Model 2100

Customer: HVL
Machine serial no: 29323
Year: 2011

MACHINE DESCRIPTION
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CHAPTER 1
SAFETY PRECAUTIONS

Contents

Correct use

Basic understanding of the **IIM 2100**

The **IIM 2100** has been built in accordance with:

- The latest developments in technology and the established safety regulations
- The agreement set forth in the contract such as nominal output, product to be filled and packaging paraphernalia as reflected by quality control samples.

The machine should not be operated improperly, as danger can occur to the operator's physical well being as well as damage to the machine and other property.

Improper modes of operation

It is improper to operate the machine

- With unapproved power sources, products and material not recommended by the manufacturer
- With the machine/ plant altered by the operator that create hazardous conditions for the operator's health

Allowable modes of operation

It is permissible to operate the machine only

- If this operating manual has been completely read and understood
- In the way described in this manual

The **IIM 2100** is intended for operation as specified in the contract. Any other or further use of the machine as for example the processing of products not listed in the order confirmation as well as operating with dangerous or hazardous substances are contrary to the regulations.

International Inventory Management LLC (IIM) assumes no liability if the machine is operated contrary to the terms of the contract or safety regulations. The risk is exclusively with the operator. This manual must be followed for installation, startup, and maintenance.

Requirements of personnel

The owner / employer may assign work which entails potential danger only to such persons who are authorized and who are able to carry out such work independently and with safety or, following prior training, are under the supervision of a person who is familiar with this work.
Operation by unskilled personnel is dangerous.

Employment restriction

Minimum age
It is recommended that persons who are at least 18 years old operate this machine independently, provided they are trained and familiar with the operation of this machine.

Qualification

Connections, installation, maintenance and repair work may only be carried out by trained, skilled personnel.

Responsibilities of the operator

It is the operator's duty to verify correct operation of the machine. Danger points occurring between **IIM 2100** machines and customer's installation must be rendered safe by the employer/operator.

Determine all safety devices

Safety devices, interlocks and couplings must be inspected at least once a year by a qualified mechanic for their safe and proper operation.

Mechanical devices venting harmful substances must be determined for their efficiency by a specialist prior to the initial start- up.

All test results should be documented.

Qualified Mechanics and Operators

Only skilled and trained personnel should be assigned responsibility for set-up, operation, maintenance and repair and the responsibility should be clearly defined.

Verify that all safety regulations are followed and that all personnel are made aware of the dangers involved.

Instructional requirements

Prior to operation the machine, personnel should be instructed on the proper operation of the machine, having read and understood the instruction manual, especially the chapter about "safety measures" as well as the valid regulations.

The instruction manual must be kept so that it is easily accessible for operators and maintenance personnel.

The operator's duties may involve the handling of dangerous and toxic substances. It is suggested that the operator be furnished with proper protective gear.

Operation

- While the machine is in operation, do not climb on the machine.
- Guards, located at the top of the machine, must not be reached over.
- Guards located on the sides and bottom of machine must be closed at all times while operating the machine.
- It is dangerous to wear long, unbound hair, loose clothing or jewelry. There is danger of being injured by getting drawn in.
- Encapsulation machines must be firmly secured to the floor at all times.

- Immediately notify responsible management of damage to the machine. Do not continue production before all problems are eliminated.
- Obey all safety precautions. Informational signs on possible hazards must be clearly displayed and legible.
- Wear hearing protection, as necessary.
- Installed safety devices must not be removed and safety switched must not be by passed.

Spare Parts

- All spare parts must comply with the technical requirements demanded by the manufacturer.
- Install larger parts and subassemblies correctly at lifting devices. Only employ technically perfect lifting devices.
- Use safety steps while working in elevated positions.
- Do not employ machine parts for climbing.
- When working in high positions, secure yourself with restraining safety harnesses.
- All handles steps, railings, landings, platforms, and ladders should be kept clean.

Change of location

- Should the machine be moved even slightly, shut off the electric mains.
- Secure all movable parts that could be of danger.
- Transport or move the machine with proper capacity lifting vehicles or lifts.
- Reconnect and start the machine after change of location.

Guarantee and responsibility

Responsibility and guarantee are as specified in the Terms and Conditions of the Manufacturer's Quotation as made a part of each Purchase Order issued.

Electrical/electronic installations

Work on electrical parts and subassemblies must only be carried out by a skilled or licensed electrician.

Do not work on the machine without turning the power off. Determine absence of voltage with a voltmeter.

Electrical problems must be corrected immediately. If imminent danger exists, the installation, subassembly or operating means may not be employed in a defective condition.

Cleaning

Cleaning work may not be performed on moving parts of the machine while it is operation.

> After cleaning, perform a leak test and determine that all fuel, motor oil , hydraulic oil lines and tubing for loose connections, abrasion and damage. Any defects must be eliminated immediately.

