LKCF

LKCF-200/400 SERIES

AUTOMATIC HARD CAPSULE FILLING MACHINE

USER MANUAL

Please read this manual carefully before installation, operation and maintenance.
Keep this manual for future reference.

TABLE OF CONTENTS

1. **Overview** 1
2. **Technical Specifications** 1
3. **Installation and Power Connection** 2
4. **Working Principle** 3
5. **Operation Instructions** 5
   - 5.1 Mold Replacement 5
     - 5.1.1 Upper and Lower Module Replacement 5
     - 5.1.2 Replacement of Capsule Feeding Components 6
     - 5.1.3 Replacement of Dosing Disk and Filling Rod 8
     - 5.1.4 Adjustment After Mold Replacement 12
   - 5.2 Machine Adjustment 12
     - 5.2.1 Adjustment of Capsule Hopper Outlet 12
     - 5.2.2 Adjustment of Capsule Closing Device 13
     - 5.2.3 Adjustment of Vacuum Separator 14
     - 5.2.4 Alignment Adjustment of Upper and Lower Modules 15
     - 5.2.5 Adjustment of Clearance Between Dosing Disc and Sealing Ring 15
     - 5.2.6 Adjustment of Powder Scraper Clearance 17
     - 5.2.7 Adjustment of Filling Rod Height 18
     - 5.2.8 Adjustment of Powder Height Sensor 20
     - 5.2.9 Adjustment of Reject Capsule Ejection 21
     - 5.2.10 Adjustment of Capsule Locking 23
     - 5.2.11 Adjustment of Finished Capsule Discharge Device 25
     - 5.2.12 Adjustment of Torque Overload Protector 27
     - 5.2.13 Adjustment of Drive Chains 28
     - 5.2.14 Adjustment of Vacuum Degree 29
6. **Start-up and Operation** 30
   - 6.1 Basic Operation 31
   - 6.2 Basic Operation of Automatic Screen 32
   - 6.3 Basic Operation of Parameter Settings 33
   - 6.4 Basic Operation of Technical Settings 33
7. **Maintenance and Cleaning** 34
8. **Troubleshooting** 35
9. **Electrical Schematic** 36
10. **Packing List and Supplied Tools** 38

1. OVERVIEW

- The LKCF-200/400 Series Automatic Capsule Filling Machine is designed to fill powder, granules, or small pellets into hard capsules.
- It adopts a pin-type filling system with intermittent operation and frequency-converter speed control.
- It can automatically complete capsule feeding, separation, filling, reject removal, locking, and finished product discharge.
- It complies with GMP-oriented production requirements and is suitable for pharmaceutical research institutes, hospitals, and small pharmaceutical factories. With corresponding molds, it can fill hard capsule sizes 00#, 0#, 1#, 2#, 3#, 4#, 5#, and safety capsules A, B, C, D, E.

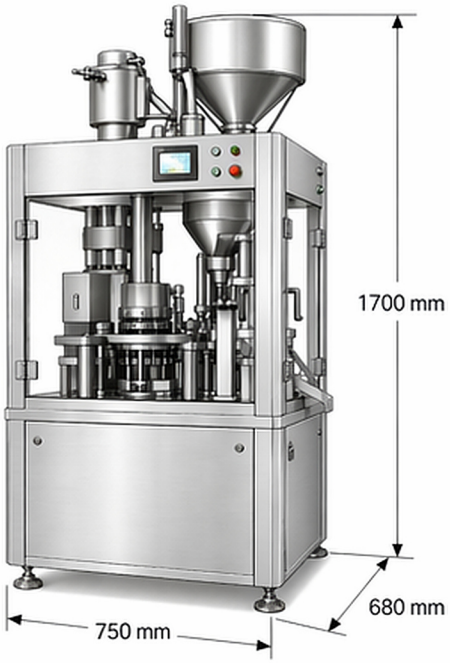


Figure 1 Overall Dimensions

2. TECHNICAL SPECIFICATIONS

Item	Specification
Overall Dimensions (L × W × H)	750 × 680 × 1700 mm
Net Weight	700 kg
Power Supply	380 V, 50 Hz, Three-phase Four-wire
Installed Power	3.75 kW
Water Supply Requirements	This machine is equipped with a water ring vacuum pump. A circulating water tank is supplied with the machine. External water supply can also be connected. Vacuum Degree: -0.02 ~ -0.06 MPa Water Flow: 250 L/h Water Pressure: 0.12 ~ 0.15 MPa Inlet Pipe Inner Diameter: 20 mm Drainage Pipe Inner Diameter: 27 mm **Note:** If an oil-free vacuum pump is configured, no water supply is required, and the vacuum degree remains unchanged. Connect the power box and air circuit as indicated under the frame to start using the machine.
Working Environment	Temperature: 21 °C ± 3 °C Relative Humidity: 40 ~ 55 %
Compressed Air Supply	During operation, the machine requires an industrial dust collector with an air flow of approximately 300 m³/h to remove reject capsules and residual powder.

