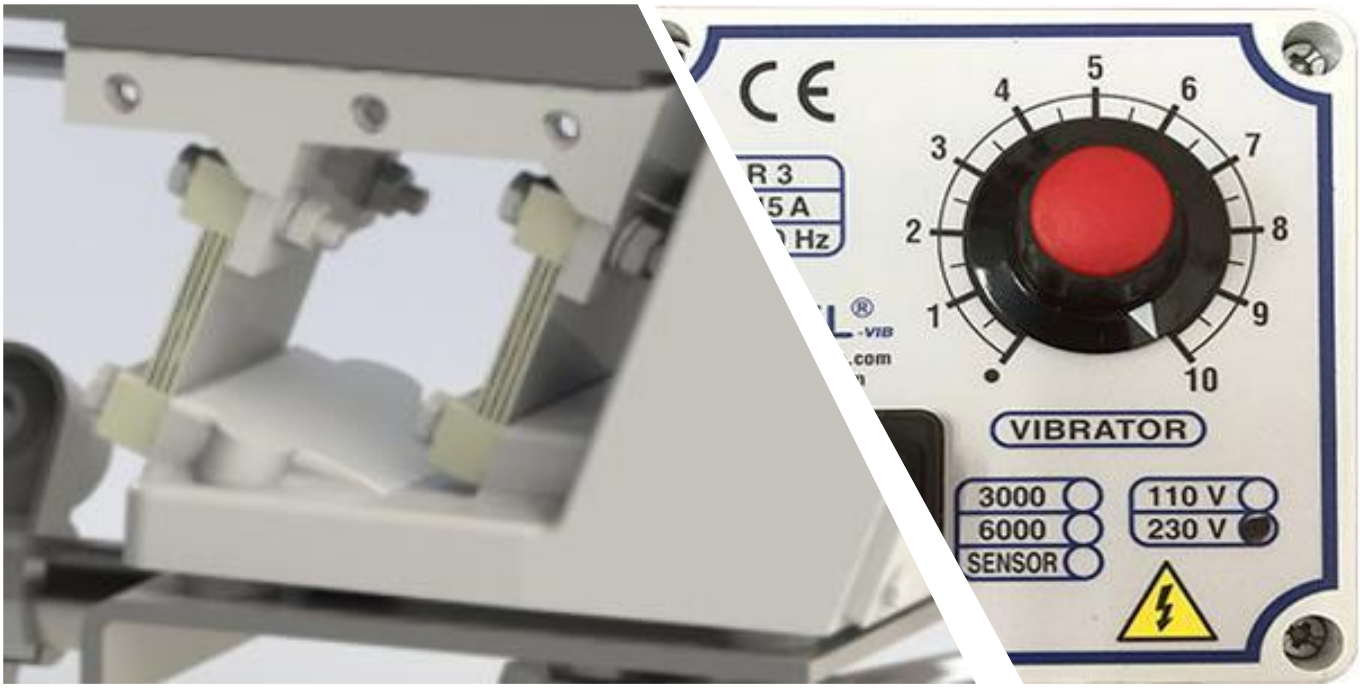
SAS LE – Vibrator Drive & Control
INSTRUCTION MANUAL



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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.

WARNINGS OVERVIEW

Re-adjustments, alterations or substitutions of any component may result in a hazardous operating condition a failure and possible damage to the equipment.

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

Under no circumstances are any alterations allowed to the 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.


For more information, consult the local safety rules. In addition, the following precautions must be observed.


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


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


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.

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

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


WARNING! Failure to observe the safety precautions contained within this manual could result in operational difficulties of the equipment and potential to 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 and maintenance team of the electrostatic equipment and their supervisory personnel understand the requirements for safe and proper usage of the electrostatic process.

DECLARATION OF CONFORMITY

AUDIMAT
n.v. automation s.a.
Tel.+32 2 735 38 95 Email: info@audimat.be

CE Conformity Declaration

1. **Product model :** Electromagnetic Linear Vibrator Unit :

   LEV1, LEV2, LEV3, LEV4, LEX1, LEX2, LEX3, LEX4 and LEX1-S

2. **Name and address of the manufacturer** or is authorised representative :

   Audimat automation S.A.
   Th. Rooseveltstreet, 19
   B-1030 Brussels

3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**

4. **Object of the declaration :**

   Equipment : Electromagnetic Vibrator
   Brand name : Tuxel-vib
   Model/type : Electromagnetic Linear vibrator unit : types LEV1, LEV2, LEV3, LEV4, LEX1, LEX2, LEX3, LEX4
   The electromagnetic linear vibrator is designed to fit a linear feeder tray. This declaration of conformity only relates to the linear vibrator and not to the control unit which is a separate device.