First Aid

- If the eyes come into contact with solvents, rinse with water immediately. It is recommended to install an eye shower. Consulting a doctor is absolutely necessary.
- Clean your skin and clothes immediately with water after contact with solvents.
- Change soiled clothes immediately.

Cleaning agents

Do not employ a high- pressure water jet to wash the machine.

- In case of normal soiling, use non- inflammable commercial cleaning agents.
- Heed the instructions and indications on the containers and packaging of the solvents.
- In case of heavy soiling, use non-flammable solvents.
- If solvent vapors can get into the surroundings, it is necessary to wear a respirator.
- Verify sufficient ventilation of the workroom during cleaning process.
- Never clean large parts such as cover guards with floor solvents.
- Protect yourself from damage of health by wearing safety wear and by using protective skin cream.

Proper safety equipment

- Respirators
- Hearing protection
- Safety gloves
- Safety glasses
- Safety shoes
- Safety apron

General instructions

- Work on the electrical installation may only be carried out by a qualified electrician.
- Read and understand built-in safety valves. Do not render them ineffective.
- Report leaking pressure lines, pressure hoses, or union joins immediately.
- Do not loosen or tighten any union joints when the machine is switched on.
- When working with oil and grease employ skin protection and skin care agents.

Hydraulic Systems (for Water Vacuum Pumps - if applicable)

Health hazards

Avoid skin contact and inhalation of spray when handling pressure liquids. If this cannot be avoided, employ suitable personal protective equipment.

Penetration of the skin by pressure liquids is particularly dangerous if these eject under high pressure due to leakage from hydraulic systems. Immediate medical attention is necessary in the case of such injuries that initially appear to be only slight.

Suitable personal protective equipment includes protective gloves and protective glasses that are resistant to the pressure liquid. Furthermore,skin protection and skin care agents must be made available and employed if skin contact is involved.

Replacement of pressure liquids

If the serviceability of the pressure liquid is no longer proved, suitable measures for the purpose of recreating the serviceability have to be undertaken or the pressure liquid has to be replaced.
In this case the pressure liquid which is no longer serviceable has to be removed as completely as possible from the hydraulic system must be replaced or cleaned.

Storage and filling

Store and fill pressure liquids in accordance with the manufacturer's specifications and in compliance with the pertinent legal regulations.
Pressure liquids are as a rule substances that present a hazard to water.

CHAPTER 2
TRANSPORTATION, INSTALLATION AND CONNECTION

Contents

Description of Order

Compare the entire description of order with the purchase order and the shipping note.

A. Determine if shipment is complete using the attached packing slip. Otherwise we refer to our general conditions for the supply of machine.
B. Report damage. The forwarding agents, the insurance company and the machine supplier are to be informed immediately after delivery of the machine with all accessories in case of damage caused by insufficient packing or during transport.

Storage and conservation

Please heed the following in order to maintain the operability of a machine that is not employed for a longer period:

1. The machine must not be exposed to extreme heat or cold, or excessive humidity
2. Position the machine on a level ground in order to avoid torsion
3. The storage ground must be dry and clean
4. Clean entire machine. All plain- finish machine elements must be lightly coated with acid-free machine oil
5. Cover entire machine to protect from dust and debris.

Supply

Normal transportation

1. The machine is transported on a wooden skid.
2. Each machine is fastened with screws on a wooden pallet and covered by a plastic film.

Sea transportation

With sea transportation the wooden pallets are additionally equipped with wood protection walls.

Air transportation

With air transportation the wooden pallets are equipped with plywood protection boxes.

Installation of the IIM 2100 Capsule Filler

Normally, the machine is installed by personnel of IIM.

Foundation

- The location of installation should be free of vibration and the foundation for the machine should be sufficiently safe for floor load. As a rule no special foundation is required. Leveled floor will be adequate.
- We recommend noise-abating or vibration-absorbing materials such as pressed cork, rubber, metal, or rubber pads. See project plan for the dimensions and the weight of the machine.
- Alignment of the machine is effected by leveling shoes, wedges or fitted supports (such as lead plates) according to the type of machine.
- Place insulating boards under the machine.
- Remove transport ropes.
- Unpack machine and determine whether it is complete and without damage due to transportation.
- Exactly align all units and all up-line and down-line installations regarding height, angle and position.
- Constantly adjust the spindle feet in order to avoid tension.
- Floor attachment is only necessary with conveyor belts.

Cleaning

Do not employ any hazardous substances for cleaning the machine - refer to chapter 1.

Cleaning the machine (see maintenance plan chapter 7).
Clean entire machine from dirt and anticorrosives, if necessary.
Avoid complete degreasing. If necessary, all plain- finish and movable machine parts may be lightly coated with acid- free machine oil.