3. INSTALLATION AND POWER CONNECTION

1. Install the machine on a level floor with sufficient load-bearing capacity. If installed on an upper floor, the floor load capacity should not be less than 1000 kg/m². Place rubber shock-absorbing pads under the leveling feet and use a standard level to adjust the machine.
2. Open the right-side door for inspection. Turn the fork clutch handwheel at the lower right of the machine to engage the two bevel gears. Use the hand crank to rotate the crank shaft and run the machine for 1–3 cycles. Lubricate all parts according to the maintenance requirements. After lubrication, disengage the two bevel gears and remove the hand crank.
3. Clean all parts that may contact the product with alcohol before commissioning.
4. Confirm that the supply voltage and frequency match the machine requirements before connection. The main motor is controlled by a frequency converter and the turret rotates clockwise. If the dust collector fan direction is opposite to the indicated direction, interchange any two power supply lines.
5. The vacuum pump, dust collector, vortex blower and stirring motor are controlled by unified internal circuits.

CAUTION Improper installation or power connection may cause equipment damage or personal injury. Please strictly follow the instructions above.

4. WORKING PRINCIPLE

The LKCF-200/400 Series Automatic Hard Capsule Filling Machine changes output by replacing molds and changing the number of holes.

- LKCF-200: 2 holes per station, max. output 200 capsules/min.
- LKCF-400: 3 holes per station, max. output 400 capsules/min.

During operation, empty capsules enter through the capsule hopper and feed system, then pass through separation, filling, locking, and discharge stations.

The machine operates in intermittent rotary indexing mode.

1. **Capsule Feeding and Separation**
   Empty capsules are fed and separated into cap and body.
2. **Lower Module Downward and Outward Movement**
   Lower modules move down and outward to receive bodies for filling.
3. **Powder Filling**
   Body segments are filled with pre-compressed powder.
4. **Reject Removal**
   Unqualified capsules are rejected and removed from the system.
5. **Lower Module Inward and Upward Return**
   Lower modules move inward and upward to return to the separation position.
6. **Capsule Locking**
   Cap and body are joined and locked together.
7. **Finished Capsule Ejection**
   Finished capsules are ejected and discharged from the machine.
8. **Mold Hole Cleaning**
   Mold holes are cleaned by vacuum/air to ensure filling accuracy.

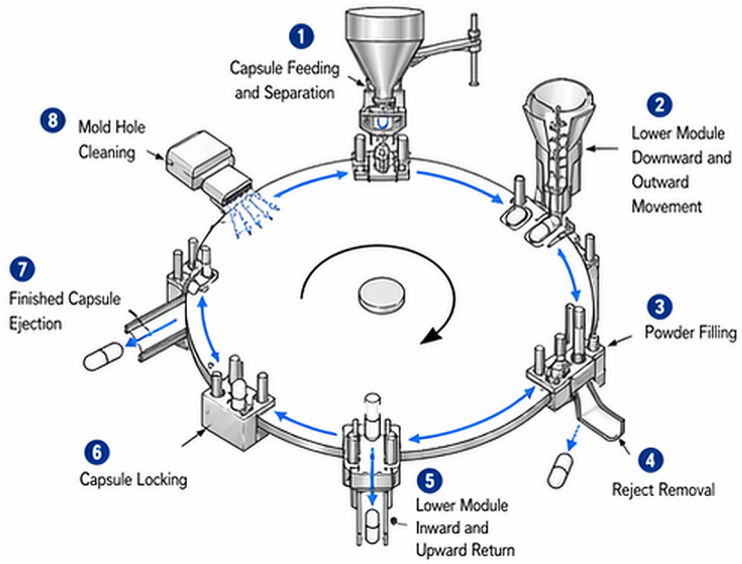


Figure 2 Capsule Movement Route (View from Top)

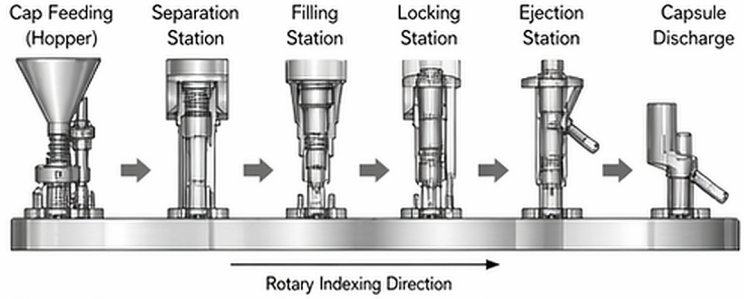


Figure 3 Main Working Stations (Side View)