5. **The object of the declaration described above is in conformity with the relevant Union harmonization legislation :**

   - Low voltage directive 2014/35/EU - applied harmonized standard(s) :
   - EMC Directive 2014/30/EU - applied harmonized standard(s) :
   - RoHS Directive 2011/65/EU - applied harmonized standard(s) :

6. **References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared :**

   LVD : EN 60204-1:2018
   EN 60529:1992+A2:2013

7. **Signed for and on behalf of:**

Place and time : Brussels 01/01/2019
Manufacturer : Audimat automation S.A.
Authorised representative(s) :

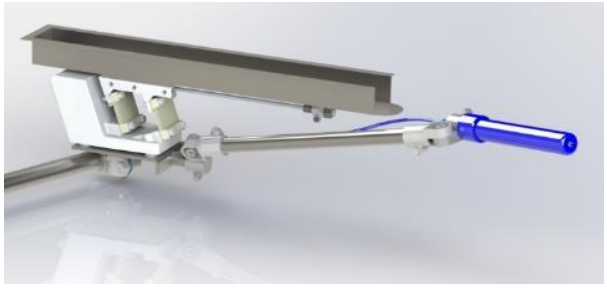
Dunand Vincent, administrator

PRODUCT INTRODUCTION

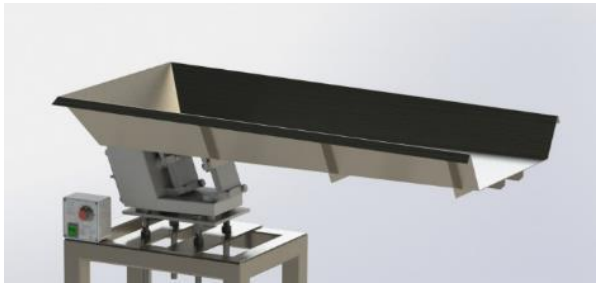
The SAS electromagnetic patented vibrating feeder design consist in two parts, defined equipment and coupled by means of leaf springs.

The drive 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 drive is equipped with tightening shoes and holes, which are pre-determined by fixing of the patented trough for the different applications.



SAS 1DV
Dry Powder Vibrator Assembly



SAS 1VF
Infeed Vibrator Assembly

The vibration movement is regulated by a Stabilized controller via an integrated potentiometer.

R3FC Controller – SAS ASSEMBLY NUMBER DV 200-097
(common for all Vibrator drives)

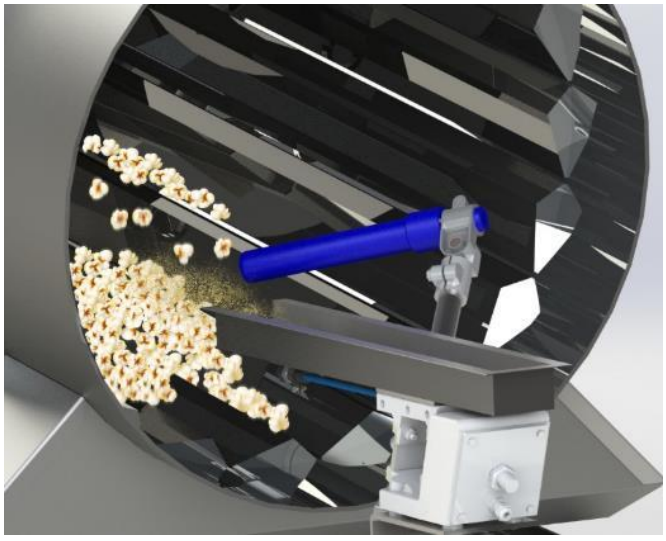
SAS APPLICATION	TRAY SIZE (dimension in mm)	VIBRATOR MODEL	VIBRO MOTOR ASSY
SAS 1DV-500-X	75 wide x 500 long	**LEX 1**	DV 200-092
SAS 1DV-760-X	75 wide x 760 long	**LEX 2**	DV 200-090
SAS 1DV-1000-X	75 wide x 1,000 long	**LEX 2**	DV 200-090
SAS IVF-200-1000	200 wide x 1,000 long	**LEX 4**	VF 200-288
SAS IVF-400-1000	400 wide x 1,000 long	**LEX 4**	VF 200-288

OPERATING PRINCIPLE

When operating, the drive 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 drive requires the use of a controller containing a rectifier, which converts alternating current into rectified current and also regulates the speed of the system.



