Elscint Automation

ELSCINT

I. Four Decades of Building Trust

1983-90

- Inception: 1983
- Introduced Vibratory bowl feeders in India
- * 5 Models developed

1991-98

- **5 Models developed**
- Various feeding SPMs developed
- Started making 20+ feeding systems a month
- Repeat orders from various customers
- Developed Various Accessories for feeders

1999-07

- 25+ feeding systems a month
- Started Exports
- Started manufacturing Hopper Elevators, Automatic Tapping & Riveting Machines

2008-14

- Increased factory area to 13500 sq. ft
- Purchased two VMCs -
  - 4 Axis
  - 5 Axis
- 40+ feeding systems a month
- Increased exports

2015-22

- 60+ feeding systems a month
- Purchased another VMC and a VTL
- Exports now constitute 30% + of turnover
- Started Manufacturing Rotary/ Centrifugal feeders on a large scale

ABOUT

Tooling of vibratory bowl feeders is a business where experience counts more than anything. In fact, it takes more than two years for a person to understand tooling of a bowl feeder. Being in business for 40 years, Elscint is very well placed in this respect. Presently Elscint's workforce has a combined tooling experience of almost 200 years behind it, ensuring that almost all types of components have been handled by its team one time or the other.

Elscint has thus, been serving the world's industry by providing small part handling solutions using vibratory bowl feeders, linear feeders, small parts conveyor feeders, rotary or centrifugal feeders etc. We also manufacture F.H.P. worm reduction gear boxes / motors for low speed, high torque, continuous duty applications. Elscint has a trained work force of highly skilled bowl toolers backed by a competent design team. Elscint has its own factory with separate office space spread over 17000 sq. ft. in the sprawling MIDC Industrial Estate at Bhosari, Pune, India. Elscint has a full fledged tool room equipped with the latest CNC machines, which include an 5 Axis VMC, an 4 Axis VMC and an VTL, these along with all types of conventional machines for machining of its own components. Inhouse machining capability helps us to ensure proper quality and repeatability of all types of components. Elscint also boasts of all types of sheet metal working equipment, thus guaranteeing its customers high quality and precision jobs. It also has its own power generation arrangement which can be used in case of need.

With more than 25000 feeding systems in operations all over the world, out of which, 30% being exports, Elscint is the go to choice when it comes to finding a partner for your feeding requirements. Further it has a presence all over India with sales & service setups at all major locations like Bangalore, Chennai, Hyderabad, Coimbatore, NCR. Additionally, representatives are available at major locations across Europe for assisting customers.

Elscint vibratory feeders and linear vibrators as well as coils (magnets) and controllers are having CE Marking from Techicka Inspekcia, a.s., Slovakia, making it the sole manufacturer from India having this certification, making its products acceptable in Europe.

ELSCINT vibratory bowl feeders

Elscint manufactures 7 models of Vibratory Bowl Feeders, i.e. 100, 160, 250, 250 D, 400, 400 HD and 630. All the Models are having CE Marking, thus conforming to the stringent European Safety Norms for Machinery Safety, Low Voltage Directive as well as the Electro Magnetic Compatibility.

Bowls: The Bowls have many distinct tooling features built into the basic bowl designs, with tracks varying in width and shape to accommodate different types of components. These inherent features of the bowl are of great assistance, when bowl tooling is being developed to fulfill a specific tooling application. The Bowls are made in either Cast Aluminum or Stainless Steel. In Stainless Steel various types of Bowls are available like Conical, Step Design, Cylindrical and Outside Track Bowl.
Drive: All drive units are correctly engineered to give stable performance at high speed with minimum maintenance.

Totally Encapsulated Type coils with adequate power for particular models, are used. A removable Guard / Cover is provided for safety. Most Drive Units are of **FULL WAVE Operation** and hence the energy **consumption of Elscint Vibratory Drive Units is 40% less** than its competitors who offer HALF WAVE Operation.

APPLICATION: Elscint Vibratory Bowls are suitable for feeding components for subsequent operations on special machines in cosmetic, electrical, mechanical, pharmaceutical, optical, bearing and many other industries. The components can be plastic caps, spouts, capsules and electrical connectors, bearings as well as heavy parts such asanchor bolts, bearing races and metal sockets. Even oily parts!

ROTARY FEEDER

MAJOR POINTS

LESS MAINTENANCE

LESS NOISE

HIGH SPEED

MECHANICAL WORKING

PHARMACEUTICAL GRADE AVAILABLE

STURDY DESIGN

CLEAN & EASY TO MAINTAIN

MAJOR FEATURES OF ELSCINT ROTARY / CENTRIFUGAL FEEDERS

- Unique Double Disc drive design ensuring high speed, proper orientation & no jamming.
- Separate Variable Frequency Drives, ensuring proper speed / feed rate.
- Sturdy design with excellent build quality.
- Optional provision for reversing of discs possible.
- Pharmaceutical grade Rotary Feeders possible.
- Elscinthane PU coating possible (food grade coating also available).
- Low noise level.
- Clean & easy to maintain.

Variety of components can be fed in the same Rotary Feeder with simple changeover tooling.