With an available dust exhaust unit, the vacuum system must be equipped with a properly functioning air-flow system.

Connection of machine

The machine is connected by personnel of IIM according to the installation plan.

Information regarding the electric connection

See the electrical wiring diagrams for the connection data (the electrical wiring diagrams are included in the machine shipment or supplied separately) .

- Verify that the available main voltage is in accordance with the voltage specified on the type plate.

- The power supply cable must be connected to the terminals LI-L2- L3 N and PE- including the ground wire of the connection box according to the code standards and the local legal specifications.
- The grounding or the ground voltage connection must be performed in accordance with the specifications of the local power supply company.
- Determine the direction of rotation (pole- correct connection). On a short switching – on impulse verify that direction of rotation is in the direction of the arrow.

Information on liability

Storage
As long as the unit supplied remains packed, we do not assume any warranty for corrosive damage which occurs by improper storage, such as moisture, except for seaworthy packaging.

Claims
We would like to point out that improper transportation does not justify replacement or warranty claim. All transportation is arranged by the purchaser, and therefore any problems arising from the improper transportation should be addressed to the purchaser's carrier. In case of doubt please contact your transportation supplier before transportation.

If a service engineer is present, he can be asked for advice concerning matters of transportation. However, he does not assume any responsibility for transportation and possibly arising damage.

Illustration and drawings
These serve for general explanation and the details are not always accordance with the design. The indicated dimensions are also without obligation.

Rights

CHAPTER 3
DESCRIPTION OF MACHINE

Contents

(continued)

Fields of Application of the IIM 2100

Depending on the version employed, the IIM 2100 is engineered for the filling of powder, tablets or coated tablets into hard gelatin capsules. No other manufacturing process is recommended.

The IIM 2100 dapsule filling process consists of seven operations as further described in this manual:

- Capsule Feeding/ Sorting - Station 1 and 2
- Capsule Separation - Station 3
- Dosing - Station 4, 5, and 6
- Faulty capsule ejection – Station 7
- Closing - Station 8, 9, and 10
- Ejection - Station 11
- Cleaning- Station 12

The machine is designed for a maximum output of 2000 capsules per minute, 120,000 capsules per hour. Adjustment of machinery to increase production is not recommended.

Flammable or explosive products may not be filled in the IIM 2100 machine! Use as per machine warranty implicit or otherwise is void when not used in accordance with manufacturer's guidelines. Parts for the IIM 2100 are provided by the manufacturer. Use of others parts by buyer and / or its operators constitute a void of warranty.

Sequence of operation

Station 1 and Station 2- Feed of capsules

Empty capsules are placed in a Capsule Hopper (Station 1).
Two Capsule Magazines feed the capsules from the Capsule Hopper downwards, whereby they are directed by Orientation Fingers and dropped into the format bores of the Upper Segment sections.

Station 3- Separation of capsules

Capsules are separated with vacuum support. The capsule caps remain in the Upper Segment section, while the capsule bodies are dropped into the Lower Segments.
While the Upper Segments move inward, the Lower Segments , with the capsule bodies are exposed to allow the capsules to be filled with product.

Station 4- Dosing station for Pellets, Tablets or coated Tablets (Before Powder)
Incorporation of this station is optional and subject to the machine version.

Station 5- Powder filling station

Powder is fed into the powder hopper, where a powder auger feeds the product into the dosing disc. With high dosing accuracy, 16 powder slugs are formed in five tamping stations housing twelve adjustable tamping pins each. In the powder transfer station powder slugs are ejected into the capsule bodies. A capacitive proximity switch controls the feed auger, ensuring a consistent product level in the fill hopper.

Station 6- Dosing station for pellets (After Powder)

Incorporation of this station is optional and subject to the machine version.

Station 7- Faulty capsule reject station

This device serves to reject non-separated capsules. Plungers push faulty capsules upwards where they are ejected by compressed air into the receptacle.

Station 8- capsule closing

The upper segment section is positioned directly over the lower segment section, ensuring exact vertical alignment of capsule cap and body. The upper segment section is then lowered onto the lower segment section.

Station 9 and 10- Capsule closing station

In this station, the capsule cap and body are joined and closed with the help of closing pins.

Station 11- Capsule Ejection Station

Pins push the filled and closed capsules out of the bores of the segments. The capsules are ejected with compressed air and discharged from the machine through an out feed chute.

Station 12- Cleaning station

The empty segments are cleaned thoroughly by compressed air and, if equipped, a brushing mechanism.