SAS 1DV
Dry Vibrator System (patented)

SAS 1VF
Infeed Vibrator System

INSTALLATION

DELIVERY INSPECTION

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

⚠ **CAUTION:** Never lift the unit by the trough, as the drive has been factory tuned for your specific application so it might be not working properly.

NOTE: When installing the drive, 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.

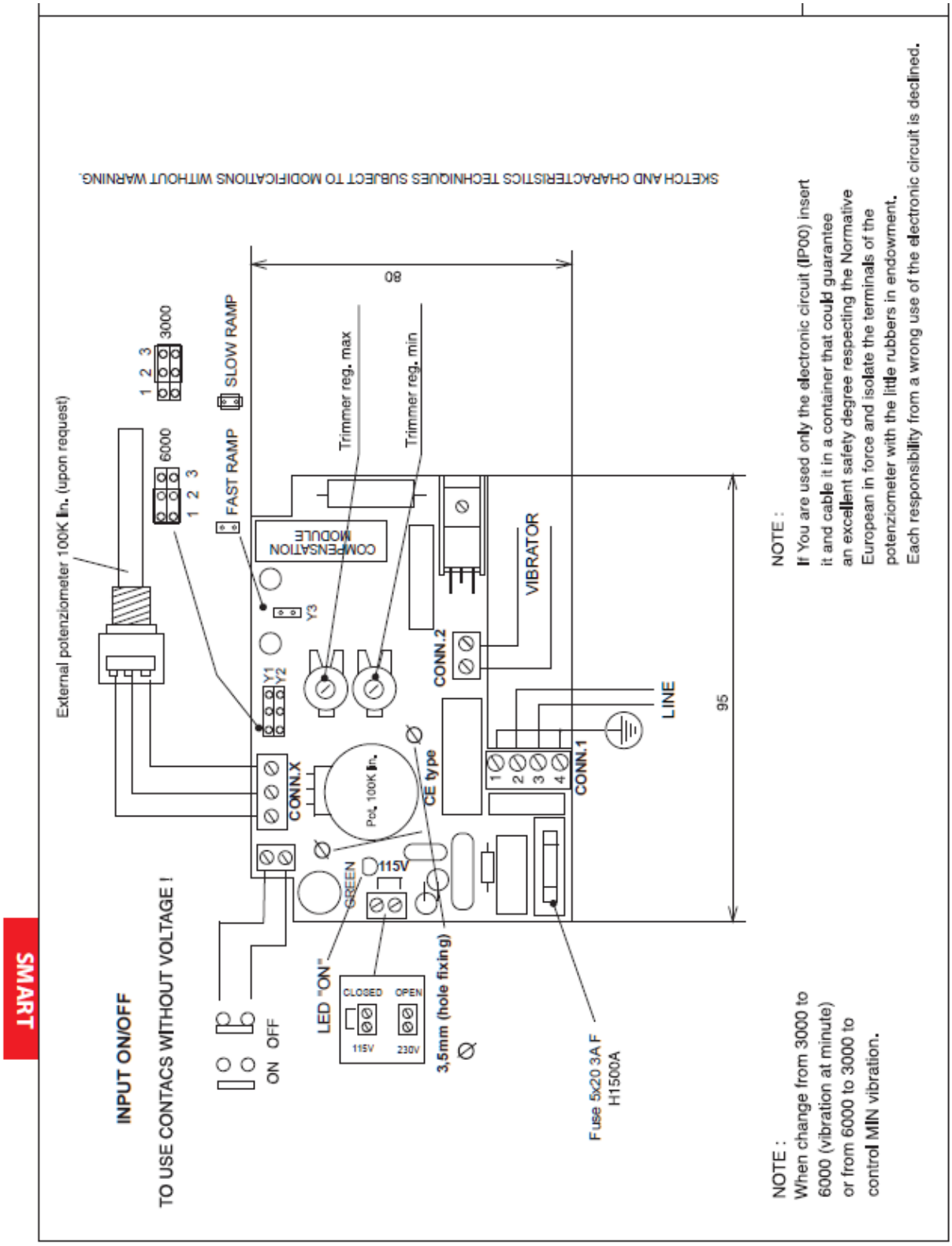
The separate control assembly should be installed as close to the drive as possible, where it is easily seen by and accessible to the operator. Installation on a wall, in a clean, dry vibration-free location is recommended. Install the control in an open location where it will receive adequate ventilation, 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 drive 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 drive, 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 drive and controller properly installed and all wiring completed, the equipment is ready for operation.