A COMPARISON CHART MENTIONING THE ADVANTAGES & DISADVANTAGES OF ROTARY OR CENTRIFUGAL FEEDERS VIS A VIS VIBRATORY BOWL FEEDERS ARE GIVEN BELOW

	Vibratory bowl feeder	**Rotary / Centrifugal Feeder**
Maximum speed	12 to 15 meters / minute	50 meters per minute
Usage of Air Jets	Sometimes required	Mostly required
Variety of parts which can be oriented & fed	Almost all parts	Only certain parts can be fed & oriented (eg. bottle caps, cylindrical rollers, needle rollers, flat and cylindrical drippers, bearing races, bearing rings etc)
Electrical supply	1 Phase	3 Phase
Possibility of damage to parts	Negligible	Negligible
Loading quantity	High (depending upon model)	Less (Stock feeder / Hopper Elevator always required
Variety of components	Possible with changeover	Possible with changeover
Food Grade Quality	Available	Available
Maintenance	Negligible	Negligible

EXAMPLES OF ROTARY FEEDERS

1

ROUND DRIPPER (Model RF 60)

Dripper size : *(dia 16 mm x 40 mm length)*

Speed achieved : ***800 parts per minute***

Dripper size : *(dia 16 mm x 70 mm length)*

Speed achieved : ***500 parts per minute***

2

FLAT DRIPPER (Model RF 80)

Dripper size : *(6 mm x 37 mm length)*

Speed achieved : ***600 parts per minute*** *– with curved side up*

Orientation : *Curved side up*

Dripper size : *(8 mm x 41 mm length)*

Speed achieved : ***500 parts per minute*** *– with curved side up*

3

ROTARY FEEDER FOR BEARING RINGS (Model RF 80)

Bearing Ring sizes : *dia 40 mm to dia 80 mm*

Speed Achieved : ***300 to 500 parts per minute***

4

ROTARY FEEDER FOR BEARING RINGS (Model RF 100)

Bearing Ring sizes: *dia 40 mm to dia 110 mm*

Speed Achieved : ***200 to 400 parts per minute***

centreless grinding

Helps in reducing manual labour as well as increasing the grinding quality of your material.