DETERMINING CORRECT DOSING DISC SIZE

Setup machine for capsule size required—use a dosing disc of any thickness for this capsule size.
Set tamping pins for normal tamping for this size disc.
Example: 20 mm. disc.
Subtract 20 from 25 (the maximum disc thickness for machine = 25)
Set station 5, the station before slug transfer, to 5. This should be the top surface of the dosing disc.
Working counterclockwise, add 2 to each station: Station 5 = 5, Station 4 = 7, Station 3 = 9, Station 2 = 11, Station 1= 13.
Run product on the machine long enough to establish a weight pattern.
Calculate the required disc size by the following formula:
Weight established / disc thickness used = mg/mm (Weight of powder for 1 mm. disc)

Weight required/ (mg/mm) = mm. (disc thickness required)

FILL VOLUME AND DOSING DISC HEIGHT

Fill volume in mm per capsule size

Height of dosing disk	0	1	2	3	4
21.8	680				
21.5	670				
21	654				
20.5	639				
20	623	500			
19.5	607	488			
19	592	476			
18.5	576	463			
18	561	451			
17.5	545	438	370		
17	529	426	360		
16.5	514	143	350	300	
16	498	401	339	290	
15.5	483	388	329	280	
15	467	376	318	271	
14.5	452	363	307	262	210
14	436	351	297	253	203
13.5	420	338	286	244	196
13	405	326	276	235	188
12.5	389	313	265	226	181
12	374	300	254	215	174
11.5	358	288	244	208	167
11	342	275	233	199	159
10.5	327	263	222	190	152
10	311	250	212	180	145
9.5	296	238	201	171	137
9	280	225	191	162	130
8.5	264	213	180	153	123
8	249	200	169	144	116

CHAPTER 4
IIM 2100 CONTROL PANEL

The IIM 2100 Control Panel is broken down into six sections as follows:

Section 1- Main Startup
Refer to page 12 - Sequence of Operation.

Start	Enables operator to run or jog the machine
Stop	Enables operator to stop machine
Reset	Allows an operator to reset / acknowledge an alarm or fault
Normal Run	Illuminates when machine is in run mode, the Run Mode allows the machine to run automatically
Inching	Illuminates when machine is in the jog mode. In the manual mode the operator can only jog the machine
Vacuum On/Off	Must be "On" for machine to run in "Normal Run" mode
Vacuum Alarm	Illuminates when attempting to run in "Normal Run" mode but Vacuum Pump not on
Feeder Jog	Push Button **-** allows the operator to manually feed powder to the Dosing Disc.
Feed Control	Push Switch - When in the Enable mode, the feed of powder to the Dosing Disc will be automatic as preset.
Auger Feeding	Illuminates when Auger is physically feeding powder
Level Sensor Alarm	Illuminates and stops machine when machine has not been able to satisfy the level sensor in a preset (adjustable) allotted time.
Doors Open	Illuminates and stops machine when machine has either an upper or lower guard door open.
Cleaning Segment	Illuminates when the compressed air solenoid opens to deliver compressed air to the Cleaning Station.
Control Voltage	When illuminated, indicates that machine is under power, and control voltage being supplied
Brake Open	When in Open mode, brake is released to the motor, allowing the operator to turn the machine by hand.
Emergency Stop	When depressed, machine will stop immediately

Section 2- Compressed Air

1. **Ejection Station Air**: Regulated amount of air pressure to Ejection Station
2. **Faulty Station Air** : Regulates amount of air flowing to Faulty Capsule Station

Prior to initial startup

Capsule Storage

Store the capsules to be processed at a room temperature of 21 C and a relative humidity of 50%.

For your safety: You are responsible! Please heed the "safety measures"!

Requirements of personnel

Who is allowed to operate the machine?

- Persons who are authorized to carry out such work because of their training and qualification
- Persons who are assigned to carry out such work by the operator of the machine

Do not carry out work without regard to the safety instructions!
Ensure that the machine is only operated when it is in safe and in operating condition.

Do not start machine before all guard- and safety devices (e.g., guard devices) that can be taken off, EMERGENCY STOP devices, sound insulation devices, exhaust are installed and in operating condition!

Before starting the machine verify that no person is endangered by the startup, insuring no physical closeness with machine's moving parts.

Machine Setting Operations

Jogging Mode

- Turn selector switch to "Inching".
- Press Start repeatedly until you reach your desired positions.

Adjust powder height level

- Push "Feeder Jog" until Dosing Bowl is filled
- Press "Feed Control" to enable automatic feeding of the bowl

Mechanical adjustment of Tamping Pins

- With Tamping Head at its lowest point set the Tamping Pins in Stations 5 to be flush with the top of the dosing disc.
- Set the Tamping pins in Station 4 2mm lower than Station 5
- Set the Tamping Pins in Station 3 2mm lower than station 4
- Set the Tamping Pins in Station 2 2mm lower than station 3
- Set the Tamping Pins in Station 1 2mm lower than station 2
- Fasten lock nut in each station.
- Run the machine through several revolutions (at least 12) and determine the capsule weight
- If the capsule weight is not correct, carry out the above steps adjusting station 2 – 4. Adding compression adds to the weight; reducing compression reduces weight.
- Run the machine while effecting the following adjustments:
    - Air blast volume at the faulty capsule reject station (via restrictor valve - 1). Air blast volume at the capsule ejection station (via restrictor valve-2).
- Run the machine through a number of revolutions
    - Determine capsule weights. Effect weight readjustment if necessary. See paragraph "Operation".