R3FC Controller

INSTALLATION



START UP

WARNING: Unauthorized modification of the drive 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 drive 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 drive 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 **Fig.1** and **Air Gap** section in this manual for instructions on adjusting the air gap or refer to Troubleshooting for instructions on avoiding a striking condition.
If the drive 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 drive 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 drive current may climb to a dangerous level and result in coil burn-out, failure of control components.

CAUTION: Do not operate the drive when either of the above conditions exist. The air gap is properly set at the factory. So, adjustment is rarely required. However, if high voltage is applied to the drive, or if the air gap has been altered due to improper handling, an adjustment may be in order.

ATTENTION: a poor adjustment of the gap can cause overheating of the coil, his destruction and cause substantial burns; its setting is imperative!

START UP

ADJUSTING THE AIR GAP

To adjust the air gap, perform the following steps referring to page 10 - **Fig. 3**

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), counterclockwise, with reference to **Table 1**, determine the adequate air gap for your drive. 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.

TABLE 1

MODEL	*COIL DIMENSION*	*QUANTITY*	*AIR GAP*	*ROTATION OF THE SCREW*
LEX 1	*Ø 21*	*1*	*1.5 mm*	*360° 1 full turn*
LEX 2	*Ø 28*	*1*	*3 mm.*	*720° 2 full turns*
LEX 4	*32 x 40*	*1*	*3 mm.*	*720° 2 full turns*