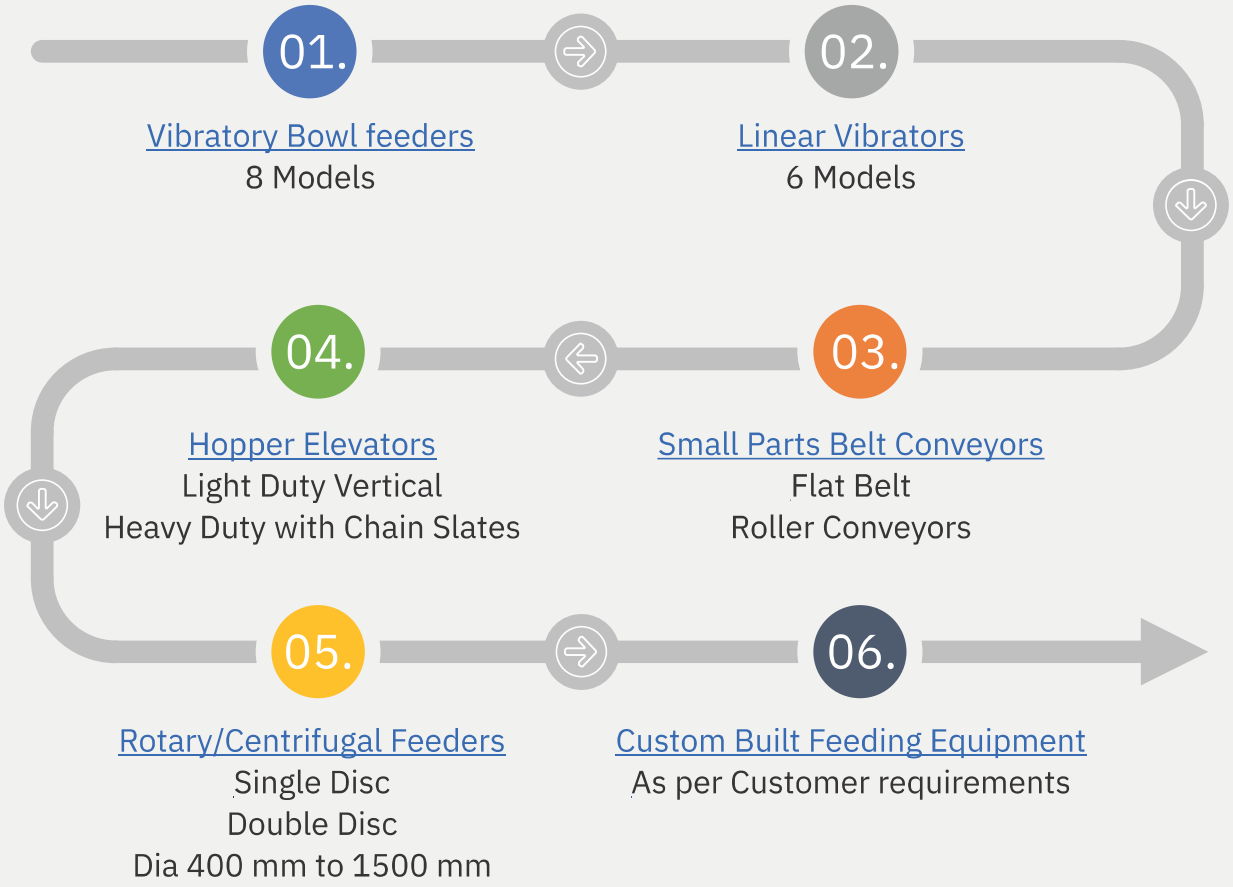
AUTO FEEDING FOR CENTRELESS GRINDING MACHINES

Elscint manufactures automatic feeding systems for centreless grinding machines. The advantage of this feeding system is that the components are fed at a continuous pressure. This leads to better and consistent quality of ground components. Another advantage is that it becomes a totally manless operation which results in one person looking after three to four machines. The output too increases tremendously as due to automatic feeding, the feeding to the centreless grinding machine can go on even during lunchtime and breaks. The system consists of a vibratory bowl feeder and a linear vibrator ahead of that a table is also provided to mount both these units. Optional accessories include equipment for extra loading capacity like silo, hopper type silo, stock-hopper, elevator as well as a X-Y table for X and Y table for X and Y adjustment. This helps in fine adjustment to accommodate the various sizes of components plus is useful while dressing of the Grinding Machine Wheel. Depending upon the size of the components and the loading capacity required, model is selected. Alternatively, Elscint can also offer gravity feeding through tubes eliminating the need of a linear vibrator.

Elscint

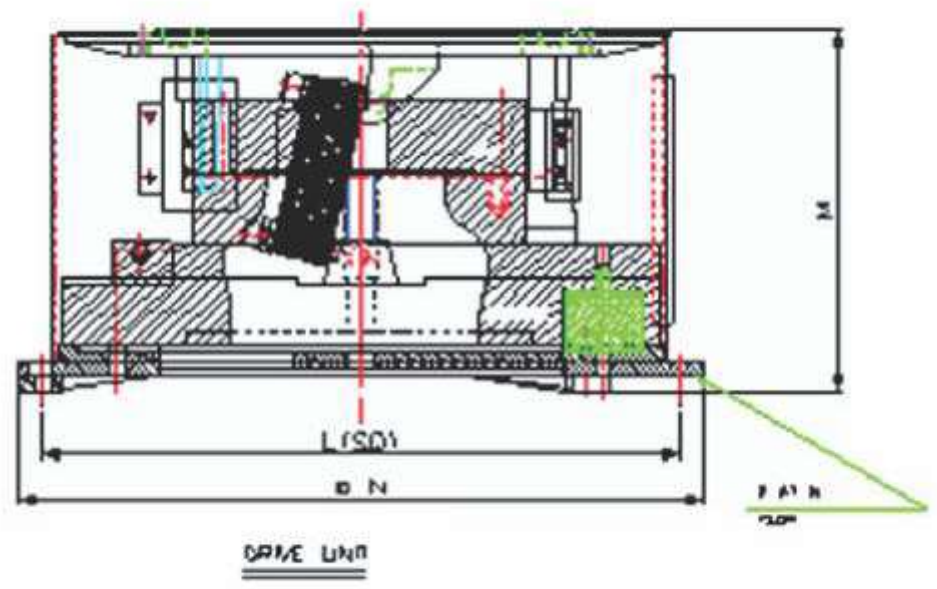
V023

Products Manufactured



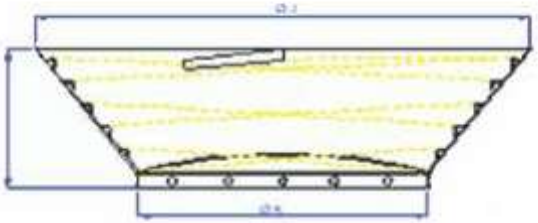
vibrator drive

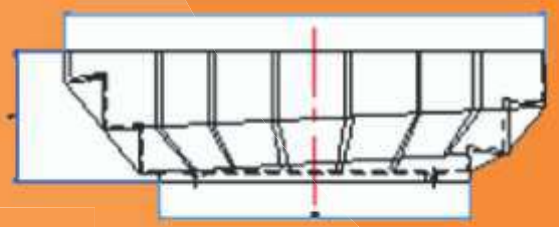
	Drive Unit						
Model	L	M	N	P	U (Coils)	V (VA)	Drive Wt.
100	110	104 + 23	SQ. 85	Ø 4.5	1	15	2.5
160	260	179 + 26	SQ. 170	Ø 6.8	1	170	17
250 D	340	198 + 24	SQ. 220	Ø 8.6	3	520	55
250 U	340	198 + 24	SQ. 220	Ø 8.6	3	520	50
400	496	210 + 31	SQ. 325	Ø 11	3	780	140
400 HD	496	246 + 31	SQ. 325	Ø 11	3	1000	165
630	720	224 + 52	SQ. 488	Ø 13	4	1500	200