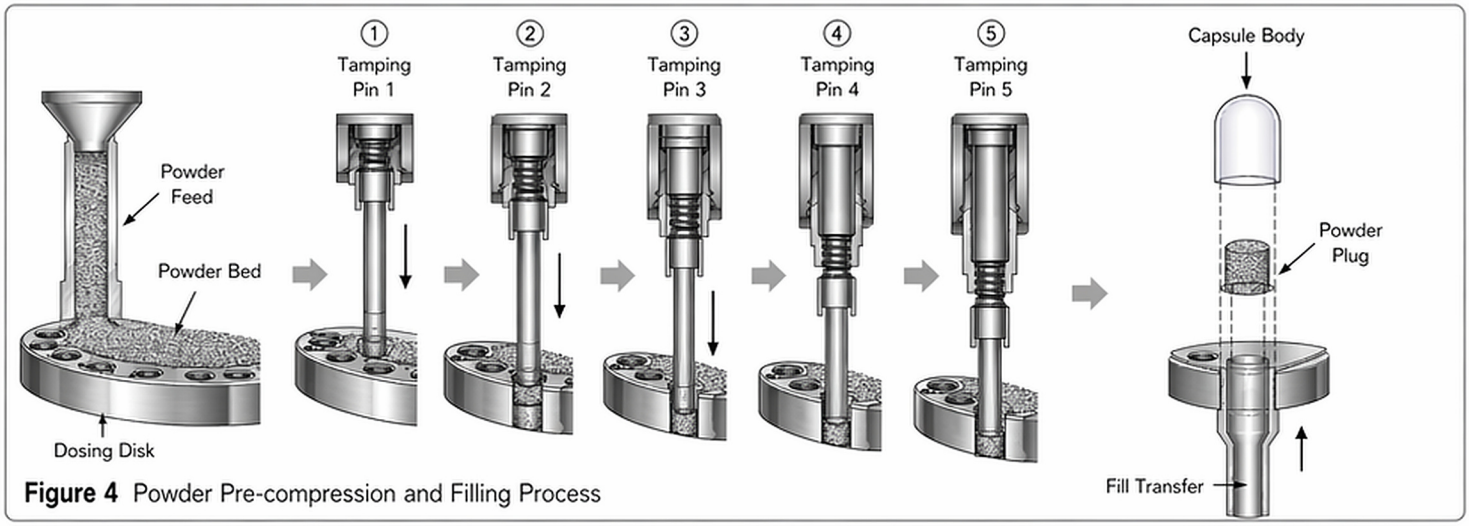


Figure 4 Powder Pre-compression and Filling Process

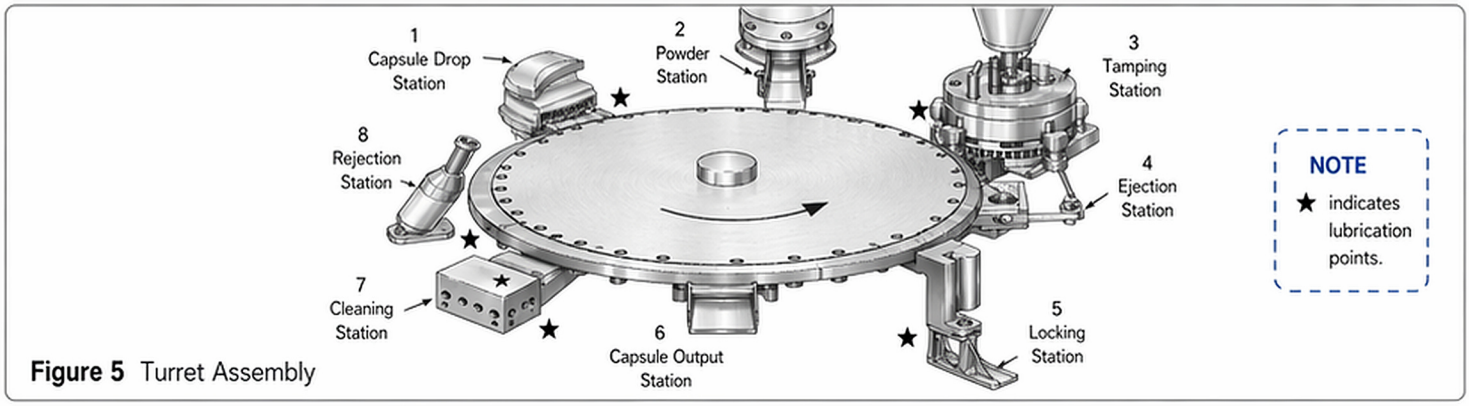


Figure 5 Turret Assembly

5. OPERATION INSTRUCTIONS

5.1 Mold Replacement

Before replacing any mold parts, switch off the main power, clean all product-contact parts, and confirm the required capsule size. Use only matching mold components for the selected capsule specification. After replacement, manually rotate the machine for inspection before start-up.

5.1.1 Upper and Lower Module Replacement

1. Open the safety door and move the turret to the replacement position.
2. Remove the upper module vertically along the locating pins.
3. Remove the lower module and clean the mounting surface.
4. Install the new modules, align Station 8, and tighten the fastening screw evenly.