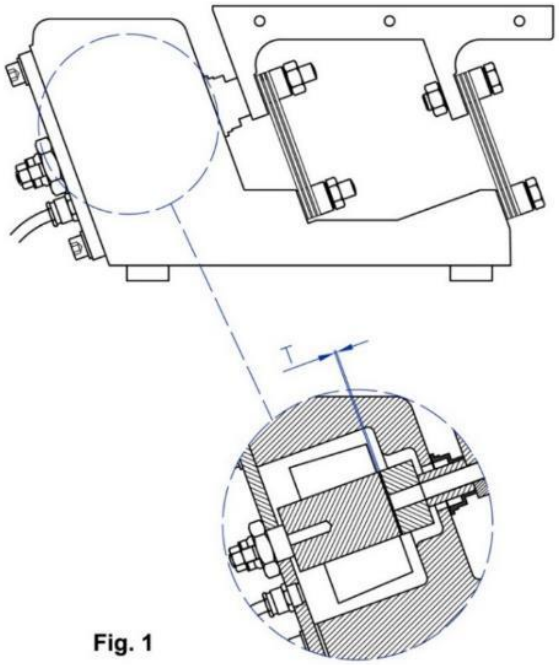


Fig. 1

START UP

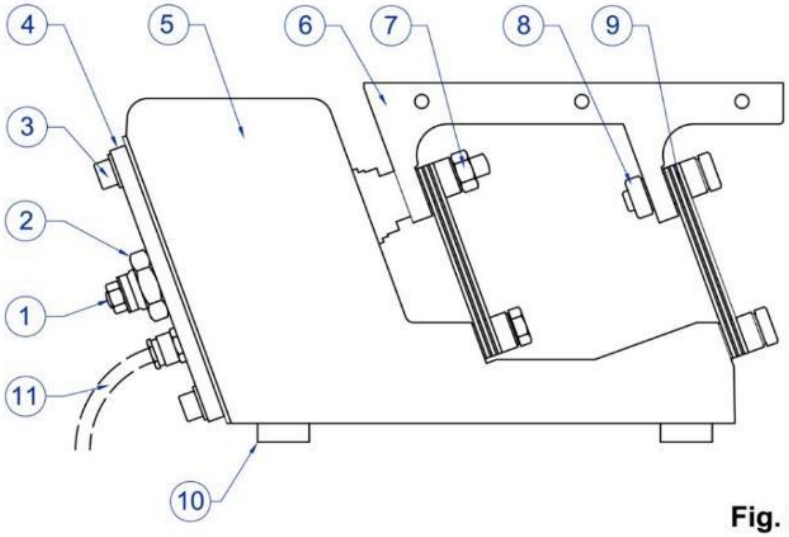


Fig. 2

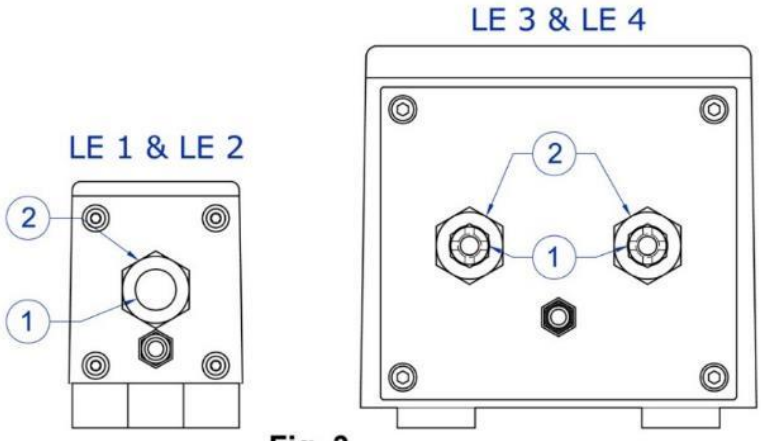


Fig. 3

PART N°	COMPONENT
1	SCREW FOR AIR GAP SETTING
2	SCREW LOCKING NUT
3	COVER SCREW
4	SEATING COIL COVER
5	STATIC EQUIPMENT – VIBRATING BODY
6	TROUGH – MOBILE PART
7	LEAF LOCKING SCREW
8	LEAF SCREW LOCKING NUT
9	LEAF ASSEMBLY
10	ANTIVIBRATING FEET
11	POWER SUPPLY CABLE

START UP

DRIVE STROKE

Drive 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 centre line of drive. The gauge can be applied at any point on the side of the trough, as close to the centre line 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 grey, it means that the graduated lines of the gauge are not parallel to the centre line of the drive.

SETTINGS

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

⚠ **WARNING:** Disconnect the drive 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**.

MODEL	***ABSORPTION (A)***	***POWER (W)***	***LEAF DIMENSIONS (mm)***	***LEAF THICKNESS (mm)***	***SCREW STOKE***
LEX 1	*0.1*	*13*	*40 x 48*	*0,75 - 1*	*7.5 N/m – M5*
LEX 2	*0.25*	*37*	*70 x 82*	*1,25 - 1,50*	*30 N/m – M8*
LEX 4	*0.65*	*68*	*90 x 98*	*2 - 2,25*	*70 N/m – M10*

TABLE 2

CLEANING

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 driver pan and if permitted to build-up excessively, will alter the natural frequency of the feeder.

Material build-up on the trough should be removed daily. Look for material build-up at the rear of the feeder trough, particularly around the material output from the screw feeder.
Humidity build-up can be prevented by factory installation of electrically warmed covering of the leaf's.

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

SERVICE

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

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

Under normal operating conditions drive 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 name plate.