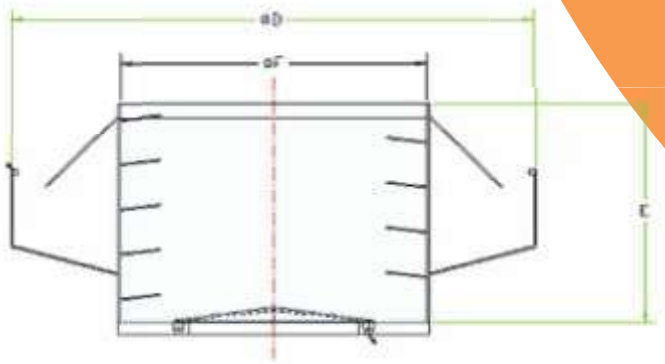


bowl

	Bowl Capacity		Step			Outer Track			Cylindrical		Conical	
Model	Volume (Ltr)	Wt (Kg)	A	B	C	D	E	F	G	H	I	J
100	0.015	0.5							20 - 65	100 - 120		
160	0.8	3	260-300	90				220 - 260	40 / 100	200 - 248	70 / 50	300
250 D	3	12	380-460	114 - 174	300	514	232	288 - 296	50 / 220	288 - 300	135 / 170	470 - 520
250 EV	5.5	12	480-530	176 - 205				288 - 296				
400	9	30	550-700	157 - 200	450	714	270	420	80 / 270	443 - 450	220	750
400 HD	12	40	800-900	200 - 264	450	714	270	420	80 / 270	443 - 450	220	750
630	18	50	950-1100	200 - 220				525	200	660	180	912







ADVANTAGE OF USING A LINEAR VIBRATOR FOR FEEDING TO CENTRELESS GRINDING MACHINES

Vibratory bowl feeders are the best feeding devices for automating the operation of centreless grinding machines, mainly the through feed types of centreless grinding machines. The vibratory bowl feeder is used for orienting the component in the correct manner / orientation, which usually is axial orientation.

After the component is oriented in the correct manner, it has to be further transported onto the work rest of the grinding machine. There are three possibilities for making this transfer -

a. Gravity Chute – In case of the gravity chute, the back pressure of the components and the inclination of the chute result in movement of the components from the bowl to the work rest of the centreless grinding machine. The advantage of using a gravity chute is that it is cheaper to make as well as to maintain. But the disadvantage of the same is that due to the emphasis on back pressure and inclination, a few (7 to 8) components are always required in the chute for generating continous and consistent pressure for the grinding operation. This always may not be possible and can lead to uneven pressure and quality of the ground components suffer due to this.

b. Small Parts Conveyor Feeder – This is a conveyor kept ahead of the bowl feeder for conveying the components onto the work rest of the grinding machine. It can generate consistent and continous pressure on the components and works very well with excellent results. The disadvantage is the cost factor, which is high and additionally, for better results, a variable drive is required, which further adds to the cost of the conveyor. Add to this the usual maintenance costs associated with the geared motors, belts etc. and this does not become a cost effective solution.

c. Linear Track – A Linear track is a chute mounted on a linear vibrator which can do the work of conveying the components from the bowl to the grinding machine work rest. The linear track can generate the same pressure on the comp nents and this can result in a very good finish quality of the components. Further no backpressure is required and hence even a single component can flow through at a very easy pace.

Therefore, the best way for feeding of components to a centreless grinding machine is to provide for a linear track ahead of the bowl feeder.

linear vibrator

Model	Coil Rating	Approx. Wt. (Kg)	Chute / Tray Wt.	Max. Chute Length (mm)	Frequency
	220 V - VA				
ELSCINT I	45 VA	7.5	0.8	550	6000
ELSCINT II	170 VA	17	2.5	750	6000
ELSCINT III	10 VA	1.8	3	300	6000
ELSCINT IV	330 VA	34	10 to 16	1000	3000
ELSCINT VI	10 VA	1.5	3	200	6000
ELSCINT SM II	170 VA	5	4	500	3000

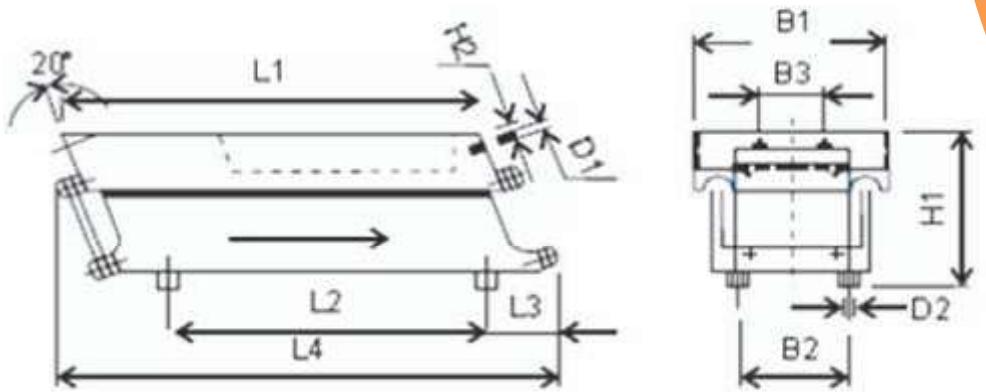
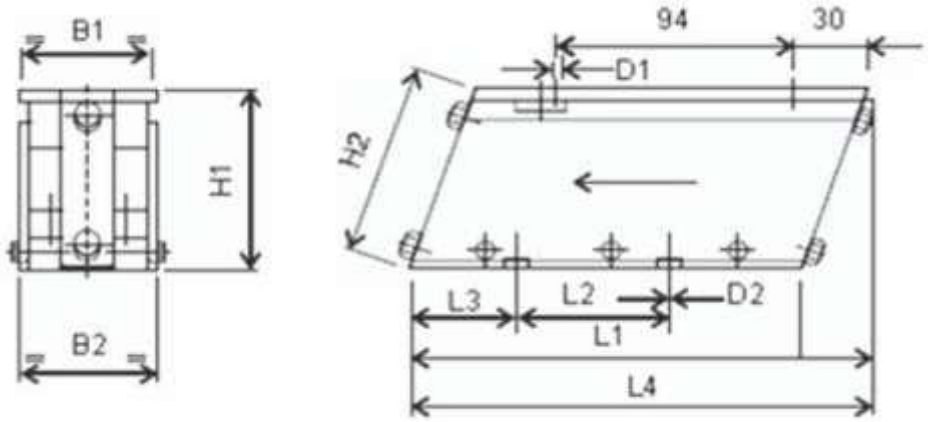