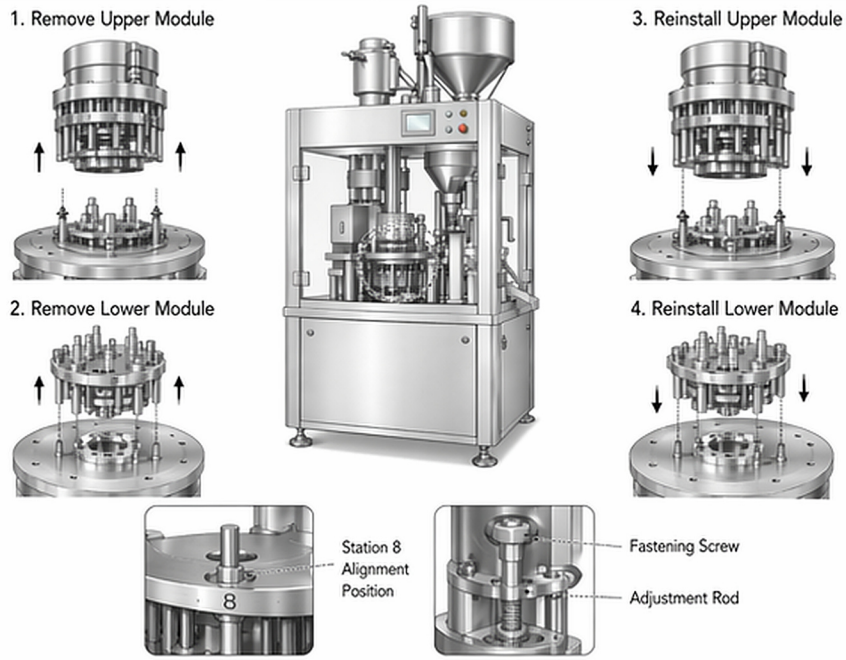


Figure 6 Upper and Lower Module Replacement

5.1.2 Replacement of Capsule Feeding Components

1. Loosen the hopper fixing screw and remove the capsule hopper.
2. Disassemble the feeding plate, rear plate, rectifying block, and fork components in sequence.
3. Install the replacement parts according to the locating pin positions and verify smooth capsule feeding.

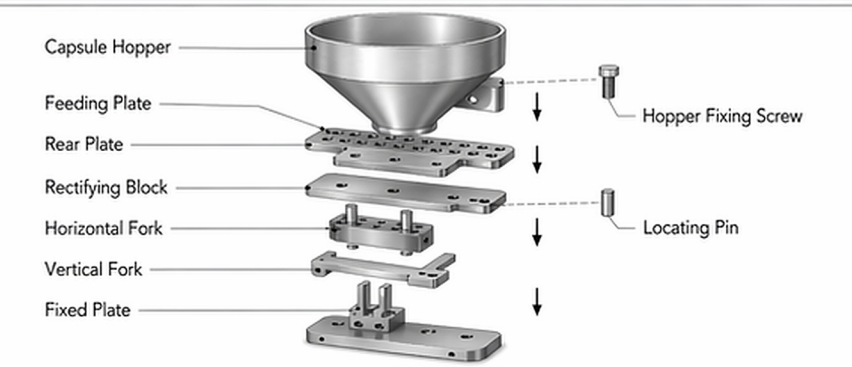


Figure 7 Capsule Feeding Assembly

5.1.3 Replacement of Dosing Disk and Filling Rod

1. Lower the filling rod and remove the cap nuts.
2. Remove the dosing disk and filling rods carefully.
3. Install the new dosing disk and filling rods, then tighten the cap nuts evenly.
4. Use the calibration rod to confirm the setting before operation.

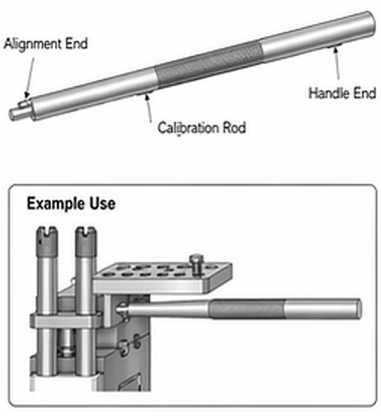


Figure 8 Calibration Rod

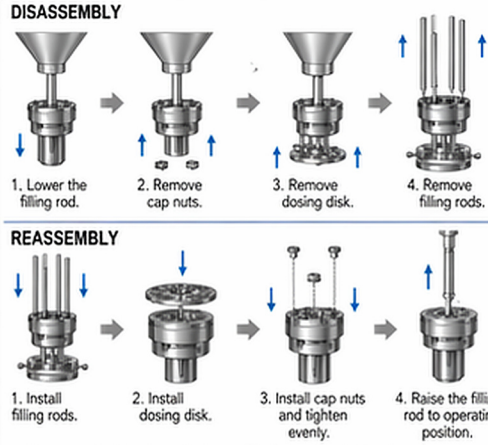


Figure 9 Dosing Disk and Filling Rod Replacement

NOTE: After mold replacement, run the machine manually for 1–3 cycles to confirm proper alignment and smooth movement before powered operation.

5. OPERATION INSTRUCTIONS

5.1.4 Adjustment After Mold Replacement

After mold replacement, key positions must be checked and fine-tuned before start-up to ensure smooth operation and accurate filling.

1. Check that the upper and lower modules are correctly aligned and that locking screws are tightened securely.
2. Verify that the capsule feeding device operates smoothly without jamming or uneven movement.
3. Confirm that the dosing disk and filling rods are correctly installed and move without obstruction.
4. Manually rotate the turret through 1–3 cycles to inspect for interference, abnormal noise, or binding.

Note: Run the machine manually for 1–3 cycles before powered operation.

5.2 Machine Adjustment

The following adjustments should be performed only by trained personnel. Ensure the machine is stopped and power is isolated where necessary before making any adjustments.

5.2.1 Adjustment of Capsule Hopper Outlet

1. Check the position and gap of the capsule hopper outlet to ensure it is centered above the feed chute.
2. Loosen the adjustment point fasteners and fine-tune the mounting bracket position to obtain the proper outlet gap.
3. Tighten the fasteners and test capsule feeding manually to ensure smooth feeding without jamming or double capsules.