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

SPARE PARTS

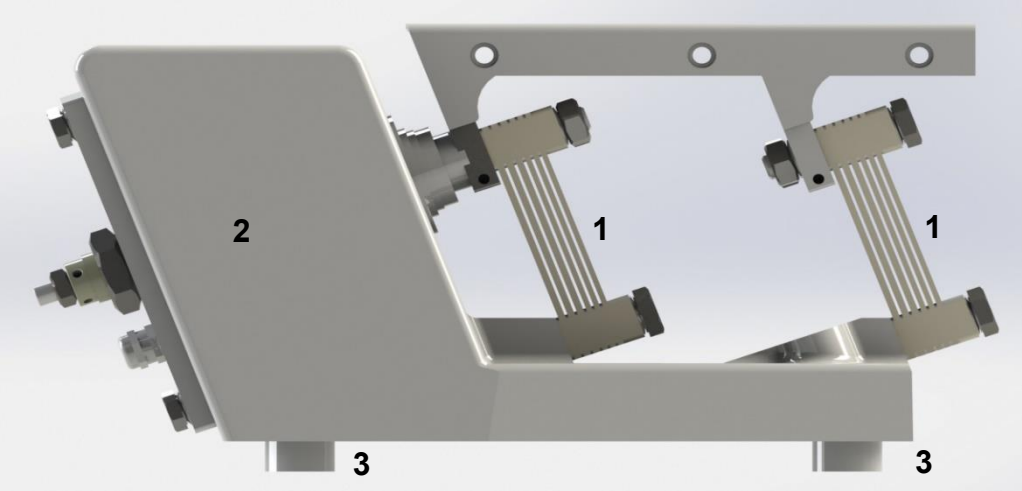


Fig 5

REPLACEMENTS PARTS LIST				
		1	2	3
MODEL	**LEAF THICKNESS (mm)**	**LEAF SPRING PART NO.**	**COIL PART NO.**	**ANTI-VIB FEET (NO.3 BLACK) PART NO.**
LEX 1	0,75 (3 ply) 1,0 (4 ply)	LE 100-180 LE 100-181	LE 100-086 (220v) LE 100-085 (115v)	LE 100-301 (set of 4 feet)
LEX 2	1,25 (5 ply) 1,50 (6 ply)	LE 100-182 LE 100-183	LE 100-088 (220v) LE 100-087 (110v)	LE 100-301 (set of 4 feet)
LEX 4	2,00 (8 ply) 2,25 (9 ply)	LE 100-184 LE 100-185	LE 100-114 (220v) LE 100-113 (110v)	LE 100-301 (set of 4 feet)

TABLE 5

DIMENSIONS

MODEL	WEIGHT	A	B	C	D	E	F	G	H	I	J	K	L
LEX 1	4.6 kg	110	75	NA	NA	NA	NA	NA	40	25	76	N/A	N/A
LEX 2	13.1 kg	145	122	M8	15	65	50	12	80	45	95	75 80	142
LEX 4	26.2 kg	175	178	M10	20	77.5	77.5	12.6	100	60	120	100 120	195