Image name

linear vibrator

Model	L1	L2	L3	L4	B1	B2	B3	H1	H2	D1	D2
ELSCINT I	247	200	45	320	122	70	40	105	13	M6	M6
ELSCINT II	340	270	63	440	160	100	60	140	15	M6	M6
ELSCINT IV	450	340	69	510	200	140	180	176	-	M6	M6
ELSCINT VI	66	34	6.3	83	43.	-	-	47	38	M4	M4
SM I	190	175	7.5	203	50	75	32	93.5	105	Ø 4.5	Ø 6.5
ELSCINT SM II	184	220	10	240	100	85	55	144 + 25	162	153	M6



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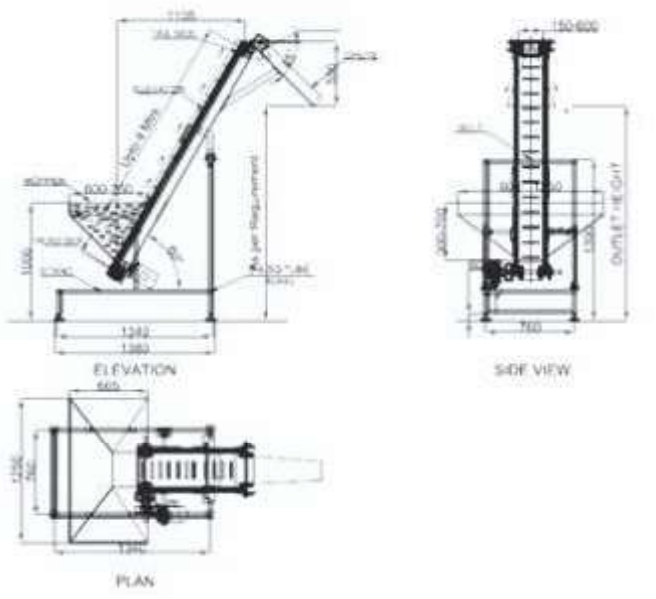
hopper

Hopper Capacity Litre	VBF Model	A	B	C	D	E	F	G	H	I	J	K	L	N	P	Weight	Feeder	Volts	Rating
50	250	350	450	430	530	900	350	11	250	390	380	350	430	180	4	50	**ELSCINT I**	200	45 V/A
130	400	600	700	680	780	970	500	13	325	650	630	600	460	180	6	80	**ELSCINT II**	200	170 V/A
130	630	600	700	680	780	1050	500	13	325	650	775	600	525	180	6	80	**ELSCINT II**	200	170 V/A

elevator



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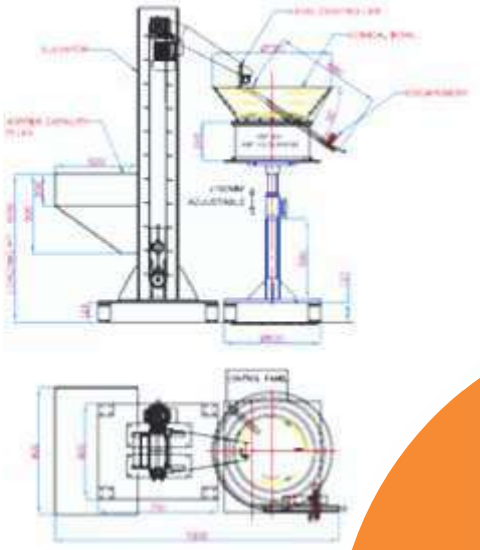

Image name

accessories

ACCESSORIES

Elscint provides all types of Accessories like (refer photo for details)

1. Stands (with Height Adjustment of 200 / 220 mm -8 to 9 inches)
2. X-Y Tables
3. Portable Jacks - for Z adjustments
1. Elscinthane Polyurethane Linings / Coatings-Rough as well as Smooth Finish possible
2. Hoppers & Silos for extra capacity
3. Noise Suppressors / Enclosures for Noise Reduction Main
4. Chutes Gravity and Linear with Sensors

SPECIAL EQUIPMENTS MANUFACTURED BY ELSCINT

ELSCINT TAPER ROLLER FEEDING, ORIENTATION & PUMP UNIT

Elscint Taper Roller, Feeding, Orientation and Elevating Pump Unit is designed for feeding and orienting taper rollers for taper roller

Application: bearings. The taper rollers are fed into the pump unit driven by a suitable Elscint reduction unit and this pump unit elevates the rollers to the desired height from where they can be fed by gravity to the work station where they are needed.

ELSCINT GEAR BOXES / MOTORS

Models Available:

Model	Torque
DM 38	100 Kg cm
DM 52	300 Kg cm
DM 38.38	4 Kg Mtr.
DM 38.52	10 Kg Mtr.