Startup

Requirements

- Turn Main Switch on front panel to the " On" position.
- Adjust Compressed Air (if necessary).
- Open "Capsule Magazine Cams" to engage Capsules.
- All required work steps of the section " Jogging Mode" have been carried out.

- Set Key Switch to " Run"
- Set speed (Manual on gearbox).
- Close all Guard Doors. Guard Doors must be closed during Production!!!
- Insure Brake Open and Run button is in " Normal Run" position.
- Always fill segments with capsules before introducing powder to machine.
- If the machine is processing Powder (Station 5):
  - Fill powder into the Powder Hopper
- If the Machine is processing Powder (Station 5) and Pellets after Powder (Station 6):
  - Fill powder into the Powder Hopper
    - Fill pellets into the Pellet Hopper
- If the machine is processing pellets or tablets prior to powder (Station 4) and powder (Station 5) and pellets after powder (Station 6):
  - Fill pellets/ tablets into Pellet/Tablets Hopper(Station 4)
  - Fill powder into Powder Hopper (Station 5)
  - Fill pellets into Pellet Hopper (Station 6)

Production operation

Safety information : Guard doors may not be opened while the machine is running

Work required during production

Adjust speed of main drive manually on gearbox

Determine weight of filled capsules. Adjust Tamping Pins to attain proper weight control (See Section "Mechanical Adjustment of Tamping Pins")

Machine shutdown

Depress the " stop" button
The machine comes to a stop in neutral position

Emergency shutdown of the machine

Set the main switch on " O=OFF" on Front Panel or depress Emergency Stop
Switch on side of Front Panel or rear of machine
The machine comes to an immediate stop
Open any guard door – the machine comes to an immediate stop.

CHAPTER 5
TROUBLESHOOTING

Contents

For Your Safety

You are responsible!
Please heed the " Safety measures"!

Requirement of personnel

Who is allowed to operate the machine?

- Persons who are authorized to carry out such work because of their training and qualifications
- Persons who are assigned to carry out such work by the operator of the machine
- Only qualified electricians, or personnel working under the direct supervision of a qualified electrician may perform work on electrical installations.

Preparations for Cancellation Faults

- Shut down the machine according to this Instruction Manual and secure against accidental switching on
- "Lock, Tag and Try"- Turn main control switch to the " off" position; Attach a Lock and Danger tag to the Control Cabinet; Return to Capsule Filler and try to energize
- Secure the working area with sufficient safe space
- Perform any and all necessary services to the Machine

Measures to be taken before switching on the machine again

- Remove Lock and Tag from Electrical Panel
- Determine safety devices are in place
- Turn the machine manually to insure proper performance

Probable Causes and Resolutions

Problem	Station	Possible Cause	Resolution
Machine does not start		Guards not closed	Close Guards – Inspect Safety Switches if problem persists
		Selector switch set on "Inching" Mode	Set Selector switch to "Run" Mode
		"Brake open" is illuminated	Depress "Brake Open"
Machine Shuts Down During "Run" Mode		Powder Level Low	Add Product to Powder Hopper
Capsules Not Separating	Station 3	Low or missing Vacuum	Adjust Vacuum pressure
		Bad Vacuum Hose connections	Check Vacuum Hoses for leaks
		Dirty Vacuum Filter	Clean Filter
		Dirty Segment Bores	Clean Segment Bores
Capsules Not Separating		Segments out of Alignment	Align Segments with Segment Alignment Pins
		Faulty Capsules	Check Capsule Lot for Brittle, Swollen or Closed Capsules and Replace if necessary
Good Capsules are ejecting in Faulty capsule area	Faulty Capsule Station	High Jet Air Velocity	Reduce Air Flow Volume
Faulty Capsules are not Ejecting	Faulty Capsule Station	Ejection Pins not ejecting Faulty Capsules out of Segment	Reset Pins and / or adjust Ejection Pin Drive Shaft
Faulty Capsules are not Ejecting	Faulty Capsule Station	Air flow set too low	Increase air flow volume
Missing Capsules in Segments Sorting Station		Magazine is adjusted too high or low causing misfeeds	Adjust Upper Segments. Magazine should be set approximately 4mm above block at lowest position
		Bent, missing or worn Magazine Springs	Replace Springs
		Damaged or half capsules entering Magazine	Remove from Segments
Low Product supply in Dosing Bowl	Dosing Station	Faulty Product Sensor	Replace Sensor or adjust height