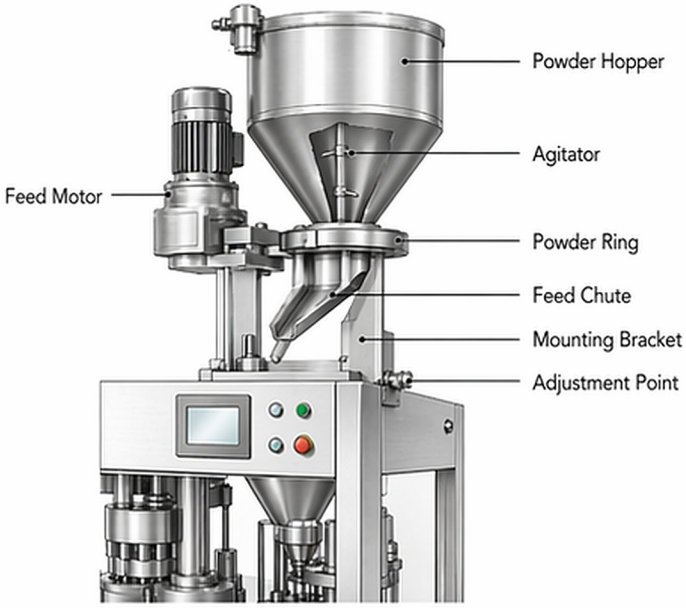


Figure 10 Feeding Device

5.2.2 Adjustment of Capsule Closing Device

1. Check the closing/locking action to ensure the tamping pins engage and release smoothly.
2. Adjust the cam or linkage position to synchronize the movement of the dosing disk and closing mechanism.
3. Confirm that the capsule locking is stable and uniform, and that capsules are not damaged or deformed during the closing process.

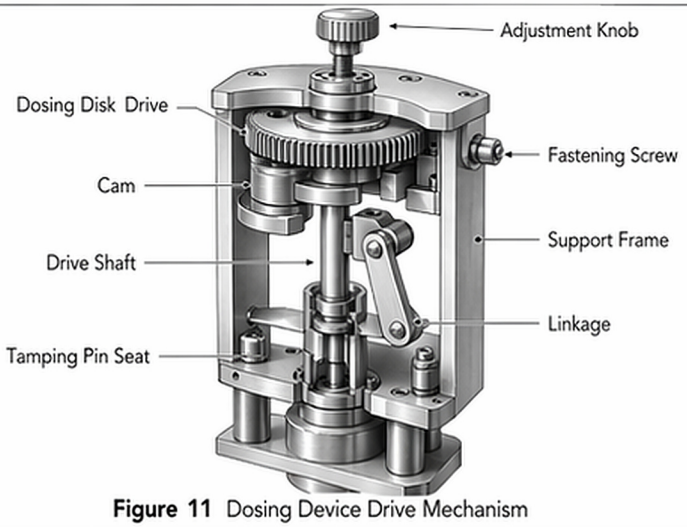


Figure 11 Dosing Device Drive Mechanism

NOTE: Adjustment work should be performed carefully. Incorrect settings may cause capsule damage, poor filling quality, or unstable machine operation.

1 OVERVIEW

The LKCF-200/400 Series Automatic Capsule Filling Machine is designed to fill powders, granules or small pellets into hard gelatin capsules.

The machine adopts a pin-type filling system with intermittent operation. It is driven by a frequency converter for stepless speed control and can automatically complete capsule feeding, capsule separation, filling, (reject removal), locking and finished product discharge.

Developed by our company with advanced technology at home and abroad and combined with practical requirements in China, the machine complies with GMP standards throughout the production process. Its main technical indexes are at the leading level in China.

By installing corresponding molds and devices, the machine can fill hard capsules sizes 00# to 5# and safety capsules A, B, C, D and E.

Since its launch, it has been widely favored by pharmaceutical research institutes, hospitals and small pharmaceutical factories.

Figure 1 Overall Dimensions

2 TECHNICAL SPECIFICATIONS

Item	Specification
Overall Dimensions (L × W × H)	750 × 680 × 1700 mm
Net Weight	700 kg
Power Supply	380 V, 50 Hz, Three-phase Four-wire
Installed Power	3.75 kW
Water Supply Requirements	This machine is equipped with a water ring vacuum pump. A circulating water tank is supplied with the machine. External water supply can also be connected. Vacuum Degree: -0.02 ~ -0.06 MPa Water Flow: 250 L/h Water Pressure: 0.12 ~ 0.15 MPa Inlet Pipe Inner Diameter: 20 mm Drainage Pipe Inner Diameter: 27 mm **Note:** If an oil-free vacuum pump is configured, no water supply is required, and the vacuum degree remains unchanged. Connect the power box and air circuit as indicated under the frame to start using the machine.
Working Environment	Temperature: 21 °C ± 3 °C Relative Humidity: 40 ~ 55 %
Compressed Air Supply	During operation, the machine requires an industrial dust collector with an air flow of approximately 300 m^3/h to remove reject capsules and residual powder.

3 INSTALLATION AND POWER CONNECTION

1. The machine frame must be installed on a level floor with sufficient load-bearing capacity. If installed on an upper floor, ensure that the floor load capacity is not less than 1000 kg/m². Place rubber shock-absorbing pads under the leveling feet and use a standard level to adjust the machine table to be level.
2. Further Inspection: Open the right side door. Turn the fork clutch handwheel at the lower right of the machine to engage the two bevel gears (Note: the main motor is in a protection state and cannot start). Use the hand crank to rotate the crank shaft and run the machine for 1–3 cycles. Lubricate all parts according to the maintenance requirements. After lubrication, turn the fork clutch handwheel to disengage the two bevel gears and remove the hand crank.
3. To prevent contamination, clean all parts that come into direct contact with the product using alcohol.
4. After confirming that the power supply voltage and frequency match the machine requirements, connect the power. The main motor speed is controlled by a frequency converter, and the turret rotates clockwise. Check the direction of the dust collector fan. If it is opposite to the indicated direction, interchange any two power supply lines.
5. The vacuum pump, dust collector, vortex blower and stirring motor are all controlled by unified internal circuits.