Construction:

1. Elscint Gear box is directly mounted on the front motor flange
2. Cast Iron and Al housings available
3. Solid & Hollow Shafts available
4. Thread Ground Worm Shafts and Phosphorous Bronze Gears
5. Factory Oil / Greased filled Gear Boxes
6. Ratios from 6:1 to 4900:1
7. Convenient mounting positions
8. Customised Adaptability

controller

Model	ED3V	EP4V	EP5V	ED5V	ED10V	EFQC1.5	EFQC3	ED5V	EFQC6
Model 100	*	*				*			
Model 160	*	*				*	*		
Model 250			*	*			*		
Model 400			*	*				*	
Model 400 HD			*					*	
Model 630					*				*
ELSCINT I	*	*				*			
ELSCINT II	*	*				*			
ELSCINT III	*	*	*	*		*	*		
ELSCINT IV									
ELSCINT VI	*	*				*			
ELSCINT SM II	*	*				*			

ED3V -Amplitude Control / Voltage Compensation - Upto 260 VA						-	Digital
ED5V -Amplitude Control / Voltage Compensation - Upto 1000 VA						-	Digital
ED10V -Amplitude Control / Voltage Compensation - Upto 2000 VA						-	Digital
EP4V -Amplitude Control / Voltage Compensation - Upto 260 VA						-	Analog
EP5V -Amplitude Control / Voltage Compensation - Upto 1000 VA						-	Analog
EFQ Series - Frequency Controllers for variation of Frequency & Voltage						-	Digital
			EFQ1.5	3 Amps Rating			Digital
			EFQ3	5 Amps Rating			Digital
			EFQ4.5	6 Amps Rating			Digital
			EFQ6	10 Amps Rating			Digital

NOTE:- ALL DIMENSIONS ARE IN MM.

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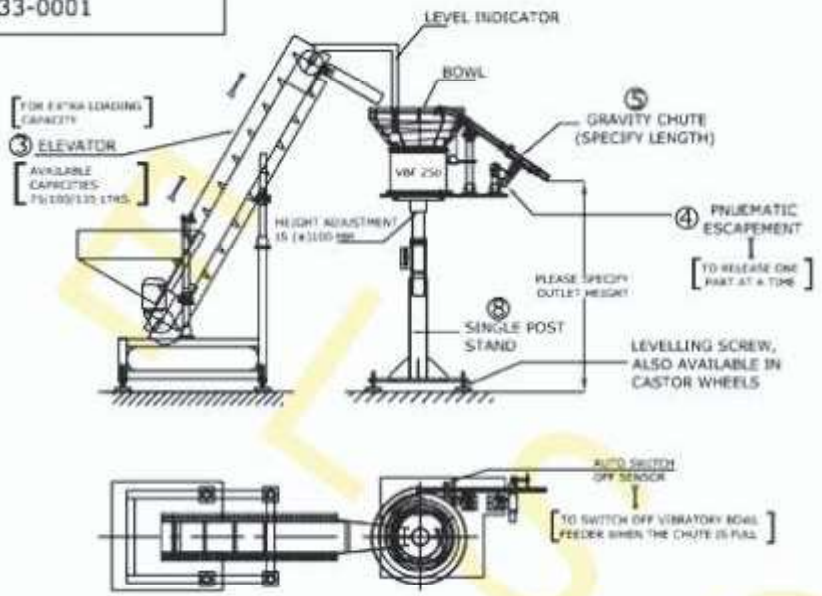
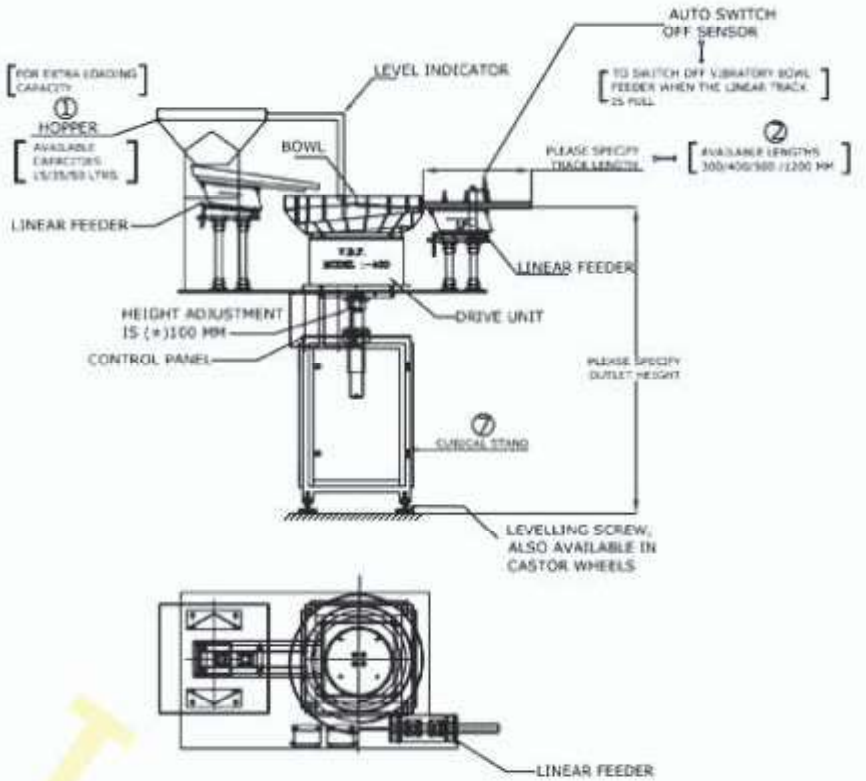
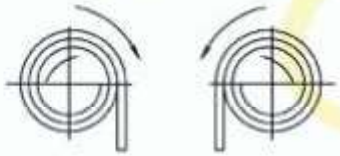