Problem	Station	Possible Cause	Resolution
Variation in Capsule Weights	Dosing Station	Incorrect distance between Dosing Disc and tamping ring causing excess powder volume	Adjust distance between Dosing Disc and tamping ring
		Worn or nonuniform Tamping Compression Springs	Replace Springs
		Powder level too low in dosing bowl	Add powder to dosing bowl
Capsule Splits		Segments not aligned	Realign Segments
		Segment Bore too large	Replace Segment
		Excessive play in Segment Carrier	Replace Segment Carrier
Capsule Dimples		Closing pins too high	Lower Closing Pins
		Capsules overfilling	Raise Tamping Pins
		Vacuum pressure too high causing separation pins to dent capsules	Lower vacuum pressure. Readjust separation pins if necessary
		Damaged Closing Pins	Replace Closing Pins

CHAPTER 6
SIZE CHANGE, PRODUCT CHANGE

Content

For Your Safety

You are responsible!
Please heed the " Safety measures"!

Requirement of personnel

Who is allowed to operate the machine?

- Persons who are authorized to carry out such work because of their training and qualifications

Persons who are assigned to carry out such work by the operator of the machine

Preparations for size/ product change

- Supply sufficient area for safe working
- Inform operators and designate supervisor in charge
- Designate responsible operator at a place where the machine can be shut down immediately

Measures to be taken before switching the machine on again a size- or product change

- Inspect all safety devices
- Perform a test run using the handwheel to determine the correct operation of the machine

Size Change

Information on the following items is required prior to size change (Refer to Section 3 of this manual)

- Capsule fill weight/ volume
- Capsule size and Dosing Disc height

Important Information

- When mounting or dismounting the size parts, cycle machine manually or in jogging mode through one station
- Cautiously count and dismount the parts to prevent damage – do not apply force!
- Use soft cloth and proper cleaning agents to clean all dismounted parts.
- Dry cleaned parts with compressed air.
- Install new size – matched size parts only- after cleaning of all components is completed.
- After each installation of a size part or a size part set, hand- cycle machine through one or two complete cycles in order to verify correct function.

Machine in jogging mode

Warning : Safety functions are rendered non optional in the jogging mode.

Please verify that no personnel other than the operator is within the range of the machine while it is cycled annually or operated in jogging mode. Only the operator with knowledge and skill necessary can perform this operation. Manufacturer is not liable for physical harm occurred to any/ all trained personnel involved in this stage of the operation.

Dismounting of Change Parts

Prior to dismounting your existing Change Parts:

Empty the Powder Hopper

(Remove pellets or tablets from respective hoppers, if applicable)

Empty capsules from the capsule hopper

Remove the Faulty Capsule Hopper and Suction Hose

Dismount Magazine Housing Guards

- Station 1 and 2; Remove the 5 outer cover guards by removing the screws

Dismount Powder Hopper and Powder Auger- Station 5

- Use crank to raise powder hopper; swivel powder hopper outwards
- Release bayonet lock at the powder auger
- Loosen the 3 T- screws; remove and clean the powder hopper along with the auger
- Release all tamping pins
- Remove the 7 stainless Y-handles on top of the tamping head; then remove the 5 individual tamping blocks and one transfer block
- Remove all tamping pins
- Remove guide ring, level sensor plate.
- Remove 6 bolts on dosing disc, and remove dosing disc and dosing bowl together
- Remove tamping ring which is located beneath the Dosing Disc
- Clean all parts thoroughly

Remove Pin Holder

- Carefully remove the pin holders

Remove Closing Station

- Loosen 1 screw
- Pivot off flap
- Pull off Upper closing head

Remove Segment sections

- Remove 2 screws each on each upper segment block (Set the screws aside for cleaning segments)
- Remove each upper segment and lower segment block by cycling the Machine in the Jog mode

Remove Capsule Magazines

- Loosen 4 Screws
- Remove 2 Capsule Bins
- Remove Magazine Screws
- Remove 2 Capsule Magazines

Removing Sorting Blocks

- Loosen 2 Screws on each Sorting Blocks

- Remove Sorting Blocks

Removing horizontal Orientation Fingers

- Unscrew 2 screws
- Remove horizontal Orientation Fingers

All Dismounted Change Parts and groups should be thoroughly cleaned and immediately dried, or cleaned with a cloth and proper cleaning solution and immediately dried with clean compressed air.