TABLE 3

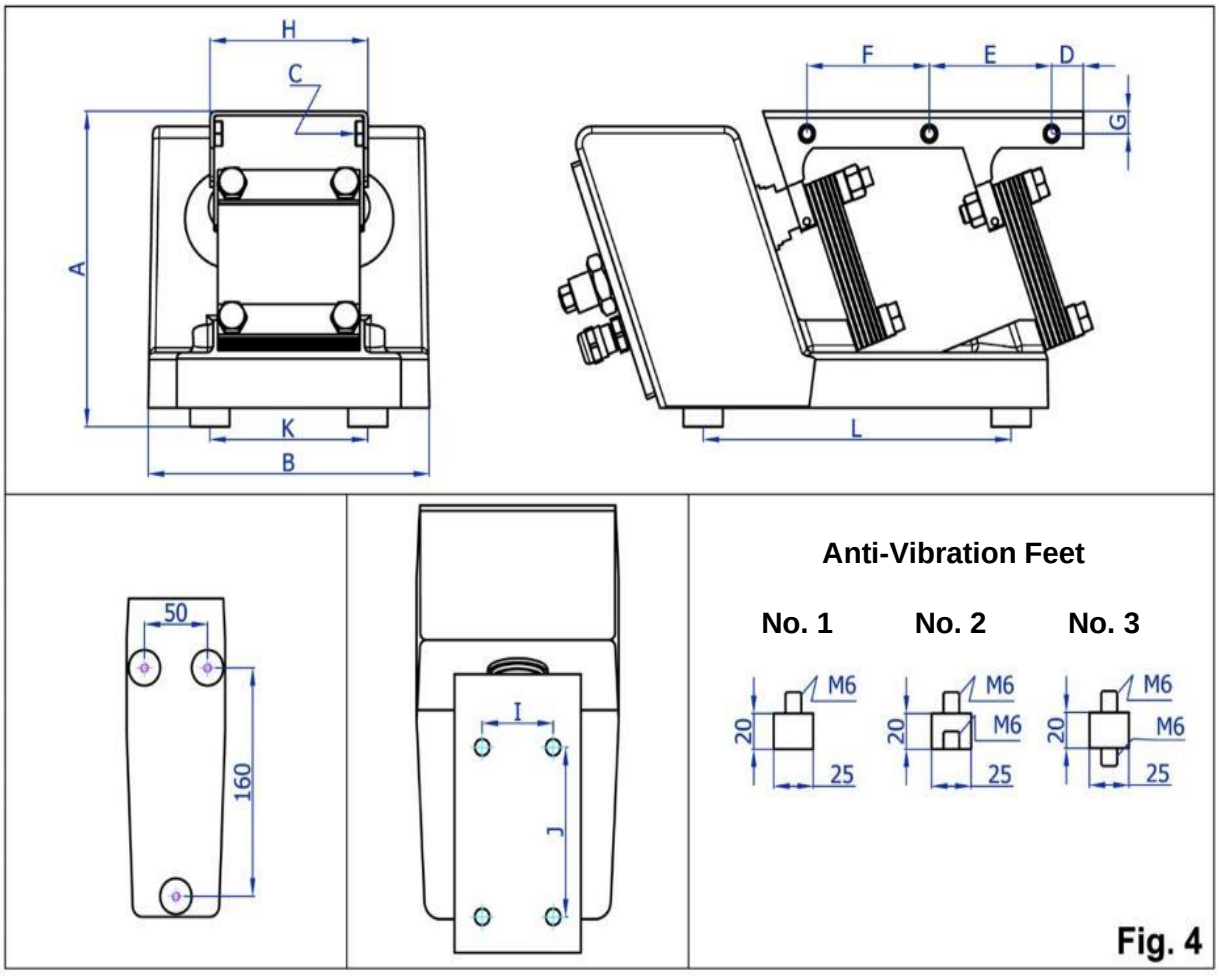


Fig. 4

TECHNICAL SPECIFICATION

WORKING CAPCITY

MODEL	TRAYS ALLOWED MAX. WEIGHT (INDICATIVE)	DELIVERY* (INDICATIVE)
LEX 1	2 kg	0,6 T/h
LEX 2	3 kg	2 T/h
LEX 4	10 kg	7 T/h

TABLE 4

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

ELECTRICAL CONTROLLER

Tension of Feeding:	115/230 V ± 5% – 50/60 Hz
Consumption:	1,5 W max
Current Max:	3,15A (RMS)
Load Min:	50 mA (RMS)
Frequency of Vibration:	3.000/6.000 v/min. (50 Hz) RC-AC
Time of Ramp:	0,2 sec. / 2 sec. (modifiable)
Regulation Min.:	80 V ± 30%
Regulation max:	220 V - 30%
On/Off	free voltage contact
Degree of Protection:	IP55 in box (IP65-NEMA4-4X)
Temperature of Storage:	–15°C / +80°C
Temperature of Operation:	–5°C / +55°C
European Norms:	EMC CE
Guarantee:	1 year (from date on circuit)
Version	PV R3FCX Z2 STD

WARRANTY

Dear Customer,

Thank you for buying a SAS products and systems. Every care has been taken, from design to manufacture, to ensure that this product gives you complete satisfaction.

Spice Application Systems Ltd guarantees that all equipment manufactured by them will be free from defective workmanship or materials for a period of 12 months or 3000 working hours, from the date of delivery of the equipment, whichever comes first.

We will rectify any manufacturing or material defects by means of suitable repair or supplying a replacement part.

Always providing that:

- Any such defect(s) is reported in writing, within the 12-month period.
- All equipment is installed, operated and maintained in accordance with specific recommendations of Spice Application Systems Ltd and good industry practice.
- Spice Application Systems Ltd supplies all spare parts and consumable items.
- Consumable spares are inspected frequently and replaced as necessary. The life of these varies with the application and they are not guaranteed for any specific period.
- Maintenance spares are inspected and replaced if necessary every 12 months or 3000 operated hours, whichever is sooner.
- Any consequential loss, however caused is expressly excluded from this guarantee

Spice Application Systems Ltd will not be liable for any repairs or replacements (including labour costs) without our written approval.

Spice Application Systems Ltd gives no performance guarantees, unless specifically indicated in our proposal. The effects erosion, corrosion and general wear and tear are specifically excluded.

Spice Application Systems Ltd reserves the right to amend or change specifications, as part of their continuous development policy.

We make no other guarantee or representation whatsoever, expressed or implied.

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