⑥ BOWL HAND/DIRECTION

PLEASE SPECIFY THE HAND/ DIRECTION OF THE BOWL WHILE PLACING ORDER



PLEASE INFORM :-

1. PLEASE GIVE COMPONENT PHOTO/DRAWING/SAMPLES
2. PLEASE SPECIFY THE OUTLET HEIGHT
3. PLEASE SPECIFY THE ORIENTATION (THE MANNER IN WHICH THE COMPONENT HAS TO COME OUT OF THE BOWL)
4. PLEASE SPECIFY FEED RATE/SPEED (IN PARTS,PCS./MIN.)
5. PLEASE INFORM WHICH OF THESE ACCESSORIES YOU WANT FROM NO. 1 TO 8

MICRO-INCH 8 16 32 63 125 250
MICRONS 0.2 0.4 0.8 1.6 3.2 6.3
ROUGHNESS SYMBOLS AND VALUES SEE IS: 3073

SR NO	REVISION	DATE	BY

MATERIAL:- QTY.:-

TREATMENT:- SCALE:-

ASSY. NAME:-

PART NAME:- VIBRATORY BOWL FEEDERS

ELSCINT AUTOMATION
W191, BHOSARI, PUNE-26
PH.NO.27122059

DRN. BY ADITYA 14.11.2011 APPD. BY

DRG. NO:- 47-133-0001 SHEET 1 OF 1

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LONG SHAFT AUTO FEEDING & UNLOADING SYSTEM

FOR CENTRELESS GRINDING MACHINES

Elscint manufactures an Auto Loading and Unloading System for Centreless Grinding Machines for longer length Shafts having length from 150 mm upto 1 metre. These Shafts being of longer length, they cannot be fed from a Vibratory Bowl Feeder. Feeding a variety of Shafts of various lengths and diameters also is not possible through a Vibratory Bowl Feeder. Hence, keeping in view these problems, Elscint Automation has developed the Auto Loading and Unloading System. The Shafts have to be kept on a inclined table, from where a Pneumatic Cylinder singles out and feeds one Shaft at a time to a Belt Conveyor which feeds the Shaft to the Centreless Grinding Machine. After the Grinding Operation is over, there is a Special Elscint Unloading Belt Conveyor by which the Shaft is taken out and turned around with the help of transfer station and fed to another Elscint Belt Conveyor which conveys it back to near the loading Station at an unloading collection station and the Shafts are aligned there ready for inspection / for the second pass through the Centreless Grinding Machine. Special care is taken so that the Shafts do not collide and push each other so that the quality of the Ground Shafts is maintained. This way, only one Operator can do the loading and unloading of two to three Machines and productivity can be increased.

AUTOMATIC
TAPPING MACHINE

Automatic Tapping Machines for sheet metal parts is a standard product developed by Elscint. In this Machine, the components are fed through a Vibratory Bowl Feeder to the Tapping Station. At the Tapping Station, tapping takes place with the help of a specially designed tapping head attachment. The completed component is then unloaded in a bin or ejected, as per requirement. In case of high speed requirements, tapping at two or four places can be done on the same component! Speeds of upto 40 pieces per minute are possible. This machine is available with PLC Control to suit the requirements of customers and their respective budgets. This machine adds tremendous value wherever there is a requirement of tapping on small components. Two, Three or even more Bowl Feeders as well as Tapping Heads can be accommodated on the same table with independent operations, however controlled by a Single PLC. This helps not only in making the Machine Compact but also reduces the cost.

ELSCINT
spring disentangler

Elscint manufactures the Elscint Spring Disentangler for disentangling of various types of Springs. It can feed out the springs through tubes to the points of use. Various types of Springs can be used in the same unit with slight change over tooling. Capacity and separation rate depends on the shape and size of the springs. An output of up to 200 springs per minute can be achieved through each feeder tube! Elscint also offers other accessories like Hand Pick Off, Escapement etc. with this equipment.

ELSCINT

VIBRATORY WELD NUT / BOLT FEEDER

This is a Nut / Bolt feeding accessory for Resistance Spot Welding Machines. This consists of an Elscint Vibratory Bowl Feeder which feeds the Nuts / Bolts. The Nut / Bolts are fed to a Pneumatic Pusher and then to an Escapement, which places the Nut / Bolt on the Work Station for Spot Welding. It is then held at that position through magnetic property. This reduces the manual intervention required for feeding and placing of the Nuts / Bolts.

sorting machine

Elscint manufactures a Sorting & Grading Unit for parts like balls, pins, rollers etc.. It is designed to feed, sort and grade such small parts which require to be graded / sorted according to their thickness / diameter. This Unit operates at a speed in excess of 300 pieces per minute depending on the size of the parts. The system utilizes an Elscint vibratory bowl feeder of suitable model. The bowl feeder feeds the parts to a set of powered gauge rolls. These are powered by an Elscint geared motor of suitable rating. For the sorting of the parts, the inclination of the rolls, plus adjustable roll spacing from one end to the other enables the parts to move / travel easily and rapidly into the desired position, while moving them to the discharge point. Undersized parts are first separated, followed by those within tolerance. Oversize and / or damaged parts continue to the end of the rolls and are discharged into a separate container. An impor tant feature is that the rolls being counter-rotating does not bind or grip the parts and are extremely sensitive to fine tolerances. The basic unit works on a fixed speed but variable speed too is possible.