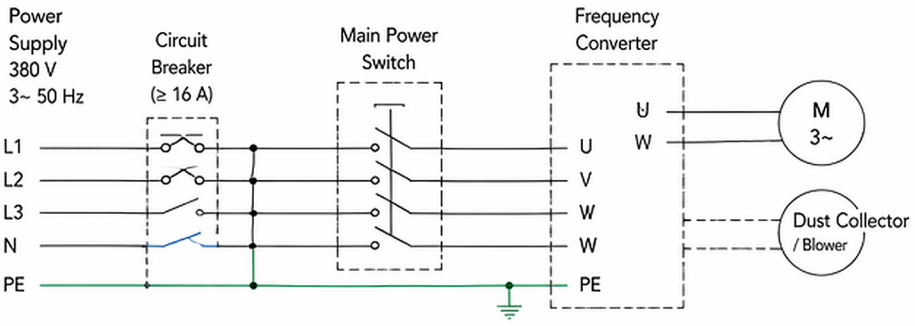
Figure 1 Machine Installation Reference

CAUTION Improper installation or power connection may cause equipment damage or personal injury. Please strictly follow the instructions above.

GROUND CONNECTION

The equipment must be reliably grounded. Connect the ground terminal (marked ⏚) at the rear of the machine to the plant grounding system.

POWER CONNECTION DIAGRAM



Terminal	Description
L1 / L2 / L3	Three-phase live line
N	Neutral line
PE	Protective earth (ground)
U / V / W	Output to main motor

Note: The machine power supply is 380 V, 50 Hz, three-phase four-wire. Ensure stable voltage and proper grounding.

6. START-UP AND OPERATION

6.1 Pre-start Inspection

Perform the following inspections before starting the machine to ensure safe operation and stable performance.

1. Ensure all parts are clean and free from residual powder or foreign objects.
2. Confirm that the correct mold set and capsule size are installed and locked in place.
3. Check that all lubrication points are properly lubricated.
4. Verify that vacuum and compressed air are connected correctly and within the specified pressure range.
5. Confirm the powder hopper is filled and the feed auger operates smoothly without blockage.

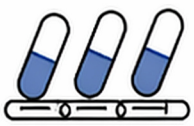
Verify vacuum, compressed air, and powder feed conditions before continuous operation.

6.2 Start-up Procedure

Follow the steps below to start the machine.

1. Power on the main switch and control system. Check for alarm messages.
2. Set the operating parameters including capsule size, filling weight, and machine speed on the HMI.
3. Perform manual trial rotation and low-speed operation to check for smooth movement and proper coordination.
4. Load capsules into the capsule hopper and ensure proper separation. Add powder to the powder hopper and start the powder feed.
5. Switch to automatic mode and gradually increase speed to the target production rate.

Operation Check Points

 Vacuum	Confirm vacuum level is within the specified range and stable during operation.
 Compressed Air	Check air pressure is within the specified range and supply is stable.
 Powder Feed	Ensure powder feeds smoothly without bridging or blockage.
 Capsule Feeding	Confirm capsules are separated correctly and feeding is stable.

6.3 Normal Production Monitoring

During operation, monitor the following items.

- Check capsule separation and filling quality regularly. Remove defective capsules promptly.
- Monitor machine output, operation status, and abnormal noise or vibration.
- Observe vacuum level, powder feed condition, and air pressure stability. Address any abnormalities immediately.

7. MAINTENANCE AND CLEANING

7.1 Daily Cleaning

- Clean all product-contact parts after each shift.
- Remove residual powder from the dosing area, capsule path, and discharge outlet.
- Wipe the machine surface with a clean soft cloth.
- Keep the capsule hopper and powder hopper clean and dry.

7.2 Lubrication Points

- Lubricate the turret cam and guide surfaces regularly.
- Apply suitable grease to moving joints and transmission points.
- Check lubrication condition before prolonged continuous operation.