Installation of new Change Parts

Install new Change Parts in the reverse order of Dismounting Change Parts as Follows:

- 2 Horizontal Orientation Fingers
- 2 Sorting Blocks
- 2 Capsule Magazines- Note: Rollers for Actuation of the opening flaps must point outwards. Do not change positions of rollers.
- 12 Lower Segments
- Space Flap
- 12 Upper Segments- Aligning with Lower Segments and centering with Alignment Pins
- Mount Closing Station
- Fit Format Ring
  1. Use crank to raise tamping head to its highest position
  2. Install Tamping Ring
     To adjust the clearance between the dosing disc and tamping ring, use the single spindle located at the base of the dosing station. This simultaneously adjusts all five support legs of the tamping ring. The desired clearance should be a consistent 0.1mm (0.004") all around, although this is product specific.

Place selected Dosing Disc and align with Guide Ring installed
Use 4 Dosing Disc Alignment Pins to align Dosing Disc in relation to the Guide Ring and secure with 6 Screws.

- Screw in 6 screws evenly to prevent skewing of the dosing disc.

Mount Level Sensor Plate and Wiper Block

- Set the plate and fasten with 2 screws
- Adjust height of the Wiper Block with the Screw – 0.10mm (0.004") over the Dosing Disc

Mount Tamping Pin Guide Ring

- Set the Tamping Pin Guide Ring
  Make sure the position of the Tamping Pin Guide Ring matched the one prior to disassembly
- Fasten with 2 screws

Mount Tamping Pins

- Install the Tamping Pins into the 5 tamping blocks and 1 transfer block prior to installing on the machine.
- Install the 5 tamping blocks and 1 transfer block on top of the guide ring and secure with the 7 stainless steel Y-handles.
- Set all their base tamping positions to 25mm on the scale.
- Bring the tamping head to its lowermost position and set tamping station 5 to be flush with the top of the dosing disc.
- Set Station 4 to 2mm below that setting (i.e. 2mm of penetration into the dosing disc)
- Set Station 3 to 2mm below that setting (i.e. 4mm of penetration into the dosing disc)
- Set Station 2 to 2mm below that setting (i.e. 6mm of penetration into the dosing disc)
- Set Station 1 to 2mm below that setting (i.e. 8mm of penetration into the dosing disc)

- Lock the adjustment with the cross screw to prevent any unwanted movement of the tamping heads.

(continued)

Mount Powder Hopper
Follow reverse steps as in Dismounting Section.

Adjust Separation Station to Capsule Size

- Manually cycle machine until the Separation Pins are in topmost position
- Place a capsule body in the bore of the Lower Segment Block of row 2
- Position the Separation Pins to just contact the Capsule body.
- If necessary, adjust the height of the Separation Pins setting by loosening the screw and repositioning the screw with the socket joint on the Separation Lever Arm (under the table). The Separation Pins should just meet the Capsule body, but not lift it. Tighten the screw on the Separation Lever Arm.

Fasten Magazine Side Covers

Fasten Suction Hose

Attach Faulty Capsule Receptacle

CHAPTER 7
MAINTENANCE

Contents

For Your Safety

You are responsible!
Please heed the " Safety measures"!

Requirement of personnel

Who is allowed to operate the machine?

- Persons who are authorized to carry out such work because of their training and qualifications
- Persons who are assigned to carry out such work by the operator of the machine

Only qualified electricians, or personnel working under the direct supervision of a qualified electrician may perform work on electrical installations.

Preparations for Maintenance Work

- Shut down the machine according to this Instruction Manual and secure against accidental switching on
- "Lock, Tag and Try"- Turn main control switch to the " off" position; Attach a Lock and Danger tag to the Control Cabinet; Return to Capsule Filler and try to energize
- Secure the working area with sufficient safe space
- Perform any and all necessary services to the Machine

Measures to be taken before switching on the machine again

- Remove Lock and Tag from Electrical Panel
- Determine safety devices are in place
- Turn the machine manually to insure proper performance

Information of Maintenance Work

Regular Maintenance and Machine Cleaning are integral for the proper performance of your Encapsulation Machine, as well as providing for a safe work place. Your machine should be vacuumed free of dust and dirt daily, as well as all sight glasses and safety enclosures cleaned daily. Thorough Cleaning of the machine should be performed after extended uptime, approximately 100 working hours, or prior to change of product.

Additionally, the effectiveness of the machine also depends on the product being run. When running powders with a high dust volume or a sticky product, the machine must be cleaned more frequently.

- Do not use any corrosive cleaning agents
- Switch the machine on/ off as described in this manual
- Observe all adjustments, maintenance, and inspection work and dates including changeover of parts
- Maintain appropriate working tools
- Thoroughly clean machine before performing general maintenance/ repair work
- Clean parts inside of machine with a brush and vacuum cleaner – do not use compressed air

Automatic lubrication system

This system delivers constant lubrication over a set period of months (from 1 month up to 12 months) to specific points in the drive of the machine.
Prior to installing new lubrication canisters, the lines must be primed, or pre-filled with lubricant using an appropriate device.
Each 125mL lubrication canister (**IIM p/n 28922**) is activated first by snipping off the small protrusion on the yellow cap, which exposes a tiny orifice through which the oil flows. Then screw the lubricator fully into the manifold plate, and adjust the dispensing dial using a 3mm hex wrench, which can be altered at any time.
Below is a chart to accompany the manifold in this machine, detailing distribution and time period of lubrication.