Accuracies of upto 40 microns are possible with this equipment. an indexing table. In the vibratory bowl feeder, the chains were oriented in lengthwise direction and were further taken forward on a motorized belt conveyor.

ELSCINT
VIBRATORY COUNTING & DISPENSING SYSTEM

Elscint manufactures a vibratory counting and dispensing system for small parts. A major problem faced by a lot of automobile manufacturers is that a particular number of screws / washers etc need to be fixed on an engine / automobile. However, a lot of times, the operators forget to fix the required number of screws on the engine / aut mobile. This results in a big quality problem as there is no way to detect this once the engine is assembled. To resolve this problem, Elscint has developed a vibratory screw counting and dispensing system wherein a set number of screws is always dispensed on pressing of a button or foot valve. The dispensing can also be activated by sensing the hand of the operator as soon as he puts his hand to collect the screws. This ensures the operator gets the required number of screws and is able to fix those. The chances of is forgetting to fix one or two screws is eliminated as he gets the required number of screws in his hand / bin and further dispensing does not take place unless all these screws

are utilized. This system is very useful for all automobile manufacturers as well as those who use similar assembly procedures. Depending upon the size of the screws, a suitable model of Elscint vibratory bowl feeder is used. The equipment comes along with a stand, dispensing chute with bin, electrical and pneumatic controls. There is an additional sensor on the dispensing chute which switches off the vibratory feeder when the chute is full. This ensures that in case the the assembly line is not working due to some reason, the operator does not have to switch off the entire system. Once he presses the foot pedal / button / places his hand for collection, the cycle commences once again automatically. Further, a level control is provided to give signal once the level of screws in the bowl reduces to ensure replenishment on time. Poka yoke too is provided to ensure that even in case where there are less or no screws to dispense, the dispensing does not take place even after pressing the foot pedal / button / hand signal. The number of screws which need to be dispensed in one lot can be changed by the operator, in case the requirement changesin the future. The equipment is available in PLC & Non-PLC versions.

ELSCINT

“Chain Plate” vision & stacking machine

Elscint Automation manufactures an automatic stacking & indexing machine for stacking of Chain plates. Various sizes of plates can be stacked in the same machine with some change-over tooling. Chain Plates are having two holes and forks were provided to engage both the holes while stacking. The plates were having a particular number and brand marking only on one side. Elscint utilized a vision camera to check the marking and ensuring that the plates with marking on the top were stacked in one fork while the ones with the marking at the bottom were stacked in another fork.

The equipment was designed for accommodating Chain Plates having size 45 mm length x 20 mm width to plates having size 26 mm length x 10 mm width. This was done by providing proper changeover tooling. The equipment consisted of a Model 400 vibratory bowl feeder (having capacity of 30 kgs), a motorized belt conveyor on which the vision camera was mounted, sorting mechanism and stacking forks mounted on

an indexing table. In the vibratory bowl feeder, the chains were oriented in lengthwise direction and were further taken forward on a motorized belt conveyor. The vision camera mounted on the same checked whether the marking was on the top or at the bottom. The ones where the marking was on the top, were pushed into a separate track and stacked onto one set of forks while the ones with the marking at the bottom were taken forward and stacked in another set of forks. In case, any of these forks got full, the conveyor would stop and indexing used to take place. After indexing, the next set of forks would come the stacking position and filling of plates in the forks would restart. The complete equi ment was mounted on a single table and controlled by a PLC with the controls provided through a separate MMI. Some plates were having no marking on either side or marking on both the sides. Such plates were pushed into alternate forks. This changeover was done through the MMI, thus requiring minimal operator intervention.

The indexing table accommodated 8 sets of forks, thus ensuring the time between loading and removal of plates by the operator was correctly matched with the other equipment in the factory of the customer.

industries

- **Bearing manufacturers**
  - Taper
  - Roller
  - Ball
  - Needle
  - Cylindrical
  - Spherical
  - Half Bearing
- **Automobile Industry**
- **Auto-ancilliaries**
- **FMCG**
  - Blades / Razors
  - Cap Feeding
- **Pharmaceutical Industry**
- **Switchgear Industry**
- **Chain manufacturing Industry**
- **SPM Manufacturers**
- **Battery Industry**
- **Machine Tools**
- **Furniture manufacturing Industry**
- **Nuclear Industry**
- **Lock Industry**
- **Camphor Manufacturing Industry**
- **Packaging Industry**
- **Electrical Industry**
- **Assembly Machine Manufacturers**
- **Glass industry**
- **Lighting**
- **Fasteners**
- **Engine Valves**
- **Nails Industry**
- **Dripper Feeding**
- **Chain Industry**
- **Condoms Manufacturing**
- **All industries where small parts require to be fed and automated**