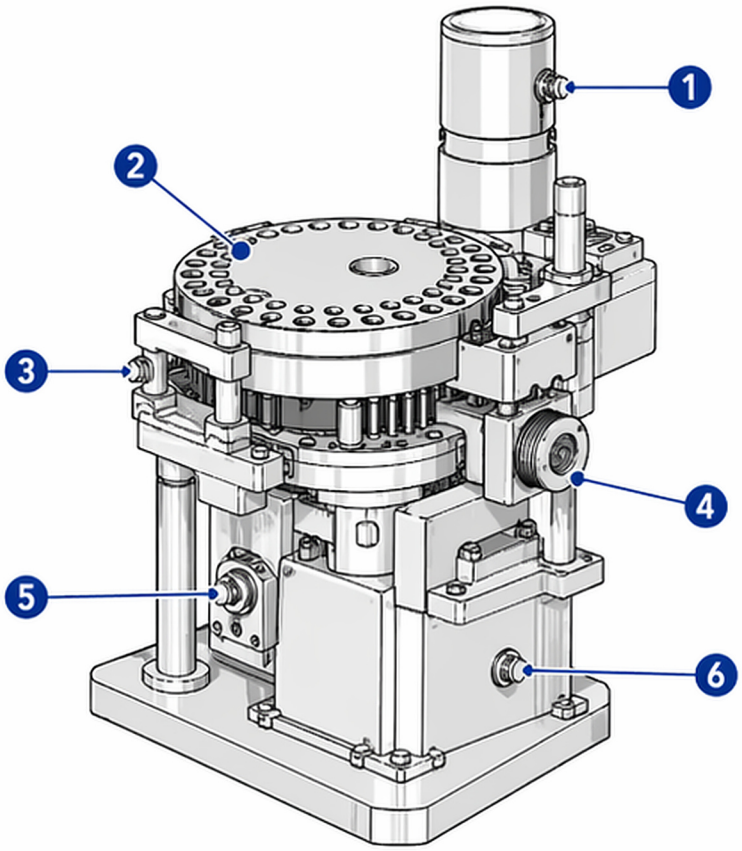


Figure 22. Main Lubrication Points

7.3 Routine Maintenance Schedule

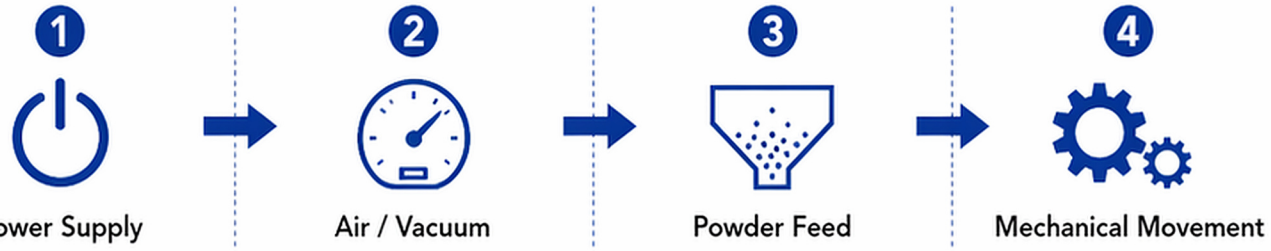
Item	Frequency	Action
1. Sealing and contact parts	Daily	Clean and inspect for wear
2. Lubrication points	Weekly	Apply grease and verify movement
3. Electrical and pneumatic connections	Monthly	Check fastening and condition

WARNING Disconnect the power supply before cleaning, lubrication, or maintenance work.

8. TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
1. Capsule separation failure	Incorrect capsule size setting; separation clearance improper; worn separation components	Check capsule size setting; readjust separation mechanism; inspect and replace worn parts if necessary.
2. Low filling weight	Insufficient powder supply; filling pin setting too low; poor powder flow	Refill powder; adjust filling pin height; improve powder flow condition.
3. Powder leakage	Seal ring worn; scraper setting incorrect; excessive powder accumulation	Inspect and replace seal ring; readjust scraper; clean excess powder.
4. Capsule locking failure	Locking mechanism out of position; capsule body/cap mismatch; abnormal turret timing	Check locking position; verify capsule quality; inspect timing and readjust.
5. Vacuum suction insufficient	Vacuum line leakage; separator blocked; vacuum source unstable	Check hose connections; clean separator/filter; verify vacuum source.

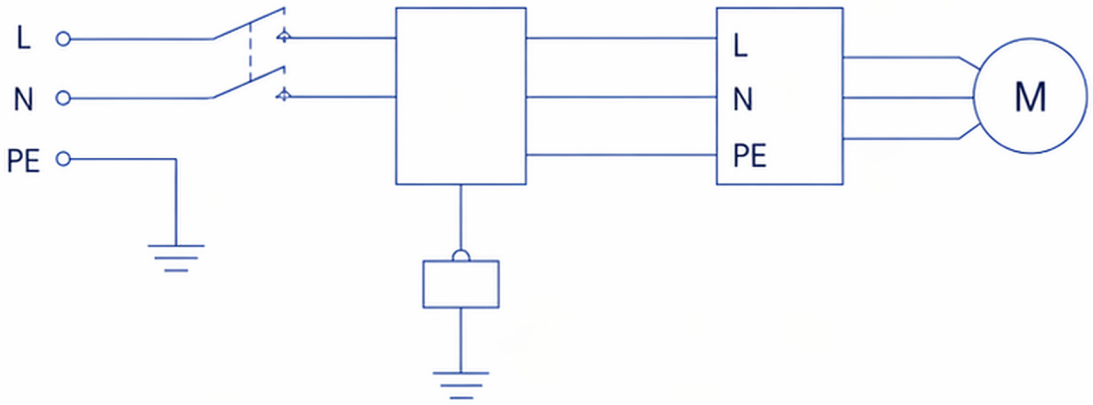
Basic Inspection Sequence



NOTE If the fault cannot be eliminated, stop the machine and contact qualified service personnel.

9. ELECTRICAL SCHEMATIC

**Electrical Schematic –
requires engineering confirmation**



The final wiring diagram must match the delivered machine configuration, voltage, and installed options. Refer only to the engineering-approved schematic supplied with the machine.

10. SUPPLIED TOOLS AND STANDARD ACCESSORIES

No.	Item	Quantity	Remarks
1	Tool Kit	1 Set	Standard service tools
2	Vacuum Hose	1 Pc	For vacuum connection
3	Seals	1 Set	Standard wearing parts
4	Fuses	2 Pcs	Electrical spare parts
5	User Manual	1 Copy	This document

NOTE Please check all supplied items against the packing list upon receipt.