Position	Function	Time to empty (months)	Date activated	Due for replacement
1	Peanut Cam, Dosing	12		
2	Brush, Ratchet Cam, Dosing	12		
3	Bevel Gears, Double Yoke	12		
4	End Bearing, Double Yoke	12		
5	Double Yoke – Center Bearing	12		
6	Large bearing, Main Shaft, Double Yoke	12		
7	Cam Follower, Tamping Cam	12		
8	Cam Follower, Tamping Cam	12		
9	Cam Follower, Upper Closing Cam	12		
10	Large Bearing, Main Shaft, Single Yoke	12		
11	Brush, Segment Geneva	12		
12	Peanut Cam, Segment	12		
13	Bevel Gears, Single Yoke	12		
14	Single yoke – Center Bearing	12		
15	Cam Follower, Sorting Cam	12		
16	Cam Follower, Faulty Capsule Cam	12		
17	Cam Follower, Separation Cam	12		
18	Cam Follower, Lower Closing Cam	12		
19	Cam follower, Ejection Cam	12		
20	Brush, Separation Cam	12		
21	Ejection Guide	12		
22	Dosing Shaft	12		

Diagram of manifold indicating lubricator positions (seen from inside machine)

4	3	2	1
8	7	6	5
12	11	10	9
16	15	14	13
20	19	18	17
24	23	22	21

Vacuum/air handling filters

Regularly clean or replace filters (**IIM p/n 5116**) on vacuum system and air handling systems.

Dismounting Machine Parts

Prior to dismounting your existing change parts:
Empty the powder hopper
Empty capsules from the capsule hopper

(Remove all pellets or tablets from the respective hoppers, if applicable)

Remove the Faulty Capsule Hopper and Suction Hose
Remove sheets- Station 1 and 2; Remove the 3 outer cover sheets by the releasing the wing screws

Remove Powder Hopper and Powder Auger

- Use crank to raise powder hopper; swivel powder hopper outwards
- Release bayonet lock at the powder auger
- Loosen the 3 T-screws; remove and clean the powder hopper along with the auger

Remove Tamping Pins

- Remove cross screw at adjustment knob
- Raise tamping head with the crank to its uppermost position
- Set all tamping positions at 25mm on the scale
- Remove the 7 stainless Y-handles on top of the guide ring and remove the 5 tamping blocks and 1 transfer block
- Remove tamping pins from each block

Remove Dosing Disc

- Remove the 2 bolts from the large diameter guide shafts
- Carefully lift out the Guide Ring - verify identical position of Guide Ring when refitting!
- Unscrew 2 screws
- Lift off plate
- Unscrew 6 screws
- Carefully dismount dosing disc with ring
- Lift out tamping ring which is located beneath the Dosing Disc
- Clean both parts thoroughly

Remove Closing Station

- Loosen 1 Screw
- Pivot off flap
- Pull off steady- plate
- Remove Upper Closing Head

Remove Upper and Lower Segments

- Remove 2 Segments each on each Upper Segment
  (Set Screws aside if cleaning segments)
- Remove each Upper Segment Block by cycling the Machine in the Jog Mode
- Remove 2 Screws each on each Lower Segment Block
- Remove each Lower Segment Block by cycling the machine in the Jog Mode
- Lift off the quick- release closure

Remove Capsule Magazine

- Loosen 4 screws
- Remove Capsule Bins
- Remove Magazine Screws
- Remove Capsule Magazines

Remove Sorting Blocks

- Loosen 2 Screws on each Sorting Block
- Remove Sorting Blocks

Remove Horizontal Orientation Fingers

- Unscrew Screws
- Remove Horizontal Orientation Fingers

Remove Separation Pin Plate

- Loosen Screw and remove both Separation Pin Plates

Remove Faulty Capsule Air Manifold

- Loosen Screw
- Turn Flap
- Remove Faulty Capsule Air Manifold

Remove Top Cam

- Remove 2 Screws
- Remove Top Cam
- Ensure exact position when refitting Top Cam

Remove Station Holder Assemblies

- Remove the 12 Segment Carriers

All Dismounted Components should be thoroughly cleaned with water and immediately dried, or cleaned with a cloth and a proper cleaning solution and immediately dried with clean compressed air.

Mounting of Machine Parts

Install Machine Parts in the reverse order of Removal (Refer to Chapter 5).