11. PACKING LIST AND RECEIPT INSPECTION

No.	Item	Quantity	Inspection Result	Remarks
1	Automatic Capsule Filling Machine (LKCF Series)	1 Set	☐ OK / ☐ NG	Main equipment
2	Vacuum Pump	1 Set	☐ OK / ☐ NG	Installed / external type
3	Dust Collector / Air System	1 Set	☐ OK / ☐ NG	Standard configuration
4	Tool Kit	1 Set	☐ OK / ☐ NG	Standard service tools
5	Spare Parts & Sealing Components	1 Set	☐ OK / ☐ NG	O-rings / seals
6	User Manual	1 Copy	☐ OK / ☐ NG	This document

Open Items Requiring Verification

- Electrical schematic details
- Final delivered machine configuration
- Power supply (Voltage / Frequency) confirmation
- Optional accessories, if applicable

Inspection Guidelines

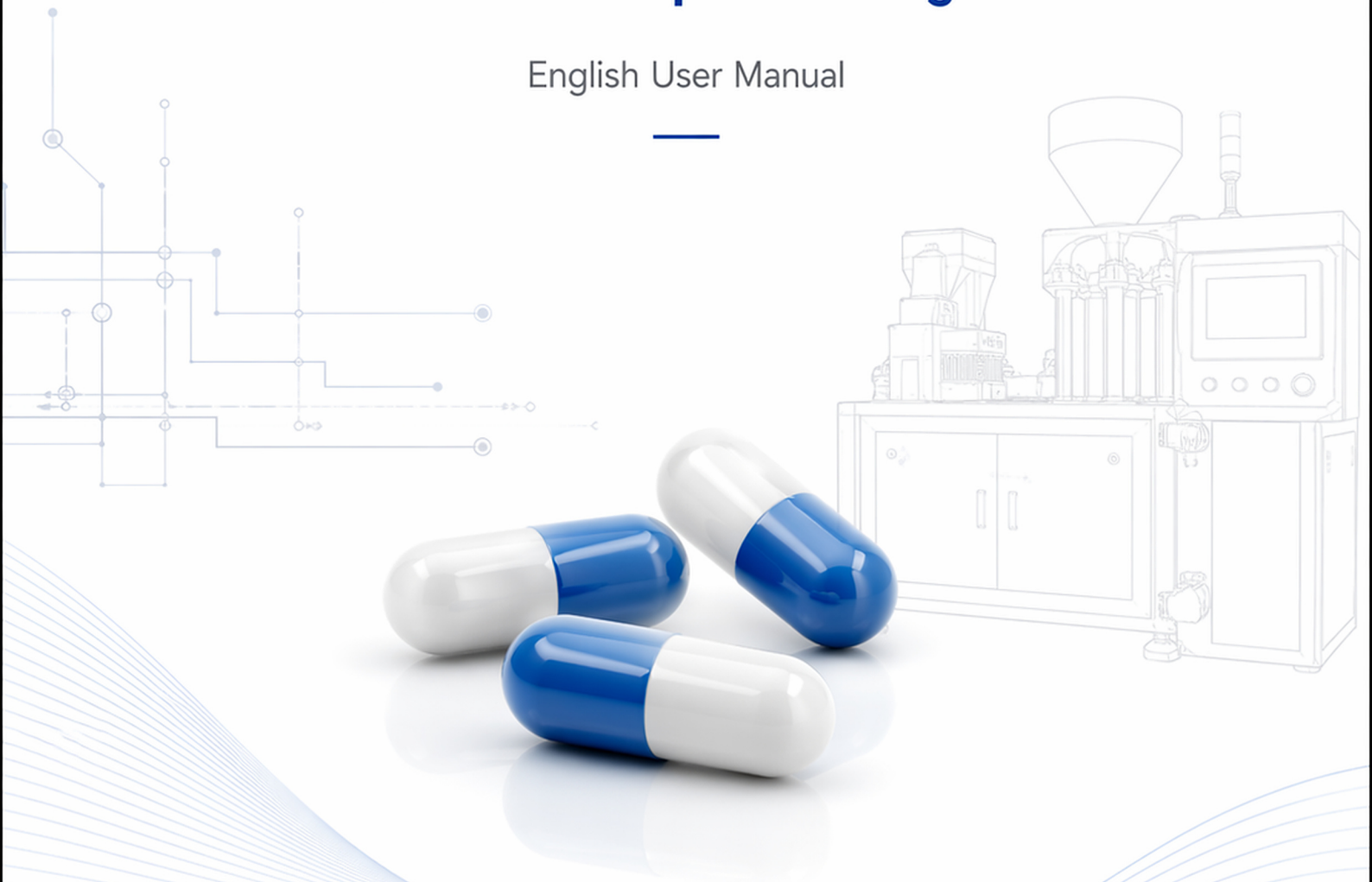
- Verify all items against the packing list before installation.
- Check for transport damage and missing parts.
- Record inspection results for future reference.

NOTE Please report any missing or damaged items within 7 days after receipt.

LKCF

LKCF-200/400 Series
Automatic Hard Capsule Filling Machine

English User Manual



Document Version: V1.0

For technical support, please refer to the supplier contact information.